

400/500 (NON-WAAS) SERIES DISPLAY INTERFACES

Pilot's Guide Addendum

*Goodrich STORMSCOPE® WX-500 Series II Weather Mapping Sensor
Goodrich SKYWATCH® Traffic Advisory System (Model SKY497)
Goodrich SKYWATCH® HP Traffic Advisory System (Model SKY899)
Bendix/King® KTA870 TAS/KMH880 Multi-Hazard Awareness System
Ryan TCAD 9900B and 9900BX*

This Pilot's Guide Addendum is written for Garmin 400/500 (non-WAAS) Main System Software Version 5.03 (400 Series) and 6.03 (500 Series) or above, and is not applicable for earlier software versions.

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CAUTION: *Use the Garmin 400/500 Series units and the Traffic/Weather Interface at your own risk. To reduce the risk of unsafe operation, thoroughly practice basic operation prior to actual use. When in actual use, carefully compare indications from the Garmin Series Unit with all available navigation sources, including the information from other NAVAIDS, visual sightings, charts, etc. For safety, always resolve any discrepancies before continuing navigation. The altitude calculated by the Garmin 400 Series Unit is the geometric height above mean sea level and could vary significantly from the altitude displayed by pressure altimeters in the aircraft.*



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CAUTION: *The Traffic and Weather information contained in this Pilot's Guide Addendum is not intended to replace the documentation that is supplied with the applicable Garmin 400/500 Series unit. The user of the Traffic and Weather Interface should know how to operate the 400/500 unit and be knowledgeable about the information in the 400/500 Pilot's Guide.*

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SECTION 1 INTRODUCTION

The Garmin 400/500 Series units provide the display interface and control for the following traffic and weather devices/systems:

- Goodrich STORMSCOPE® WX-500 Series II Weather Mapping Sensor
- Goodrich SKYWATCH® Traffic Advisory System (Model SKY497)
- Goodrich SKYWATCH® HP Traffic Advisory System (Model SKY899)
- Bendix/King® KTA870 TAS/KMH880 Multi-Hazard Awareness System
- Ryan TCAD 9900B and 9900BX

The interface capability allows traffic and weather data to be shown on the 400/500 color display, which gives the pilot the ability to quickly identify traffic and weather hazards relative to the aircraft.

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SECTION 2 GOODRICH STORMSCOPE INTERFACE

GOODRICH STORMSCOPE DESCRIPTION



NOTE: *The Stormscope is not intended for hazardous thunderstorm penetration. Displayed weather information is approved for weather avoidance only. Refer to the WX-500 User's Guide for a detailed description of Stormscope operation.*

The Goodrich STORMSCOPE WX-500 Series II Weather Mapping Sensor is a passive weather avoidance system that detects electrical discharges associated with thunderstorms within a 200-nm radius of the aircraft. The STORMSCOPE measures relative bearing and distance of thunderstorm-related electrical activity and reports the information to the display. Interfaces are currently only available for the WX-500 Series II STORMSCOPE System.

Power-Up Self-Test

The power-up self-test (Figure 2-1) ensures that the WX-500 functions are operating properly. An error message is displayed on the Message Page if data is no longer being received.



Figure 2-1 Stormscope Power Up Page

User-Initiated Test

In addition to the power-up test, the WX-500 performs a continuous self-test. This continuous self-test is performed several times per minute. A user-initiated test can also be performed. The WX-500 Pilot's Guide lists all of the possible faults, probable causes, and recommended actions if system failures are noted.

Performing a user-initiated test:

- 1) From the default Nav Page, turn the small **right** knob to select the Weather Page.
- 2) Press the **MENU** Key to display the Page Menu.
- 3) Turn the small **right** knob to select 'Self-Test?' (Figure 2-2).



Figure 2-2 Weather Page Menu

- 4) Press the **ENT** Key.

DISPLAYING STORM DATA ON THE MAP PAGE

The Map Page (Figure 2-3) displays cell or strike information using yellow lightning strike symbology overlaid on a moving map. This added capability improves situational awareness, which in turn makes it much easier for the pilot to relate storm activity to airports, nav aids, obstacles and other ground references.

