AutoMeter®
TEST EQUIPMENT



Xpress XTC-150
Operator Manual

Xpress Testing - Fast Charging

The Xpress XTC-150 is the ultimate load tester and battery charger with fast and accurate automated testing and charging for the professional.

CONGRATULATIONS!

You have purchased Auto Meter's Xpress XTC system designed to load test a battery and automatically provide a fast charge when needed. The system is fully automated with LCD readout for menu instructions and test results and LED lights for unattended distance viewing. If you should have any questions about your tester or the testing procedures, please see the back cover for contact information.

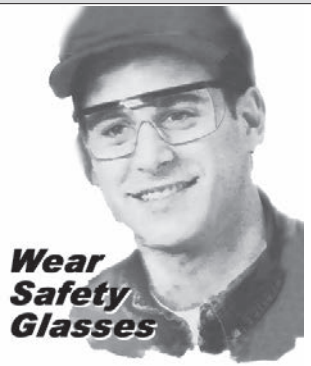
Xpress XTC 150

Tests ---------- 6 Volt and 12 Volt Battery Check and Load Test
Load Sequence ---------- Automated 200 Amp resistive ribbon
Charge Sequence 5 to 30 min. (larger discharged batteries longer)
CCA Range ---------- 100 – 1600
CA Range ---------- 125 – 2000
LCD ---------- Backlit 1" x 2.5" 4 line x 16 characters
Cooling ---------- 5" Internal Fan
Leads ------ Load Amp/Volt – 8 ft. , 6 Gauge/20 Gauge 2 conductor
Power Cord ---------- 14 AWG 15 ft.
Size ---------- 13" x 11" x 9 1/4"
Weight ---------- 43.5 lbs
Internal Printer ---------- AC-14 *Optional*
PC Null Modem Serial Cable ---------- AC-12 *Optional*

CONTENTS

Specifications ---------- 2
Safety ---------- 4
Cause of Battery Failure ---------- 4
Inspection and Visual Check ---------- 5
What to Expect ---------- 6
Controls and Functions ---------- 7
Hook-Up ---------- 8
Battery Preliminary Check ---------- 9
Battery Load Test and Charge Sequence ---------- 10
Automated Conditions ---------- 11
Charge Only Sequence ---------- 12
Optional Printer Operation ---------- 13
Changing Beeper Option ---------- 13
Review Tests ---------- 14
About XTC-150 and selecting PC download ---------- 14
PC Interface ---------- 15
Download Information ---------- 16
Capture Text into Microsoft Excel ---------- 17
Care and Maintenance ---------- 18
Warranty and Service Information ---------- 19
Contact Information ---------- 20

SAFETY



- Carefully read all operating instructions before using the Xpress XTC-150.
- Wear eye protection when working around batteries.
- The XTC is equipped with a 15ft power cord. Never use an extension cord that is more than 50ft and it must not be smaller than 12 gauge. Make sure the extension cord and receptacle are properly grounded.
- Be sure each test is completed before removing load clamps to prevent arcing and potential explosion from battery gases. Never remove load clamps while testing. ***Caution:*** When the ON/OFF switch is OFF it does not prevent the tester from loading. The AC switch is for charging.
- Keep sparks flames or cigarettes away from batteries.
- 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^{O} F. Allow the battery to warm to room temperature before testing or charging.
- Never connect load clamps to more than one 6 volt or one 12 volt battery at a time. Connection to 24 volts will dangerously overload the circuitry. Do not test multiple batteries or 24 volt systems using the Xpress XTC.
- ***Warning!*** Never attach the Xpress XTC to a battery that is connected to any other tester or charging unit. Damage may result.

CAUSE OF BATTERY FAILURE

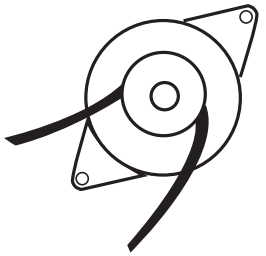
- **Incorrect Application:** Wrong size battery may have inadequate cold cranking Amp rating for original vehicle specifications.
- **Incorrect Installation:** Loose battery hold-downs cause excessive vibration, which can result in damage to the plates.
- **Improper Maintenance:** Low electrolytic fluid 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 fairly old, the failure may be due to 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 regulator setting can cause lead sulfate to gradually build up and crystallize on the plates greatly reducing the battery's capacity and ability to be recharge.

