Model 9900BX ARGUS DISPLAY INTERFACE SUPPLEMENT

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Introduction

This Pilot's Guide is a reference for the interface with the Ryan TCAD Model 9900BX and the Eventide ARGUS Displays. It does not replace the ARGUS manufacturer's Operator's Manual or the Ryan TCAD Pilot's Handbook. Argus software has been developed specifically for the Model 9900BX. This supplement covers use of the older software prepared for the Model 9900B and the newer software for the Model 9900BX.

Operator Controls & Basic Displays

The Ryan TCAD Model 9900BX Display/Controller serves as the TCAD controller and digital-profile traffic display. The ARGUS shows traffic information in a plan-view, graphical presentation.

The ARGUS will initialize normally. When communication between the Multifunction Display and the Model 9900BX is established, a message that your aircraft is specially equipped for traffic alert is displayed on the ARGUS.

After initialization, proceed with operation of the Multifunction Display in a normal manner.

Model 9900BX data will be shown in a "thumbnail" abbreviated view on part of the display. The symbols for closing and parting traffic depicted on the ARGUS display are identical to those shown on the TCAD Model 9900BX. The symbols and definitions are available at any time on a special help screen on the ARGUS.

The Air Traffic Shield

The range and height of the displayed area is controlled by the shield size selected on the Model 9900BX. The range selected on the TCAD is the maximum range limit for traffic displayed on the ARGUS, within the limitations noted in the limitations section.

The Air Traffic Shield only limits the display of traffic. It does not limit the tracking of Traffic Alerts (TA). If traffic beyond the selected shield limit meets the requirements for a TA, then an audible announcement will be made and the Star and traffic shown on the Model 9900BX Display/Controller will identify the TA Traffic.

Thumbnail Display:
The solid circle is always one mile. The intermediate circle (if shown) represents three miles. The outermost circle shows the number that corresponds to the range for that circle.

The shield range selected on the Model 9900BX determines the number on the outermost

ring. TCAD "rounds" range to the next lowest whole number. For instance, if two NM is selected then the outermost range ring will show 2. If 2.1, 2.2 or even 2.9 is selected, TCAD will round to 2nm. Traffic beyond two miles will be shown on the ARGUS out to the limit selected on Model 9900BX.

When only a dotted ring is shown, the range selected on the Model 9900BX is less than 1 NM, and the range ring corresponds to that selected range.

The inner and middle range rings on the full-screen view are marked. The outer range ring corresponds to the range in the lower right corner of the display.

Note that the scale on the display is compressed between three and six NM, meaning the distance between the three mile and six mile ring is less than the distance between the one and three mile ring. This reduces clutter and dedicates more area for traffic close to your aircraft.

Threat Acquisition

TCAD will respond normally to traffic acquisition, and the ARGUS will show the traffic as long as the bearing is available for the traffic (see limitations). As with other ARGUS functions, selecting the smallest TCAD range consistent with operations is best to minimize clutter on the display.

Approximately six threats can be shown on the ARGUS. In the event of threat overlap, the higher-priority threat (the closer in range) is shown over the other threat until there is no longer any overlap.

Help Displays

The Help page on the ARGUS provides basic legend information to allow the operator to quickly interpret the traffic information on the ARGUS.

Fault Displays

If the ARGUS fails to detect the Model 9900BX, or if the TCAD data received by the ARGUS is detected as invalid, TCAD ERROR will show on the thumbnail display. The large full-screen display will show "TCAD COMMUNICATION LOST".

If the TCAD altitude information is invalid, the ARGUS will display TCAD ALT (on the thumbnail display) or TCAD ALTITUDE INVALID (on the full-screen display).

If the shield size selected on the Model 9900BX is more than 9.9 miles, a SHIELD INVALID message will be shown.

Any display should also pass the "common sense" test. If the information displayed seems wrong it probably is and should be checked.

Appendix 1   **Limitations**

The maximum range ring on the ARGUS is twenty-one miles, in the Unrestricted Mode.

The ARGUS software that was designed for the Model 9900B operates identically for the Model 9900BX with one exception. The ARGUS does not recognize the greater range capability of the Model 9900BX. In particular, the ARGUS does not recognize a shield size greater than 9.9 miles. The TCAD Model 9900BX Enroute shield can be increased to 10.0 NM and the Unrestricted Mode limit is 21 miles. If the ENRT shield size is set to a range greater than 9.9 miles or the Unrestricted mode is selected, a "TCAD Shield Invalid" message will appear on the ARGUS. The message will disappear if the TRML or STD mode is selected, or the ENRT Mode is selected and the shield size is 9.9 miles or less.

