
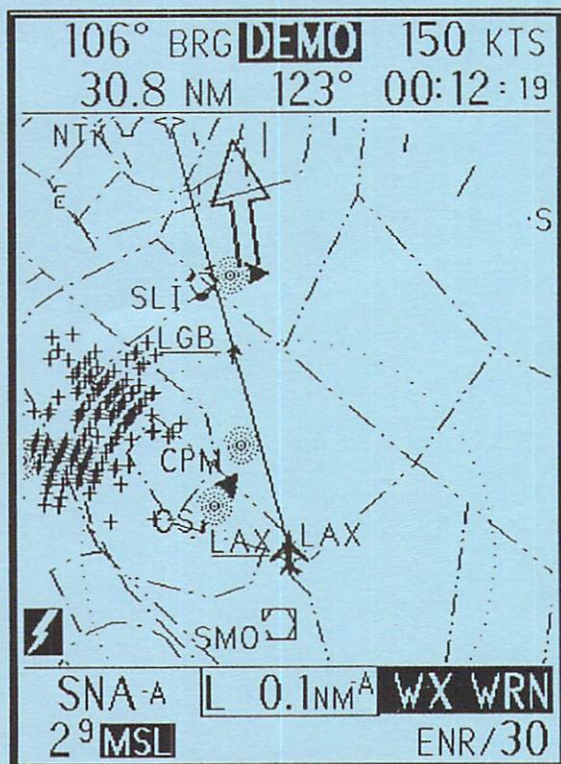


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ARGUS®/ WX-500 SUPPLEMENT



Storm cell overlay in ADF/WD: map & plan mode

February 1999, Part # 141029, Rev. C

Overview of WX-500 Software

Version 5.2x software contained in the ARGUS 5000/CE & 7000/CE and the new enhanced monochrome units allows the ARGUS to interface directly with the BFGoodrich Stormscope® WX-500 Series II Weather Mapping Sensor. This capability consolidates the two systems and enables the ARGUS to display the information it receives from the WX-500 Processor and eliminates the expense of an external adapter or additional display head.

The WX-500 updates the ARGUS every two seconds with the range and bearing data of the lightning (electrical discharges) associated with thunderstorms. This information, represented as cells and strikes, is used by the ARGUS to plot the location of the thunderstorms which is then seen either on a dedicated display screen, superimposed on the map display, or in a thumbnail insert into the map display.

The crisp resolution provided by the ARGUS CRT display makes the ARGUS an invaluable tool for determining an alternate route when a dangerous weather condition calls for flight plan modification. This latest software version provides an array of new options to access critical weather information faster than ever before.

THE STORMSCOPE WX-500

Introduction

This addendum is intended for use in conjunction with the BFGoodrich WX-500 Stormscope® Series II Weather Mapping Sensor User's Guide and assumes a thorough understanding of the ARGUS operation and its Reference Manual.

The following example shows the ARGUS flying in DEMO flight plan mode. You can do this with or without a connection to the STORMSCOPE WX-500. Without a connection, the ARGUS will generate its own simulated storms at mid-range and will give you the opportunity to familiarize yourself with the STORMSCOPE WX-500's features. Not quite sure how to set up a demo flight plan? See the "Flight Plan Quick Start" section at the back of this addendum or refer to pp. 88-89/pp. 80-81 ARGUS Version 5.X Reference Manual. (Note page references sequenced: CE manual/Monochrome manual.)

Getting Started

Power up the ARGUS. Once the ARGUS displays its limitations screen and passes its self-test, it will display the information screen. Press any key. Without a connection to the STORMSCOPE WX-500, the next screen will instruct you to "press any key."

If you are in your aircraft with a STORMSCOPE WX-500 connection, this next screen typically takes time to appear because the WX-500 is transferring the WX-500 STORMSCOPE logo page. Press any key and the self-test screen for the antenna mounting jumper will appear. Should you receive a message indicating that the location of your antenna has changed, check the **ERROR MESSAGES** section in the back of this addendum. Otherwise, press any key.

