

## **SB-300**

### **Operator's Manual**

#### ***Hand Held-Accuracy with a 40 Amp Load***

The SB-300 is a hand-held tester that is the auto industry's answer to portability in a professionally accurate battery load tester.

# CONGRATULATIONS!

You have purchased one of Auto Meter's hand-held Battery, Starting and Charging System Analyzers. It is designed to test each component of a vehicle's electrical system with speed and accuracy. If you should have any questions about your tester, testing procedures, or service see page 20 for contact information.

## SB 300

Load Test Capacity .....	40 Amp
Battery Sizes .....	200-1600 CCA
Digital Display .....	1" x 2.5" - 4 line x 16 character
Volt Ranges.....	Digital 0-30
Cooling .....	Heat Sink Ventilation
Leads .....	Load Amp-2 1/2 ft., 16 Gauge
Size .....	3 3/4" x 6 3/4" x 1"
Memory .....	stores the last 50 tests
Internal Battery.....	9 Volt Alkaline
<i>Optional AC-22</i> .....	Infrared printer and carrying case
<i>Optional AC-21</i> .....	Carrying case only
<i>Optional AC-12</i> .....	PC Interface adapter cord
Weight.....	1.34 lbs.

## What to Expect from the SB-300:

***Immediately determine battery.*** The SB-300 is a portable full-featured menu-driven battery tester that provides quick, professional load results using Auto Meter's Pulsed Load. Preliminary quick battery checks will increase charging productivity. The SB-300 is user friendly. It tells you what to do. It is professionally accurate. Detailed test results are LCD displayed after each test and can be reviewed and/or printed from memory.

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**Note:** The SB-300 performs a preliminary check, load tests 6 volt and 12 volt. The SB-300 automatically identifies the appropriate voltage and displays the menu selection and instructions needed for that system.

## SAFETY

- Carefully read all operating instructions before using the SB-300
- Wear proper protection when working around batteries.
- Be sure each test is complete before removing load clamps to prevent arcing and potential explosion from battery gases. Keep sparks, flames, or cigarettes away from batteries.
- Keep hair, hands, and clothing as well as tester leads and cords away from moving blades and belts.
- Provide adequate ventilation to remove car exhaust.
- In extremely cold temperatures, check for frozen electrolytic fluid before applying load. Do not attempt to Load Test or charge a battery under 20 degrees. Allow the battery to warm to room temperature before testing or charging.
- **Warning!** Never attach the SB-300 to a battery that is connected to any other tester or charging unit. Damage may result.



## CAUSE OF BATTERY FAILURE

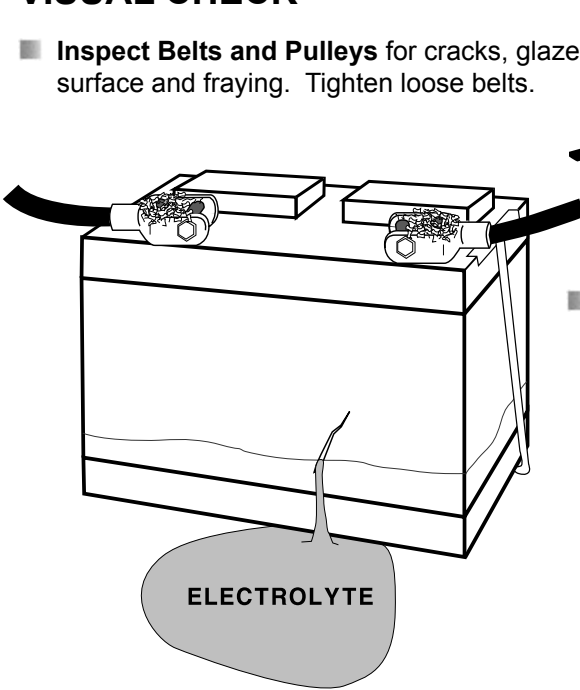
- **Incorrect Application:** Wrong size battery may have inadequate cold cranking Amp rating for original vehicle specifications.
- **Incorrect Installation:** Loose battery hold-downs cause excessive vibration, which can result in damage to the battery plates.
- **Improper Maintenance:** Low electrolytic fluid and corrosion on battery connections can greatly reduce battery life and affect battery performance.
- **Age of Battery:** If the date code on the battery indicates it is old, the failure may be caused by natural causes.
- **Overcharging:** Overcharging caused by a high voltage regulator setting or incorrect battery charging can cause excessive gassing, heat and water loss.
- **Undercharging:** Undercharging caused by a faulty charging system or low voltage regulation can cause lead sulfate to gradually build up and crystallize on the plates greatly reducing the battery's capacity and ability to be charged.