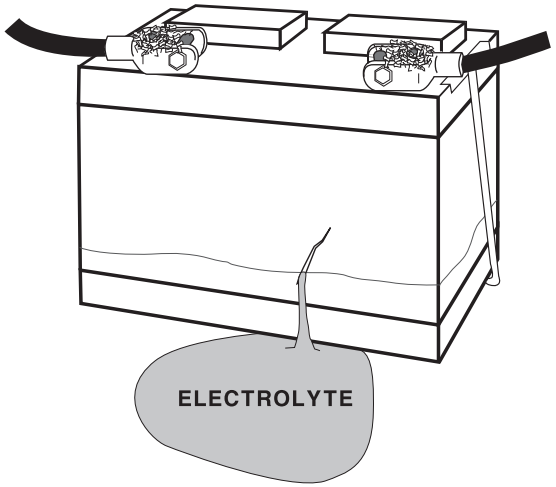
INSPECTION

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** 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 defective battery must be replaced before proceeding.

…from your Xpress XTC Tester/Charger

The Test and Charge Sequence can indicate in 30 seconds if a 6 or 12 Volt battery is 'Good', 'Bad', 'Marginal'. If the XTC indicates that the battery needs charging it will automatically charge the battery and in some cases you will know the results within 5 minutes. Except in the case of large discharged batteries 30 minutes will be sufficient to determine if the battery is 'Good', 'Bad' or 'Marginal'. There is no need to spend needless charging time on a bad battery. During the charge sequence the XTC will indicate the maximum time remaining to bring the battery to a full charge. The graphically arranged LED's make it possible to view the Xpress testing and charging status at a distance – fully unattended.

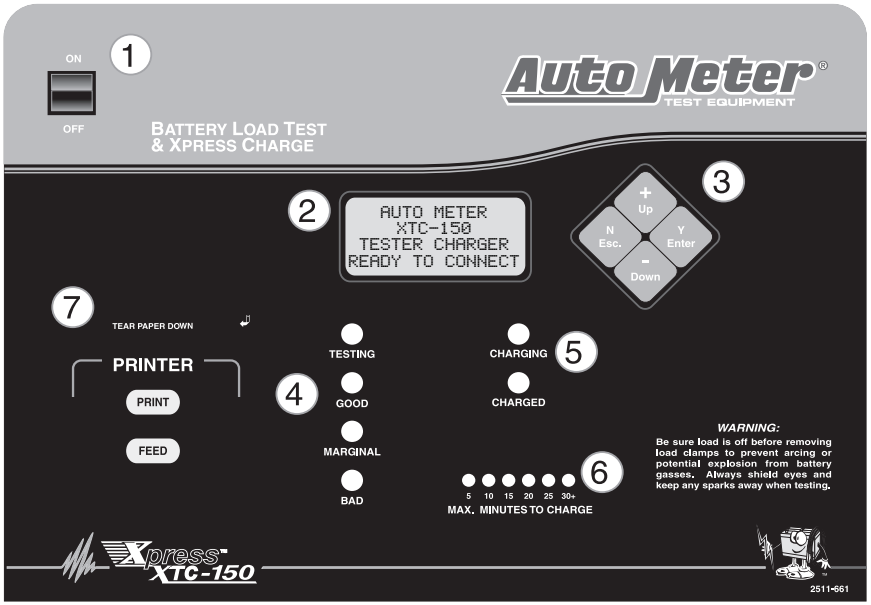
The LCD provides easy menu instructions and test results for close-up operation.

The optional printer allows printout of the last test made.

Using an optional AC-12 cable you can download the last 100 tests to a PC. You can also capture the last 100 tests into Microsoft Excel.

1. **AC On/Off Switch**
LCD turns on when AC switch is on.

2. **LCD**
Displays menus and test results.



3. **KEYS**
When each key is pressed a beep sounds to assure contact has been made**.**
Y Enter Key:
This key selects the main or next menu. It also selects 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. It also increments a value.
-Down Key:
This key moves the cursor down in order to select a menu line. It also decrements a value.
N Esc Key:
This key cancels a test or progression. It also returns to the previous menu.

