

- c. A problem that could hinder system operation has occurred. For example, when the Gunner's GPS Intensity knob facade is moved outside of calibration range, the message shown in Figure 2-85 displays.

Each time a system message displays, the I/O or TC must respond to the message to close the message screen and return to normal system operation. This response is in one of the following methods, as dictated by the on-screen prompts:

- a. Click the OK button to acknowledge receiving message. The message closes.
- b. Select one of the options in the message screen. The system responds according to the option and closes the message.
- c. In some cases after acknowledging the message, the I/O or TC take further action before normal operation can continue. These cases are indicated by the red hand on the left side of the message or by the red color of the screen.

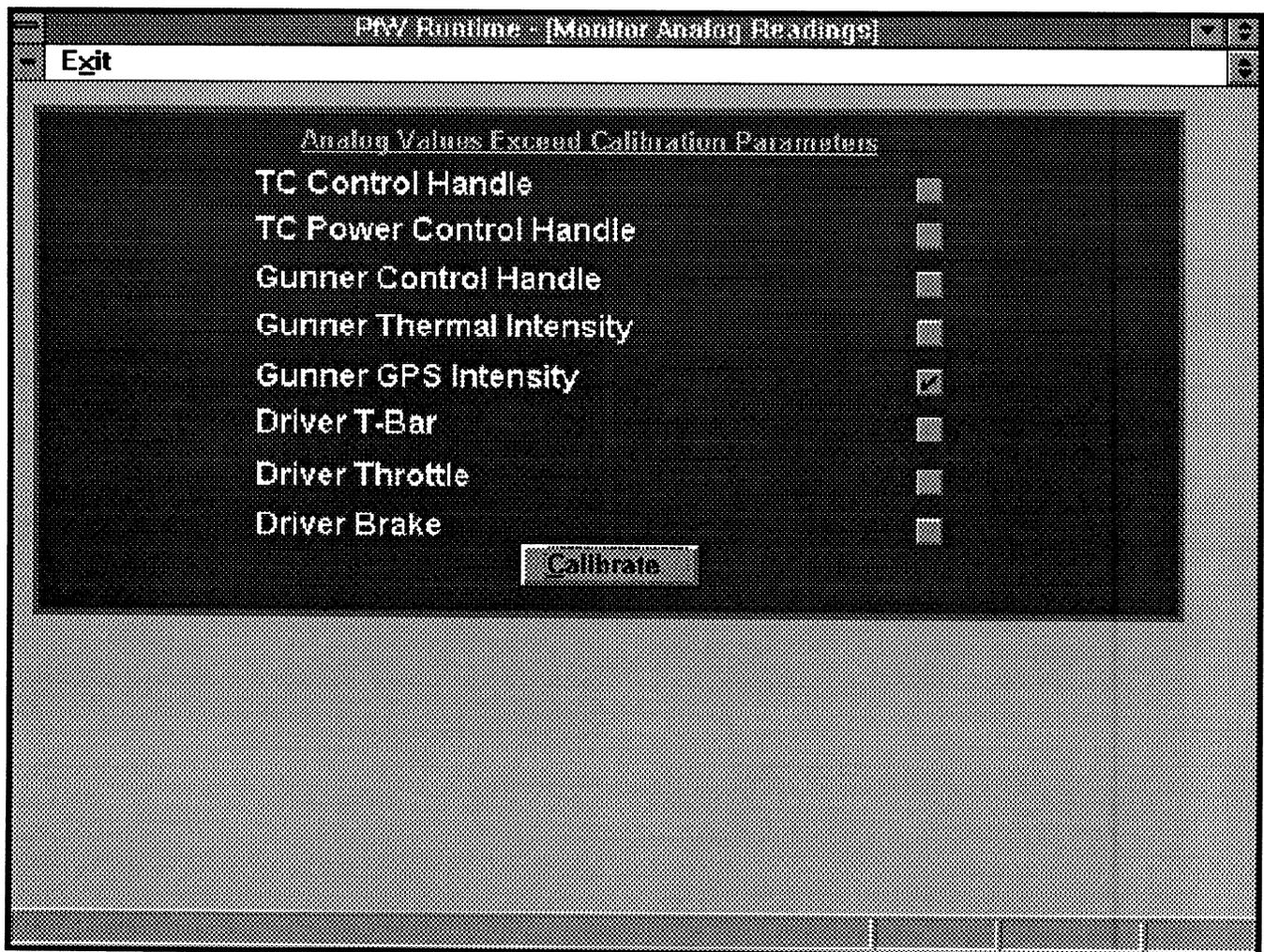


Figure 2-85. Calibrate Message

2.6.3 **Secondary Operating Mode.** With the Tank Commander's Passkey engaged (Secondary Operating Mode), the TC can control the training simulation from the remote keypad in the tank. **All** functions available to the I/O through the IOS, except Evaluation exercises and Records Management functions, are available to the TC through the remote keypad. However, Performance records are not saved to the database in Secondary Operating Mode.

To change from Primary Operating Mode under the I/O control to Secondary Operating Mode, perform the following at the I/O Control Panel.

- a. Turn the Tank Commander Passkey to the ON position.

**NOTE**

Having both passkeys in the OFF position at the same time shuts down the system. When changing operating modes, always place the Tank Commander's passkey in the ON position before placing the Instructor/Operator passkey in the OFF position.

- b. Turn the Instructor/Operator Passkey to the OFF position. The **TC's** keypad becomes active and the **IOS** keyboard becomes inactive. The **IOS** monitors remain functional.

2.6.4 **AFIST Main Screen.** The **AFIST** Main Screen, Figure 2-81, provides access to the **AFIST** options while displaying the current **AFIST** status in the Status Box. Changes to the status cannot be made through this box, but must be made using the appropriate options from the Exercise Management option on the Main Menu Bar. The following data displays in the Status Box.

- a. **Control Mode.** Displays who has control of the exercise: Instructor/Operator (I/O) (Primary mode) or Tank Commander (TC) (Secondary Mode).
- b. **Exercise Mode.** Displays the mode of the selected exercise: Orientation, Training, or Evaluation.
- c. **Terrain.** Displays the currently selected terrain database: Desert or European.
- d. **MOPP button.** Indicates (checked or unchecked) if the selected exercise is to be conducted under Nuclear, Biological, and Chemical conditions.

- e. **Auto Loader button.** Indicates (checked or unchecked) whether the Auto Loader is activated for the exercise (simulation run). If the mode is activated, the exercise is being conducted without a Loader as part of the crew. The simulation automatically provides the ammunition selected by the Gunner, so Loader **errors** are not scored against the crew. If the mode is not activated, the exercise is conducted with a Loader as part of the crew.
- f. **Crew ID.** Displays the crew identification number of the currently selected crew. The crew identification number is a unique alphanumeric identifier assigned by the individual unit to identify a specific crew.
- g. **Group.** Displays the group number for the currently selected group. The displayed value is I, II, III, IV, IVA, **IVB**, V, VIA, or VIB. Each group represents a training skill level and consists of related exercises with similar objectives. There are a total of six groups, each with six training exercises and three evaluation exercises. Group I represents the least difficult or lowest level and Group VI the most difficult or highest level.
- h. **Exercise.** Displays the exercise number for the currently selected exercise. The displayed value is **1, 2, 3, 4, 5,** or 6. This is a unique identifier for the particular exercise within a specified group.
- i. **Task.** Displays the task number for the currently selected task. The **displayed** value is **1, 2, 3, 4, 5,** or 6. This is a unique identifier for the particular task within a specified exercise.

To access the **AFIST** Diagnostics, Exercise Management, Record Management, and Utilities functions, select the following from the Main Menu Bar.

- a. **Diagnostics.** Select this for the following options:
  - (1) **Built-In Tests.** Select this option to run the BIT during system operation. The screens that support this option are described in 3.9.
  - (2) **Calibrate/Recalibrate.** Select this option to calibrate or recalibrate the Tank Commander, Gunner, and Driver stations and the GAS. The screens that support this option are described in 2.6.7.
  - (3) **Daily Readiness Check.** Select this option

option are described in 2.6.6.

- (4) FID. Select this option to access the Fault Isolation Diagnostics (FID) function. The screens that support this option are described in Chapter 3, Section II.
- b. Exercise Management. Select this option to identify and select the exercise to be simulated. The screens that support this option are described in 2.6.8.2.
  - c. Records Management. Select this to access the following options:
    - (1) Crew Identification. Select this option to identify the members of the tank crew and select the tank crew for training. The screens that support this option are described in 2.6.8.1.
    - (2) Crew Performance. Select this option to select the tank crew and view or receive a printout of the crew's performance history. The screens that support this option are described in 2.6.10.1.
    - (3) Unit Performance. Select this option to print a group-level report, select a unit, or view or print the unit's performance summary. The screens that support this option are described in 2.6.10.2.
  - d. Utilities. Select this to access the following options:
    - (1) Tank Type Selection. Select this option to select and configure the simulation to support either an MI or M1A1 tank. The screens that support this option are described in 2.6.5.
    - (2) Tape Utility. Select this option to perform the following:
      - (a) Back up data onto a tape.
      - (b) Restore data from a tape.
      - (c) Erase a tape.
      - (4) Format a tape.

The screens that support this option are described in 2.6.11.2.

2.6.5 **Tank Type Selection.** Upon initial installation of the AFIST and after successful completion of the poststart checks, configure the system for training with either the M1 or the M1A1 tank. To select the tank configuration for training, at the AFIST Main screen, select Tank Type Selection from the pull-down Utilities menu. The system displays the M1 screen, described in 2.6.5.1.

2.6.5.1 **M1 Screen.** At the AFIST Main screen, select Tank Type Selection from the pull-down Utilities menu. The M1 screen, Figure 2-86, displays.

- a. Click the Yes button to configure the system for the M1 tank.

- b. Click the No button to configure the system for the M1A1 tank. The M1A1 screen, described in 2.6.5.2, displays.