# INSPECTION

- Valid automotive electrical system testing depends on all the components being in good operating condition. In addition, the battery **MUST** have sufficient charge for testing. Carefully perform the following before attempting any electrical diagnosis.

## VISUAL CHECK

- **Inspect Belts and Pulleys** for cracks, glazed surface and fraying. Tighten loose belts.



- **Inspect Battery** for terminal corrosion, loose or broken posts, cracks in the case, loose hold-downs, low electrolyte level, moisture and dirt around the terminals.

- **Inspect Starting System.** Check starter, solenoid, and regulator for loose connections, loose mounts and frayed or cracked wires.
- **Important Note:** A known defective battery must be replaced before proceeding.

# CONTROLS AND FUNCTIONS

## LCD:

Displays menus and test results.

## KEYS:

When each key is pressed, a beep sounds to assure contact has been made.

### On/Off Key:

This is the manual on/off key. The display will show "READY TO CONNECT!" when the unit is turned on.

### Y Enter Key:

This key selects the next menu, the cursor line item and answers 'yes' to a test progression.

### +Up Key:

This key moves the cursor up in order to select a menu line item and increments certain displayed values.

### -Down Arrow Key:

This key moves the cursor down in order to select a menu line and decrements certain displayed values.

### N Esc Key:

This key cancels a test or progression. It also returns to the previous menu.

### Print Key:

Point the SB-300 infrared print light towards the *Optional AC-22* infrared printer receiver and press the print key. Test results will be printed.



### Infrared Print Light:

When the print button is pressed infrared data will be transmitted to the printer when pointed in the direction of the printer (up to 40 ft.).

### PC Download Jack:

By removing the boot the adapter cord AC-12 can be inserted.

# MAINTENANCE

## CLAMP MAINTENANCE:

- Both jaws of each clamp must firmly engage the battery terminal. The wire

CHECK OFTEN FOR LOOSE JAWS  
OR DAMAGED INTERNAL INSULATOR

soldered to the copper insert jaw must be insulated from the other wire soldered to the opposite handle. This insulation is required so that one can read the Amps and the other can read the Volts. Damaged clamps or loose wires will affect readings. Make sure the copper jaw insert is properly insulated from the clamp and the clamps are clean and in good repair.

Over time the battery clamps will need to be replaced if any of the following are indicated:

- CCA values seem extreme.
- If there is continuity between the copper insert and the clamps.
- If there is excessive damage or corrosion to the cables or clamps.

## CLAMP and BATTERY REPLACEMENT

- Remove the screws from the back cover.
- Separate top and bottom cover and open like a book leaving the ribbon in contact with the PC board that will remain with the back cover.
- **CLAMPS:** Remove the cables and strain relief. With the new load clamp leads pointing down; insert the new strain relief into the back cover. Make sure the red clamp wires are attached to the left two screws of the green screw terminal (labeled POS) and the black clamp wires are connected to the right two screws (labeled NEG). It does not matter if either of the two red clamp wires is switched. The same applies to the two black clamp wires. Just make sure the red clamp wires are to the left (POS) and the black clamp wires are to the right. (NEG)
- **BATTERY:** Remove the battery and replace with a 9 Volt battery. Match the (+) on the new battery with the (+) on the PC board.
- Reverse the procedure to assemble the unit.