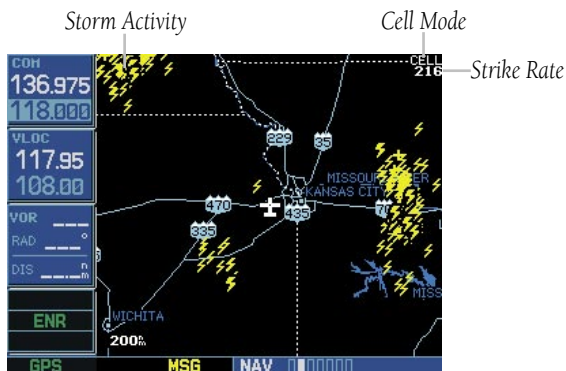


Figure 2-3 Storm Data on Map Page



NOTE: Storm data is displayed on the Map Page only if aircraft heading is available.

In normal operation, the current mode and rate are displayed in the top right-hand corner of the Map Page. The mode is indicated by the word “STRIKE” when in strike mode, or “CELL” when in cell mode.

Strike mode indicates the approximate location of lightning strikes. Only the data that is viewable on the screen is included in the strike rate.

Cell mode uses a clustering program to identify clusters of electrical activity that indicate cells. Cell mode is most useful during periods of heavy storm activity. Displaying cell data during these periods frees the user from sifting through a screen full of discharge points and helps to better determine where the storm cells are located.

The strike data display phases are listed below:

- Lightning Symbol (latest strikes; less than one minute; a black guard band is placed around the strike symbol during the first six seconds of display)
- Large Plus “+” sign (more than one minute old)
- Small Plus “+” sign (more than two minutes old)
- Strike Data is no longer displayed (after three minutes)

Configuring storm data on the Map Page:

- 1) From the default Nav Page, turn the small **right** knob to select the Map Page.
- 2) Press the **MENU** Key to display the Page Menu.
- 3) Turn the small **right** knob to select ‘Setup Map?’.
- 4) Press the **ENT** Key, the flashing cursor highlights the GROUP field.
- 5) Turn the small **right** knob to display the Map Setup Options Menu and select ‘Weather’.
- 6) Press the **ENT** Key. The flashing cursor highlights ‘Weather’ in the GROUP field.
- 7) Turn the large **right** knob to select the desired Weather mode field.
- 8) Turn the small **right** knob to select the desired setting.
- 9) Press the **ENT** Key.
- 10) Repeat steps 7-9 for remaining Weather mode fields as desired.
- 11) Press the **CLR** Key to return to the Map Page.

Clearing the Map Page

Routinely clearing the Map Page of all discharge points is a good way to determine if a storm is building or dissipating. In a building storm discharge points reappear faster and in larger numbers. In a dissipating storm discharge points appear slower and in smaller numbers.

Clearing the Map Page of all discharge points:

- 1) From the default Nav Page, turn the small **right** knob to select the Map Page.
- 2) Press the **MENU** Key to display the Page Menu.
- 3) Turn the small **right** knob to select 'Clear Storm Data?' (Figure 2-4).



Figure 2-4 Map Page Menu

- 4) Press the **ENT** Key.

Storm Data Display Range

Storm data can be displayed on the 2000 nm zoom scale, but the data only goes out as far as the STORMSCOPE can report (200 nm).

North Up Mode: Since the range for Stormscope data is 400 nm diameter total (200 nm in front and 200 nm behind), the 500 nm range in North Up mode shows all the data.

Track Up Mode: In the Track Up mode at the 500 nm range, a portion of Stormscope lightning data can be behind ("aft" of) the aircraft and therefore not visible on the Navigation Map.

Selecting a storm data display range:

- 1) From the default Nav Page, turn the small **right** knob to select the Map Page.
- 2) Press the **MENU** Key to display the Page Menu.
- 3) Turn the small right knob to select 'Setup Map?'
- 4) Press the **ENT** Key.
- 5) Turn the small **right** knob to select the Weather Group.
- 6) Press the **ENT** Key.
- 7) Turn the large **right** knob to select the desired lightning symbol option.
- 8) Turn the small **right** knob to select the desired range (Figure 2-5).



Figure 2-5 Range Window

- 9) Press the **ENT** Key.

Panning the Map Page

Panning moves the map beyond its current limits without adjusting the map scale. In panning mode a target pointer flashes on the map display, and a window appears at the top of the map display showing the latitude/longitude position of the pointer. The window also shows bearing and distance to the pointer from the aircraft's present position.

Panning with the cursor on the Map Page allows the pilot to zoom in and isolate individual cells. Strike data is not typically updated on the Map Page while the panning cursor is on, therefore, when the panned map is first displayed, the data is only a "snapshot" of conditions.

