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StormscopeTM

Series II Weather Mapping Systems

WX-PA

Instruction

Manual

This manual contains operating instructions and recommended service information for the WX-PA Portable Analyzer. This information is supplemented and kept current by Service Letters published by 3M.

P/N 78-8060-5798-6

3M Aviation Safety Systems
6530 Singletree Drive
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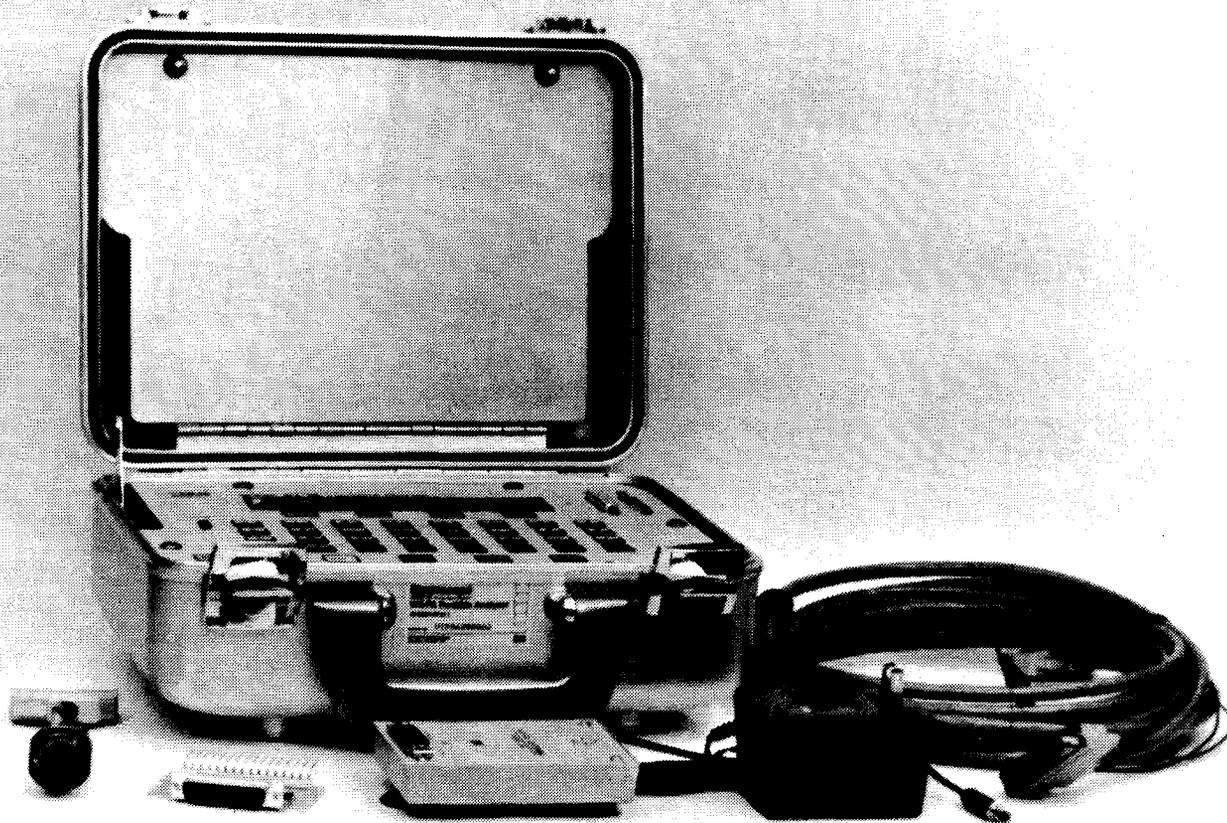
1. General Information

The WX-PA Portable Analyzer is a portable test unit used for testing and programming of StormscopeTM Weather Mapping Systems.

In addition to generating the signals necessary to test the weather mapping capabilities of StormscopeTM systems (both Series I and Series II), the WX-PA can be used to test the heading stabilization of appropriately equipped Series II models, to enter checklist information on the WX-1000/WX-1000+, and to perform pre-installation checkout and testing on Series II StormscopeTM models.

The WX-PA may be used on installed systems to check the installation of Series I and Series II StormscopeTM systems, or used in conjunction with the Series II systems Connector Pod Assembly (3M P/N 78-8060-5750-7) to perform bench testing and checklist programming of Series II StormscopeTM systems.

The Series I StormscopeTM systems referred to in this manual are the WX-7, WX-7A, WX-8, WX-9, WX-10, WX-10A, WX-10AJ, WX-11, WX-11J, and WX-12 systems.



<u>Item</u>	<u>Description</u>	<u>3M P/N</u>
A	WX-PA	78-8060-5710-1
B	WX-PA Antenna	78-8060-5744-0
C	Battery Charger	78-8060-5797-8
D	WX-PA Antenna Cable	78-8060-5763-0
E	Antenna Cable Adaptor	78-8060-5796-0
F	WX-PA Test Plug	78-8060-5821-6

WX-PA System
Figure 2.1

2. Unit Description

The WX-PA (3M P/N 78-8060-5710-1) is shown in Figure 2.1. Its major components are:

2.1. Carrying Case

The carrying case contains the keyboard, display, battery, and solid state electronics.

2.2. WX-PA Test Antenna

The transmitting antenna (3M P/N 78-8060-5744-0) is used to couple test signals to the StormscopeTM system under test. It is supplied with suction cups to facilitate fastening of the WX-PA antenna to the system antenna.

2.3. Antenna Cable

The WX-PA antenna cable (3M P/N 78-8060-5763-0), 25 feet long, connects the WX-PA to the test antenna. The cable is equipped with 25 pin D sub-miniature connectors on each end, and with a suction cup on the test antenna end. The cable, along with the test antenna, is stored in the inner lid in the carrying case.

2.4. Antenna Cable Adaptor

The antenna cable adaptor (3M P/N 78-8060-5796-0) allows the WX-PA to directly drive a Series II system without an antenna. The adaptor consists of a 25 pin D sub-miniatures connector and a Cannon connector. It is connected between the WX-PA antenna cable and the Series II system antenna cable. The primary use of the adaptor is an aid in troubleshooting.

NOTE

This adaptor can not be used with Series I Systems.

2.5. WX-PA Test Plug

The WX-PA test plug (3M P/N 78-8060-5821-6) is for use with the Output Verification Mode. The 16 test points on the test plug may be viewed with a scope to determine the operational integrity of the WX-PA outputs.

