# BASEWEST

## *Operating & Maintenance Manual*

## *Model TS-420 Test Set*

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# 25-60-41

## 1.0 General

This manual covers operations and maintenance of the BaseWest Model TS-420 test set - a rechargeable, handheld instrument with a digital LCD readout designed specifically for testing airline escape slide lighting systems and their components. The Model TS-420 comprises the following features:

- Operating mode options – The TS-420 functions as both a voltmeter and ammeter selectable by a Mode Selection switch.
- Voltmeter with built-in load bank - This mode is used to test battery condition. A rotary switch on the instrument panel allows the selection of closed circuit test under selectable resistive loads as well as an open circuit (no load) test.
- Ammeter with integral power supply - This mode is used to verify the current draw of the slide light harness through an internal regulated 5VDC power supply. Current readings can be used to verify proper function of the light harness and, in some cases, as an indicator of a light-out condition. The ammeter function has a built-in timer that allows hands-free, walk-around inspection and automatic instrument shut-down after 20 seconds.
- Test set status indicators – The instrument panel includes two status indicators that provide an indication of test set readiness and battery condition.
- Rechargeable NiCad battery – Recharging is accomplished via a charging port on the side of the instrument and a supplied AC charger.


**Figure 1. TS-420 Test Set with Charger**

**NOTE**: The TS-420 test set is no longer available for procurement and is replaced by the Model TS-421. The TS-420 continues to be in-service, and remains active for calibration and repair so long as needed replacement parts are available.

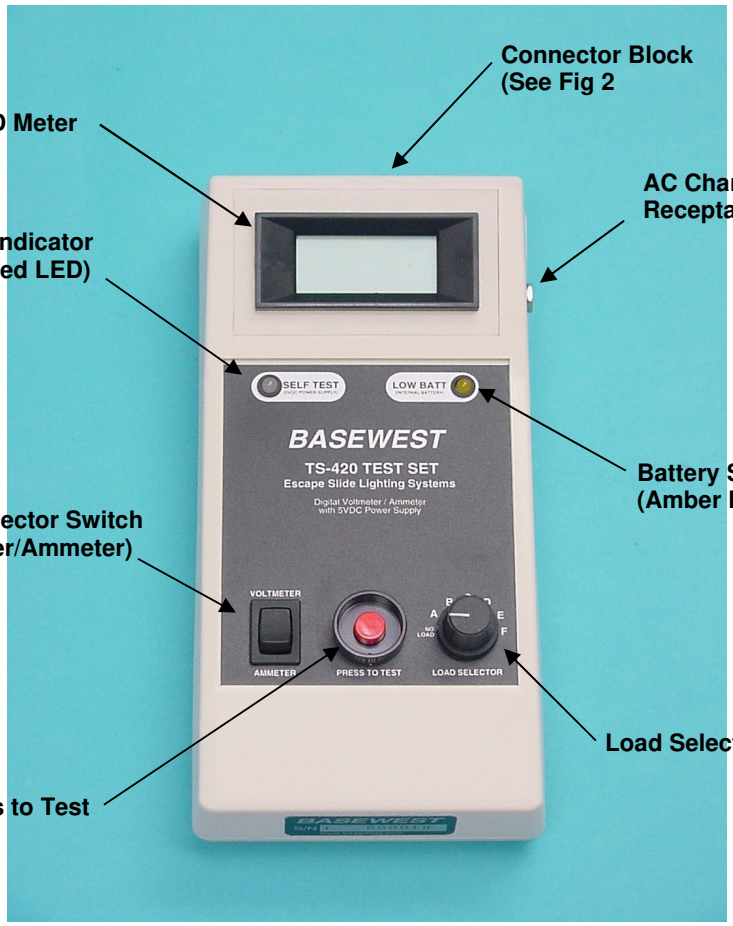


**Figure 1. TS-420 – General Arrangement**


**Figure 2. Connector Block**

## 2.0 Battery Testing (Voltmeter Mode)

2.1 Place the Mode Selector switch to VOLTMETER.

2.2 Connect the 4-contact test lead on the battery pack to the mating 4-pin System Test connector (Figure 2). Note that this connector is keyed for proper alignment.

2.3 Select the proper test load (A through F or NO LOAD) on the Load Selector switch. Refer to OEM manuals for the proper test load setting for the battery and/or slide lighting systems under test. The NO LOAD position provides an open circuit test, if required.