Selecting the panning function and panning the map display:

- 1) Press the small **right** knob to activate the panning target pointer (Figure 2-6).
- 2) Turn the small **right** knob clockwise to move up, or counterclockwise to move down.
- 3) Turn the large **right** knob clockwise to move right, or counterclockwise to move left.



Figure 2-6 Panning on Map Page

- 4) To cancel the panning function and return to the present position, press the small **right** knob.

WEATHER PAGE

Weather Page—400 Series

In addition to the Map Page, storm data can also be viewed on the Weather Page. In the 400 Series, when the STORMSCOPE is connected to the unit, the Weather Page appears after the Traffic Page in the sequence of NAV Pages, resulting in a total of nine pages (Figure 2-7).

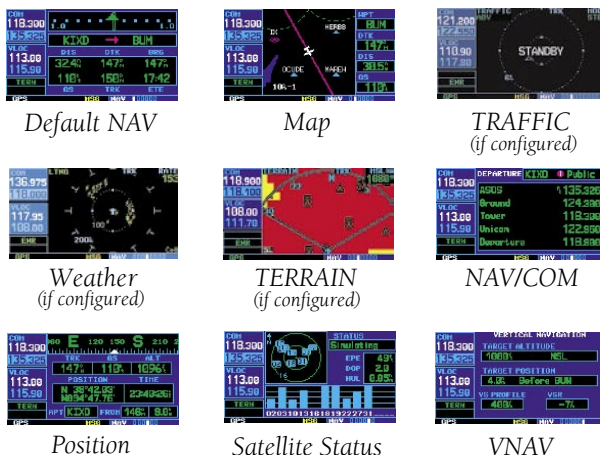


Figure 2-7 400 Series NAV Pages

Weather Page—500 Series

In addition to the Map Page, storm data can also be viewed on the Weather Page. In the 500 Series, when the STORMSCOPE is connected to the unit, the Weather Page appears after the Traffic Page in the sequence of NAV Pages, resulting in a total of seven pages (Figure 2-8).

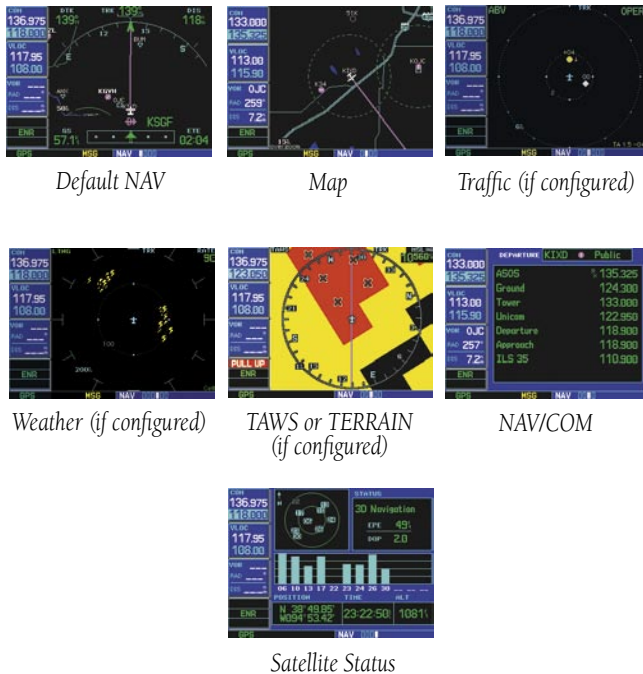


Figure 2-8 500 Series NAV Pages

Weather Display

The Weather Page (Figure 2-9) displays either a 360° or a 120° viewing angle. In normal operation, the current strike rate is displayed in the top right-hand corner, and 'LTNG' is displayed in the top left-hand corner. When in strike mode, 'STRIKE' is displayed in the lower right-hand corner of the Weather Page and when the unit is in cell mode, 'Cell' is displayed in the lower right-hand corner of the Weather Page.