2.6. Charger

The WX-PA is powered by a sealed, rechargeable 12V lead-acid battery for portable operation. The battery charger supplied (3M P/N 78-8060-5797-8) is a calculator style battery charger, which has sufficient output to power the WX-PA without draining the battery.

3. Display and Controls

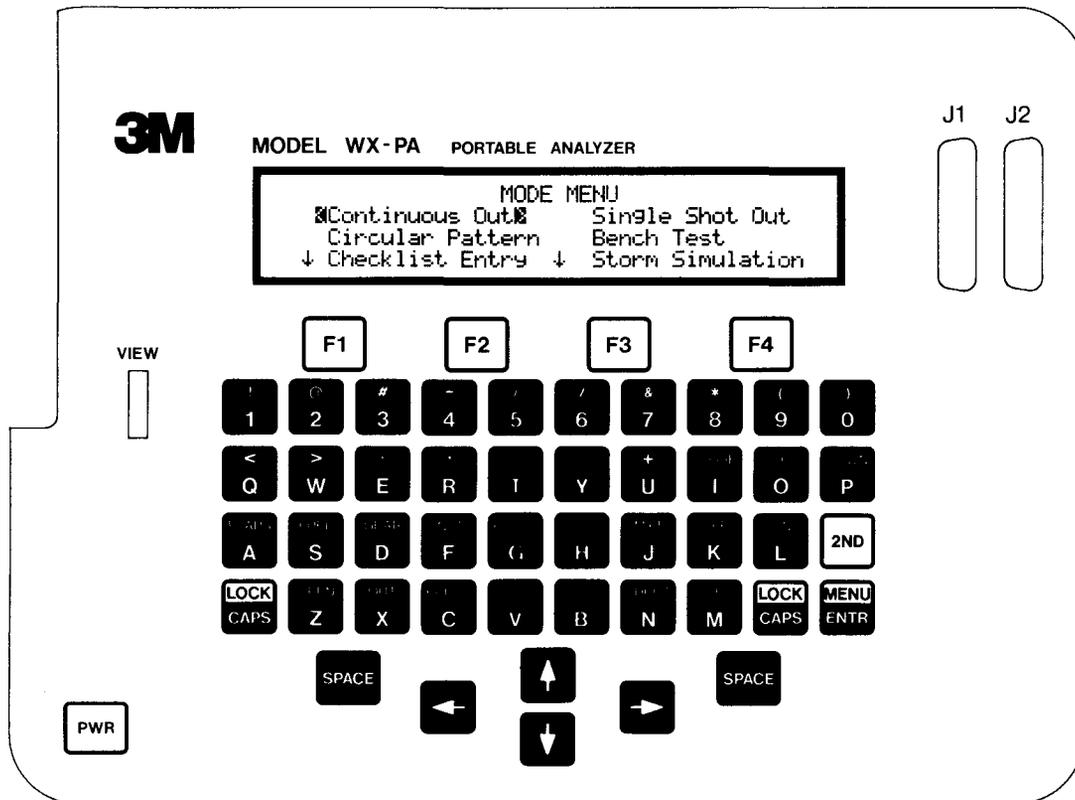
The WX-PA control panel is shown in Figure 3.1.

3.1. Display

The Liquid Crystal Display is comprised of 4 lines of 40 characters each. The top line is generally used to indicate the mode of operation. The second and third lines contain the operating parameters, and indicate selection choices. The fourth line either contains additional selection choices, or indicates the functions of the four "Function Keys" labeled F1 through F4.

3.2. Controls

The control panel consists of the keyboard, the VIEW control, a DB-25 jack (J1) for interconnection to Stormscope™ systems, and an expansion DB-25 jack (J2), for use with future Stormscope™ expansion functions.



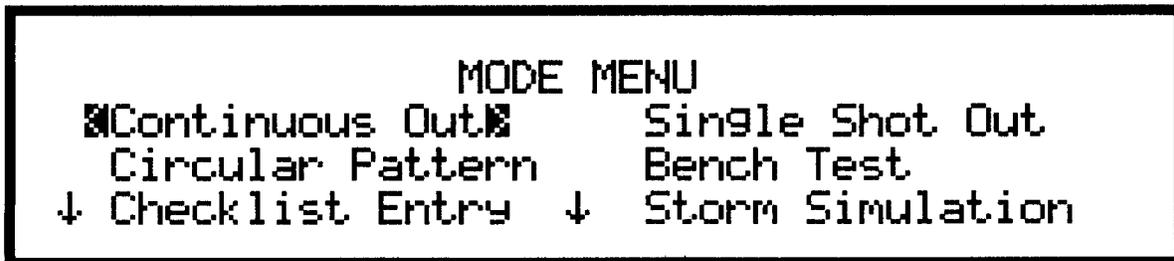
Control Panel
Figure 3.1

4. Operational Modes

The WX-PA is capable of several different operating modes. When the unit is switched on, the WX-PA initiates its own internal self test, displays the results, and then displays the Mode Menu shown in Figure 4.1.

The Continuous Out, Single Shot Out, Circular Pattern, and Storm Simulator modes may be used either with the StormscopeTM system (Series I or Series II) installed in the aircraft, or on the bench. The Bench Test and Checklist Entry Modes may be used only in conjunction with the Bench Kit Connector Pod.

The Mode Menu cursor, consisting of blinking brackets surrounding an item, is moved up, down, left, or right by the four corresponding arrow keys. If additional items are available above or below the displayed items, up or down arrows are displayed on the top or bottom lines. Once the cursor highlights the desired item, the mode is selected by pressing the ENTR key. Pressing 2ND ENTR (MENU) returns the system to the Mode Menu.



Mode Menu
Figure 4.1

4.1. Continuous Output

Figure 4.2 shows the display for Continuous Output Mode. The Series number (selectable as Series II, WX-7 through WX-10, or WX-10A through WX-12) at the top middle may be changed by pressing the "S" (Series) key. Antenna Mount (Top Mount or Bottom Mount) at the top right is changed by pressing the "A" (Antenna) key.

In the Continuous Output mode, the WX-PA will output a continuous series of test signals. The output is started or stopped by pressing the ENTR key.