The **LRN DATA LOST** message will appear. Activate a flight plan. (Check the "Flight Plan Quick Start" section for this procedure.)

A display screen will appear which displays **DEMO** in reverse video at the top of the screen and **PLN/(a range #)** in the lower right-hand corner of the screen. Let's explore some of the **DISPLAY OPTIONS** you have with the ARGUS and the STORMSCOPE WX-500.



Selecting the Mode

Press **AUX** rapidly three times (or hold it down for five seconds) and press **AMEND** when the **MAIN MENU** appears. You are now on the **DISPLAY FEATURES** screen. Notice the **ARGUS** softkeys are redefined with this menu selection.

Select the display option for your **STORMSCOPE WX-500** display on the first line. **STORMSCOPE WX-500** choices will appear as **WD** (Weather Display). Press **[CHG]=[ARR]** to scan these options or use the Rotary Encoder knob if you own a color **ARGUS**.

DISPLAY OPTIONS WITH ADF

ADF & WD OFF
ADF MODE
ADF/WD: PLAN
ADF/WD: MAP+PLAN
WD CELL MODE
WD STRIKE MODE

DISPLAY OPTIONS W/O ADF

WD MODE OFF
WD CELL MODE
WD STRIKE MODE
WD ON MAP

DISPLAY FEATURES	
DISPLAY OPTIONS:	
→ ADF/WD: MAP+PL	PAGE
Y AIRSP. FIXES	LINE
Y NAVAIDS	
Y SPECIAL USE AIRSPACE	CHG
Y AIRPORTS	
N HELIPORTS	RTN
N USER WPTS	
WD INSET-CELL	
NO AIRWAYS	
DISP. FEATURES END	

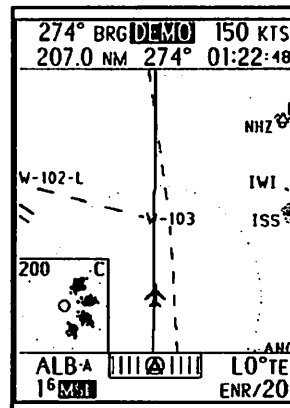
ARGUS Display Features Screen
7000/CE

CELL MODE and **STRIKE MODE** are weather displays. Flight plan waypoints and courselines(if enabled) are also shown. The remaining options display weather warnings as necessary.

To determine how the Stormscope WX-500 is displayed along with the map, press **[LINE]=[ENR]** until you reach the second line from the bottom on the **DISPLAY FEATURES** screen. This feature allows you to choose between a thumbnail insert of cells or strikes into the map, or an overlay on the map of either cells or strikes in ranges greater than 25 nm.

STORMSCOPE WX 500+MAP DISPLAY OPTIONS

WD ON MAP-CELL
WD INSET-CELL
WD ON MAP-STRK
WD INSET-STRK

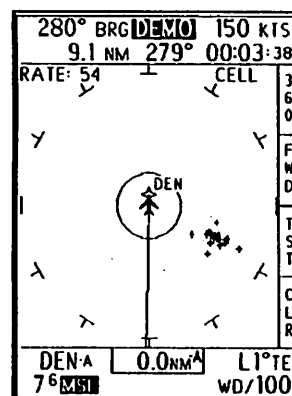


ADF/WD: MAP & PL/5000 CE
WD Inset-CELL ENR/20

The WD Operating Controls

The following example will illustrate the STORMSCOPE WX-500 features as controlled by the ARGUS without the map display. Select **WD CELL MODE** and press [RTN]=[AUX] to return to the display. You should now be viewing a **DEMO** Weather Display screen. For owners of all ARGUS 5000 models there is a legend on the right side of the screen. The ARGUS softkeys are redefined specifically for the Weather Display.

The 7000/CE will not show a legend. Use the chart below to determine your softkey definitions. (There are key caps available with these captions. Contact your ARGUS dealer for more information.)