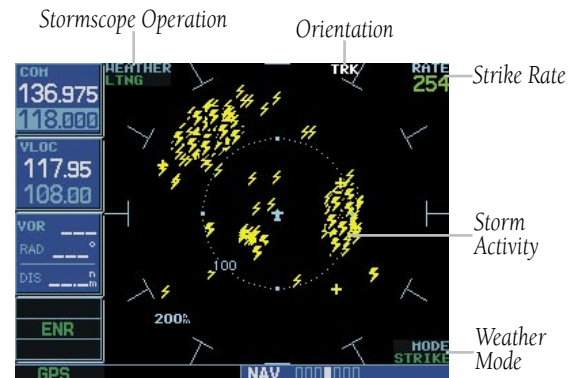


Figure 2-9 Weather Page

Selecting the desired Weather Display Mode:

- 1) From the default NAV Page, turn the small **right** knob to select the Weather Page.
- 2) Press the **MENU** Key to display an options menu (Figure 2-10).



Figure 2-10 Weather Page Menu

- 3) Select the desired display angle from the options menu and press the **ENT** Key.

Weather Display Interpretation

For weather display interpretation, study the examples in the WX-500 User's Guide which are designed to help relate the cell or strike patterns shown on the display to the size and location of thunderstorms that may be near the aircraft.

SECTION 3 SKYWATCH AND BENDIX/KING INTERFACE

Introduction

With the exception of traffic display range selections, all information in this section pertaining to the display and control of the Goodrich SKYWATCH (SKY 497) also applies to the Goodrich SKYWATCH HP (SKY 899) and the Bendix/King KTA 870/KMH 880—this includes TCAS-like symbology. Traffic display range selections are as follows:

- SKYWATCH (SKY 497)—2 nm, 2 and 6 nm, 6 and 12 nm.
- SKYWATCH HP (SKY 899)—2 nm, 2 and 6 nm, 6 and 12 nm, 12 and 24 nm.
- Bendix/King KTA 870/KMH 880—2 nm, 2 and 6 nm, 6 and 12 nm, 12 and 24 nm, 20 and 40 nm.

SKYWATCH Description

Please, refer to the SKYWATCH Pilot's Guide for a complete description of the SKYWATCH system.

Power-up Self-Test

Check for the following test criteria on the Traffic Page during power-up:

- If the SKYWATCH passes the power-up test and the aircraft both has a squat switch and is on the ground, the Standby Screen is displayed (Figure 3-1).
- If the SKYWATCH passes the power-up test and the aircraft both has a squat switch and is airborne, the Traffic Page is displayed on the 6-nm display range and in the normal altitude display mode.

- If the SKYWATCH passes the power-up test and the aircraft does not have a squat switch, the Standby Screen is displayed (Figure 3-1).
- If the SKYWATCH continues to fail, please refer to the failure response section in the SKYWATCH Pilot's Guide on actions to take.



NOTE: When the system is in standby, the SKYWATCH does not transmit, interrogate, or track intruder aircraft.



Figure 3-1 Standby Mode

Tracking intruder aircraft

- 1) Press the small **right** knob to activate the cursor and highlight 'STBY'.
- 2) Turn the small **right** knob to select 'OPER'.
- 3) Press the **ENT** Key to confirm operating mode and begin tracking intruder aircraft.



NOTE: The **FAILED** message occurs when the system detects an error that prohibits further traffic display operation as long as this message stays on the screen.

User-initiated Test

In addition to the power-up test, the SKYWATCH performs a continuous self-test. This continuous self-test is performed several times per minute. A user-initiated test of the SKYWATCH Interface can also be performed.



NOTE: A user-initiated test can only be performed when in standby or failed mode.

Performing a user-initiated test:

- 1) Turn the small **right** knob to select the Traffic Page.
- 2) From the Traffic Page, press the **MENU** Key to display the Page Menu.
- 3) Turn the small **right** knob to select 'Self Test?'
- 4) Press the **ENT** Key.

Voice Announcements

See the SKYWATCH Pilot's Guide for information on voice announcements.

Switching Between Standby and Operating Modes

The unit must be in operating mode for traffic to be displayed. The ability to switch out of standby into operating mode on the ground is especially useful for scanning the airspace around the airport before takeoff. Operating Mode is confirmed by the display of 'OPER' in the upper right-hand corner of the Traffic Page (Figure 3-2).

Switching to Operating Mode from Standby Mode:

- 1) Press the small **right** knob to activate the cursor and highlight 'STBY'.
- 2) Turn the small **right** knob to select 'OPER?'
- 3) Press the **ENT** Key to confirm and place the SKYWATCH in operating mode, SKYWATCH switches out of standby into the 6-nm display range.