The range of the test signal output may be varied by use of the F1 and F2 function keys. Each press of F1 increases the range of the signal while F2 decreases the range. The available ranges are 15, 30, 55, 75, 120, and 170 nm. The selected range is displayed on line 2 of the display. The selected range "rolls over" at 15 nm (goes to 170 nm) and at 170 nm (goes to 15 nm) if the F2 or F1 keys respectively are pressed.

```
Continuous Out      Series II      Bottom Mnt
Range = 30nm        Bearing = 0°
                    PAUSED
Range↑      Range↓      Bearing↑      Bearing↓
```

F1

F2

F3

F4

Continuous Output Mode
Figure 4.2

In a similar manner, the bearing of the test signal may be varied by use of the F3 and F4 keys. Each press of F3 increases the bearing by 30 degrees, while F4 decreases the bearing by 30 degrees.

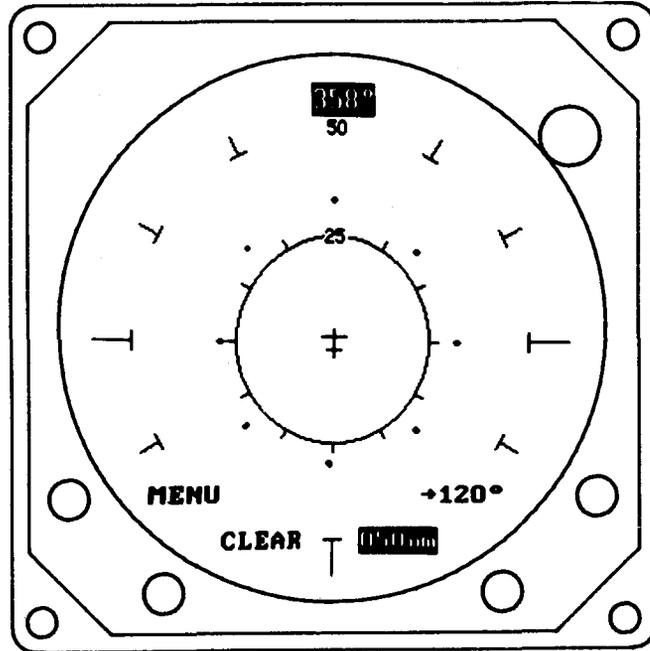
The range and bearing may be changed either before starting the test signal output, or while the test signal is being output.

4.2. Single Shot Output

The Single Shot Output mode is similar to the Continuous Output mode, except that only a single test signal is output for each press of the ENTR key.

The range and bearing of the test signal is varied just as in the Continuous Output mode.

The Series Number, and Top Mount or Bottom Mount are selected as in the Continuous Output Mode, Section 4.1 paragraph 1.



Circular Pattern
Figure 4.3

4.3. Circular Pattern

The Circular Pattern mode outputs a series of test signals at a selected range and continuously incremented bearing. The output is started and stopped by pressing the ENTR key.

F1 and F2 increase and decrease the range of the test signal while F3 and F4 increase or decrease the amount of bearing increment. The resulting output causes a circular pattern of dots on the StormscopeTM system display at the selected range, with the dots spaced apart by the amount of bearing increment.

For example, with the selected range at 30 nm, and the bearing increment at 45 degrees, the WX-PA would output a test signal first at 30 nm, 0 degrees, then one at 30 nm, 45 degrees, then at 30 nm, 90 degrees, etc.. This pattern is illustrated in Figure 4.3.

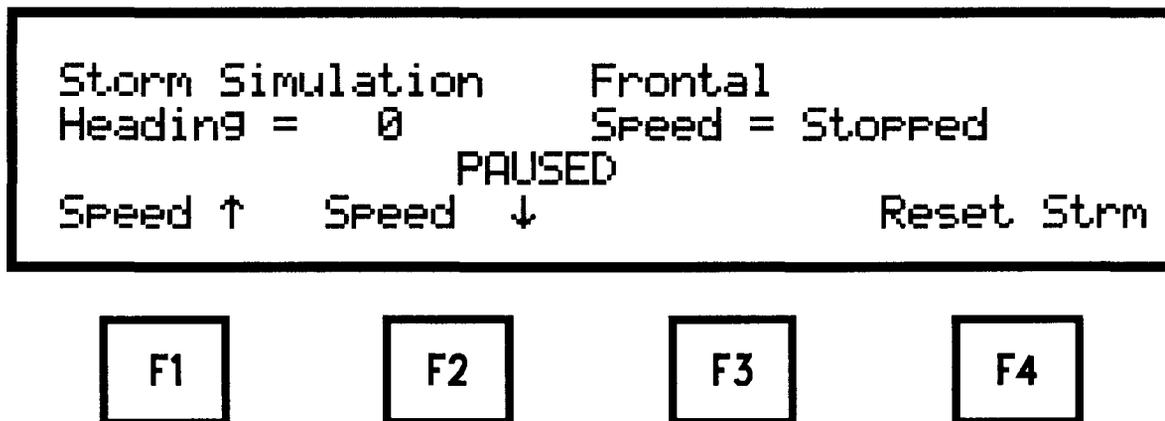
The Series Number, and Top Mount or Bottom Mount are selected as in the Continuous Output Mode, Section 4.1 paragraph 1.

4.4. Storm Simulator

The Storm Simulator Mode is primarily for use in demonstration of StormscopeTM Series II systems. This mode may be used either on installed systems, or in conjunction with the Series II System bench kit connector pod.

After selecting this mode from the Mode Menu, the storm menu is displayed - Frontal, Weak Frontal, 2 Cells, and 1 Cell. Position the cursors on the desired storm, and press ENTR. The storm is started and stopped by pressing ENTR. Figure 4.4 shows the display for the Storm Simulator Mode.

Each cell within a storm is in different stages of maturity, some building, and some dissipating.



Storm Simulator
Figure 4.4

4.4.1. Aircraft Speed

The simulated speed of the aircraft is selectable by F1 and F2 as Stopped, Slow, Medium, and Fast. In the Stopped speed, the storm will maintain it's position and intensity indefinitely. In the Medium speed, the storm will take approximately 20 minutes to travel 100 nm. The Slow speed is 1/5 the Medium speed, and the Fast speed is twice the Medium speed.

4.4.2. Aircraft Heading

The simulated heading of the aircraft may be altered by the Left and Right Arrow keys. The current heading is displayed on line 2 of the display.

4.4.3. Storm Reset

The storm may be reset back to the original starting position by pressing the F4 key. The heading is reset back to zero, and the speed is reset to Stopped.

4.5. Additional Output Mode Features

When used with a Series II System bench kit connector pod, the output modes (Continuous, Single Shot, Circular Pattern, and Storm Simulator) offer some additional functions.