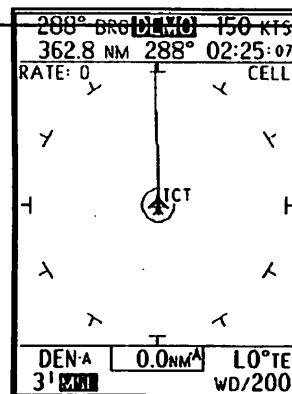
Cell Mode
100 nm range/360° view
5000/CE

[360]=[DEP]	For available range selections of 200, 100, 50, and 25 in 360° view.
[FWD]=[ENR]	For available range selections of 200, 100, 50, and 25 in a forward view.
[TST]=[ARR]	STORMSCOPE WX-500 operator- initiated self-test. A satisfactory test will be indicated by a return to the regular display.
[CLR]=[AUX]	Push and hold for at least one second to clear the discharge points on the screen. Do this periodically while monitoring a storm to determine if the storm is building or dissipating.

Reading the Screen

To determine which range view is displayed, look in the bottom right corner of your screen. For this demo, the message should read WD/200. This will give you a 360° view in the 200 nm range. Press [360]=[DEP] until you see WD/200 in the bottom right corner of your screen.

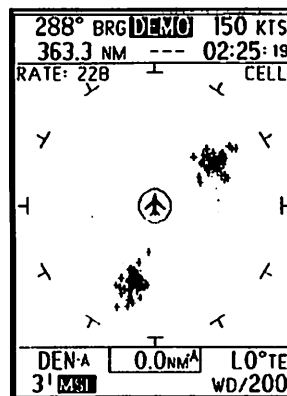
The 25 nm range is represented by the small, solid ring in the center of the screen. The subsequent rings (dotted) appear in increasing distance to the 200 nm range ring on the outer edge.



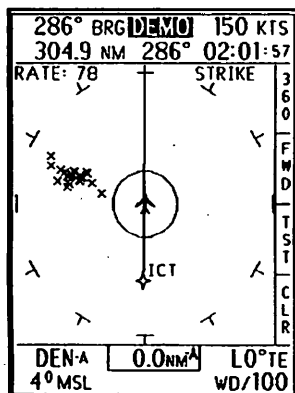
Cell Mode
200 nm range/360° view
7000 CE

In the top left corner of the display you will see the **RATE** calculation. The ARGUS calculates the number of cells or strikes-per-minute that are displayed on the screen in the current range over the last 20 seconds. This enables you to determine if the storm is intensifying or dissipating. **STRIKE** or **CELL** will be displayed in the upper right-hand corner according to the mode selection.

The **CELL** mode displays filtered storm data using small + signs to represent storm cells. It is useful during periods of heavy electrical activity because random strikes may be associated with clusters by the filtering algorithm. A cleaner view on the screen makes it easier to determine a safe route.



Storm display in Cell Mode



Storm display in Strike Mode
5000/CE

The **STRIKE** mode depicts electrical discharge points with small x's. This raw data plots discharges where they are actually detected without an association to a cluster. It is helpful during periods of light electrical activity because it plots the initial lightning strikes of an intensifying thunderstorm more quickly than the **CELL** mode.

To view the storm display in **STRIKE** mode, return to the **MAIN MENU**. Press **AMEND** and select **WD STRIKE** mode. Press **[RTN]=[AUX]** to view the raw data. (Refer to Chapter 4 of your **STORMSCOPE WX-500** User's Guide for more complete information on interpretation of the displays.)

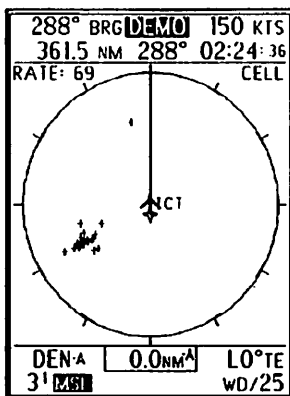
Clearing the Discharge Points

To determine if a storm is intensifying or dissipating, it is necessary to clear the discharge points from the screen periodically. To clear the screen, press and hold **[CLR]=[AUX]** for at least one second and release. Notice how the discharge points reappear. In a building storm, the discharge points reappear faster and in larger numbers than they will in a dissipating storm. The size of the cluster of discharge points indicates only the size of the storm area. The storm intensity is determined by the speed with which the discharge points appear. The faster the discharge points appear, the more potent the storm.