NOTE: If the aircraft has a squat switch and the pilot does not manually switch out of standby, the SKYWATCH will automatically switch out of standby 8 to 10 seconds after takeoff.

Switching to Standby Mode from the Traffic Page:

- 1) Press the small **right** knob to activate the cursor and highlight 'OPER'.
- 2) Turn the small **right** knob to select 'STBY?'
- 3) Press the **ENT** Key to confirm and place the SKYWATCH in standby mode.



NOTE: If the aircraft has a squat switch, STBY is not displayed while the aircraft is airborne but will go into standby 24 seconds after landing. This delay allows the SKYWATCH to remain out of standby during a touch-and-go maneuver.

Altitude Display Mode

The selected altitude display mode (ABV: look up, NRM: normal, BLW: look down, or UNR: unrestricted) is displayed in the upper left-hand corner of the Traffic Page. The SKY 497 continues to track up to 30 intruder aircraft within its maximum surveillance range, regardless of the altitude display mode selected.

Changing the Altitude Display Mode:

- 1) From the Traffic Page, press the small **right** knob to activate the cursor and highlight the current mode (Figure 3-2).
- 2) Turn the small **right** knob to cycle through the options. The screen changes to display the traffic detected within the selected altitude display range. The 400 Series screen also displays unrestricted traffic (UNR) having a maximum range as specified by the SKYWATCH Pilot's Guide. Refer to the SKYWATCH Pilot's Guide for information regarding altitude display ranges.



NOTE: Confirmation is not required, the mode is changed immediately when using the small **right** knob.



Figure 3-2 "UNR" Selected

- 3) Press the small **right** knob to turn the cursor off after the selection is made.

Traffic Page

Traffic can be displayed both on the Map Page (only if heading is available) and on the Traffic Page (Figure 3-3). See the Garmin 400/500 Series Installation Manual available at authorized Garmin service centers for details.

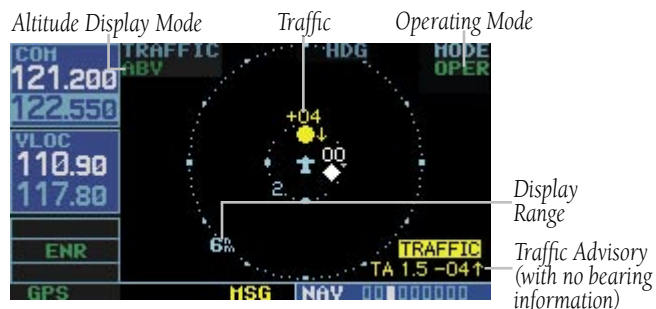


Figure 3-3 Traffic Page

Traffic Warning Window

When the unit is not on the traffic page and a traffic threat is imminent, the Traffic Warning Window (Figure 3-4) is displayed, which shows a small thumbnail map. When the Traffic Warning Window is displayed, press the **ENT** Key to display the Traffic Page, or press the **CLR** Key to return to the previous page.



NOTE: The Traffic Warning Window is disabled when the aircraft ground speed is less than 30 knots or when an approach is active.



Figure 3-4 Traffic Warning Window

Traffic Page Display Range

The display range on the Traffic Page can be changed at any time.

Changing the display range on the Traffic Page:

Press the **RNG** Key to zoom through the following range options:

- 2 nm
- 2 and 6 nm
- 6 and 12 nm
- 12 and 24 nm for the SKY 899 only

Configuring Traffic Data on the Map Page

The display of traffic information is designed to closely resemble the display symbology used by Goodrich on the SKYWATCH.

Traffic is only displayed on the Map Page if aircraft heading data is available. When heading is not available, Traffic Advisories are displayed as non-bearing banners on the Map Page. See the Garmin 400/500 Series Installation Manual available at authorized Garmin service centers for details.

Configuring traffic on the Map Page:

- 1) Turn the small **right** knob to select the Map Page.
- 2) Press the **MENU** Key to display the Page Menu.
- 3) Turn the small **right** knob to select 'Setup Map?'.
4) Press the **ENT** Key. The flashing cursor highlights the GROUP field.
- 5) Turn the small **right** knob to select 'Traffic'.

- 6) Press the **ENT** Key (Figure 3-5).



Figure 3-5 Map Setup Menu

- 7) Turn the large **right** knob to select the desired Traffic Mode option.
- 8) Turn the small **right** knob to select the desired option
- 9) Press the **ENT** Key. Repeat steps 7-9 for Traffic Symbol and Traffic Label.
- 10) Return to the Map Page by pressing the **CLR** Key.