# 1

## HOOK UP

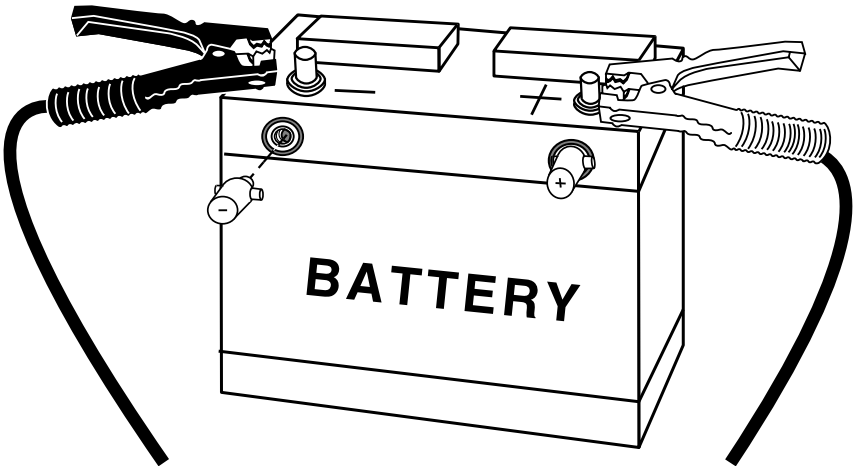
Press the On/Off button: Connect the clamps as instructed on the LCD.

```
AUTO METER
SB 300
BATTERY TESTER
READY TO CONNECT
```

```
>ENTER BATTERY
TEMP 70F
USE +/-
'Y' TO CONTINU
```

Enter the approximate battery temperature in degrees Fahrenheit or Celsius then press (Y Enter).

**Note:** Go to the setup to change temp scale to Celsius. The temperature request only appears once for each battery tested. If the clamps are disconnected you will be prompted again to begin a new battery test.



**Note!** Take special care when connecting to battery side terminals. If necessary use a side post adapter to prevent thread damage. When testing dual post batteries always connect load clamps to the post to which the system is attached. If a load test is made from a post connection and the alternator is mounted to side terminals a battery load test can be completed, but a continuity problem may still be in the side terminals when testing the alternator.

### CONNECTION ERRORS

- If the clamps are reversed the Reversed Connection screen will flash.
- If one or both of the clamps are not in complete contact CHECK CONNECTIONS! will flash.



# 2

## PRELIMINARY CHECK

If connections are proper the following will be displayed:

```
CHECKING BATTERY  
PLEASE WAIT...
```

After the battery check is complete, similar to one of the following sample results will be displayed.

```
PRELIM. CHECK  
12.24V CHRG 50%  
EST. CCA 1100  
'Y' TO CONTINUE
```

Press (Y Enter) and continue the load test.

```
CHARGE AND RETEST  
10.95V CHRG 5%  
EST. CCA 300  
'Y' TO CONTINUE
```

The battery needs charging before a Load Test can be made.

If you continue to the Load Test on a battery under 11.0 Volts. You may be asked the following during the sequence:

```
>HAS BATTERY  
BEEN CHARGED?  
  
'N' OR 'Y'
```

# 3

## BATTERY LOAD TEST

From the Preliminary Check the following will appear:

```
>ENTER RATED CCA  
600  
USE +/-.  
'Y' TO CONTINUE
```

You can also select **Battery Test** from the main menu and then press (Y Enter).

```
>BATTERY TEST  
STARTER TEST  
ALTERNATOR TEST  
OTHER
```

Press the (+Up) or (-Down) key to increment or decrement to the rated CCA of the battery.

For ease of adjustment the estimated CCA rating from the battery check will appear unless you have set a default CCA rating in the SETUP menu. Press (Y Enter) to continue test.

```
>ENTER BATTERY  
TEMP 70F  
USE +/-.  
'Y' TO BEGIN
```

**Note:** Enter the approximate battery temperature in degrees Fahrenheit or Celsius. This request will only appear if the load clamps have been disconnected since the preliminary check.