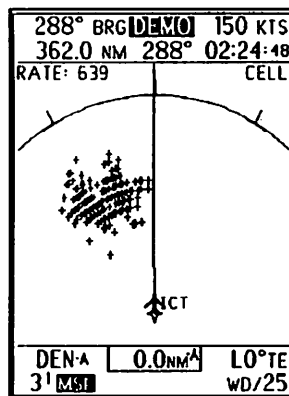
Modifying Your Point of View

Thunderstorm activity is displayed in a 360 degree view or a forward view. Press [360]=[DEP] until you read WD/25 in the bottom right-hand corner of the screen for a 360 degree weather view at the 25 nm range. Optionally, you may press [FWD]=[ENR] for better definition in a forward view. Notice your range selection appears in the bottom right-hand corner of the screen exactly as it does in the 360 degree weather view.

7000/CE



Cell Mode in 360° view.
Range selection 25 nm.



Cell Mode in FWD view.
Range selection 25 nm.

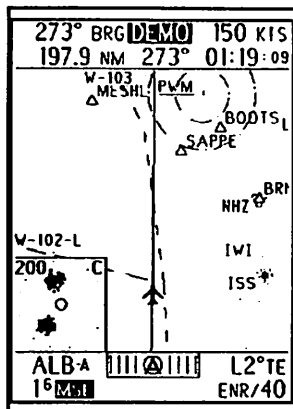
Never use your STORMSCOPE system to attempt to penetrate a thunderstorm. The FAA Advisory Circular, Subject: Thunderstorms, and the Airman's Information Manual (AIM) recommend that a pilot "avoid by at least 20 miles any thunderstorm identified as severe or giving an intense radar echo." STORMSCOPE WX-500 User's Guide, pg. ii.

THE ARGUS AND THE STORMSCOPE WX-500

Map and Weather Display Options

WD INSET-CELL / WD INSET-STRK

The ARGUS will display the STORMSCOPE WX-500 data in a thumbnail insert in the lower left-hand corner of your display screen that allows you to track developing storm systems without cluttering your map display.



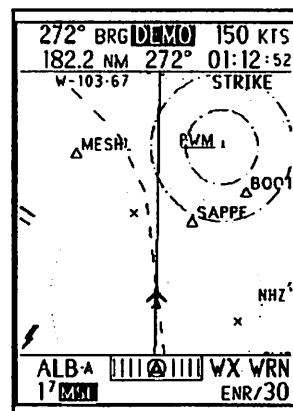
ADF/WD: Map & Plan/ENR/30
WD Inset - Cell 5000/CE

To view the insert, return to the **MAIN MENU**. Press **AMEND** and select **ADF/WD: MAP & PLAN**. Press **[LINE]=[ENR]** until you reach the second line from the bottom. Choose **WD INSET-CELL** and press **[RTN]=[AUX]**.

In both of these options, cells and strikes are depicted by dots and the range view appears in the upper left-hand corner of the inset. The **C** or **S** in the upper right-hand corner denotes your selection. The small, solid range ring in the center of the inset represents 25 nm. The dotted range ring at the edge of the inset corresponds to the last range view selected in the regular **WD MODE** or in the full-screen **WD** display. Weather warnings are not displayed in these options.

WD ON MAP-CELL / WD ON MAP-STRK

For an overlay of either cells or strikes over the ARGUS map display, select either the **WD ON MAP-CELL** or the **WD ON MAP-STRK** option. Storms will be overlaid only if you have chosen a range view of greater than 25 nm. In full-color mode, the ARGUS CE will show cells as red +’s and strikes as red x’s and **CELL** or **STRIKE** will appear in the upper right-hand corner of the map. If the range is less than 25 nm, the storms and their identifiers will not be displayed and the **WX WRN** (weather warning) will appear.