Traffic mode allows the operator to choose which traffic is displayed (all traffic, traffic and proximity advisories, or traffic advisories only). The traffic symbol (Table 3-1) is used to depict the type of traffic (400/500 Series and Goodrich use the same symbology):

Type of Traffic	Symbol
Traffic Advisories (TA)	
Proximity Advisories (PA)	
Other	

Table 3-1



NOTE: Proximity Advisories (PA) are displayed as solid white diamonds. SKYWATCH shows these PAs as hollow diamonds since the SKYWATCH display is monochrome. PAs are defined as traffic within the 4.0-nm range, within ± 1200 ft. of altitude separation, and are not a traffic advisory (TA).

The traffic label is the altitude separation above or below the symbol and the vertical speed sense arrow to the right of the symbol (Figure 3-6).

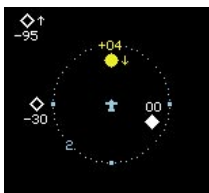


Figure 3-6 Traffic Label

From the Map Page, traffic in a thumbnail format can be displayed in any of the top three data fields (top four fields on the 500 Series) on the right side of the Map Page (Figure 3-8).

When a Traffic Advisory is active, the “Traffic” banner is displayed in the lower right corner of the Map Page (Figure 3-7)



Figure 3-7 Traffic Banner

Displaying Thumbnail Traffic on the Map Page

- 1) Turn the small **right** knob to select the Map Page.
- 2) Press the **MENU** Key to display the Page Menu.
- 3) Turn the small **right** knob to select ‘Change Fields?’.
- 4) Press the **ENT** Key.
- 5) Turn the large **right** knob to select one of the top three fields (top four fields on the 500 Series).
- 6) Turn the small **right** knob to select ‘TRFC’ from the Select Field Type List.
- 7) Press the **ENT** Key. (Figure 3-8)



Figure 3-8 Thumbnail Traffic on Map Page



NOTE: The thumbnail range defaults to 6 nm and cannot be changed.

Highlighting Traffic Data Using Map Panning

Another map page function is panning, which allows changing the map beyond its current limits without adjusting the map scale. Select the panning function by pressing the small **right** knob, a target pointer flashes on the map display (Figure 3-9). Also a window appears at the top of the map display showing the latitude/longitude position of the pointer, and the bearing and distance to the pointer from the present position.

Selecting the panning function and panning the map display:

- 1) Press the small **right** knob to activate the panning target pointer (Figure 3-9).



Figure 3-9 Panning the Map Display

- 2) Turn the small **right** knob clockwise to move up, or counterclockwise to move down.
- 3) Turn the large **right** knob clockwise to move right, or counterclockwise to move left.
- 4) To cancel the panning function and return to the present position, press the small **right** knob.

When the target pointer is placed on traffic, the traffic range and altitude separation are displayed. The traffic is identified as:

- TA: Traffic Advisory
- PA: Proximity Advisory
- TRFC: Other Traffic

Monitoring Traffic

Refer to the SKYWATCH Pilot's Guide for information regarding monitoring traffic on the display and the corresponding actions to take.

Failure Response

Errors indicated by a FAILED screen prevent continued use of the SKYWATCH. See the Goodrich SKYWATCH Pilot's Guide for detailed information on Failure Response.

Description of Traffic Advisory Criteria

For a description of Traffic Advisory criteria and display interpretation, refer to the SKYWATCH Pilot's Guide.

SECTION 4 RYAN TCAD INTERFACE

Differences between the Ryan 9900B TCAD and the Ryan 9900BX TCAD

All information in this section pertaining to the display and control of the Ryan 9900B TCAD also applies to the Ryan 9900BX TCAD except for the following:

- TCAS-like symbology is used in the 9900BX as opposed to the 9900B (similar to SKYWATCH).
- Altitude modes are available similar to SKYWATCH (normal, look up, look down, unrestricted).
- Ranges are manually controlled instead of being automatically re-sized to the current shield.
- Traffic display range selections are different:
- Ryan 9900B—range is slaved to current shield size.
- Ryan 9900BX—2 nm, 2 and 6 nm, 6 and 12 nm, 12 and 24 nm.

Ryan TCAD Description



NOTE: Refer to the *Ryan TCAD Pilot's Guide* for a detailed description of the Ryan TCAD System.