2.4 Push the red Press-To-Test button to display the voltage of the battery pack under the selected load condition. The Self-Test indicator must illuminate GREEN during this test. If not, see Section 5.0

2.5 Release the Press-To-Test button after the displayed voltage is recorded. The test set will return to the OFF condition automatically.

**NOTE**: This test may also be accomplished on legacy batteries (P/N 7-1025 though 7-1085 series) by connecting one set of battery Blue/White power leads to the Voltmeter Connection inputs on the Connector Block (Figure 2).

## 3.0 Light Harness Testing (Ammeter Mode)

3.1 Place the Mode Selector switch to the AMMETER position.

3.2 Connect the light harness to the Connector Block at the head of the instrument (Figure 2) based on the system configuration option, below, under test:

a) Installed slide light system with integral battery pack - Connect the battery pack's 4-contact test lead to the 4-pin System Test Connection on the Connector Block.

b) Installed slide light systems without battery packs - Connect the OEM-specified harness power input to the Connector Block as specified by the OEM manual. Special test accessory cables may be specified.

c) Individual slide light harnesses with two quick-disconnect connectors - Connect the quick-disconnects onto pins of the Ammeter Connection on the Connector Block (Figure 2). Observe polarity on LED-based systems - BLUE (+), WHITE (-).

d) Individual slide light harnesses without quick-disconnects - Connect harnesses to the Ammeter Connection via an appropriate interface such as an alligator clip lead.

3.3 Actuate and release the Press-To-Test switch. Confirm that the Self-Test indicator illuminates GREEN. If this indicator is RED, remove unit from service for recharging (see Section 4.0).

**NOTE**: If the Self-Test indicator is on (GREEN) and the Battery Status indicator is on (AMBER), the test set is OK for test, but should be recharged at the next opportunity.

3.4 Record the milliampere reading on the digital meter. Confirm that the current reading is within OEM-specified tolerances.

## 4.0 Internal Battery Recharging and Replacement

4.1 General

The TS-420 is provided with a rechargeable Ni-Cad pack, P/N 6-1035. When the Battery Status indicator illuminates AMBER, it is an indication that the internal battery capacity is OK for test, but recharging will soon be required. If the Self-Test indicator comes on RED, the internal battery voltage is too low to provide accurate test results and must be recharged before the unit is returned to service.

4.2 Battery Recharging

a) Connect the battery charger (P/N 36-1002 or 36-1019) to an AC outlet with appropriate adapter, if required. If the test set is provided with the P/N 36-1019 charger, it can be used with either a 120VAC or 220VAC outlet. The P/N 36-1019 charger is provided with a two-prong European-type outlet adapter accessory.

**NOTE**: International customers must use an appropriate adapter for 110VAC service, or a converter for 220VAC service, depending on the country.

b) Connect the charger output plug into the receptacle on the side of the TS-420 test set.


**Figure 3. Internal Battery Charging Arrangement**

c) The battery should be left on charge for approximately eight (8) hours, or overnight. After charging, disconnect the charger and place the Mode Selector switch into the AMMETER position and Press-To-Test. If the Self-Test indicator illuminates GREEN,

and the Battery Status indicator is OFF, the unit is sufficiently charged to return to service.

**NOTE**: If the unit must be used before full charge is reached, the unit may be returned to service temporarily if the Self-test indicator and the Battery Status indicators are both on (GREEN and AMBER, respectively). The unit MAY NOT be returned to service if the Self-Test indicator is RED.

d) If the Self-Test indicator comes on RED after a full charge cycle, the test set should be returned to BaseWest for service.

4.3 Battery Replacement

The internal rechargeable Ni-Cad battery should provide several years of service. Use the following procedure to replace the battery when necessary.

a) Turn the test set face down on a stable surface. Remove four (4) screws on bottom of instrument case.

b) Carefully remove the bottom portion of the instrument case and lay aside.


**Figure 4. Internal Battery Access**

c) Locate the battery lead wire, and follow it to the connector on the PC board. While securing the instrument with one hand, carefully disconnect the battery connector from the PC board and remove the battery. (**NOTE**: The battery is secured by mating patches of Velcro. Use care in removing the battery pack form its Velcro attachment; do not use excessive force.