4. **Battery Test Sequence**
Indicating Testing, Good, Marginal or Bad.

5. **Battery Charge Sequence**
Indicating Charging or Charged.

6. **Time to Charge**
Indicating maximum minutes to charge.

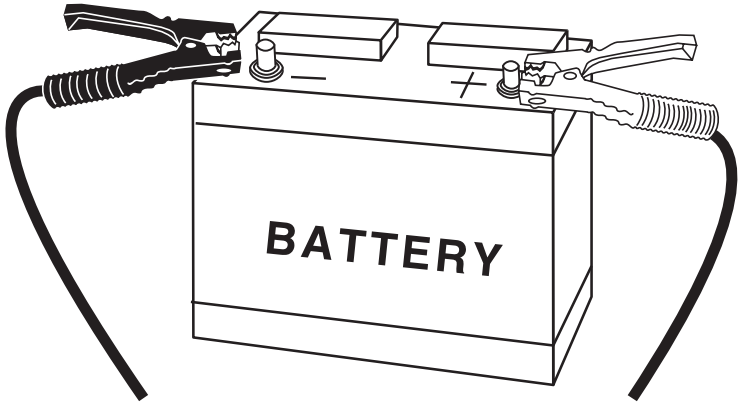
RS232 Serial Port (Rear)
The last 100 tests can be downloaded to a PC.



HOOK UP

1. Turn on the AC switch. The LCD will indicate "READY TO CONNECT" if the unit is properly plugged into an AC outlet. For your safety, make sure the AC receptacle is properly grounded.

Note: The XTC is equipped with a 15ft power cord. Never use an extension cord smaller than 12 gauge or longer than 50ft. Make sure the extension cord and receptacle are properly grounded.



2. Connect to only one 6-volt or 12-volt battery at a time.

Note: Due to gases and usual corrosion around the positive terminal it is important to connect the positive (+) red clamp first. Make sure the connection is certain. Then connect the negative (-) black clamp.

3. If the Express XTC displays one of the following messages check your connections.

```
REVERSED BATTERY
  CONNECTIONS!!
```

Red = (+) Positive and Black = (-) Negative

```
  CHECK BATTERY
   CONNECTIONS

 'Y' TO CONTINUE
```

Make sure the terminals are clean and the connection is sure then press 'Y' Enter. If the "Check Battery Connections" remains the connections are not secure. If you are sure of a solid connection replace the battery.

PRELIMINARY BATTERY CHECK

1. Turn on the AC switch and connect the load clamps to a 6-volt or 12-volt battery. The following will appear on the LCD.

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

The last temperature entered is displayed.

2. Use the +(Up) and -(Down) keys to enter the current battery temperature. The last temperature entered is displayed for adjustment. The (Up) and (Down) keys increment and decrement in units of 10. **Press 'Y' to begin.**

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

Wait for results.

3. The results will display in the following format indicating the test number for later review, a 6V or 12V Battery, the voltage of the battery and the percent charged. The estimated CCA is also indicated:

```
#290 12V BATTERY
12.18V CHRG. 41%
EST. CCA    950
  'Y'FOR MENU
```

Press 'Y' for menu to Test and charge or charge only

```
#290 6V BATTERY
6.18V CHRG. 60%
EST. CCA    450
  'Y'FOR MENU
```

6 Volt Sample

TEST and CHARGE SEQUENCE

1. From the menu select TEST & CHARGE using the +/- keys.

```
>TEST & CHARGE
 CHARGE ONLY
 REVIEW/PRINT
 ABOUT
```

Then press 'Y' Enter to enter type of rating.

2. Select the type of battery rating using the +/- keys. The rating used in the test is indicated within <> brackets.

```
SELECT RATING!
<CCA>  CA  MCA
USE +/-.
'Y' TO CONTINUE
```

Then press 'Y' Enter to enter rating.

3. The rating displayed will be the estimated rating determined during the preliminary check and adjusted if CA or MCA is selected. Adjust the rating using the +/- keys.

```
ENTER RATED CCA
1350
USE +/-.
'Y' TO BEGIN.
```

Press 'Y' Enter to begin test.