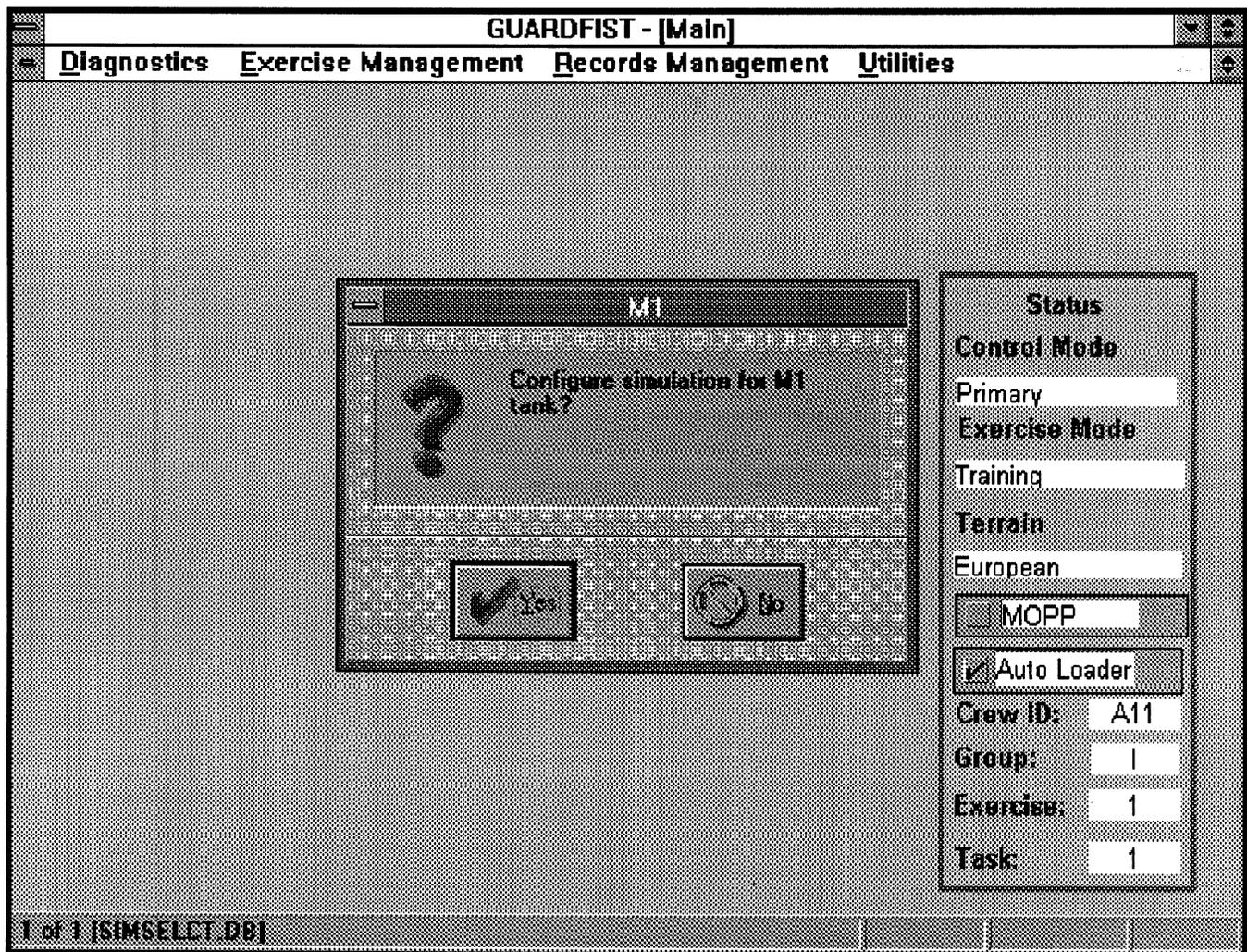


Figure 2-86. M1 Screen

2.6.5.2 **M1A1 Screen.** At the MI Screen, click on the No button. The M1A1 screen, Figure 2-87, displays.

- a. Click on the Yes button to configure the system for the M1A1 tank.

- b. Click on the No button to return to the AFIST Main Screen.

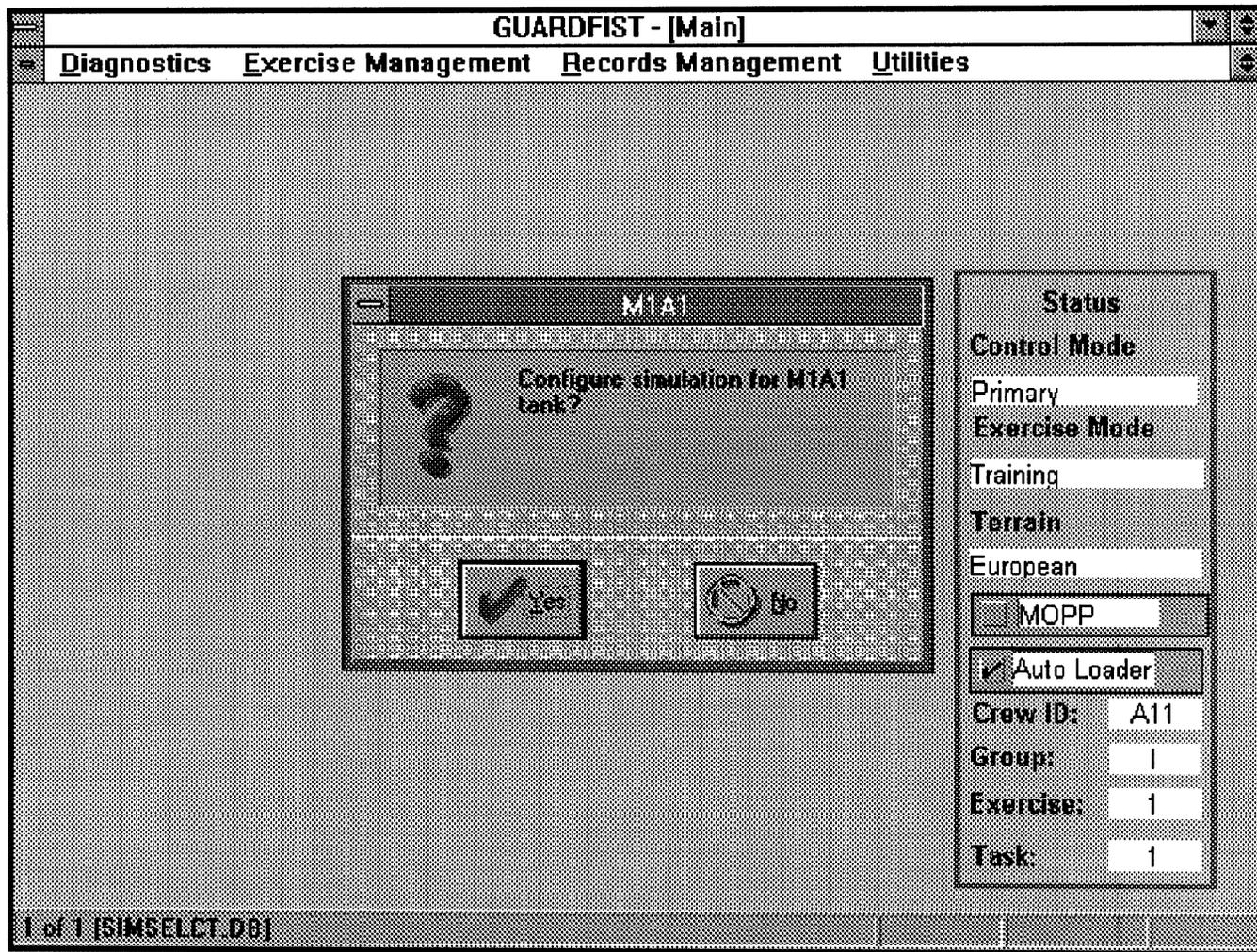


Figure 2-87. M1A1 Screen

2.6.6 **Daily Readiness Check (DRC).** The I/O can conduct a DRC on all AFIST digital controls and lights or digital controls and lights in selected crew stations or on individually selected digital controls and lights. The I/O also can conduct a check of random tank sound effects.

Upon initial system installation, and after successful completion of the BIT, the I/O must conduct a DRC of all digital controls and lights and the audio DRC, as presented in 2.6.6.1 through 2.6.6.4. To begin the DRC, at the AFIST Main Screen, select Daily Readiness Check from the pull-down Diagnostics menu. The TC Station Daily Readiness Check Status Screen, Figure 2-88, displays.

2.6.6.1 **Selecting Controls and Lights for DRC.** The I/O can select controls and lights for a DRC either in groups, through the Autosequence Setup Screen, or individually, through crew station Daily Readiness Check Status Screens.

- a. Upon initial system installation, and after successful completion of the BIT, conduct a DRC on all digital controls and lights, as follows:

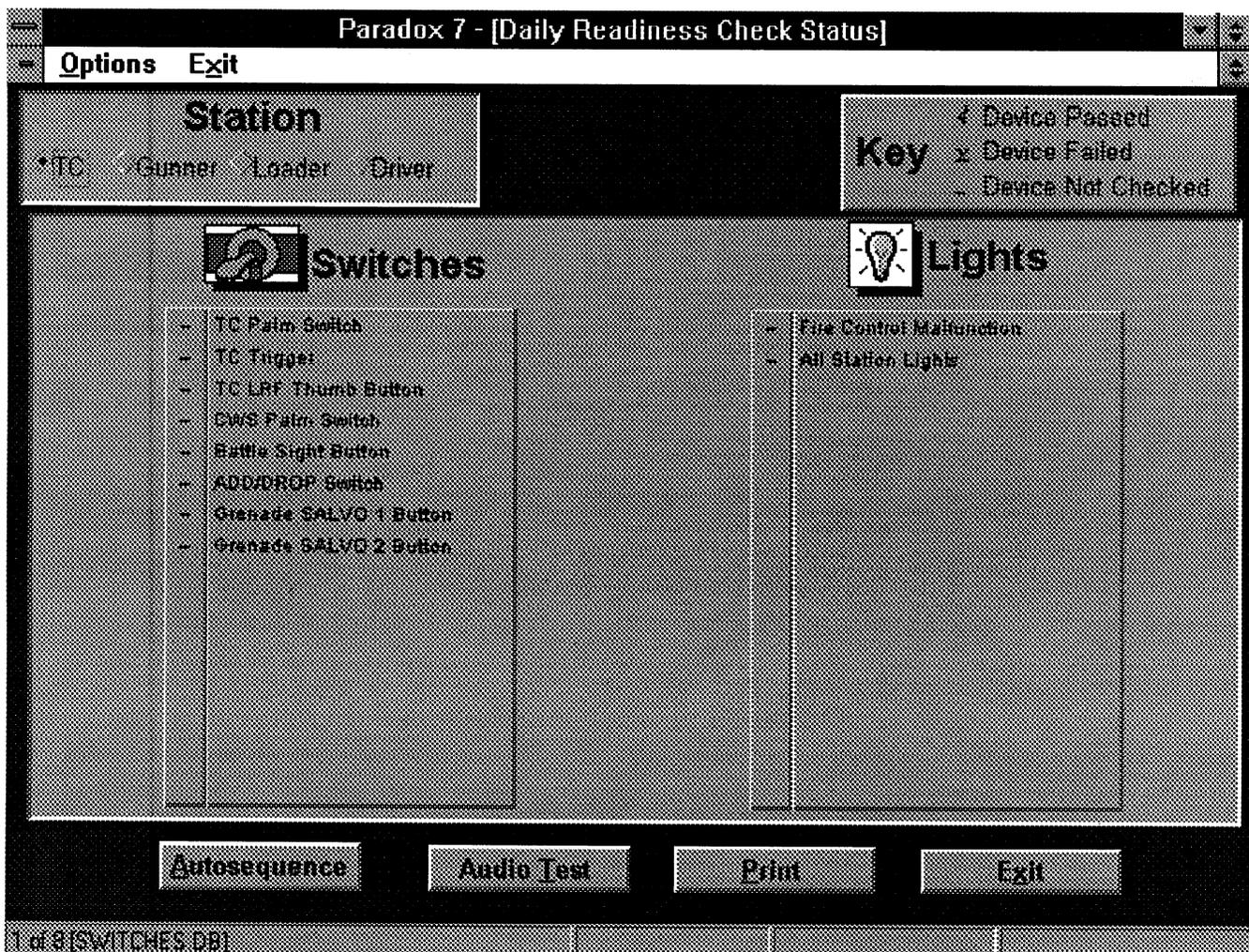


Figure 2-88. TC Station Daily Readiness Check Status Screen

- (1) At the TC Station Daily Readiness Check Status Screen, click on the Autosequence button or select **AutoSequence** from the pull-down Options menu. The Autosequence Setup Screen, Figure 2-89, displays.