Some jumpiness in the displayed threats can be expected due to reception angles and reflections. This is most evident at distances greater than three NM or when your aircraft is on the ground.

The number of threats displayed is limited, and TCAD monitors many more threats than can be shown on the display. When a threat of higher priority appears on the display, replacing one of lower priority, it appears that one of the threats jumps from one part of the display to another. This can be disconcerting, but is of no consequence.

Occasionally TCAD will not show a bearing to a threat. The traffic will be displayed on the TCAD, and the normal audible and visual alerts will occur. Traffic without bearing is not displayed on the ARGUS.

Appendix 2   **Disclaimer**

The ARGUS Display is ancillary to the TCAD display. Traffic information, especially regarding the altitude separation, is available immediately by viewing the TCAD display.
Appendix 3   (Reserved)

Appendix 4   Interface with Ryan TCAD 9900BX and the Argus Series Moving Map Displays.

There are two ways to access secondary functions on the ARGUS. INFOrmation can be accessed by pressing [ENR] and [AUX], or with a remote switch or button on the panel or the yoke. Similarly, SELect can be accessed by pressing AUX and DEP, or by a remote switch or button. When INFO or SEL are referred to in this section, "press the button" is used but in fact any of the above methods can be used.

The ARGUS will scroll through the normal self-test and limitations display. When the message "push key to continue" is shown, press any key. When communication between the Argus and the TCAD is established, a message that your aircraft is specially equipped for traffic alert is displayed. Press any key again.

Proceed with operation of the ARGUS in a normal manner.

If MP+PL was selected in the Amend mode (see Amend section in this guide) TCAD data will be shown in a "thumbnail", abbreviated view in the lower left corner of the display (see Figure 1). The symbols shown on the display are similar to those shown on the TCAD and are defined in Figure 3. Symbol definitions are available on a special help page on the ARGUS. The thumbnail display is not shown in the ARRival Mode.
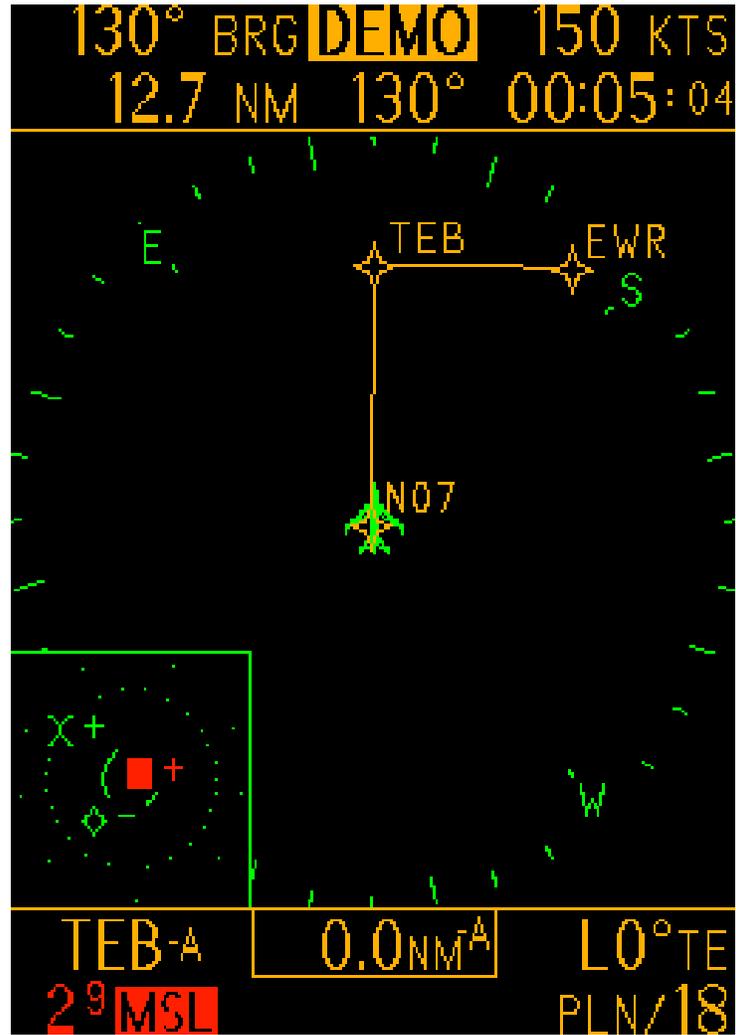
Figure 1   Thumbnail Traffic Display
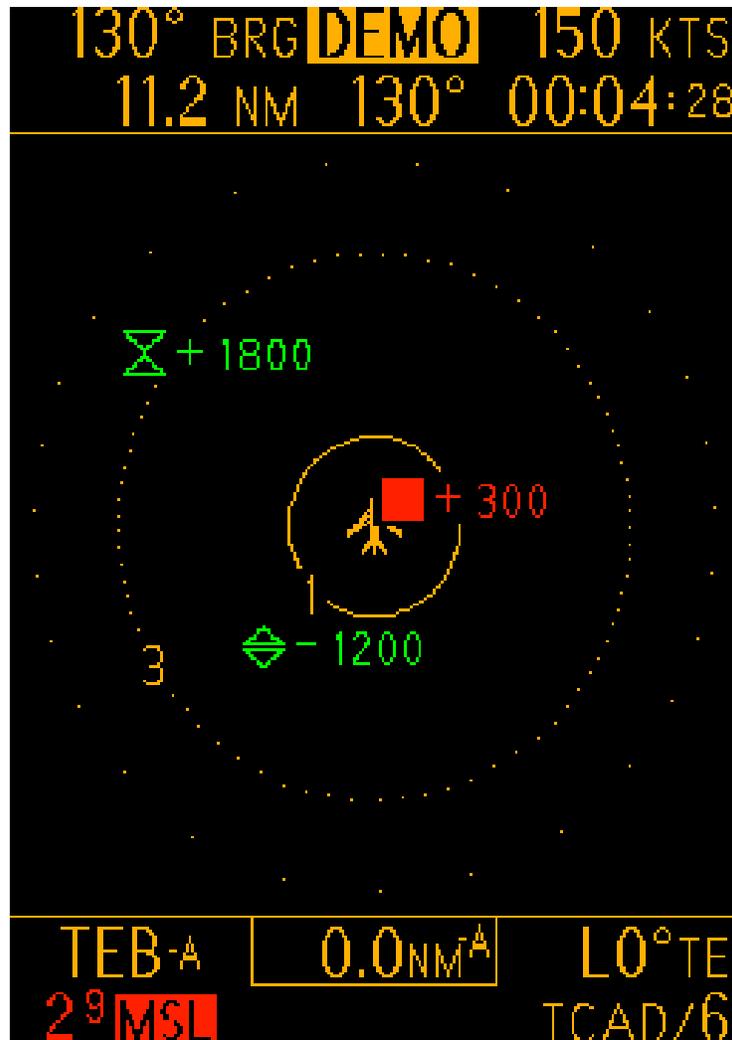
Figure 2   Full-screen Traffic Display