NOTE: If you disconnect the battery after the preliminary check, or bypass the preliminary check altogether, a menu will request a temperature input for the connected battery. Otherwise, the temperature input during the preliminary check will be used automatically.

```
>IS THIS A 6V
 BATTERY?
```

If the XTC-150 determines a low voltage it will ask if the battery is a 6 Volt. Press the "Yes" or "No" key.

```
CHOOSE BATT TYPE
STD, LEAD ACID
USE +/-,
'Y' TO CONTINUE
```

Select the type of battery you are testing and charging use the +/- keys to cycle through the choices. The types of batteries are standard, flooded lead acid and AGM. The XTC-150 uses this choice to set the charging limits for each battery.

```
TESTING BATTERY
PLEASE WAIT...

  'N' TO STOP
```

Wait for results. See Automated Conditions for status. Other Conditions:

if the battery has a surface charge the LCD will display "REMOVING SURFACE CHARGE" and if the load clamps become disconnected or loose "CHECK BATTERY CONNECTIONS" will appear.

AUTOMATED CONDITIONS

If the battery needs charging the XTC-150 will automatically charge the battery and then run a Load Test. The LED indicators will show the status during a fully automated Test and Charge sequence. This makes it possible to view the status and final results at a distance.



- Red "TESTING" light indicates battery is being tested.
- Red "CHARGING" light indicates battery is being charged.
- Green "GOOD" light indicates battery is good.
- Green "GOOD" with Red "CHARGING" light indicates battery is being charged.
- Green "GOOD" with Green "CHARGED" light indicates battery is good and has been charged.
- Yellow "MARGINAL" indicates battery is marginal.
- Yellow "MARGINAL" with Green "CHARGED" light indicates battery is marginal and has been charged.
- Red "BAD" indicates the battery is too bad to charge or is considered bad after a charge is attempted.
- "MAX. MINUTES TO CHARGE" in increments of 5 indicates the time left to charge the battery. This may be longer for large discharged batteries.
- "DEEPLY DISCHARGED" refer to flip chart. Remove battery from XTC-150 and slow charge battery overnight - refer to charging chart on page 19.

```
#290 12V BATTERY
  GOOD BATTERY
EST. CCA    975
  'Y'FOR MENU
```

LCD TEST RESULTS:
Include "GOOD BATTERY", "MARGINAL BATTERY" and "BAD BATTERY".

CHARGE ONLY SEQUENCE

1. From the menu select CHARGE ONLY using the +/- keys.

```
 TEST & CHARGE
>CHARGE ONLY
 REVIEW/PRINT
 ABOUT
```

Then press 'Y' Enter to enter type of rating.

2. Select the type of battery rating using the +/- keys. The rating used in the test is indicated within <> brackets.

```
SELECT RATING!
<CCA>  CA  MCA
USE +/-.
'Y' TO CONTINUE
```

Then press 'Y' Enter to enter rating.

3. The rating displayed will be the estimated rating determined during the preliminary check and adjusted if CA or MCA is selected. Adjust the rating using the +/- keys.

```
ENTER RATED CCA
1350
USE +/-.
'Y' TO BEGIN.
```

Press 'Y' Enter to begin charging.

```
CHOOSE BATT TYPE
STD, LEAD ACID
USE +/-,
'Y' TO CONTINUE
```

Select the type of battery you are testing and charging use the +/- keys to cycle through the choices. The types of batteries are standard flooded lead acid and AGM. The XTC-150 uses this choice to set the charging limits for each battery.

```
TESTING BATTERY
PLEASE WAIT...

  'N' TO STOP
```

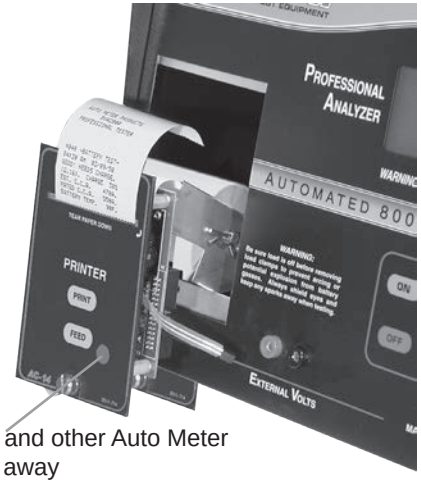
NOTE:
If you disconnect the battery after the preliminary check, or bypass the preliminary check altogether, a menu will request a temperature input for the connected battery. Otherwise, the temperature input during the preliminary check will be used automatically.

```
#290 12V BATTERY
 BATTERY CHARGED
EST. CCA    1000
  'Y'FOR MENU
```

Warning:
Do not Charge a battery if it's temperature is under 20° F.