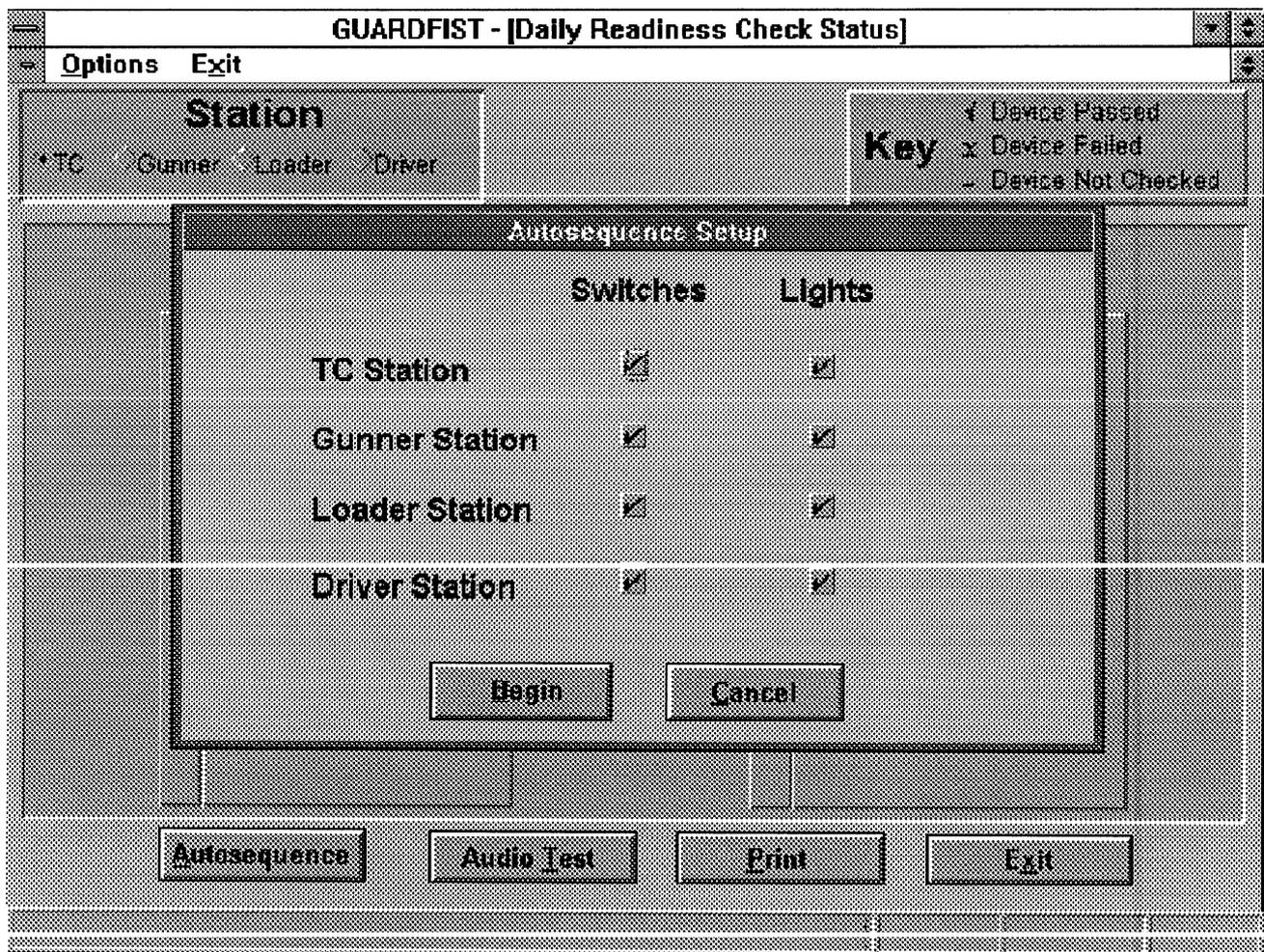
**NOTE**

The I/O also can select the DRC Autosequence by clicking on the Autosequence Button or selecting Autosequence from the Options menu at the Gunner, Loader, or Driver Station Daily Readiness Check Status Screens.

- (2) Upon initial system installation, ensure all radio buttons under Switches and Lights are selected (indicated by a check mark). To perform a DRC only on specific areas, ensure only the radio buttons for those areas are selected. Lights, switches, or both of

selected crew stations can be deselected or selected. To deselect a group from the Autosequence DRC, click on it (check mark **disappears**). To reselect that area, click on it again (check mark reappears).

- (3) Cancel button. **Click** on this button to cancel the Autosequence Setup and return to the Daily Readiness Check Status Screen.
- (4) Click on the Begin button to start the autosequence of the DRC based on the selections made for the TC Station, Gunner Station, Loader Station, and Driver Station above. The system displays the individual DRC screens for the selected controls and lights. During the Autosequence, DRC screens for each control and light are opened sequentially in the following order:
  - (a) TC Station switches.



**Figure 2-89. Autosequence Setup Screen**

- (b) TC Station lights.
- 0 Gunner's Station switches.
- (d) Gunner's Station lights.
- ⊖ Loader's Station switches.
- (f) Loader's Station lights.
- (g) Driver's Station switches.
- (h) Driver's Station lights.

Refer to 2.6.6.2 for procedures to conduct DRCs at these screens.

- b. When a device fails the Autosequence DRC, re-select it after steps have been taken to correct the problem as follows:

**NOTE**

Use the Autosequence process in a. to re-select a group (or groups) of switches or lights that failed the initial DRC.

- (1) Click on the radio button next to the crew station with the failed device. The Daily Readiness Check Status Screen for that crew station displays.

**NOTE**

AFIST automatically displays the TC Daily Readiness Check Status Screen when Daily Readiness Check is selected from the pull-down Diagnostics menu. The I/O can display another Daily Readiness Check Status Screen by clicking a crew station radio button at any Daily Readiness Check Status Screen.

At each Daily Readiness Check Screen, the symbol displayed in front of each device indicates the DRC status for that device, as follows:

- (a) "✓." Device passed the DRC.
- (b) "x." Device failed the DRC.
- (c) "-." Device has not been checked with the DRC. Defaults to this symbol upon initial system initialization.

- (2) At the desired Daily Readiness Check Status Screen, select the device for DRC by double-clicking on it, then conduct the DRC for it as outlined in 2.6.6.2 and 2.6.6.3. AFIST displays the following devices at each screen:

(a) TC Station Daily Readiness Check Status Screen, Figure 2-90:

- 1 TC Palm Switch.
- 2 TC Trigger. ,
- 3 TC LRF Thumb button.
- 4 CWS Palm Switch.
- 5 Battle Sight button.

- 6 ADD/DROP Switch.
- 7 Grenade SALVO 1 button.
- 8 Grenade SALVO 2 button.
- 9 Fire Control Malfunction.
- 10 All Station Lights.

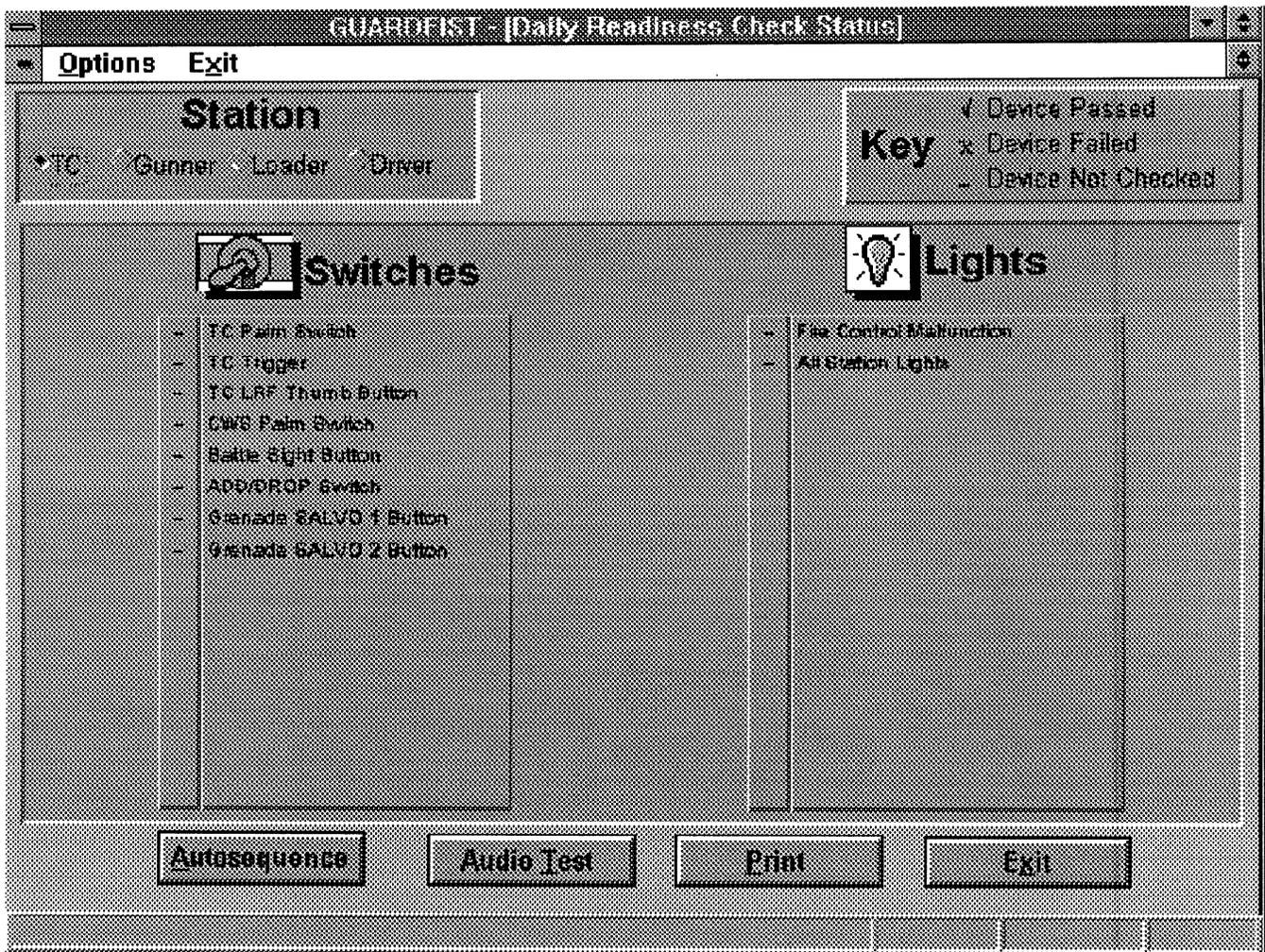


Figure 2-90. TC Station Daily Readiness Check Status Screen

(b) Gunner Daily Readiness Check Screen, Figure 2-91:

- 1 Gunner Palm Switch (left and right).
- 2 Gunner Trigger (left and right).
- 3 Gunner LRF Thumb button (left and right).
- 4 LRF SAFE/ARM Switch.