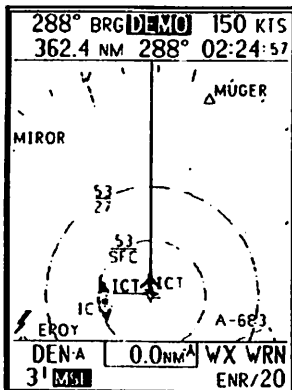
ADF Map & Plan/ ENR 30
WD on Map-STRK 5000CE

Weather Warnings

The ARGUS continues to receive information from the STORMSCOPE WX-500 even if you are flying with the **WD MODE OFF**. Impending storm activity in the general direction of your flight path is indicated by a warning message **[WX WRN]** in the lower right-hand corner of the screen and flashing lightning icons on either side at the bottom of the display. The chart below illustrates which display options include weather warnings. You will see storm cells or strikes displayed in these modes only if you have chosen a map range of greater than 25 nm.

Display Options Mode with ADF	Weather Displays and Warnings
WD CELL MODE	Weather display only. NO warnings displayed.
WD STRIKE MODE	
ADF & WD OFF	Warnings displayed.
ADF MODE	
ADF/WD: PLAN ADF/WD: MAP & PLAN	Warnings displayed. Storm cell or strike overlays visible in ranges of 25 nm or greater. Warnings will replace ADF digital reading in lower right-hand corner.
WD INSET-CELL	NO warnings displayed.
WD INSET-STRK	
WD ON MAP-CEL	Warnings displayed.
WD ON MAP-STRK	

Display Options Mode without ADF	Weather Displays and Warnings
WD CELL MODE WD STRIKE MODE	Weather display only. NO warnings displayed.
WD MODE OFF	Warnings displayed.
WD ON MAP	Warnings displayed. Storm cell/strike overlays visible in ranges of 25 nm or greater.



Weather warning display
ADF/WD: map & plan/ENR 20

WX WRN (Reverse video) Both the warning and lightning icon in reverse video alert you to dangerous electrical activity. You are heading directly into a storm within 25 nm +/- 60 degrees off each side of the nose of your aircraft.

Notice the figures are not showing storm cells even though storm activity is indicated. The ARGUS will only display storm cells overlaid on the map display in ranges of 25 nm or greater.

WX MSG (Not shown) STORMSCOPE WX-500 is reporting an error condition. No cells or strikes will be displayed on the map. Switch to **WX CELL MODE** or **WX STRIKE MODE** for more information.

Instant Full-Screen Display Access

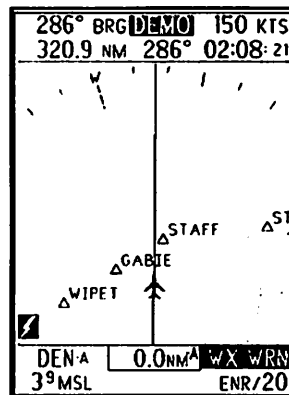
Regardless of what display option you have chosen, if you receive warning messages on your screen or notice increased storm activity on your WD inset, you may want to access the full-screen display immediately. Whether or not storms are overlaid on the map, inset, or not displayed at all, the full-screen display is accessible any time the ARGUS is connected to the STORMSCOPE WX-500.

Return to the **MAIN MENU** and press **AMEND**. On the **DISPLAY FEATURES** page select **ADF & WD OFF** and press **[RTN]=[AUX]** to return to the display. Press **[ENR]** for a range selection of **ENR/20**.

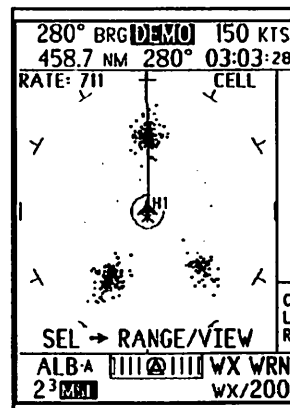
To access a full screen display of the current activity, press **INFO (ENR)**

Defining the Warnings

WX WRN This warning appears if there is a storm within 25 nm of the aircraft's position, or if there is a storm within 100 nm and within 60 degrees off each side of the aircraft's nose. The activity in this area warrants monitoring on a regular basis. Notice the warning appears in the space normally reserved for the digital ADF reading.