During the test the following will appear.

```
TESTING BATTERY  
PLEASE WAIT...
```

Wait for test results.

After the Load Test is completed one of the following sample results will appear.

```
#32 12V BATTERY  
GOOD BATTERY.  
12.84V CHG 100%  
EST CCA 650
```

Ready for service.

```
#32 12V BATTERY  
MARGINAL BATTERY.  
12.84V CHG 100%  
EST CCA 450
```

If the battery is marginal, it should be replaced under adverse driving conditions.

```
#33 12V BATTERY  
BAD BATTERY  
12.45V CHG 75%  
EST CCA 120
```

Replace Battery

```
#34 12V BATTERY  
GOOD NEEDS CHRGE.  
12.24V CHG 50%  
EST CCA 600
```

Charge and place into service.

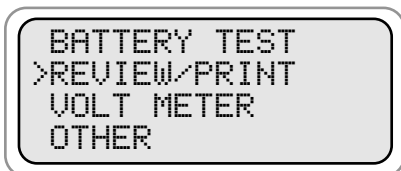
```
#35 12V BATTERY  
CHARGE AND RETEST  
12.06V CHG 25%  
EST CCA 320
```

Battery did not have a sufficient charge for a complete Load Test. Charge and retest.

# 4

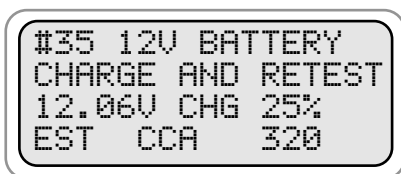
## REVIEW TESTS

From the main menu select REVIEW/PRINT.



Press (Y Enter).

The last test will be displayed.



Press (+Up) or (-Down) key to select the desired test.

## OPTIONAL INFRARED PRINTER

The optional AC-22 printer. An invisible infrared beam links the SB-300 to the printer from up to 40 ft away. No connection cords are needed. For more instructions on how to operate the printer consult the printer manual.

Printer Type ----- Thermal Printing  
Paper ----2.25 in x 80 ft. Roll Thermal Paper (included)  
Power ---- AC and Cigarette Lighter adapters (included)

## PRINTING TEST RESULTS

Point the SB-300 in the direction of the AC-22 printer (in or out of the case) with the printer's IR receiver pointed in the direction of the SB-300. Press (Print). You should be within 40 ft of the printer. Wait for the screen to clear before moving the SB-300. It takes a moment to send all the test data. The SB-300 also operates the AC-14 printer installed in Auto Meter's XTC-150 tester/charger or BVA-2000 heavy-duty tester/analyzer.

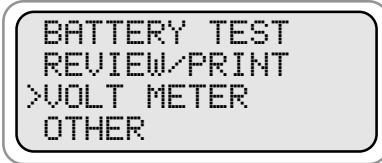
- Make sure the Infrared Printer is properly set up.
- After a test is made with the SB-300 make sure the results are displayed on the LCD.
- Point the SB-300 in the direction of the Infrared Printer (within 40 ft.)
- Press the <Print> key and the test results will be printed.
- Depending upon the test made the printer will sometimes yield more information than the LCD.
- **Multiple Test Printing:** Pressing the print button repeatedly (up to six times) will automatically print the test in review and previous tests.



# VOLT METER

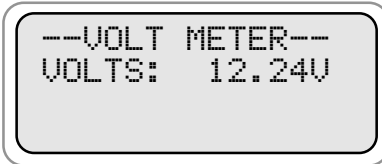
Unusual problems with a battery and the need to localize loss of current can be determined with the manual volt reading.

From the Other Menu select **Volt Meter**.



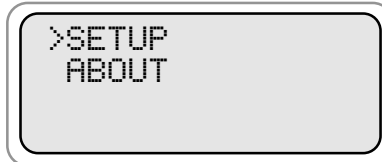
Press (Y Enter)

The following will be displayed.