5 GPS 3X/10X Switch.

6 Ammunition Select Switch.

7 Gun Select Switch.

8 FLTR/CLEAR/SHTR Switch.

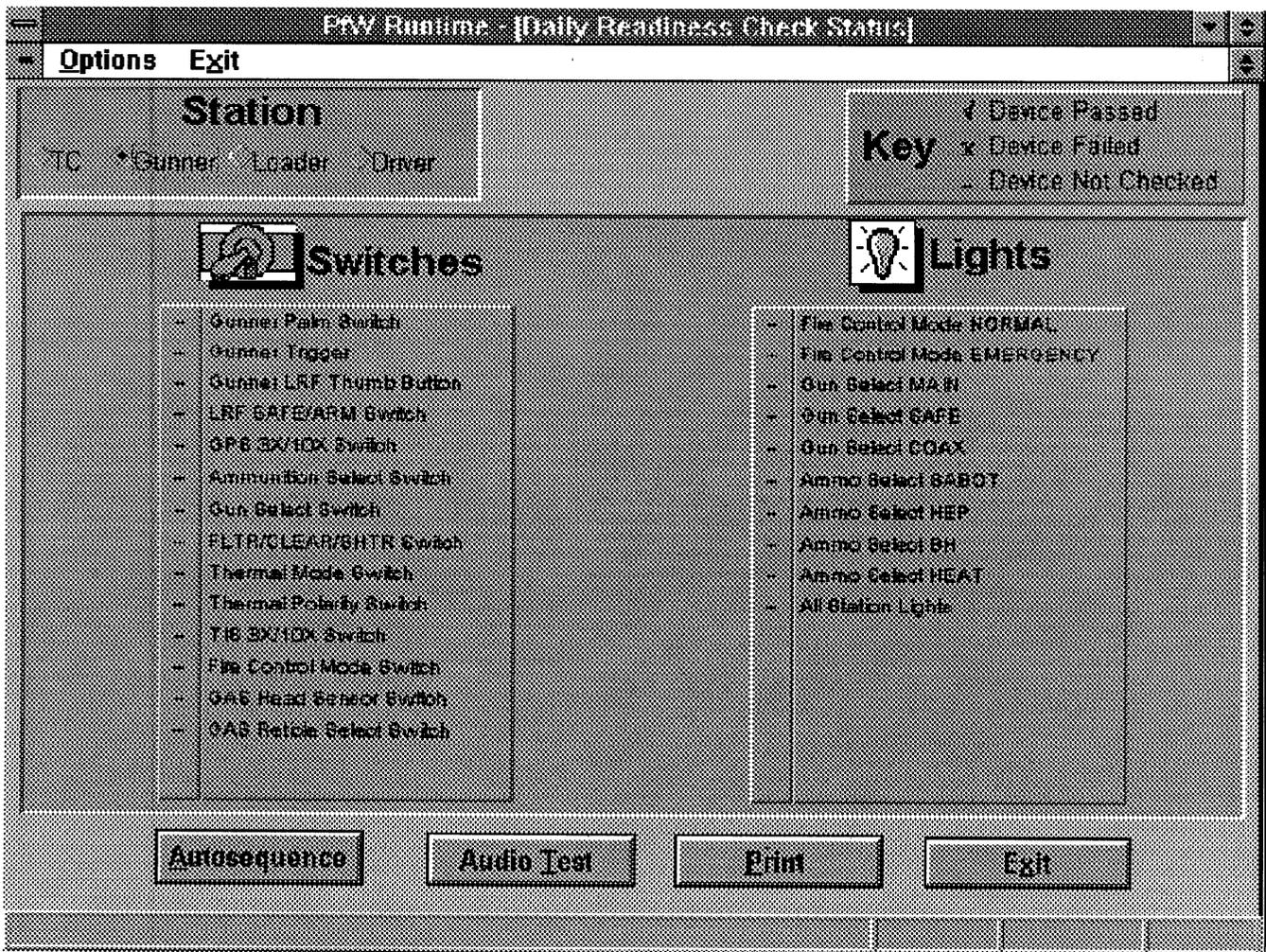


Figure 2-91. Gunner Station Daily Readiness Check Status Screen

9 Thermal Mode Switch.

10 Thermal Polarity Switch.

11 TIS **3X/10X** Switch.

12 Fire Control Mode Switch.

13 GAS Head Sensor Switch (GAS Proximity sensor).

14 GAS Reticle Select Switch.

15 Fire Control Mode NORMAL.

16 Fire Control Mode EMERGENCY.

17 Gun Select MAIN.

18 Gun Select SAFE.

19 Gun Select COAX.

20 Ammo Select SABOT.

21 Ammo Select HEP (MI).

22 Ammo Select BH (MI).

23 Ammo Select HEAT.

24 All Station Lights.

(c) Loader Station Daily Readiness Check Status Screen, **Figure 2-92:**

1 Knee Switch.

2 SABOT Retrieval Switch.

3 HEAT Retrieval Switch.

4 Breech Loading Panel button.

5 Ejection Guard (M1A1).

6 SAFE/ARM Handle (MI).

7 Gun/Turret Drive Switch.

8 ARMED Indicator.

9 SAFE Indicator.

10 EL UNCPL Indicator.

11 POWERED Indicator.

12 Breech Loading Panel READY.

13 Breech Loading Panel LOADED.

14 SABOT Retrieval.

15 HEAT Retrieval.

16 All Station Lights.

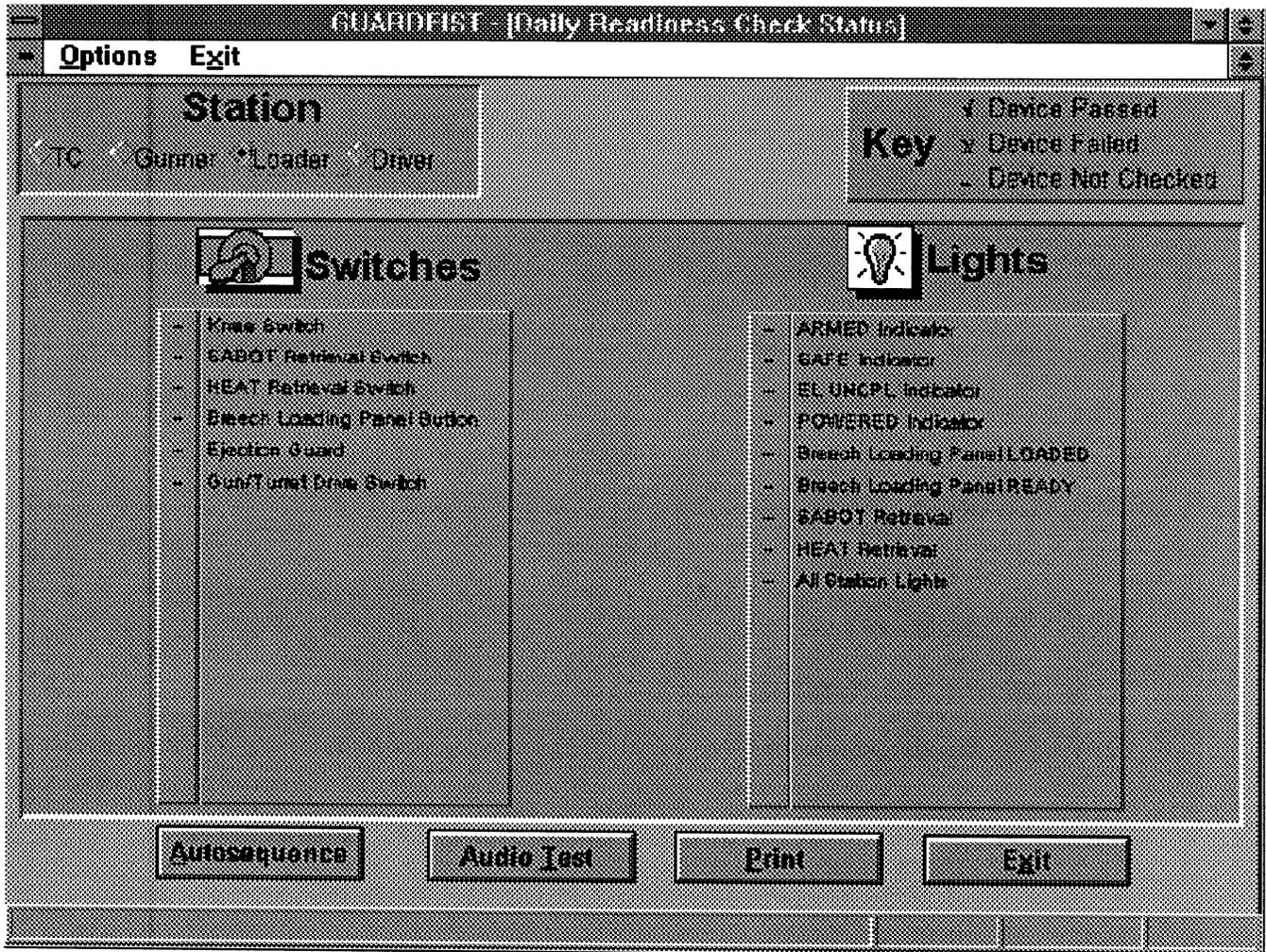


Figure 2-92. Loader Station Daily Readiness Check Status Screen

- (d) Driver Station Daily Readiness Check Status Screen, Figure 2-93:
- 1 Transmission Shift Control.
  - 2 Tactical Idle.
  - 3 Smoke Generator.
  - 4 Night Scope.
  - 5 Smoke Generator Indicator.
  - 6 All Station Lights.
- (3) To print the Daily Readiness Check Status Screen, click on the Print button or select Print from the pull-down Options menu.
- (4) To conduct the DRC on a group or group of crew station devices, at any Daily Readiness Check Status Screen, click on the Autosequence button or select Autosequence from the pull-down Options menu. The system displays the Autosequence Screen described in a. above.
- (5) To perform a DRC on a device in a crew station other than the one displayed, click on the radio button beside the crew station. The Daily Readiness Check Status Screen for that station displays.
- (6) To exit the Daily Readiness Check Screen and return to the AFIST Main Screen, click on the Exit button or select Exit from the Menu bar.

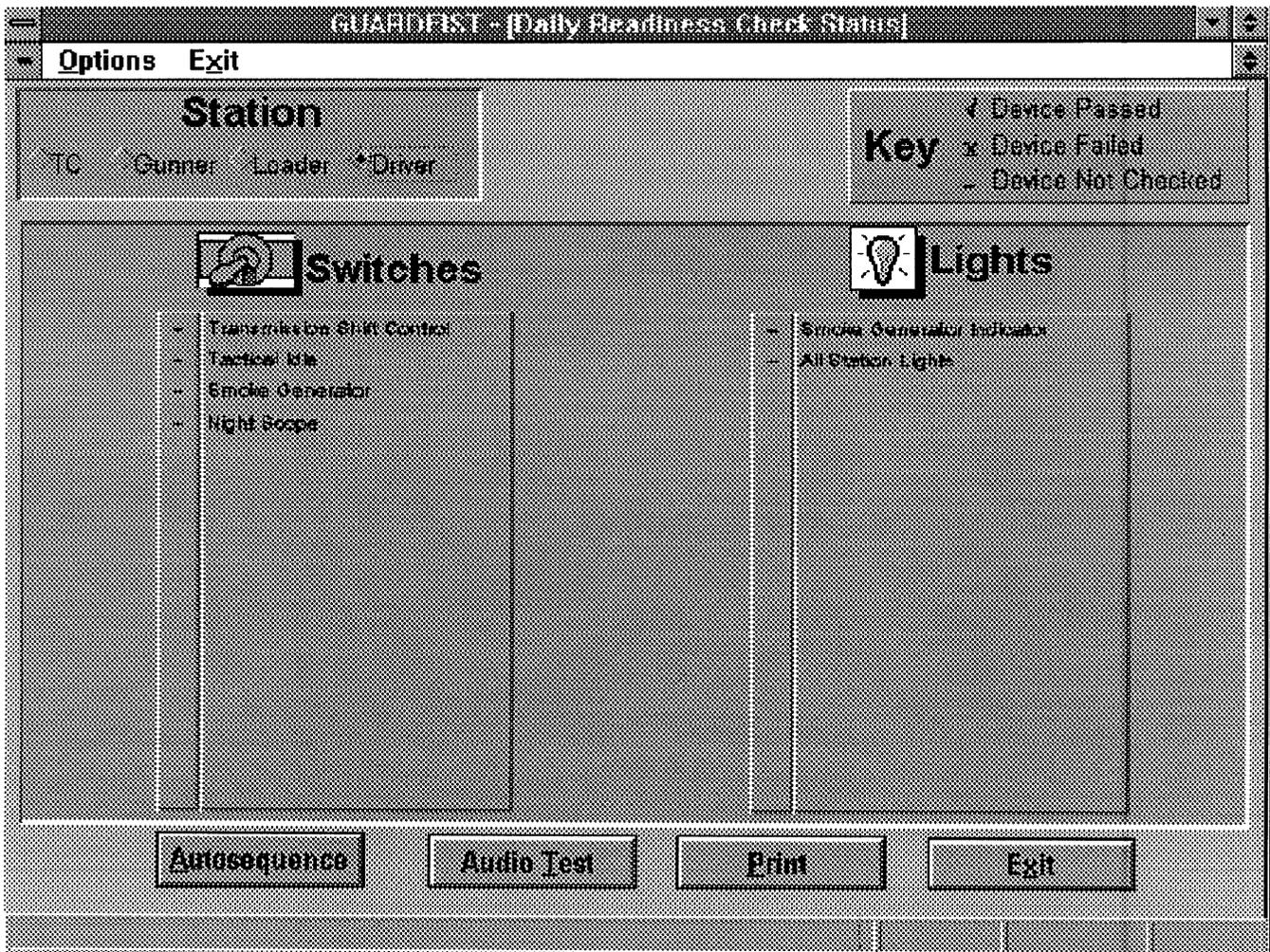


Figure 2-93. Driver Station Daily Readiness Check Status Screen

2.6.6.2 Conducting DRC on a Switch. For each switch selected with the procedures in 2.6.6.1, AFIST displays a DRC screen, like the one shown in Figure 2-94, one at a time. At each screen, perform the DRC of that device as follows:

- a. Call out each position in the Positions column one at a time. The assistant places the component in each position as it is called out. For this component to pass the DRC, each position on the screen must illuminate when the component is placed in that position.
- b. Use the Status radio buttons to enter the results of the DRC of this device, as follows:

- (1) Not Checked radio button. System defaults to this option. Click on this if the device is not to be checked during the DRC Autosequence. The system displays the screen for the next component in the DRC Autosequence.