PRINTER and BEEPER

PRINTER *(OPTIONAL)*



Press (PRINT) to obtain a printout of the LCD results. This is done after each finished test or during REVIEW.

Note: Tear printouts down to provide even separation and avoid jamming.

Turning off the AC power, pressing and holding print button and turning power on changes printing option from automatic to manual.

Infrared receiver is used with the BVA-200 and other Auto Meter handheld testers. Prints from up to 50 feet away

Changing Paper:



1. Disconnect clamps from any battery.
2. Unplug the AC cord.
3. Loosen the thumbscrew at the bottom of the printer.
4. Carefully remove the cover.
5. Replace the new paper roll by feeding it under the roll and over the PC board as illustrated. Press the FEED button to check the advance of the paper.
6. It is best NOT to disconnect the ribbon cable, but if for any reason you do disconnect the ribbon cable make sure the top edge of the ribbon cable attached to the XTC-150 is also correctly aligned with the top of the printer. Do not twist the ribbon cable. Make sure the pins are aligned properly. Do not force, but make sure the connection is solid.
7. Reinstall printer by inserting the top tab under the panel and tightening the thumbscrew. Be careful not to damage the printer ribbon cable.

Changing Beeper Option:

At the end of each test the beeper will sound. If you prefer not to use the reminder beeper you can change this option. To toggle between the REMINDER BEEPER OFF and ON simply press the (+) Up key while turning the AC switch on.

```
REMINDER BEEPER
OFF!
```

```
REMINDER BEEPER
ON!
```

REVIEW / PRINT

1. From the menu select REVIEW/PRINT using the +/- keys.

```
 TEST & CHARGE
 CHARGE ONLY
>REVIEW/PRINT
 ABOUT
```

Then press Y Enter to review tests. The last test will be displayed.

```
#290 12V BATTERY
12.18V CHRG. 41%
EST. CCA    950
  'Y'FOR MENU
```

Press Down (-) to view previous test and Up (+) to increment to the last test.

2. If a record was kept of the test number it will be easy to locate. Once the test is located press PRINT on the optional printer.

ABOUT THE XTC-150 and PC Download

Select ABOUT from the main menu. The following is displayed.

```
 TESTER/CHARGER
  VERSION 1.2
   9/11/2000
 COPYRIGHT 2000
```

In order to reach the PC Download instruction press NO (-).

```
CONNECT THE XTC
TO A PC.
9600, N, S, 1.
'N' TO CANCEL
```

You are ready to download. See page 15 for instructions.

PC INTERFACE

1. Using Auto Meter's optional adapter cord AC-12, attach it to the PC port on the rear of the Xpress XTC and then to an unused serial port on the back of your computer. Make sure the XTC is plugged in and not connected to a battery. Turn on your Express XTC.

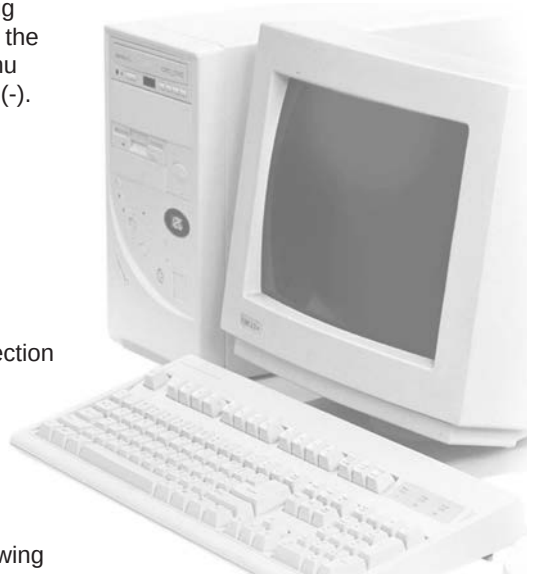
Note: Most computers are configured with at least one serial port (identified as COM 1), and some have a second serial port, usually identified as (COM 2). Check your computer manual to locate and identify a serial port connector. Even if you have a physical COM port you need to make sure it is working 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.