4.5.1. Mic Key Inhibit

The Mic Key Inhibit function may be switched on or off by pressing "I" (Inhibit). "Inhibit On" will be displayed on the WX-PA when the inhibit line is being asserted.

4.5.2. Heading Stabilization

If the unit under test is a heading stabilized Series II system, the following functions are available in the output modes.

4.5.2.1. Heading Change

The heading may be changed by the use of the left and right arrow keys. Each press of the Arrow Keys decreases (left arrow) or increases (right arrow) the heading by 2 degrees.

4.5.2.2. Heading Flag ON/OFF

The flag line may be tested by pressing "F" (Flag). "Flag On" will be displayed when the flag line is asserted. Pressing "F" again turns the flag line off.

4.6. Bench Test

All Series II systems must be bench tested prior to installation. To perform this test, a bench kit connector pod (3M P/N 78-8060-5750-7) is required in addition to the WX-PA.

For details on the Bench Test procedure, refer to the maintenance section (Section 5) of the StormscopeTM Series II Instruction Manual for the particular StormscopeTM system being installed or tested.

4.7. Output Verify

The Output Verify mode is used to test the various outputs of the WX-PA. After selecting the mode, install the WX-PA Test Plug (Figure 2.1) on J1, and press ENTR. The WX-PA first tests its communication functions, and then generates waveforms on all outputs. An oscilloscope is then used to determine the integrity of the output circuitry.

The WX-PA Test Plug is supplied with 2 ground connections (TP1 and TP16), and 14 signal connections (TP2 through TP15). The oscilloscope traces from these test points should appear as follows when in the Output Verify mode.

4.7.1. Waveform Descriptions

- 4.7.1.1. TP2 and TP3 are 31.25 kHz sine waves with a 13.5 Volt (+/- 10%) Peak to Peak output.
- 4.7.1.2. TP4 is a 31.25 kHz sine wave with a 5.0 Volt (+/- 10%) Peak to Peak output.
- 4.7.1.3. TP5 through TP10 are 31.25 kHz sine waves with 0.4 Volt (+/- 10%) Peak to Peak outputs.
- 4.7.1.4. TP11 through TP13 are 31.25 kHz sine waves with 2.4 Volt (+/- 20%) Peak to Peak outputs.
- 4.7.1.5. TP14 and TP15 are 5 Volt, TTL signals at 1 kHz (+/- 20%).

4.7.2. Test Failures/Return for Service

In the event of a communication function failure, the WX-PA will display "COMM ERROR", and will then proceed with the waveform output test. If "COMM ERROR" is reported, or if any of the waveforms are out of tolerance, the WX-PA should be returned for service.

Before returning a system to 3M, ensure that the following steps have been taken:

Call 3M Service Department (614)847-2070 to report the failure, and to receive a Return Authorization Number.

Copy and complete the complaint form Figure 4.5 and return the completed copy along with the repair to:

3M Aviation Safety Systems
6530 Singletree Drive
Columbus, Ohio 43229
(614) 847-2070

**3M STORMSCOPETM WEATHER MAPPING SYSTEMS
WX-PA COMPLAINT REPORT**

A copy of this form must be completed and returned to 3M with the defective WX-PA system to provide complete information about the defect. This will reduce turnaround time and insure Warranty Credit where applicable.

Dealer _____

City, State _____

Name _____ Phone No. () _____

WX-PA Serial # _____

Warranty Non-Warranty (Check One)

Explain problem fully (Use additional page if necessary).

Describe Waveforms observed in Output Verify Mode, Include Test Point Number

Sketch

Has this system been to 3M for repair before? Yes ___ No ___
If yes, was the symptom the same as this one? Yes ___ No ___

To facilitate repair of the system, a Return Authorization number must be obtained by phone from 3M (614)847-2070.

List RA number here: RA # _____.

Figure 4.5

4.8. Checklist Entry

A total of six checklists may be entered into the WX-1000/WX-1000+ using the WX-PA. The Checklist Entry mode may be entered either by selecting it from the Mode Menu Display, or by pressing ENTR at the conclusion of the Bench Test Mode.

Checklists may be added to or updated even after the WX-1000/WX-1000+ has been installed in an aircraft. To do this, simply remove the Series II Processor from the aircraft, and install it in the bench kit connector pod as described in the maintenance section of the StormscopeTM Instruction Manual.

4.8.1. Checklist Editor Description

Using the Checklist Entry mode to enter Checklist information into the Series II system is similar to using a typewriter. Characters are displayed on the WX-PA as each key is pressed, and the checklist title or item is transferred to the Series II system each time ENTR is pressed.

4.8.1.1. Cursor Position

The position where the next character will be entered is normally marked by a blinking block. This blinking block is the cursor. Each time a character is entered, the character is displayed, and the cursor advances one position to the right.

4.8.1.2. Arrow Keys - Cursor Movement

The cursor is moved by the use of the arrow keys. Each press of the Right or Left arrow key moves the cursor one position to the right or left respectively. The Up and Down arrow keys move the cursor up or down one line (only in Checklist Item Edit, not in Checklist Title Edit).

4.8.1.3. Character Entry - Typeover/Insert

The normal character entry mode is typeover. In other words, if the cursor is on a character, and a alpha/numeric key is pressed, the original character will be replaced by the character pressed.

Insert mode (selected by pressing F1) is used to insert a character(s) between two existing characters. This mode is indicated by an underline cursor, and stays on until F1 is pressed again. When in Insert mode, the selected character(s) will be inserted at the cursor position, and all characters to the right of the cursor will be moved one position to the right. If the line is already full (15 characters for the title, and 20 characters for items) and a character is inserted, the last character of the line will be dropped from the line.

4.8.1.4. The 2ND Key

The 2ND key is used to select the punctuation symbols, the MENU function, the CAPS LOCK function, and the checklist word items. The 2ND mode is indicated by "2nd" displayed at the end of line 3 of the display. The 2ND mode is toggled on and off, i.e., the first press of 2ND turns 2nd on, and the next turns it off.

4.8.1.5. CAPS and CAPS LOCK

The normal entry mode for checklist entry is lowercase characters. When the CAPS key is pressed, "CAPS" is displayed at the end of line 2, and the next character entered will be capitalized. After entering the character, the entry mode will switch back to lower case, and subsequent characters will be in lowercase. When CAPS LOCK is selected (by pressing 2ND, and then CAPS) all subsequent characters will be capitalized. CAPS LOCK may be turned back off again by pressing CAPS.