When the INFORmation Mode is selected the TCAD thumbnail view will expand to a full-screen view (see Figure 2). The full-screen view shows the altitude separation next to each threat.

When the TCAD is displayed on the full-screen, pressing the SELect button will cause an individual threat to be tagged with a rectangle containing the MSL altitude (or Flight Level) of that threat (this is called the Traffic Selection function). The N-number, squawk or transponder type will be shown in the bottom center of the screen. Each additional press of the SELect button will sequence the tag to the next highest priority traffic (as defined by the TCAD) until all the threats have been shown. To exit the TCAD SELect mode, press the SELect button to step through each threat until the last threat is displayed.

Hold the INFOrmation button for more than one second to return the ARGUS to its previous mode and the TCAD to the thumbnail display.

As with the ARGUS, selecting the smallest TCAD range consistent with operations is best to minimize clutter on the display.

Help Function & Fault Displays

Press the INFOrmation button when showing full-screen traffic information to access the TCAD Help function.

If the ARGUS fails to detect the TCAD, TCAD ERROR will be shown on the thumbnail display. The large full-screen display will show "TCAD COMMUNICATION LOST".

Failure of the altitude input to TCAD will cause TCAD ALT and TCAD ALTITUDE INVALID to be displayed on the Argus
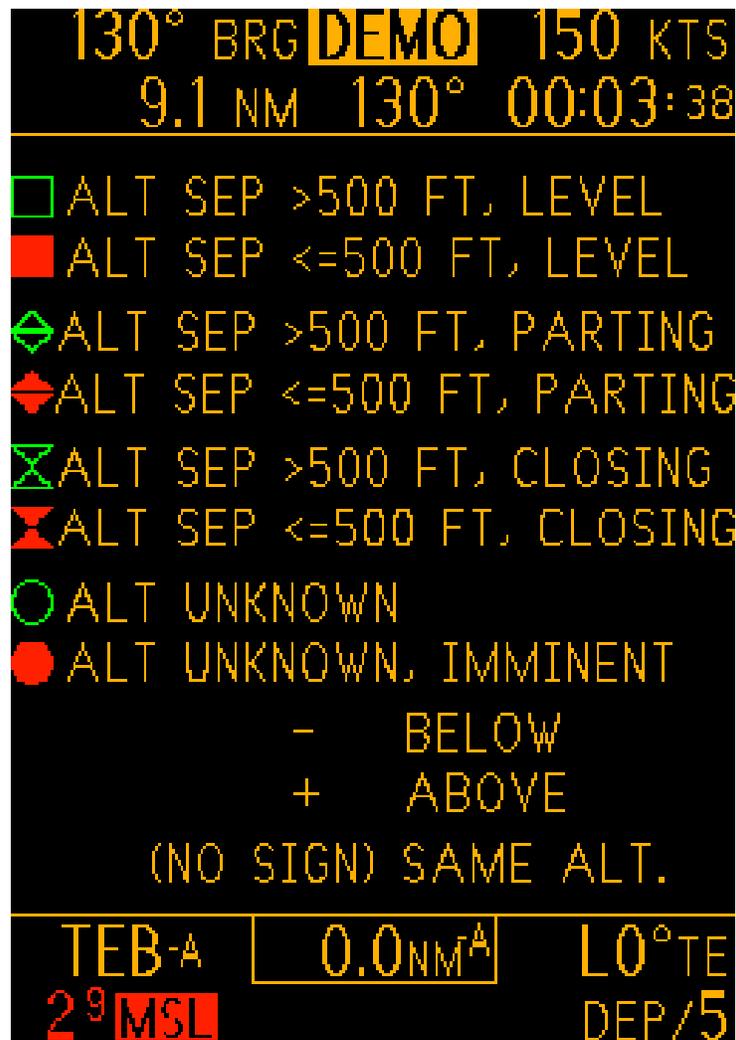
Figure 3   TCAD/ARGUS Help Screen with TCAD Symbol Information

AMEND

TCAD is selected in the ARGUS AMEND Mode.   There are three choices:

ADF/TCAD: MP+PL: This means the ADF and TCAD will be displayed in the thumbnail view on the maps and in the large-screen plan view.

TCAD/ADF: OFF: This means the thumbnail view is not shown, but TCAD information is shown in the large-screen plan view. The selection also affects the display of the ADF (the ADF card is not displayed.

ADF Mode: This means the thumbnail view is not shown, but TCAD information is shown in the large-screen plan view.

The selection also affects the display of the ADF (the ADF card is shown full time).

The same amend page will also enable the TCAD help page to be displayed. TCAD help can be selected, Y or N. If Y is selected, then the help page is available when the INFOrmation button is pressed when viewing the large-screen TCAD display on the ARGUS.

Exit AMEND Mode normally.

Table of Buttons and Functions

Understanding of the interface with TCAD with ARGUS can be enhanced with an understanding of the buttons and functions:

All TCAD parameters such as shield height and shield radius and TCAD Mode selection are controlled by the TCAD display.

Function	Press	Result
Amend, to select the TCAD display options on ARGUS	[AUX] three times, then select AMEND	To choose the TCAD thumbnail view on all map modes except Arrival, select MP+PL. To enable the large-screen Plan view only, select TCAD + ADF:off or ADF Mode. Also enable the help page, Y or N.
Show the TCAD thumbnail display.	No button press is necessary.	The thumbnail display (shown in Figure 2) is available in all modes except ARRival. See Figure 3 for symbol information.
Function	Press	Result
To go from the thumbnail TCAD display to the full-screen TCAD display	Press INFO	Expanded TCAD information is displayed. See Figure 2.
To go from the full-screen TCAD display back to the thumbnail display.	Hold INFO for more than one second.	The thumbnail display (shown in Figure 2) is available in all modes except ARRival. See Figure 3 for TCAD symbol information.
To access the Traffic Selection function; to get MSL altitude & Squawk/N-number of traffic	Press SEL when in the full-screen TCAD display.	Shows the MSL of the selected traffic and the transponder type, N-number or squawk of the traffic is shown at the bottom of the display. Press the SEL button to select additional traffic.

To get out of the Traffic Selection function	Press the SEL button until all threats have been selected, then once more for the full-screen TCAD display.	
To access the help screen, for TCAD symbol definitions	Press INFO when in the full-screen view	TCAD will display TCAD symbol definitions. See Figure 3.
To go from the help screen back to the thumbnail view	Hold INFO button down for more than one second.	Thumbnail view is shown

Disclaimer

The ARGUS display is supplemental to the TCAD display. Traffic information about the traffic, particularly regarding the altitude separation, is available immediately by viewing the TCAD display.

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End of Multifunction Display Interface Supplement to the Pilot's Handbook, Model 9900BX