2. **Opening Windows 98 Hyper Terminal:**

- Assuming step 1 is correct plug in the Xpress XTC and turn on the AC switch. From the main menu select ABOUT and then Down (-). (See page 14).
- Select Windows Start
- Then Programs
- Then Accessories
- Then Communications
- Then Click on Hyper Terminal
- Double Click Hypetrm.exe Application
- Type in a name for your connection then select an icon for future identification
- Select OK
- Select the COM port number you have previously identified in step one.
- Select OK and select the following from the pull down menu:

Bits per second	9600
Data bits	8
Parity	None
Stop Bits	1
Flow Control	Hardware

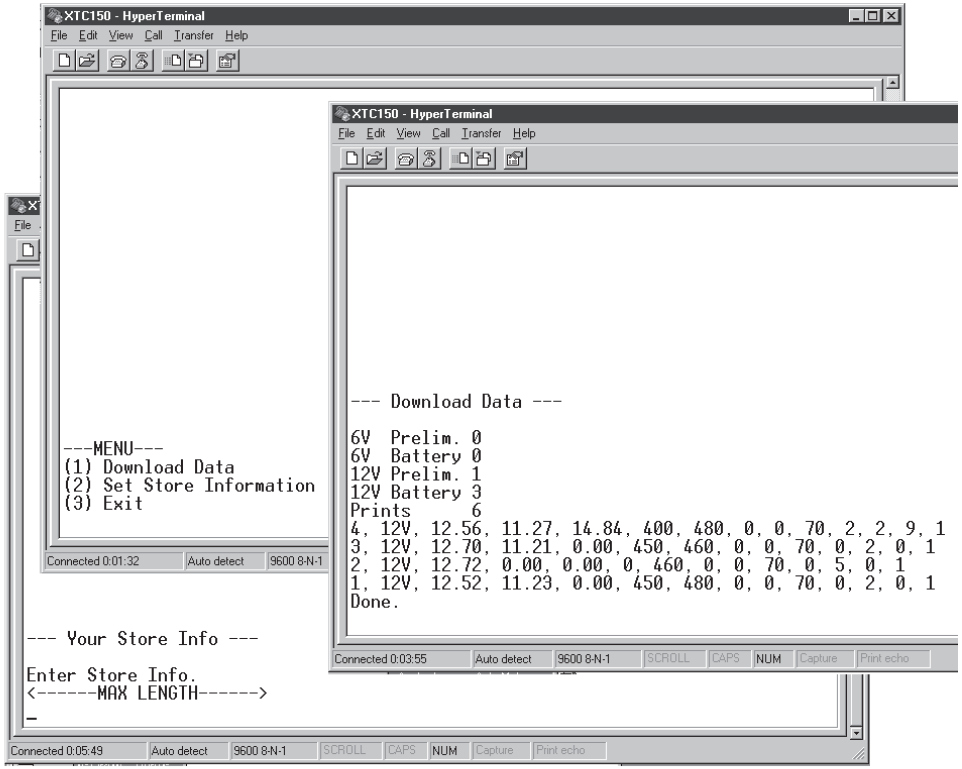
- Select OK
- Press YES (Enter) to display the menu.



DOWNLOAD INFORMATION

3. Screen Menu and Download:

- With the XTC download menu press 1 to download the last 100 tests.
  To save the information displayed see "Capture text"
- Press Enter again to return to Menu.
- Press 2 if you want to set your store information.
  Enter up to 5 lines within the displayed "< ----Max Length---- >." Use Backspace to make changes, not arrow keys. The optional printer will print blank lines for each line left blank. Press Enter to return to Menu
- Press 3 to exit



USING Microsoft Excel

4. Capture Text into Microsoft Excel

For other software applications consult your software manual.