Weather warning display
ADF/WD: map & plan/ENR 20
reverse video



Instant Full-Screen Display of cells
5000 CE

+ **AUX**) with no selected object. Press **INFO** again for the full-screen display of strikes. The cells and strikes are depicted by dots and may be cleared by pressing **[CLR]=[AUX]**. By pressing **INFO** once again, you will go to the normal displays of **INFO**, usually starting with altitude. Remember to press **AUX** a tiny bit earlier than **ENR** to reach **INFO**.(ARGUS Reference Manual pp.120-127/110-117.)

Notice **SEL→ RANGE/VIEW** at the bottom of the display. When the full-screen display is shown, pressing **SEL (DEP + AUX)** will change the range and view of the WD displays. As in the **CELL** and **STRIKE MODES**, thunderstorm activity is displayed in a 360 degree view or a forward view.

A simple method for changing the range of the inset display: Press **INFO** to access the full-screen display and press **SEL** to change ranges. Hold **INFO** until the display returns to the map mode.

The range selected in the full-screen display will affect the inset display as well as the regular WD mode. Ranges selected in the regular WD mode will affect the inset display as well as the full-screen display. The chart below illustrates how to adjust your full-screen range/view once it is on your screen.

INFO (ENR +AUX)	Press once for full-screen display of cells.
INFO (ENR +AUX)	From cell display press again for full-screen display of strikes.
INFO (ENR +AUX)	From strike display press again for normal INFO display.
SEL (DEP + AUX)	Pressing intermittently will access available range selections of 200,100,50,25 in 360° and forward views respectively.
SEL (DEP + AUX)	Holding SEL for several seconds will cycle the ARGUS backwards through the above range/view selections.

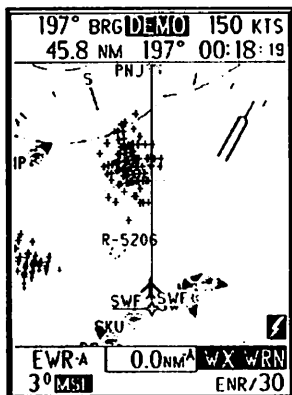
If you need to select an object on the map, the inset will disappear for a few seconds. If the location of the object is in the bottom left-hand corner of the map, the object box will appear beside the inset.

Please note, you must deselect all objects on your screen to reach the full-screen display. To deselect a facility (or facilities), press **SEL** until all of your facilities have been displayed and select the blank. (ARGUS Reference Manual pp.121-122/pp.111-112.)

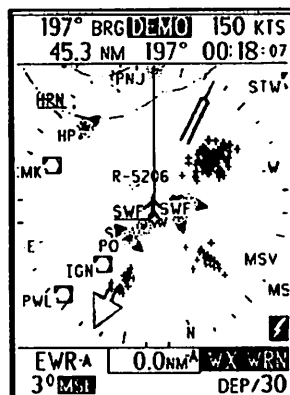


In comparison, the **DEP** mode provides you with a more detailed 360° view of your immediate surroundings. If you are using ADF, the needle is in full view at all times. Press **DEP/30** for a comparative view to **ENR/30**. In the **DEP** mode ranges, 1 through 40 nm, storm cells will be visible in the 30 and 40 nm screen ranges only.

7000/CE



ADF/WD: map & plan ENR/30

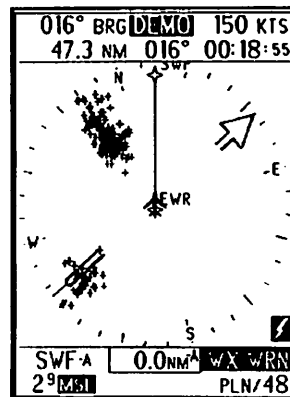


ADF/WD: map & plan DEP/30

ADF/WD: PLAN - The ADF needle is displayed and weather warnings appear as appropriate if **INSET** is not displayed. Storms are visible if the most distant waypoint is greater than 25 nm or more in range and if you are showing **PLN** in the bottom right-hand corner of your screen. After the ARGUS has completed its self-test, it will enter the **PLAN** mode when you press any button. **PLAN** may also be entered by depressing the **DEP** button (pp.38-40/pp.32-34 ARGUS Reference Manual). Press **INFO** with no selected object for a full-screen display of cells or strikes.