The Ryan TCAD (Traffic and Collision Alert Device) is an on-board air traffic display used to identify potential collision threats. TCAD computes relative altitude and range of threats from nearby Mode C and Mode S-equipped aircraft. TCAD will not detect aircraft without operating transponders or those that are beyond radar coverage. TCAD, within defined limits, creates a shield of airspace around the aircraft, whereby detected traffic cannot penetrate without triggering an alert.

Operator Controls and Basic Displays

If there is no communication between the display unit and the TCAD unit, a message will appear, notifying the user. After initialization, proceed with operation of the 400/500 Series unit in a normal manner.

TCAD data can be shown in a “thumbnail” view on the Map Page. TCAD data also displays on both the Traffic Page (Figure 4-1) and the Map Page if heading data is available.



Figure 4-1 Traffic Page

The symbols for closing and parting traffic shown on both the Map Page and the Traffic Page are identical to those shown on the Ryan TCAD (see Ryan TCAD Pilot's Guide for detailed description):

Symbol	Name	Description
	TRFC	Altitude separation >500 feet, steady altitude separation
	TA	Altitude separation <=500 feet, steady altitude separation
	TRFC	Altitude separation >500 feet, closing
	PA	Altitude separation <=500 feet, parting
	TRFC	Altitude separation >500 feet, parting
	TA	Altitude separation <=500 feet, closing

Table 4-1

Configuring TCAD Data on the Map Page

The display of traffic information closely resembles the display symbology used by the Ryan TCAD. **Traffic data is only displayed on the Map Page if heading data is available.**

Configuring Traffic on the Map Page:

- 1) Turn the small **right** knob to select the Map Page.
- 2) Press the **MENU** Key to display the Page Menu.
- 3) Use the small **right** knob to select 'Setup Map?'
- 4) Press the **ENT** Key. The flashing cursor highlights the GROUP field.
- 5) Turn the small **right** knob to select 'Traffic' (Figure 4-2).



Figure 4-2 Map Setup Options Menu

- 7) Press the **ENT** Key.
- 8) Turn the large **right** knob to select the desired Traffic Mode option.
- 9) Turn the small **right** knob to select the desired option.
- 10) Press the **ENT** Key. Repeat steps 8-10 for Traffic Symbol and Traffic Label.
- 11) Press the **CLR** Key to return to the Map Page.

Displaying Thumbnail Traffic on the Map Page

The Map Page has the ability to display traffic in a thumbnail format in any of the top three fields (top four fields on a 500 Series unit) on the right-hand side of the Map Page.

To display Thumbnail Traffic on the Map Page:

- 1) Turn the small **right** knob to select the Map Page.
- 2) Press the **MENU** Key to display the Page Menu.
- 3) Use the small **right** knob to select 'Change Fields?' (Figure 4-3).



Figure 4-3 Map Page Menu

- 4) Press the **ENT** Key.
- 5) Turn the large **right** knob to select one of the top three fields (top four fields on a 500 Series unit).
- 6) Select 'TRFC' from the Select Field Type List.
- 7) Press the **ENT** Key.



NOTE: The thumbnail range defaults to 6 nm and cannot be changed.

Monitoring Traffic

Refer to the information in the TCAD Pilot's Guide regarding monitoring traffic on the display and the corresponding actions to take.

Highlighting Traffic Data Using Map Panning

Panning is another map page function, which allows moving the map beyond its current limits without adjusting the map scale. Select the panning function—by pressing the small **right** knob—a target pointer flashes on the map display. Also a window also appears at the top of the map display showing the latitude/longitude position of the pointer, and the bearing and distance to the pointer from the present position.

When the target pointer is placed on traffic, the traffic range, altitude separation, squawk code (if available), and tail number (if available) are displayed (Figure 4-4).

Panning the map:

- 1) Press the small **right** knob to activate the panning target pointer (Figure 4-4).



Figure 4-4 Panning the Map Page

- 2) Turn the small **right** knob to move up (turn clockwise), or down (turn counterclockwise).
- 3) Turn the large **right** knob to move right (turn clockwise), or left (turn counterclockwise)
- 4) Press the small **right** knob to cancel map panning and return to the present position, .