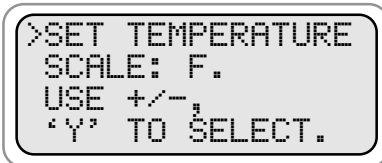


# OTHER MENU ITEMS

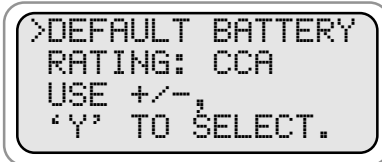
From the main menu select **OTHER**



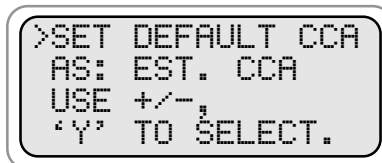
Then select **SETUP**



You can select F for Fahrenheit or C for Celsius.



You can select the default battery rating in: CCA, MCD, CA, EN, IEC, DIN, JIS, or NONE ("NONE" prompts for a rating each time a test is ran).



You can also select the default rating to be the estimated rating from the preliminary check or a particular amount such as 550 CCA.

# PC INTERFACE

**1.** From the main menu select **Other** then **About**. The version will be displayed. Press the **Down (-)** key to get the download instruction screen. Using Auto Meter's optional adapter cord AC-12 insert the stereo plug into the jack on the SB-300 (see page 6) and then plug the serial adapter into a free serial port on the rear of your computer.

**Note:** Most computers are configured with at least one serial port (identified as COM 1), and some have a second serial port, usually identified as (COM 2). Check your computer manual to locate and identify a serial port connector. Even if you have a physical COM port you need to make sure it is working properly before you proceed. Consult your computer manual. If your computer serial port is configured for 25 pin you will need to obtain an adapter from your computer store. If your computer does not have an available serial port and you're planning on using *Windows HYPER Terminal* as illustrated below, you will need to buy and install an adapter card with a serial port.

## USING WINDOWS 98/2000/NT/XP

**Note:** The SB-300 will interface with any basic (ANSI) terminal emulation software. Most operating systems contain a program that will do this. Following are instructions for Windows 98. For other operating systems consult the Manual for that system.

## 2. Opening Windows HyperTerminal:

- Select Windows "Start"
- Then "Programs"
- Then "Accessories"
- Then "Communications"
- Then "Hyper Terminal"
- Double Click Hypetrm.exe Application
- Type in a name for your connection
- Select an icon for future identification
- Select OK
- Select the COM port number you have previously identified in step 1.
- Select OK and select the following from the pull down menus:
  - Bits per second 9600
  - Data bits 8
  - Parity None
  - Stop Bits 1
  - Flow Control Hardware
- Select OK



# DOWNLOAD TEST INFORMATION

## 3. PC Screen Menu

- If the SB-300 is properly connected to your PC and the LCD shows "CONNECT ANALYZER TO A PC" the menu should automatically be displayed in Hyper Terminal.
- Press 1 to download the last 50 tests.  
To save the information displayed see "Capture text into Microsoft Excel." See SB-300 test labels below for identification.
- Press Enter to return to Menu.
- Press Enter to return to Menu.
- Press 3 to Exit.