ADF & WD OFF - Map display only, but will show weather warnings. Press **INFO** with no selected object for a full-screen display of cells or strikes.

ADF MODE - ADF only, but will show weather warnings. Press **INFO** with no selected object for a full-screen display of cells or strikes.



ADF/WD: plan mode PLN/48

WD CELL MODE - Normal WD display with cells depicted as '+'s. Range and view are selected by using **[360]=[DEP]** for 360° view and **[FWD]=[ENR]** for a forward view. The range and view selected in this mode will affect the **INSET** display. Operator initiated self-test key available in this mode.

WD STRIKE MODE - Normal WD display with strikes depicted as x's. Range and view are selected by using [360]=[DEP] for 360° view and [FWD]=[ENR] for a forward view. The range and view selected in this mode will affect the **INSET** display. Operator initiated self-test key available in this mode.

The ARGUS as the Primary ADF

Although weather warnings will be displayed as appropriate, if the ARGUS is selected as the primary ADF, you must press **AUX** four times to have full access to all the ARGUS' features.

ERROR MESSAGES

The STORMSCOPE WX-500 User's Guide provides a comprehensive look at error messages beginning on page 3-2. Should you receive an error message, you may press **AUX** and **ENR** for **INFORMATION** to reach the Fault Log in **WD CELL MODE** or **WD STRIKE MODE**. The most recent fault listed should be the one you've just received. Match the code given with the error message chart in the STORMSCOPE WX-500 User's Guide for more details. The chart below illustrates error messages displayed on the ARGUS.

ERROR	INTERPRETATION	ACTION
STORMSCOPE WX-500 Communication Lost	The ARGUS is not receiving data from the WX-500	Check WX-500 circuit breaker or see your installer for service.
STORMSCOPE WX-500 Self-test Running	Pilot initiated self-test in progress.	Once self-test is complete, unit will return to display or indicate error.
STORMSCOPE WX-500 Antenna Error		See your installer for service.
STORMSCOPE WX-500 Antenna Jumper Changed		See your installer for service.
STORMSCOPE WX-500 Inhibit Line Stuck On	The inhibit line that disables the STORMSCOPE WX-500 during radio transmission has been active for too long.	Try to determine why radio is still transmitting (mic stuck?). See your installer if problem persists.
Bad WX-500 HDG	Warning (yellow) indicating that the WX-500 is not reading heading.	Storms must be cleared after making a turn. Unit will continue to operate without heading source, but see your installer for adjustment or repair.

FLIGHT PLAN QUICK START

Use the following condensed versions to reacquaint yourself with these procedures. The information below can be found in more detail in the ARGUS Reference Manual.

To Create and Store a DEMO Flight Plan: Press [AUX] rapidly three times to reach the **MAIN MENU**. Press [ENR]=**FLIGHT PLANS/WPTS**. Press [ENR]=**CREATE/EDIT FP/WPT**. Press [DEP]= **CREATE FP/WPT**. Press [DEP] again to select **CREATE FLIGHT PLAN**. Press [DEP]= **NEW FLIGHT PLAN**. Enter your selected waypoint or "identifier" and press **DONE**, followed by **ADD**. Press [DEP]=**INSERT** to select a destination. Press **DONE**, **ADD**, **DONE** and **SAVE** to store the flight plan in the ARGUS. (See Sec. 5, Flight Planning and Recording in the ARGUS Reference Manual for more details.)