- With the XTC-150 menu in the HyperTerminal (step 3) select Capture Text in the HyperTerminal Transfer Menu.
- Type in **c:\my documents***download***.txt** and then select Start.
- Press 1 as indicated in the XTC-150 menu to download. When finished select Capture Text again from the Transfer Menu. Then select Stop.
- Launch Microsoft Excel then select open file.
- Under "Files of Type" select All Files (*.*). Highlight your file then Open.
- Select "Delimited" and start at row 1. Then select <Next>
- Select "Comma" then <Next>
- Under Column Date Format select "General" then <Finish>

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1		1												
2														
3														
4	--- Download Data ---													
5														
6	6V Prelim. 0													
7	6V Battery 0													
8	12V Prelim. 1													
9	12V Battery 3													
10	Prints 6													
11		4 12V	12.56	11.27	14.84	400	480	0	0	70	2	2	9	1
12		3 12V	12.7	11.21	0	450	460	0	0	70	0	2	0	1
13		2 12V	12.72	0	0	0	460	0	0	70	0	5	0	1
14		1 12V	12.52	11.23	0	450	480	0	0	70	0	2	0	1
15	Done.													

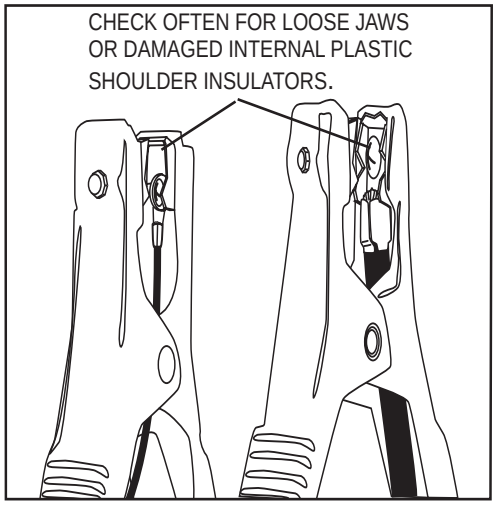
- After the file is loaded you can delete unwanted rows and format columns as desired. Using the illustration above the interpretation is listed below by the Excel column starting with column A.

A. Test Number
B. Type of Battery
C. Beginning Voltage
D. Loaded Voltage
E. Ending Voltage
F. Rated CCA
G. Estimated CCA @ 0 Minutes
H. Estimated CCA @ 5 Minutes
I. Estimated CCA @ End
J. Temperature in Fahrenheit
K. Time Charged in minutes
L. Battery Condition Results
   1 = BAD
   2 = GOOD
   3 = MARGINAL
   4 = CHARGE RETEST
   5 = PRELIMINARY TEST
M. Status
   0 = NONE
   7 = CHARGED
   8 = TIMED OUT
   9 = CHARGING
   10 = BAD CONNECTION
   11 = DISCONNECTED
   12 = ABORTED
   13 = HARDWARE ERROR
   14 = POWER ERROR
N. Type of Rating
   1 = CCA
   2 = CA
   3 = MCA

CARE AND MAINTENANCE

- Keep leads free of oil. Clean with warm, soapy water.
- Never insert an object into the fan vents. This can cause electrical and/or mechanical damage. Never cover the fan vents.
- Never attempt to open up or repair the tester. Repairs should only be done by an authorized repair center. Note: Doing so could void the warranty.
- Always be sure the load is off and the load clamps are removed before cleaning.

LOAD CLAMPS



- Both jaws of each clamp must firmly engage the battery terminal. The copper jaw connects to the smaller gauge wire that reads the voltage and the silver jaw connects to the larger conducting wire, which draws the load in each test. Jaw insulation is necessary for accurate readings. Damaged clamps or loose wires will affect the readings. Keep clamps clean and in good repair.

- 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 check the post to which the system is attached. If a load test is made from a post connection and the alternator is connected to side terminals a battery load test and charge can be completed, but the problem may be in the side post connections.

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 with dated proof of purchase. This warranty applies only to the original purchaser and is non-transferable. Shipper 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.

OCV	STATE OF CHARGE	Charger Maximum Rate 50 A	30 A	20 A	10 A	2 A
12.6 V	100%	READY TO USE				
12.4 V	75%	0.6	0.9	1.3	2.5	12.5
12.2 V	50%	1.2	1.9	2.7	5.1	25.5
12.0 V	25%	1.8	2.9	4.3	7.8	39.0
11.8 V	0%	2.5	4.0	5.7	10.7	53.5