The traffic is identified as follows:

- TA: Traffic Advisory—This is traffic within 500 ft. of altitude separation that is converging or maintaining altitude separation.
- PA: Proximity Advisory—This is traffic within 500 ft. of separation and it is not a TA.
- TRFC:—Other traffic

TCAD Setup Page

The Ryan TCAD Setup Page is accessed from the Traffic Page. The TCAD Setup Page allows traffic data to be configured. The definitions of the available options are listed in the TCAD Pilot's Handbook.

Changing a TCAD setup option:

- 1) Turn the small **right** knob to select the Traffic Page.
- 2) Press the **MENU** Key to display the Page Menu.
- 3) Turn the small **right** knob to select 'Setup?'
- 4) Press the **ENT** Key. The flashing cursor highlights the Mode field (Figure 4-5).



Figure 4-5 Ryan TCAD Setup Page

- 5) Turn the small **right** knob to select the desired mode. The mode selection determines which shield definition to display and change.
- 6) Press the **ENT** Key.
- 7) Select the desired remaining options fields by turning the large **right** knob, then turn the small **right** knob to select the desired option, and press the **ENT** Key to confirm the selection.
- 8) Return to the Traffic Page by pressing the **CLR** Key.

Traffic Page Fields

There are two selectable fields on the Traffic Page: the Operating Mode Field and the Barometric Pressure Field. The Operating Mode Field selects the TCAD operating mode (Table 4-2). Please, refer to the TCAD Pilot's Handbook for a complete description of all modes of operation. For the 9900BX model, this field is replaced with the SKYWATCH style altitude mode.

TCAD 9900B Operating Modes	
GND	Ground Mode
TML	Terminal Mode
STD	Standard Mode
ENR	Enroute Mode
UNR	Unrestricted Mode

Table 4-2



NOTE: The modes APR (approach) and DEP (departure), are displayed when in either of those modes, but are not manually selectable.

To select the Operating Mode:

- 1) From the Traffic Page, press the small **right** knob to activate the cursor, the operating mode field is highlighted.
- 2) Turn the small **right** knob to select the desired operating mode.
- 3) Press the **ENT** Key.



NOTE: The traffic display range is automatically set to the shield size and cannot be changed (9900B only).

The second selectable field, located in the upper right-hand corner of the display, is the Barometric Pressure field, which displays the Barometric Pressure in inches of mercury. The Barometric Pressure field on the Traffic Page is used to set the barometric pressure in the Ryan TCAD unit. Please, refer to the TCAD Pilot's Handbook for a detailed description of this feature.

Changing the Barometric Pressure:

- 1) From the Traffic Page, press the small **right** knob to activate the cursor and highlight the Operating Mode field.
- 2) Turn the large **right** knob to select the Barometric Pressure Field.
- 3) Use the small **right** knob to select the desired value (Figure 4-6). When editing the value, use the large **right** knob to select the digit to edit.



Figure 4-6 Barometric Pressure Selected

- 4) Press the **ENT** Key.
- 5) Press the small **right** knob to exit the field.

When the TCAD 9900BX model is interfaced there is an additional annunciation in the lower left-hand corner of the Traffic Page. This indicates the TCAD unit being in approach mode (APR) or if the approach is armed (APR ARM).

Air Shield

Refer to the TCAD Pilot's Handbook for a detailed description of the Air Shield.

Traffic Warning Window

When the unit is not on the traffic page and a traffic threat is imminent, the Traffic Warning Window (Figure 4-7) is displayed. The Warning Window shows a small thumbnail map and can display the Traffic Page (press the **ENT** Key) or return to the previous page (press the **CLR** Key).



NOTE: *The Traffic Warning Window is disabled when the aircraft ground speed is less than 30 knots or when an approach is active.*



Figure 4-7 Traffic Warning Window

Threat Acquisition

Refer to the TCAD Pilot's Handbook for a detailed description of the Air Shield.

Audible and Visible Alerts

Voice and tones are used to alert the pilot. The alert descriptions used by TCAD are listed in the TCAD Pilot's Handbook. Voice is used only during the highest level of alerting; otherwise, tone is used. The voice alerting can be turned on or off from the TCAD Setup Page or from the configuration pages. See the Garmin 400/500 Series Installation Manual available at authorized Garmin Service Centers (only for the 9900 model).

Fault Displays

If the unit fails to detect the TCAD or if the TCAD data that is received is invalid, the traffic screen shows "DATA FAIL".

Limitations

Refer to the TCAD Pilot's Handbook for limitations of the TCAD system.



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