4.8.1.6. Checklist Word Entry

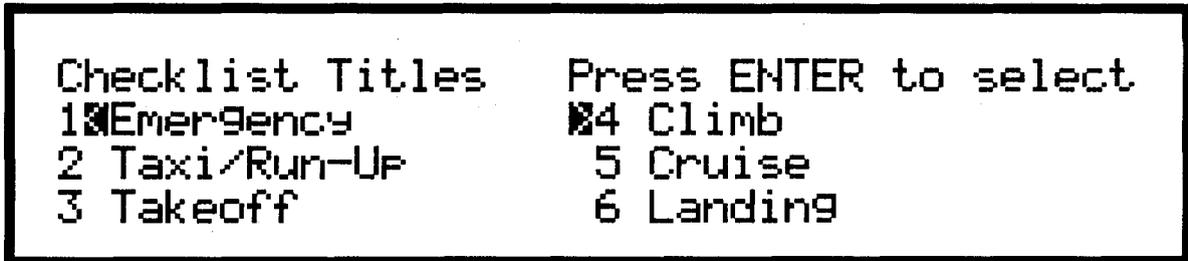
In addition to character entry in checklist mode, entire words may be entered with a single key. These words (CLOSE, CTRL, DOWN, etc.) are accessed by pressing 2ND, and then the desired word.

Additionally, the words may be entered with no letters capitalized, only the first letter capitalized, or all letters capitalized. For example, if the word "knots" is to be entered into the checklist, press 2ND and then G. If "Knots" is to be entered, press CAPS, then 2ND, and then G. If "KNOTS" is to be entered, press 2ND, then CAPS, then 2ND, and then G.

When in Insert entry (4.8.1.3), the entire word is inserted at the cursor position, and the rest of the line is moved to the right by the number of characters in the checklist word.

4.8.2. Checklist Title Selection

Select Checklist Entry from the Mode Menu. The WX-PA display will appear as in Figure 4.6. If any checklists have previously been entered, the titles will be displayed on lines 2, 3 and 4. If checklists have not yet been entered, all titles will be blank.



Checklist Title Menu
Figure 4.6

Generally, checklist 1 should be used for an emergency checklist, as it will appear first on the Series II system checklist mode, making it easier to access during an emergency. The order of the remaining five checklists is not important, except that they must be filled in order. In other words, if there is no title for checklist 2, checklist 3 may not be selected.

To select the checklist title to edit, position the blinking cursors on the desired checklist with the arrow keys, and press ENTR.

4.8.3. Checklist Title Edit

After selecting the checklist, the display will appear as in Figure 4.7. The checklist number and checklist title (if any) will be displayed on line 2, with a blinking block cursor on the first character. In addition to the Editor keys described in section 4.7.1, the following keys are valid in the Checklist Title Edit Mode.

```
Checklist Title Edit
1Emergency
lower case Alpha
```

F1

F2

F3

F4

Checklist Title Entry
Figure 4.7

4.8.3.1. F2 - Delete a Character

Pressing the F2 key deletes the character at the cursor position. All characters to the right of the cursor are moved left one position.

4.8.3.2. MENU - Return to Checklist Menu

Pressing 2ND ENTR (MENU) will exit Checklist Title Edit, and return to the Checklist Menu. If any characters have been entered, the WX-PA will prompt

"Exit without Saving (Y/N)"

If the title entered is to be saved, press N, and then press ENTR. If the title need not be saved, press Y, and the system will return to the Mode Menu.

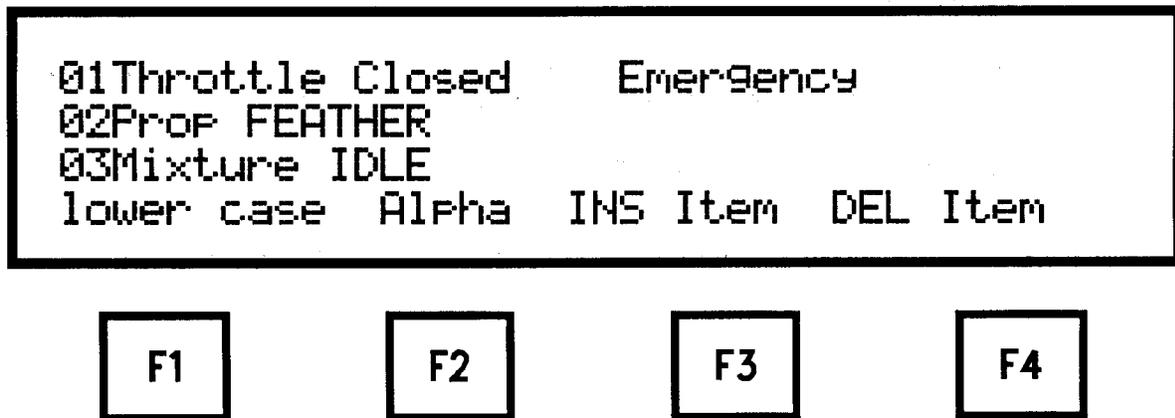
4.8.3.3. ENTR - Saving the Checklist Title

Enter the checklist title (maximum of 15 characters), or modify the existing title, and then press ENTR when the title entry is complete. The title will be transferred to the Series II system, and any items associated with that checklist number will be read from the Series II system and displayed on the WX-PA.

4.8.4. Checklist Item Edit

After a title has been entered, or an existing title has been accepted by pressing ENTR, the WX-PA will switch to the Checklist Item Edit mode (Figure 4.8). The checklist title is in the upper right of line 1, and the first three items (if any) are displayed on lines 1 through 3, along with the item numbers. The item numbers are for reference only. They are not displayed on the Series II system.

In addition to the Editor keys described in the section 4.7.1, the following keys are valid in Checklist Item Edit.



Checklist Item Edit
Figure 4.8

4.8.4.1. F2 - Delete a Character

Pressing the F2 key deletes the character at the cursor position. All characters to the right of the cursor are moved left one position.

4.8.4.2. F3 - Insert Line

Pressing the F3 key will move all lines following (and including) the current line (the line the cursor is on) down one line, and will insert a blank line, leaving the cursor at the beginning of the blank line. If the checklist being edited is already full (30 items), the WX-PA will prompt:

"Checklist Full, Must Delete Item First"

indicating that if a new line is to be inserted, an existing line must first be deleted before the new line can be added.