- (2) Press radio button. Click on this if this component passes the DRC. The component passes DRC if each position in the Positions column illuminates when the component is placed in that position.

- (3) Fail radio button. Click on this if this component fails the DRC. The component fails DRC if any position in the Positions column does not illuminate when the component is placed in that position. Upon completion of the DRC, refer to the Troubleshooting procedures in Chapter 3, Section II, to correct the problem.

- c. Click on the Next Switch button to go to the next screen in the DRC Autosequence. (This button displays only if this screen was displayed as a result of the DRC Autosequence.)

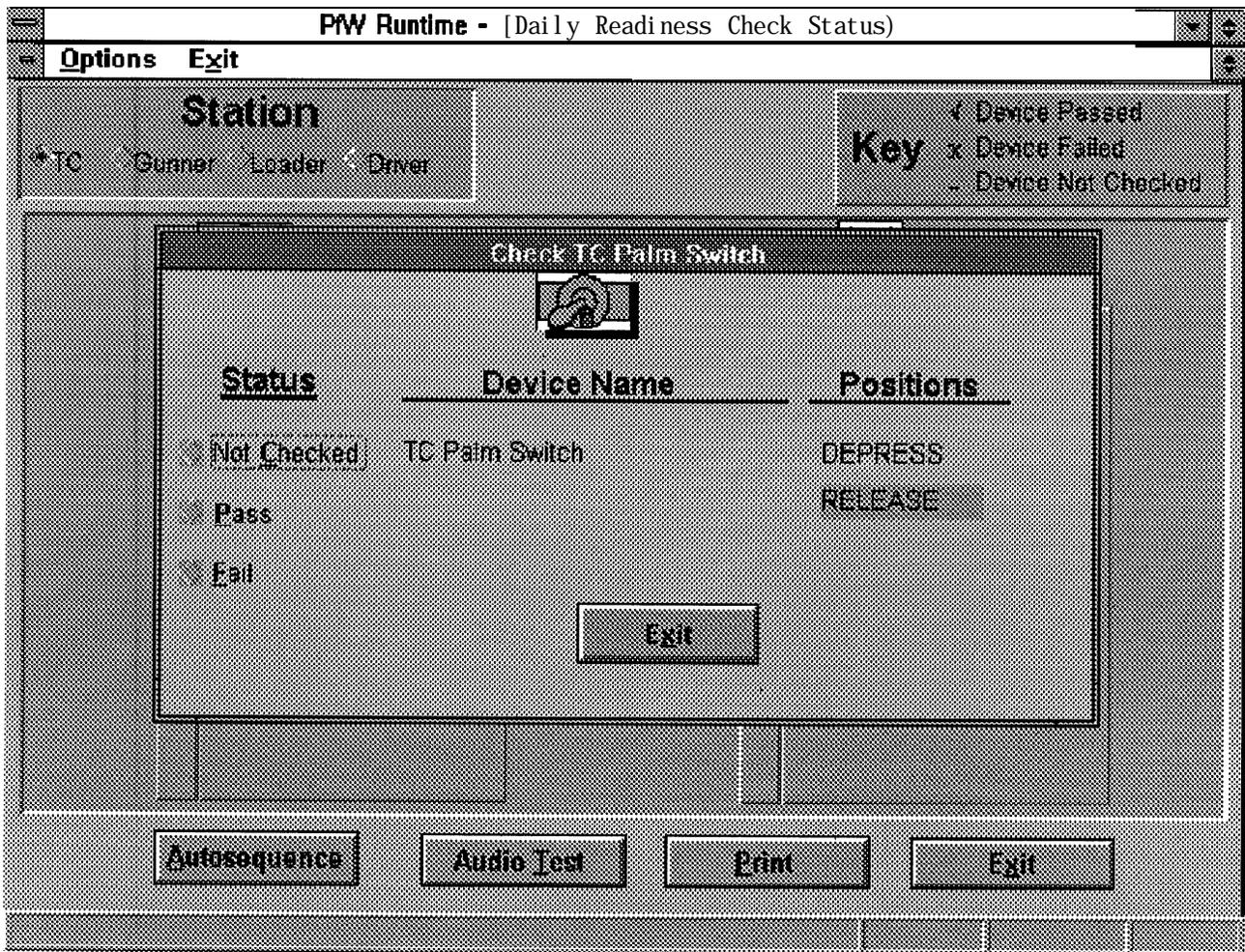


Figure 2-94. Check TC Palm Switch Screen

- d. Click on the Exit button to exit this screen. The system returns to the Autosequence Setup Screen, if this screen was displayed as a result of the DRC Autosequence, or to the appropriate crew station Daily Readiness Check Status Screen.

of this component, as follows:

- (1) Not Checked radio button. System defaults to this option. Click on this if the device is not to be checked during the DRC Autosequence. The system displays the screen for the next component in the DRC Autosequence.
- (2) Pass radio button. Click on this if this component passes the DRC. The component passes the DRC if the light in the tank and the light below the button both illuminate.

2.6.6.3 Conducting DRC on a Light. For each light selected with the procedures in 2.6.6.1, AFIST displays a DRC screen, like the one shown in Figure 2-95, one at a time. At each screen, perform the DRC of that device as follows:

- a. Click the OFF/ON button. The corresponding light in the tank and the light below the button on the screen illuminate. Click the button again. Both lights go out. If either light does not illuminate when clicked on, or does not go out when clicked off, click the Fail button to fail this component in the DRC.
- b. Use the status radio button to enter the results of the DRC

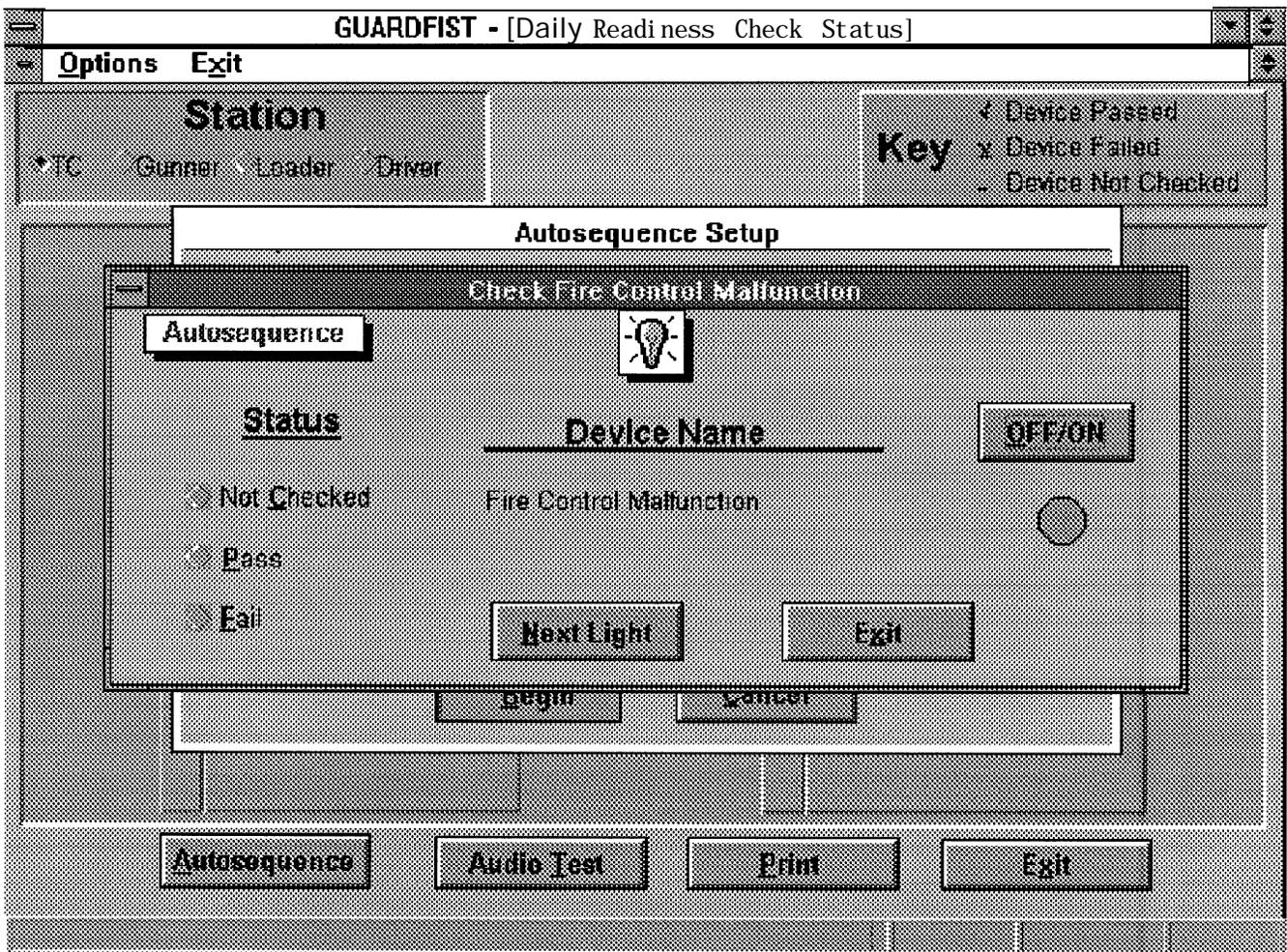


Figure 2-95. Check Fire Control Malfunction Screen

- (3) Fail radio button. Click on this if this component fails the DRC. The component fails the DRC if either the light in the tank or the light below the button does not illuminate or does not go out. Upon completion of the DRC, refer to the Troubleshooting procedures in Chapter 3, Section II, to correct the problem.
- c. Click on the Next Light button to go to the next screen in the DRC Autosequence. (This button displays only if this screen was displayed as a result of the DRC Autosequence.)
- d. Click on the Exit button to exit this screen. The system returns to the Autosequence Setup Screen, if this screen was displayed as a result of the DRC Autosequence, or to the appropriate crew station Daily Readiness Check Status Screen.

2.6.6.4 Audio Test Screen. Perform a DRC of tank sound effects upon initial installation of the AFIST. To do this, perform the following:

- a. At the TC, Gunner, Loader, or Driver Daily Readiness Check Status Screen, click on the Audio Test button. The system plays a randomly selected tank sound effect, then displays the Audio Test Screen, Figure 2-96, asking if operator heard the randomly selected test sound effect.
- b. Click on the Yes button if the test sound effect was heard. The system returns to the screen from which Audio Test was selected.
- c. Click on the No button if the test sound effect was not heard. The system returns to the screen from which Audio Test was selected. Refer to the Troubleshooting procedures in Chapter 3, Section II.