SB-300  
Test Labels

Battery

Test #	Test Type	Beginning Voltage	Loaded Voltage

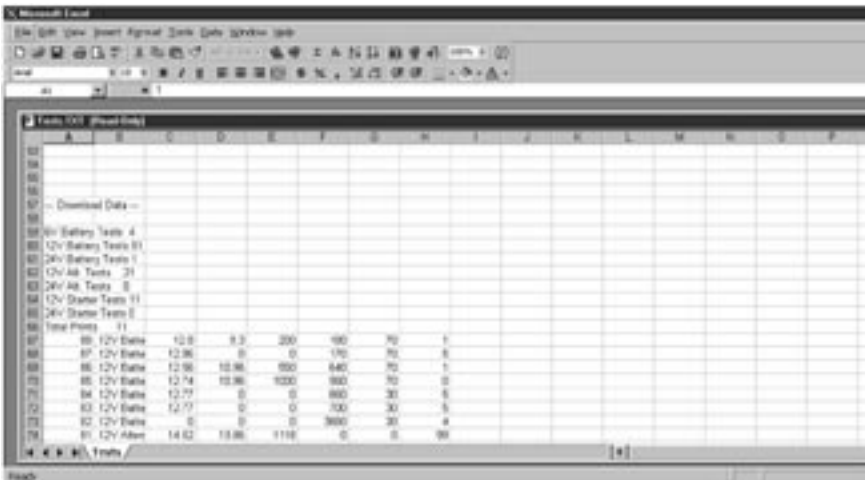


# CAPTURING TEXT

## 4. Using Microsoft Excel

**Note:** For other software applications consult your software manual.

- Make sure menu is displayed as shown in illustration page 20 #3.
- Select "Capture Text" in the Transfer Menu.
- Type in **c:\my documents\download.txt** and then select Start.
- Press "1" to download. When finished select "Capture Text" again from the Transfer Menu then select "Stop".
- Launch Microsoft Excel and select "Open File".
- Under "Files of Type" at the bottom of the open file window select All Files (\*.\*)).
- Highlight your **download.txt** file then select "Open".
- Select "Delimited" and start at row 1 then "Next"
- Select "Comma" then "Next"
- Under Column Date Format select "General" then "Finish"



- After the file is loaded you can delete unwanted rows and format columns as desired. The following are labels for identifying the 8 columns of information.

Rated CCA	Final Est. CCA	TEMP	Condition: 0 = BAD 1 = GOOD	3 = GOOD NEEDS CHARGE 4 = CHARGE AND RETEST 5 = CONTINUE TESTING 6 = MARGINAL
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# NOTES

# LIMITED WARRANTY

## **12 MONTHS FROM DATE OF PURCHASE- CABLES 90 DAYS**

The manufacturer warrants to the consumer that this product will be free from defects in material or workmanship for a period of twelve (12) months from the date of original purchase.

Products that fail within this 12 month warranty period will be repaired or replaced at the manufacturer's option to the consumer, when determined by the manufacturer that the product failed due to defects in material or workmanship. This warranty is limited to the repair or replacement of parts and the necessary labor by the manufacturer to effect the repair or replacement of the product. In no event shall the manufacturer be responsible for special, incidental or consequential damages or costs incurred due to the failure of this product.

Improper use, accident, water damage, abuse, unauthorized repairs or alterations voids this warranty. The manufacturer disclaims any liability or consequential damages due to breach of any written or implied warranty on its test equipment.

## **WARRANTY AND SERVICE INFORMATION**

Warranty claims to the manufacturer's service department must be transportation prepaid and accompanied by a dated proof of purchase. This warranty applies only to the original purchaser and is non-transferable. Freight damage incurred during return shipments is not covered under this warranty. It is the responsibility of the shipper (the customer returning the Test Equipment) to package the tester properly to prevent any damage during return shipment. Repair costs for such damages will be charged back to shipper (customer returning the Test Equipment). Protect the product by shipping in original carton or add plenty of over-pack cushioning such as crumpled up newspaper.



## ***How to use this manual if viewed in full screen format.***

- ***Click on this page or any page being viewed and you will return to the Table of Contents hyperlinks.***
- ***You can also use your left arrow to navigate back and your right arrow to navigate forward.***
- ***Press Ctrl P to print. Be sure to select desired pages or print all.***
- ***To return to this page navigate to last page.***
- ***Press ESC to Exit full view.***



### ***Auto Meter Products Inc.***

350 West Center Street  
Pleasant Grove, Utah 84062

Service (801) 785-0051 ext. 223  
Toll Free (866) 883-TEST (8378)  
Fax (801)785-8699  
[www.autometertest.com](http://www.autometertest.com)