4.8.4.3. F4 - Delete Line

Pressing the F4 key will delete the current line. All succeeding lines will be moved up one line.

4.8.4.4. MENU - Return to Checklist Menu

Pressing 2ND ENTR (MENU) will exit Checklist Item Entry, and return the system to the Checklist Menu. If any characters have been entered on the current line without ENTR having been pressed, the WX-PA will prompt

"Exit without Saving (Y/N)"

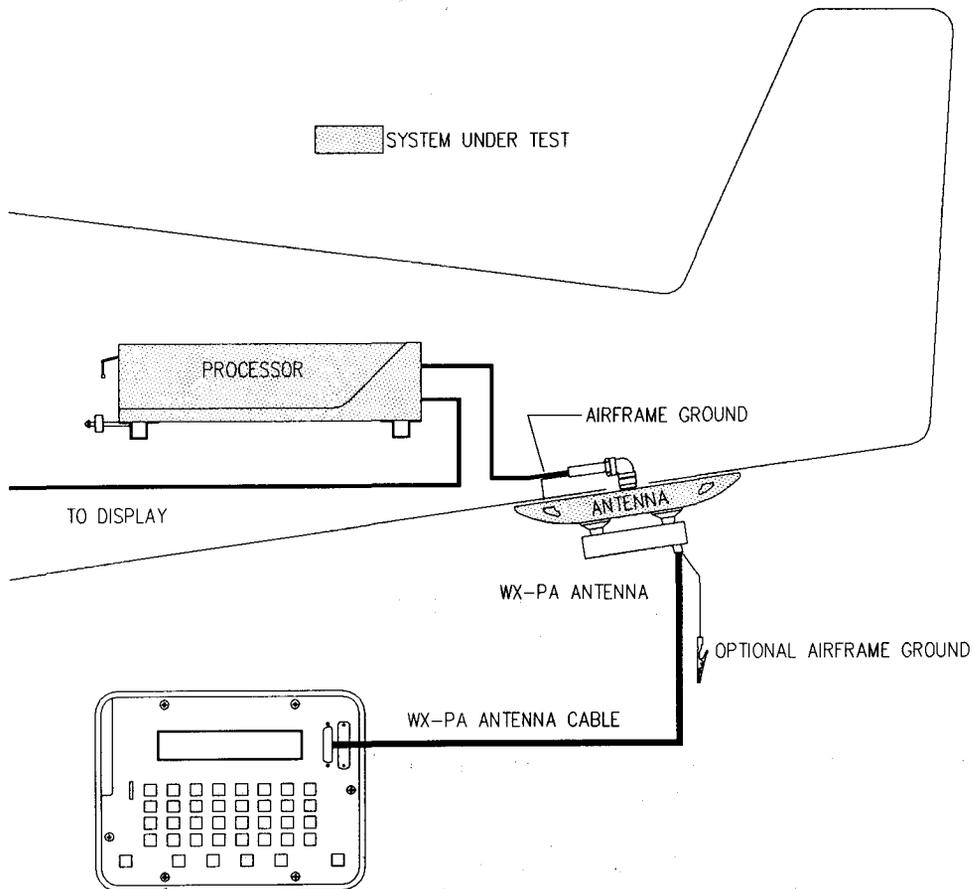
If the item entered is to be saved, press N and complete entry of the line. If the item need not be saved, press Y, and the system will return to the Checklist Menu.

4.8.4.5. ENTR - Saving An Item

ENTR, when pressed, saves the item entered and transfers it to the Series II system.

5. Testing Installed Units

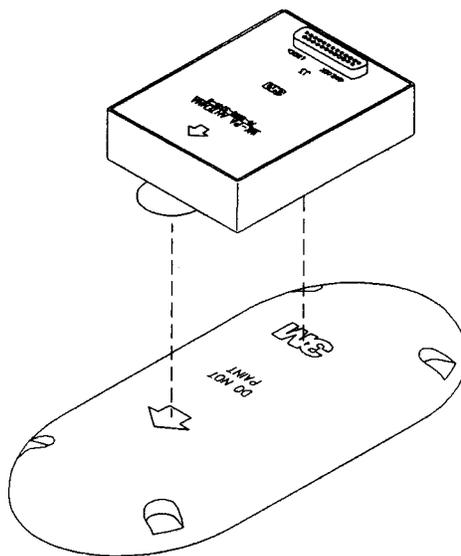
All StormscopeTM systems must be tested after they have been installed to ensure proper operation of both the system and the installation. Figure 5.1 illustrates the connections for this test.



Aircraft Test Setup
Figure 5.1

5.1. Setup

The WX-PA antenna must be positioned correctly on the Series II antenna. The proper alignment is shown in Figure 5.2. The suction cups on the WX-PA should be moistened to ensure that they will hold securely. Note also that the antenna cable is supplied with a suction cup, which when attached will provide strain relief for the WX-PA antenna.



WX-PA Antenna Alignment
Figure 5.2

5.1.1. Connect the WX-PA antenna cable between the WX-PA (J1) and the WX-PA antenna (J3). Press POWER on the WX-PA keyboard, and select the "Continuous Output Mode".

5.1.2. Power up the Series II Stormscope™ system in the "Self Test Disable" Mode. To do this, hold in the Top Right Button while applying power to the Stormscope™ system.

5.1.3. If the Stormscope™ antenna is mounted on top of the aircraft, press "A" on the WX-PA panel to select "Top Mount". If "Top Mount" is not selected when testing a top mounted antenna, the data displayed on the Stormscope™ system will be reversed East to West. The default setting for the Antenna Mount is "Bottom Mount".

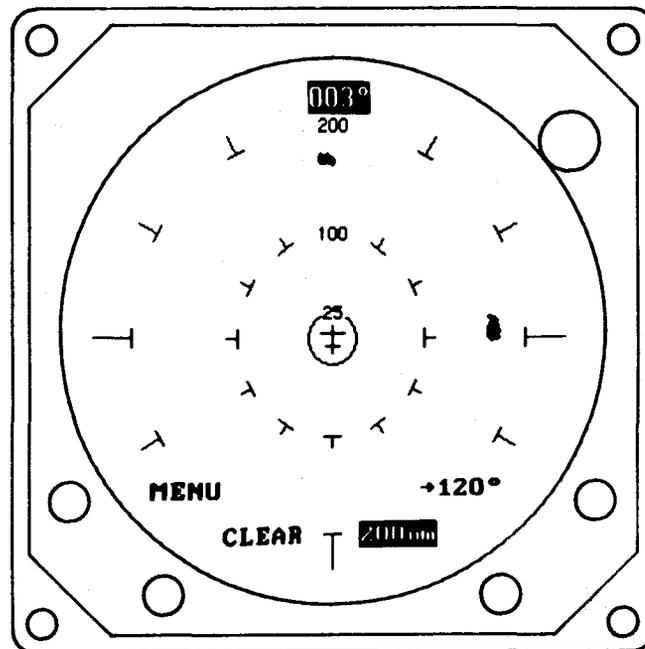
5.1.4. If the system to be tested is a Series I press "S" once to select "WX7 - 10", or again to select "WX10A - 12". For Series II systems, the default series number is correct. If an incorrect Series number is selected, the data may be displayed on the Stormscope™ in an erratic manner.