**Have you heard the sound?  
If yes, press 'Y', otherwise press 'N'**

Figure 2-96. Audio Test Screen

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2.6.7 **Calibrate/Recalibrate Screen.** Calibration of **AFIST** analog controls is critical for proper operation. Calibration provides the simulation software with values which coincide with the movement of the controls at the various crew stations in the tank. The I/O directs all calibration operations by personnel inside the tank from his position at the **IOS**. A calibration menu provides on-screen prompts to assist the I/O in completing calibration.

**NOTES**

- a. These procedures must be performed when the **AFIST** is initially installed:

Monitor alignment. Refer to 2.6.7.3 for monitor alignment procedures.

Full calibration.

GAS calibration.

- b. When preparing for training on a system which has remained installed from a previous training session, the I/O may check selected controls to confirm calibration.
- c. If a sensor or tank control has been removed and **replaced**, the I/O must calibrate that particular control.

System calibration may be either full or partial. Full calibration must be performed only when the system is first installed on the tank and when the TC, Gunner, and Driver change. Partial calibration must be performed if any of the following occurs:

- a. Movement of one or more sensors.
- b. A sensor loses (or is suspected to have lost) calibration.
- c. Change of TC, Gunner, or Driver.

In the case of a. or **b.**, above, recalibrate only the sensor(s) or assembly involved. For c., recalibrate the crew position involved.

To access calibration functions, at the **AFIST** Main Screen, select Calibrate/Recalibrate from the pull-down Diagnostics menu. The Calibrate/Recalibrate Screen, Figure 2-97, displays.

- a. Click on the TC Station button or select TC Station from the pull-down Options menu to display to the TC Station Calibration Screens. These screens are described in 2.6.7.2.1.
- b. Click on the Gunner Station button or select GNR Station **from** the pull-down Options menu to display the Gunner Station Calibration Screens. These screens are described in 2.6.7.2.2.
- c. Click on the Driver Station button or select DRV Station **from** the pull-down Options menu to display the Driver Station Calibration Screens. These screens are described in 2.6.7.2.3.
- d. Click on the Full System Cal button or select Full Calibration from the pull-down Options menu to display the Full Calibration Screens. Full system calibration must be **performed** when **AFIST** is first installed. These screens are described in 2.6.7.1.
- e. Click on the GAS CAL button or select GAS CAL from the pull-down Options menu to calibrate the GAS. The system runs a scenario described in 2.6.7.3. GAS calibration must be performed when **AFIST** is first installed.
- f. Click on the Exit button or select Exit from the menu bar to exit the Calibration/Recalibration Screen and return to the **AFIST** Main Screen.

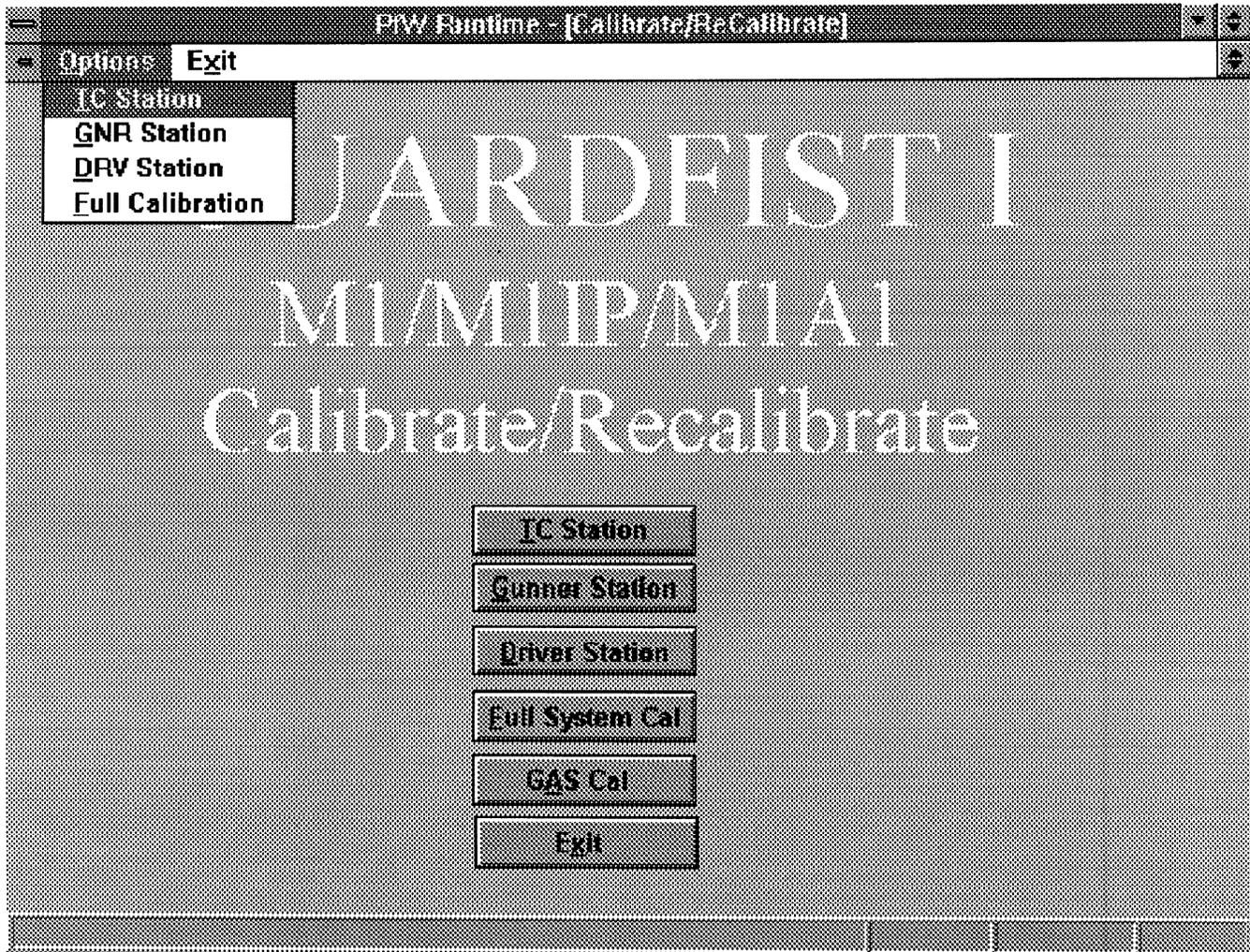


Figure 2-97. Calibrate/Recalibrate Screen

#### 2.6.7.1 Full Calibration.

##### **NOTE**

Calibration values will vary depending on the tank type, the particular tank, and the crew performing the calibration. The values illustrated in the following screens provide only a general range of values for each control.

Full system calibration must be performed when AFIST is first installed. Under a full calibration, AFIST guides the I/O through a sequence of calibration screens and procedures for each crew station analog control. The I/O must complete the entire calibration sequence before exiting this function and saving the calibration results to the database. To perform full system calibration, do the following:

- a. Click on the Full System Cal button or select Full Calibration from the pull-down Options menu. The calibration screens for each control display in the following order:
  - (1) Gunner Control Handle Calibration.
  - (2) GPS Reticle Intensity Calibration.

- (3) TIS Reticle Intensity.
- (4) TC Control Handle Calibration.
- (5) CWS Control Handle Calibration.
- (6) Power Control Handle Calibration (Steer-Throttle Control).
- (7) Throttle Calibration.
- (8) Brake Calibration.

Figure 2-98 shows a typical calibration screen.

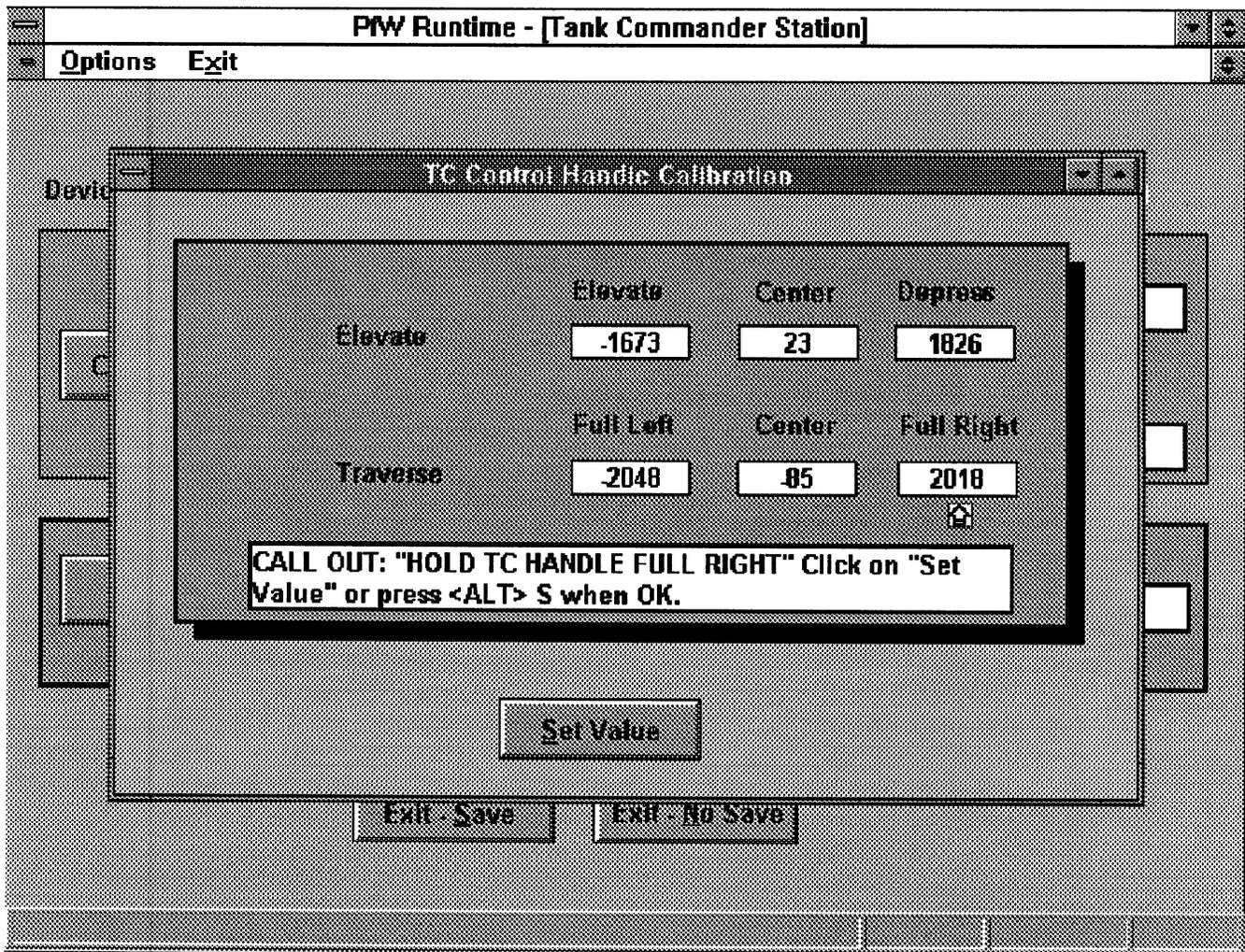


Figure 2-98. TC Control Handle Calibration Screen

## NOTES

To obtain an accurate value for the center traverse positions, the assistant must release the control handle once it is placed in the center traverse position.

Before calibrating the brake full on position, adjust the brake sensor until the release calibration value is  $0 \pm 50$ . Then proceed with brake calibration.

The Steer-Throttle Control is used in much the same way as motorcycle handles. To obtain accurate values, the assistant must place the control in position as follows:

- Full Left. Extend the right arm fully and contract the left arm fully.
- Center. Release the control handle once it is placed in the center traverse position.
- Full Right. Extend the left arm fully and contract the right arm fully.