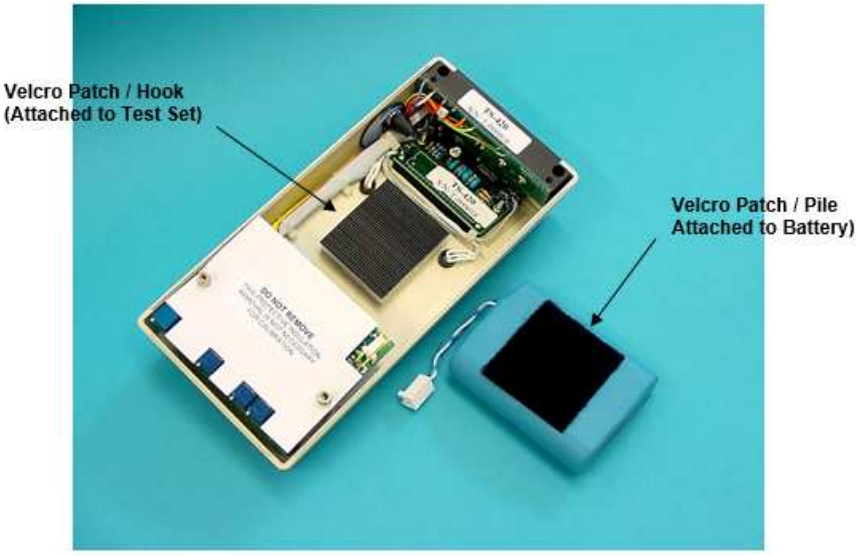


**Figure 5: Battery Removed**

d) Install the replacement battery exactly as before. Center the battery over the Velcro pad and gently press into place.

e) Carefully re-connect the battery connector to the PC board. Note that the connector is keyed to prevent misalignment.

f) Replace bottom portion of case and secure with four screws.

## 5.0 Indications & Troubleshooting

### 5.1 Voltmeter Mode

The following Indications apply when the VOLTMETER mode is selected and the Press-To-Test button has been pushed:

a) Self-Test indicator is GREEN - Test set is operational and OK for test

b) Self-test indicator does not illuminate - Test set requires servicing; return to BaseWest.

c) LCD meter displays DC volts in the range of 0.00 to 19.99; if not, return for repair.

### 5.2 Ammeter Mode

The following Indications apply with the instrument switched to the AMMETER mode and the Press-To-Test button is activated:

a) Self-Test indicator is GREEN, Battery Status indicator is OFF - Test set is operational and OK for test; the battery charge level is medium to high.

b) Self-Test indicator is GREEN, Battery Status indicator is AMBER - Test set is operational and OK for test, but internal battery is getting low. Recharge the internal battery at the next opportunity.

c) Self-Test indicator is RED and Battery Status indicator is AMBER – Remove from service and recharge. If normal indications do not re-appear per para. 5.2 a), return to BaseWest for service.

d) Self-Test indicator is OFF - Test set requires servicing; return to BaseWest.

e) LED meter should display milliamperes in the range of 0 to 1999 mA (no decimal)

## 6.0 Care and Maintenance

6.1 The TS-420 test set is a sensitive electronic instrument; handle with appropriate care.

- **Do not drop or crush the instrument**
- **Do not apply external electrical inputs, except AC charger**
- **Keep instrument away from all fluids**
- **Protect from extreme temperatures, weather/rain, extended UV radiation**

6.2 The device is designed for handheld use in a shop environment but is not designed to withstand a drop to the ground or to survive excessive compression loads.

6.3 The device is splash resistant, but not waterproof; do not allow the device to sit in standing fluids or subject to rain. Excessive exposure to UV can affect the LCD meter.

6.4 Surface cleaning, only, with a soft cloth slightly dampened with water or alcohol is authorized. DO NOT use other solvents or cleaners.

## 7.0 Calibration

7.1 A link to the TS-420 calibration manual 25-60-42 is available on the BaseWest website under “Resources”. Calibration is recommended at one-year cycles but is dependent on user requirements and policy. See the calibration manual for recommended calibration accessories.

7.2 When a TS-420 test set is returned to BaseWest for service or calibration, it is first inspected for proper form, fit and function and battery condition. Any needed repairs or replacements are coordinated with the customer prior to calibration. NIST calibration is conducted by a local NIST-certified calibration house and calibration sticker attached. The test set is returned to BaseWest for final inspection before return to the customer along with calibration paperwork and any accessories that were returned.

7.3 Unauthorized repairs may void warranty and result in operational problems or failure to calibrate properly. If repairs are necessary, the test set should be returned to BaseWest.