5.2. Checking Azimuth

The first check is for correct azimuth or bearing. Place the WX-PA in Continuous Output Mode, and set the range at 170 nm, and the bearing at 0 degrees. Press ENTR on the WX-PA to start the test signal. With the Stormscope™ system display on the 200 nm range, verify that the system is plotting discharge points inside the 200 nm range ring, at 0 degrees.

Next change the strike bearing to 90 degrees on the WX-PA (bearing can be changed while the strike output is running). Verify that the system is plotting discharge points inside the 200 nm range ring, at 90 degrees.

Figure 5.3 illustrates the proper display for this test.



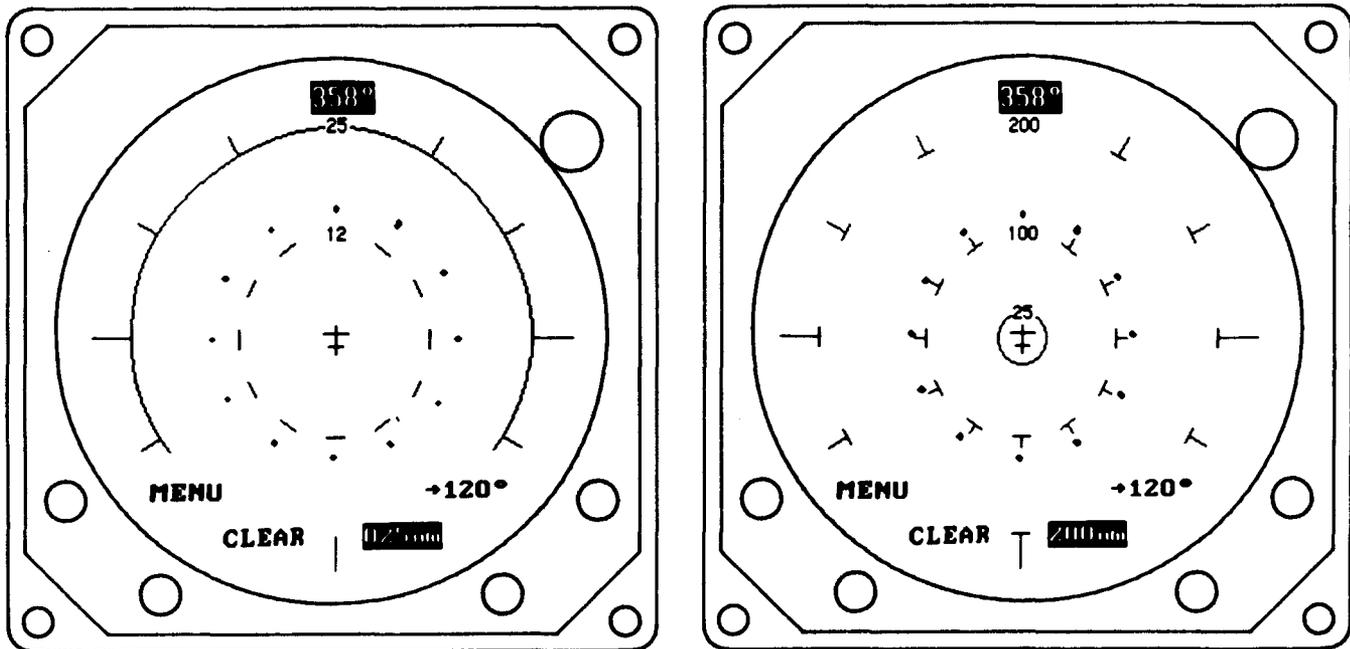
Azimuth Display
Figure 5.3

5.3. Checking Range

The next test is for range accuracy. Exit Continuous Output Mode, and select Circular Pattern Mode. Set the WX-PA range to 120 nm, and the bearing increment to 30 degrees. Press ENTR to start the test strike output. Set the Stormscope™ range to 200 nm and verify that a circle of discharge points is plotted outside the 100 mile range ring, spaced 30 degrees apart.

Decrease the WX-PA test strike range to 15 nm, switch the Stormscope™ to the 25 mile range, and verify that the discharge points are plotted outside the 12 nm range ring.