To Activate a Stored Flight Plan: Press [AUX] rapidly three times (or hold button down for five seconds). Go to **FLIGHT PLANS/WPTS** and press [ENR]. Press [DEP] to **ACTIVATE FP/WPT**. Press [ENR]=**FLIGHT PLAN**. If you have multiple stored flight plans, choose one. Press [DEP]=**NEXT F.P.** to review your flight plans. Press [AUX]=**USE**. Select [FWD]=[DEP] or [REV]=[ENR] and press [ACTV]=[AUX].

To "Fly" a Flight Plan in DEMO MODE: Return to **AMEND** and press [PAGE]=[DEP] until you reach the **SIMULATED FLIGHT** page. Press [CHG]=[ARR] or use the Rotary Encoder knob and choose **FLY** under **FLIGHT PLAN**. Similarly, choose a speed. Press [AUX]=[RTN] and you should see your flight plan in place. At this point, you may or may not be set up for the Weather Display.

The ARGUS will not enter **DEMO MODE** if it is receiving data from an external navigation source. Remember to return the ARGUS to **EXTERNAL NAVIGATION** when you have completed your **DEMO** flight. To return the ARGUS to **EXTERNAL NAVIGATION**: Press [AUX] three times. Go to **FLIGHT PLANS/WPTS** by pressing [ENR]. Press **EXTERNAL NAV**=**[ARR]**.

GLOSSARY

discharge points	Symbols that represent the atmospheric electrical discharges associated with thunderstorms. May depict intra-cloud, inter-cloud or cloud-to-ground electrical discharges; lightning.
rotary encoder	A rotating control knob that "encodes" (communicates with) circuitry by the number of clicks or the direction of its revolution. The ARGUS CE's "PUSH-ON" knob is a rotary encoder capable of a variety of functions in various menus and circumstances (pp. 8-10 ARGUS Reference Manual.)
reverse video	Caption that is highlighted by a reverse presentation to surrounding text. REVERSE VIDEO.
softkeys	Keys that are redefined with a new menu selection.

INSTALLER

For **SETUP**:

Hold **INFO=AUX & ENR** when you apply power. Press **AUX** three times to reach **MAIN MENU**. Press **ARR=INSTALL/SETUP** option. Press **PAGE=DEP** to **ADAPTER SELECT**. Press **CHG=ARR** and select **BFG WX-500** under **ADAPTER TYPE**. Press **PAGE=DEP** to access the **WX-500** test function controls on the next page. The display **TEST MODE: NONE** should appear. This is correct for normal operation. The other options are **NOISE MONITOR** and **STRIKE TEST**. In the **NOISE MONITOR** and **STRIKE TEST** modes, do not press the **DEP=ENR** key while performing test. Access to **SYSTEM DATA** and **FAULT LOG** is accomplished through the **WD Cell** or **WD Strike Mode**. From the **MAIN MENU** choose the **AMEND MODE**. On the Display Features Page, under Display Options, **WD** functions can be selected. Press **INFO=AUX & ENR** or **INFO REMOTE SWITCH** if activated. System Data Page 1 will come up; System Data Pages 2 & 3 and Fault Log are accessed by pressing **INFO** progressively. Exiting test mode can be accomplished by holding down **INFO** switch. Refer to **STORMSCOPE WX-500** manual for test modes. Note: Stepper type heading source should not be used if the **STORMSCOPE WX-500** is to be connected to an **ARGUS**.

WIRING CONNECTIONS:

These connections are for establishing communication between the **ARGUS** and the **STORMSCOPE WX-500** only. See the **ARGUS** and **STORMSCOPE WX-500** installation manuals for full details on the remaining connections.

<u>SIGNAL</u>		<u>WX-500</u>		<u>ARGUS</u>
<u>RS-232 TX</u>	-	<u>J3-20</u>		<u>IP1-18</u>
<u>RS-232 RX</u>	-	<u>J3-8</u>		<u>IP1-19</u>
<u>RS-232 GND</u>	-	<u>J2-5</u>		<u>IP1-10</u>
<u>CASE GND</u>		<u>GND LUG</u>		<u>IP1-12 & 24</u>