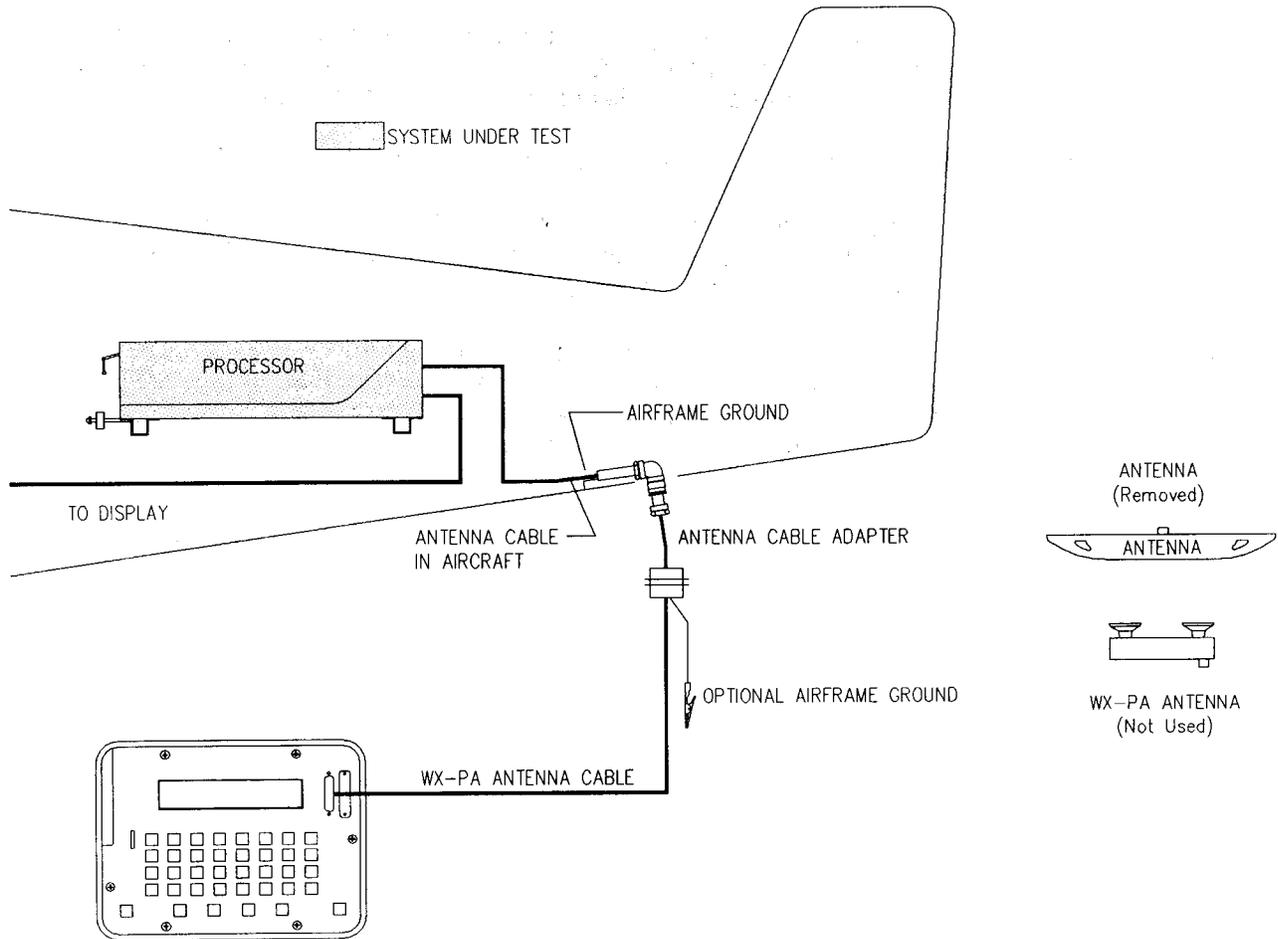
Figure 5.4 illustrates the proper displays for this test.



15 nm Test

120 nm Test

Range Display
Figure 5.4



Series II Antenna Bypass
 Figure 5.5

5.4. Bypassing the Series II Antenna

If the Series II system does not plot as described above, the Series II system antenna can be eliminated as the problem area with the following procedure.

NOTE

This procedure can only be used on a Series II system. The Series I systems are not compatible with the WX-PA direct drive.

Power down the Series II system. Referring to Figure 5.5, disconnect the Series II system antenna and disconnect the WX-PA antenna. Connect the WX-PA Antenna Cable Adaptor between the WX-PA Antenna Cable and the Series II System Antenna Cable.

Once the connections are complete, repeat the tests of sections 5.2 and 5.3.

If the original problem persists, then either the Series II system wiring is at fault, or the Series II processor is at fault. The Series II system should be Bench Checked according to the Maintenance Section of the Instruction Manual.

If the test results are good this time, then either the Series II system antenna is faulty, or there is excessive electrical noise in the area of the antenna installation. The Series II system antenna should be checked with the Bench Check Procedure to eliminate it as a problem. In addition, the antenna location should be skin mapped.

6. Battery Operation

The WX-PA contains an integral, rechargeable 12 Volt sealed lead-acid battery for portable operation. The battery will, when fully charged, power the system for two to four hours. However, if extended operation (checklist entry or bench testing) is anticipated (operation for over 1 hour at a time), it is recommended that the WX-PA be connected to the Battery Charger during operation.

Several standard features are incorporated into the WX-PA design to insure maximum battery life.

6.1. Lid Switch

When the lid of the WX-PA is closed, the battery is completely disconnected from the system except for the battery charging monitor. The battery drain with the lid closed is only 15 micro-amps. Therefore, the WX-PA should be stored with the lid closed and the charger plugged in when not in use.

6.2. Timed Power Down

With the lid open, and the WX-PA unit on, if no key presses are made within a 20 minute period, the WX-PA will power down, going into a minimal current drain. Before powering down, the WX-PA will sound 2 long beeps, wait 15 seconds, sound 2 more beeps, wait another 15 seconds, then sound 3 long beeps. If any key is pressed before the 3 long beeps, the unit will not power down. If the WX-PA does power down, pressing the POWER key will restore power to the unit.

NOTE

If the WX-PA is in Checklist Title Entry or Checklist Item Entry, be sure to press ENTR at the end of each line. Any checklist title or item which has been typed in, but which has not been transferred (i.e., pressing ENTR at the end of the line) will be lost when the timed power down occurs.

Although the current draw on the battery is reduced in this mode, it is still enough to discharge the battery over a period of time.

6.3. Low Battery Shutoff

If the battery voltage falls below 10.5 Volts, the low battery shutoff control causes the WX-PA to power down immediately. This can be detected by watching the WX-PA display while pressing the POWER key. The WX-PA will beep 4 times, display Self Test results briefly (1 to 2 seconds), and then power down. If this is the case, the charger must be connected to the WX-PA and left for a period of not less than 8 hours. If the battery does not charge after this time period, the WX-PA should be returned for service to:

3M Aviation Safety Systems
6530 Singletree Drive
Columbus, Ohio 43229
(614) 885-3310

The return procedure outlined in section 4.6.2 of this manual must be followed to return the WX-PA to 3M for service.

6.4. Automatic Charger Shutoff

The WX-PA is equipped with a charger sensing circuit which will internally disconnect the charger from the battery once a full charge has been attained. Therefore, it is possible to leave the charger plugged into the WX-PA any time it is not being used, without danger of over-charging or damaging the battery.

To be certain of a full charge, plug the charger into the WX-PA, switch the WX-PA on, then off again, and then close the lid.

7. Specifications

7.1. Enclosure

Height5.06 in.

Width12.00 in.

Depth9.00 in.

Weight 10 lbs.

7.2. Antenna

Height 0.8 in.

Width 4.4 in.

Depth 3.2 in.

Weight 7 oz.

7.3. Charger

Rated at 15 VDC, 600 mA maximum.

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