- b. At each calibration screen, follow the directions in the Instruction Box and call out the control position. As the assistant places the control in that position, the value displayed for the position changes. Be sure to instruct the assistant to keep the control in position until the next command is given and to release the Gunner Control Handle, TC Control Handle, CWS Power Control Handle, and the Steer-Throttle Control once these controls are placed in the center traverse position. Before calibrating the brake Full On position, adjust the brake sensor until the release calibration value is  $0 \pm 50$ .

- c. When the displayed value stabilizes, click on the Set Value button. The arrow advances to the next calibration value and the screen displays the value for that position.
- d. Repeat Steps b and c for all control positions.
- e. When all settings are calibrated and set with the Set Value button, the calibration message screen for that control, displays. Figure 2-99 shows a typical calibration message screen.
- f. Click on the OK button.
  - (1) If all controls have not been calibrated, the calibration screen for the next control in the sequence displays.

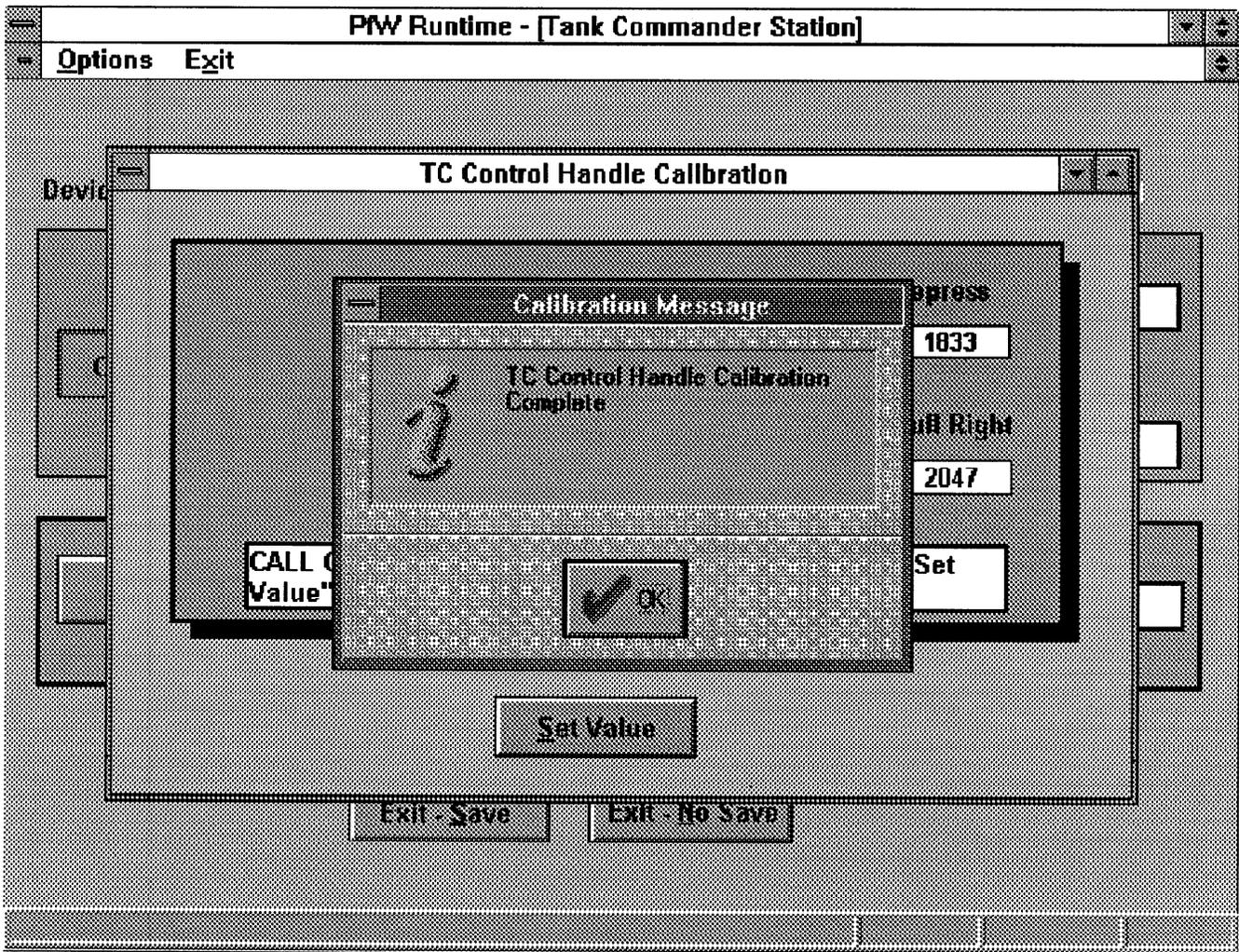


Figure 2-99. TC Control Handle Calibration Message Screen

- (2) If all controls have been calibrated, the Save Calibration Results Screen, Figure 2-100, displays.
- (a) Click on the Yes button to save the new calibration data to the system database and return to the AFIST Main Screen.
- (b) Click on the No button to return to the AFIST Main Screen without saving the new calibration data to the system database.

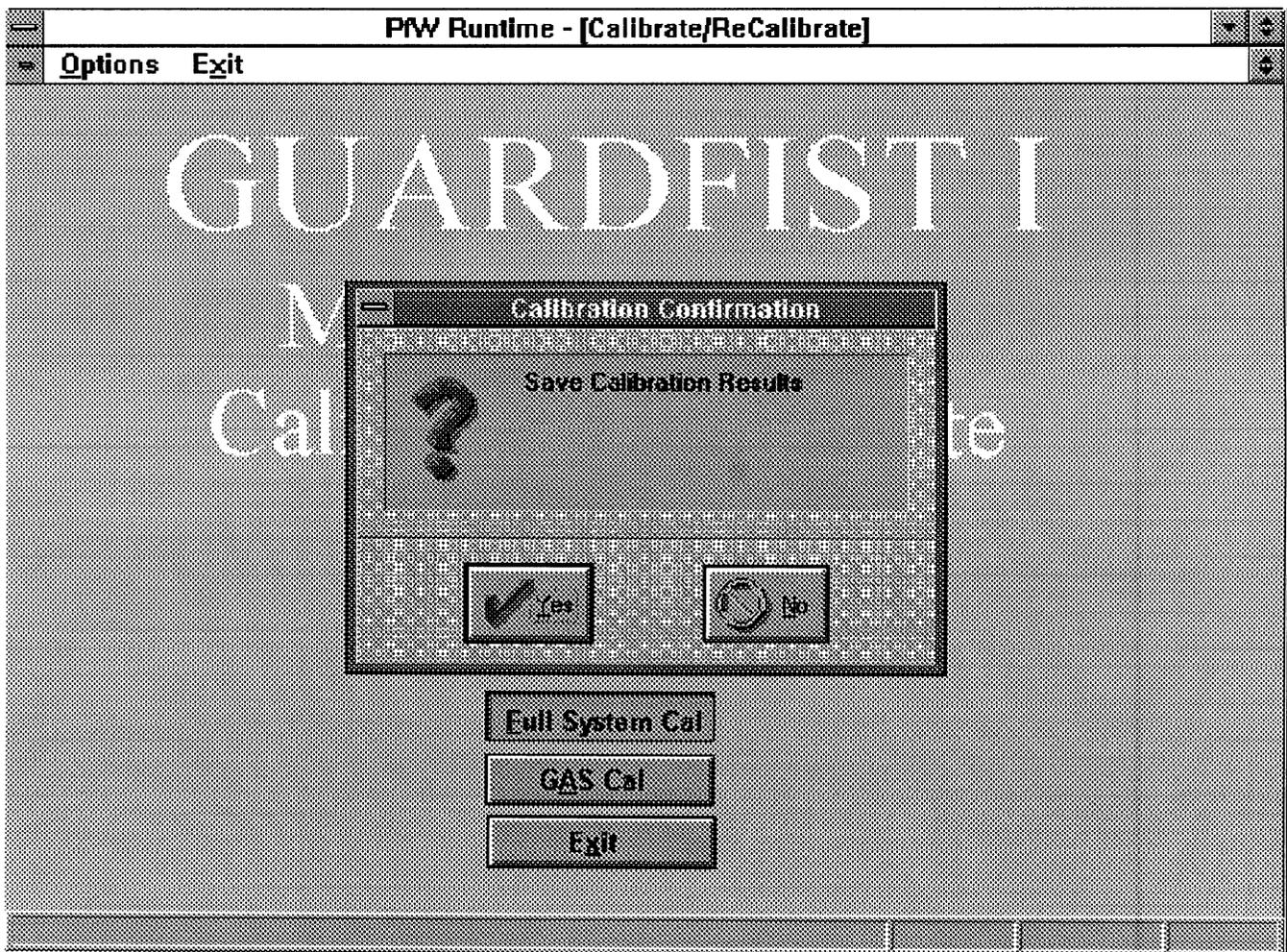


Figure 2-100. Save Calibration Results Screen

2.6.7.2 Partial Calibration. Partial calibration must be performed if any of the following occurs:

- a. Movement of one or more sensors.
- b. A sensor loses (or is suspected to have lost) calibration.
- c. Change of TC, Gunner, or Driver.

Perform partial calibration of controls within individual crew stations according to the following paragraphs.

2.6.7.2.1 TC Station Calibration. To calibrate only TC Station controls, perform the following:

- a. At the Calibrate/Recalibrate Screen, click on the TC Station button or select TC Station from the pull-down Options menu. The Tank Commander Station Screen, Figure 2-101, displays.

This screen displays the current settings, calibration status, and date of the last calibration for the TC Control Handle and CWS Control Handle. It is also used to save changes caused by calibration or recalibration of the TC Control Handle or CWS Control Handle during partial calibration. Both controls in the TC Station should be recalibrated whenever the TC changes.

- b. Verify each control is properly calibrated. Controls displaying a RECAL status or with invalid values in the Current Settings should be recalibrated. The displayed Status of each control should be OK and the Current Settings should display valid calibration values.

(1) Control Handle Elevation Current Settings:

(a) Elevate. Displays the maximum

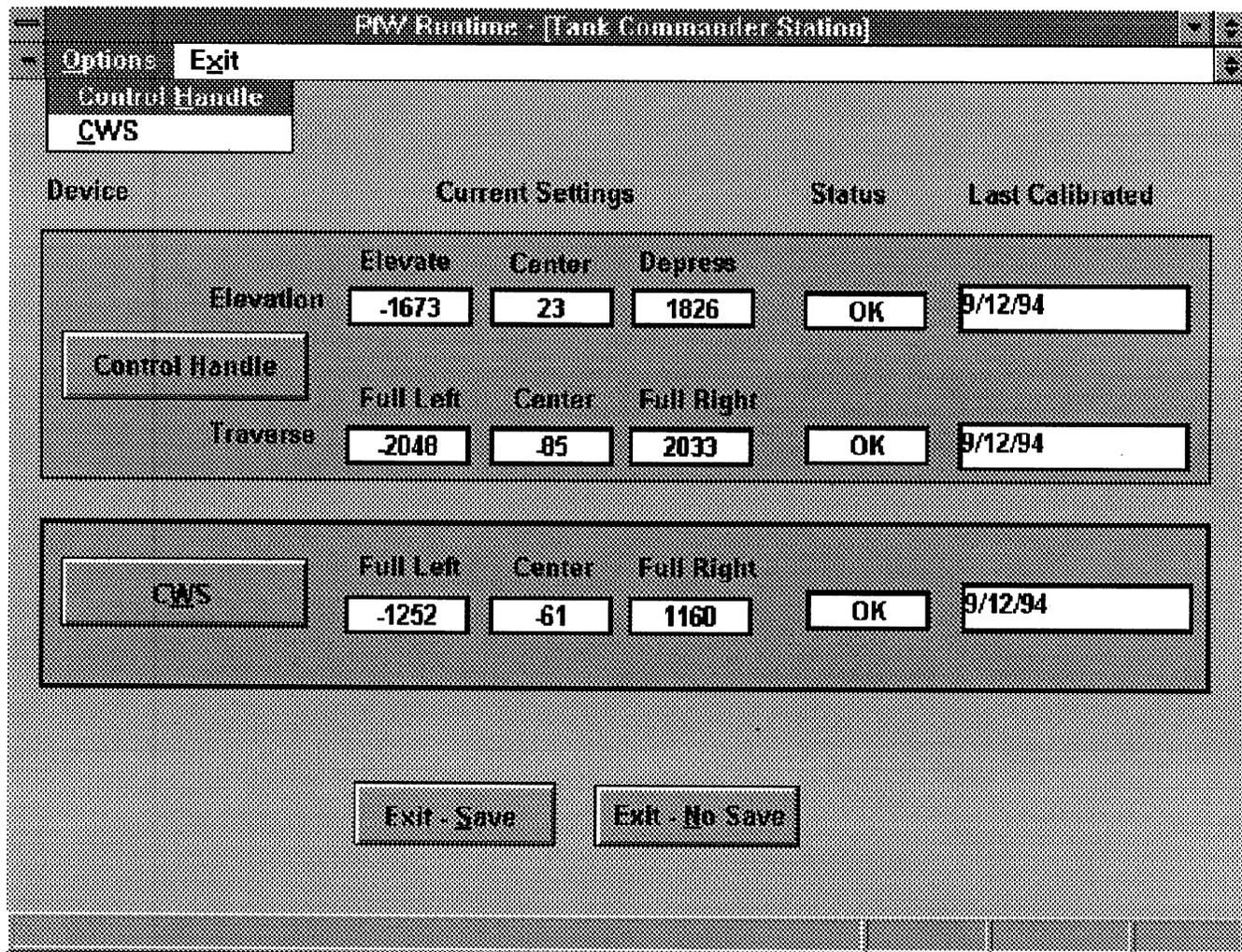


Figure 2-101. Tank Commander Station Screen

- elevation calibration value,
- (b) Center, Displays the center elevation calibration value.
- 0 Depress. Displays the maximum depression calibration value.
- (2) Control Handle Traverse Current Settings:
  - (a) Full Left. Displays the extreme left traverse calibration value.
  - (b) Center. Displays the center traverse calibration value.
  - (c) Full Right. Displays the extreme right traverse calibration value.
- (3) CWS Current Settings:
  - (a) Full Left. Displays the extreme left traverse calibration value.
  - (b) Center. Displays the center traverse calibration value.
  - (c) Full Right. Displays the extreme right traverse calibration value.
- c. Select the control to be calibrated by clicking on the control button or selecting it from the pull-down options menu. The calibration screen for the selected control displays. Figure 2-98 shows a typical calibration screen.
  - d. Follow the directions in the Instruction Box and call out the control position. As the assistant places the control in that position, the value displayed for the position changes. Be sure to instruct the assistant to keep the control in position until the next command is given, Be sure to instruct the assistant to release the control handle once the control is placed in the center traverse position.
  - e. When the displayed value stabilizes, click on the Set Value button. The arrow advances to the next calibration value and the screen displays the value for that position.
  - f. Repeat Steps d and e for all control positions.
  - g. When all settings are calibrated and set with the Set Value button, the calibration message screen for that control, displays. Figure 2-99 shows a typical calibration message screen.
  - h. Click on the OK button. The system returns to the Tank Commander Screen.
  - i. Click on the Exit - Save button or select Exit-Save from the pull-down Exit menu to exit the Tank Commander Station calibration function and save the new Tank Commander's Station calibration data to the system database.
  - j. Click on the Exit - No Save button or select Exit-No Save from the pull-down Exit menu to exit the Tank Commander Station configuration without saving the new Tank Commander's Station calibration data to the system database.

**NOTE**

To obtain an accurate value for the center traverse positions, the assistant must release the control handle once it is placed in the center traverse position.

2.6.7.2.2 Gunner Station Calibration. To calibrate only Gunner's Station controls, perform the following:

- a. At the Calibrate/Recalibrate Screen, click on the Gunner Station button or select GNR Station from the pull-down Options menu. The Gunner Station Screen, Figure 2-102, displays.

This screen displays the current settings, calibration status, and date of the last calibration of the Gunner's Power Control Handle, GPS Reticle Intensity knob, and TIS Reticle Intensity knob. It is also used to save changes caused by calibration or recalibration of the Gunner's Power Control Handle, GPS Reticle Intensity knob, and TIS Reticle Intensity knob. All controls in the Gunner Station should be recalibrated whenever the Gunner changes.

- b. Verify each control is properly calibrated. Controls displaying a RECAL status or with invalid values in the Current Settings should be recalibrated. The displayed Status of each control should be OK and the Current Settings should display valid calibration values.

(1) GNR-Control Handle Elevation Current Settings:

- (a) Elevate. Displays the maximum elevation calibration value.
- (b) Center. Displays the center elevation calibration value.
- (c) Depress. Displays the maximum depression calibration value.

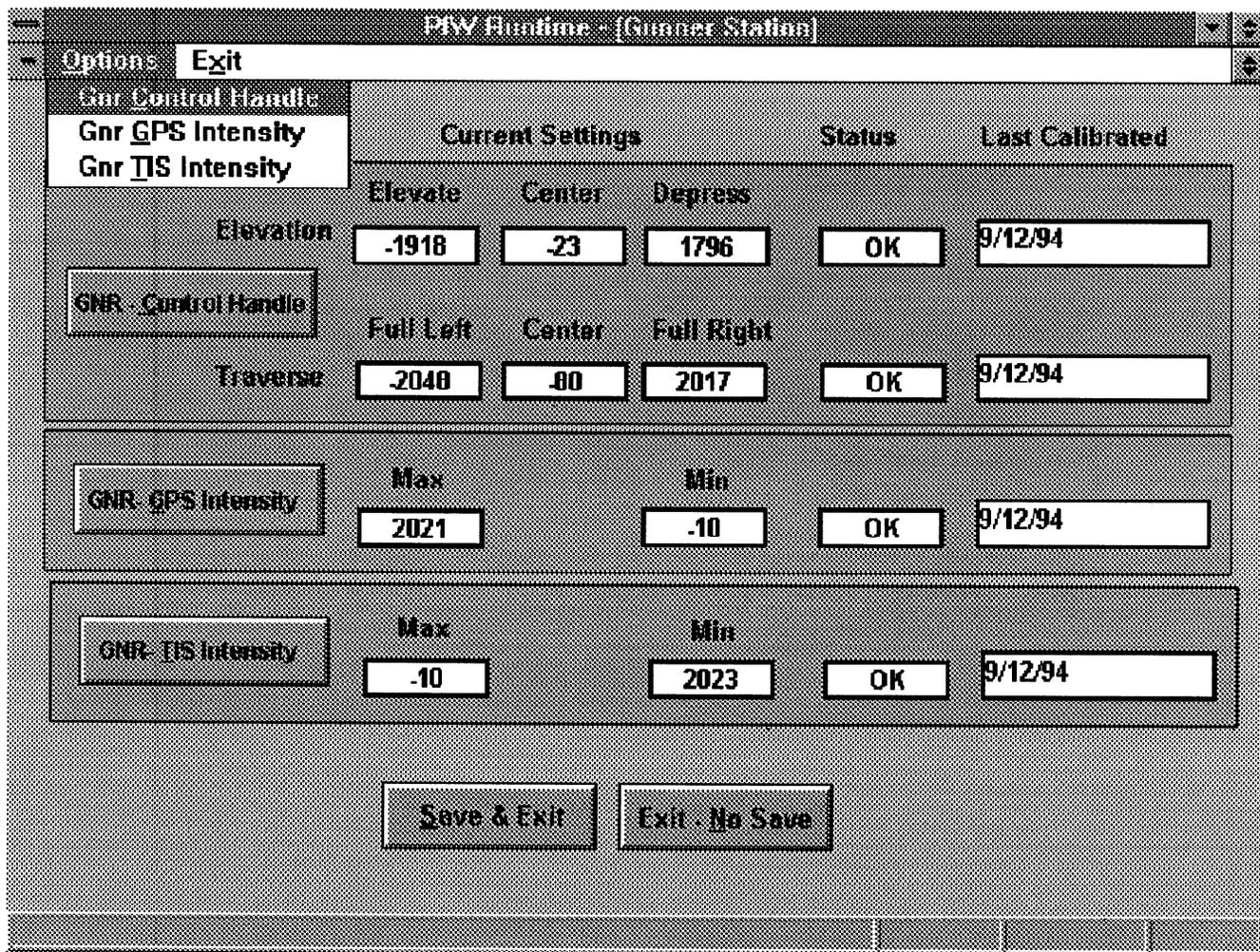


Figure 2-102. Gunner Station Screen

- (2) GNR-Control Handle Traverse Current Settings:
    - (a) Full Left. Displays the extreme left traverse calibration value.
    - (b) Center. Displays the center traverse calibration value.
    - (c) Full Right. Displays the extreme right traverse calibration value.
  - (3) GNR-GPS Intensity Current Settings:
    - (a) Max. Displays the maximum (full clockwise) calibration value.
    - (b) Min. Displays the minimum (full counterclockwise) calibration value.
  - (4) GNR-TIS Intensity Current Settings:
    - (a) Max. Displays the maximum (full clockwise) calibration value.
    - (b) Min. Displays the minimum (full counterclockwise) calibration value.
- c. Select the control to be calibrated by clicking on the control button or selecting it from the pull-down Options menu. The calibration screen for the selected control displays. Figure 2-98 shows a typical calibration screen.
- d. Follow the directions in the Instruction Box and call out the control position. As the assistant places the control in that position, the value displayed for the position changes. Be sure to instruct the assistant to keep the control in position until the next command is given. Be sure to instruct the assistant to release the control handle once the control is placed in the center traverse position.
  - e. When the displayed value stabilizes, click on the Set Value button. The arrow advances to the next calibration value and the screen displays the value for that position.
  - f. Repeat Steps d and e for all control positions.
  - g. When all settings are calibrated and set with the Set Value button, the calibration message screen for that control, displays. Figure 2-99 shows a typical calibration message screen.
  - h. Click on the OK button. The system returns to the Gunner Screen.
  - i. Click on the Save & Exit button or select Exit-Save from the pull-down Exit menu to exit the Gunner Station calibration function and save the new Gunner's Station calibration data to the system database.
  - j. Click on the Exit - No Save button or select Exit-No Save from the pull-down Exit menu to exit the Gunner Station configuration without saving the new Gunner's Station calibration data to the system database.
  - k. At the conclusion of calibration, place the GPS and TIS reticle intensity knobs in midrange position.

### NOTE

To obtain an accurate value for the Gunner Power Control Handle center traverse position, the assistant must release the control handle once it is placed in the center traverse position.

2.6.7.2.3 **Driver Station Calibration.** To calibrate only Driver's Station controls, perform the following:

- a. At the Calibrate/Recalibrate Screen, click on the Driver Station button or select DRV Station from the pull-down Options menu. The Driver Station Screen, Figure 2-103, displays.

This screen displays the current settings, calibration status, and date of the last calibration of the **Steer-Throttle Control**, **Brake**, and **Throttle**. It is also used to save changes caused by calibration or recalibration of the Power Steering Control, Brake, and Throttle. All controls in the Driver Station should be recalibrated whenever the Driver changes.

- b. Verify each control is properly calibrated. Controls displaying a **RECAL** status or with invalid values in the Current Settings should be recalibrated. The

displayed Status of each control should be OK and the Current Settings should display valid calibration values.

- (1) Steer-Throttle Control Current Settings:
  - (a) Full Left. Displays the full-left-turn position calibration value.
  - (b) Center. Displays the center position calibration value.
  - (c) Full Right. Displays the **full-right**-turn position calibration value.
- (2) Brake Current Settings:
  - (a) Full On. Displays the calibration value for a fully depressed brake.

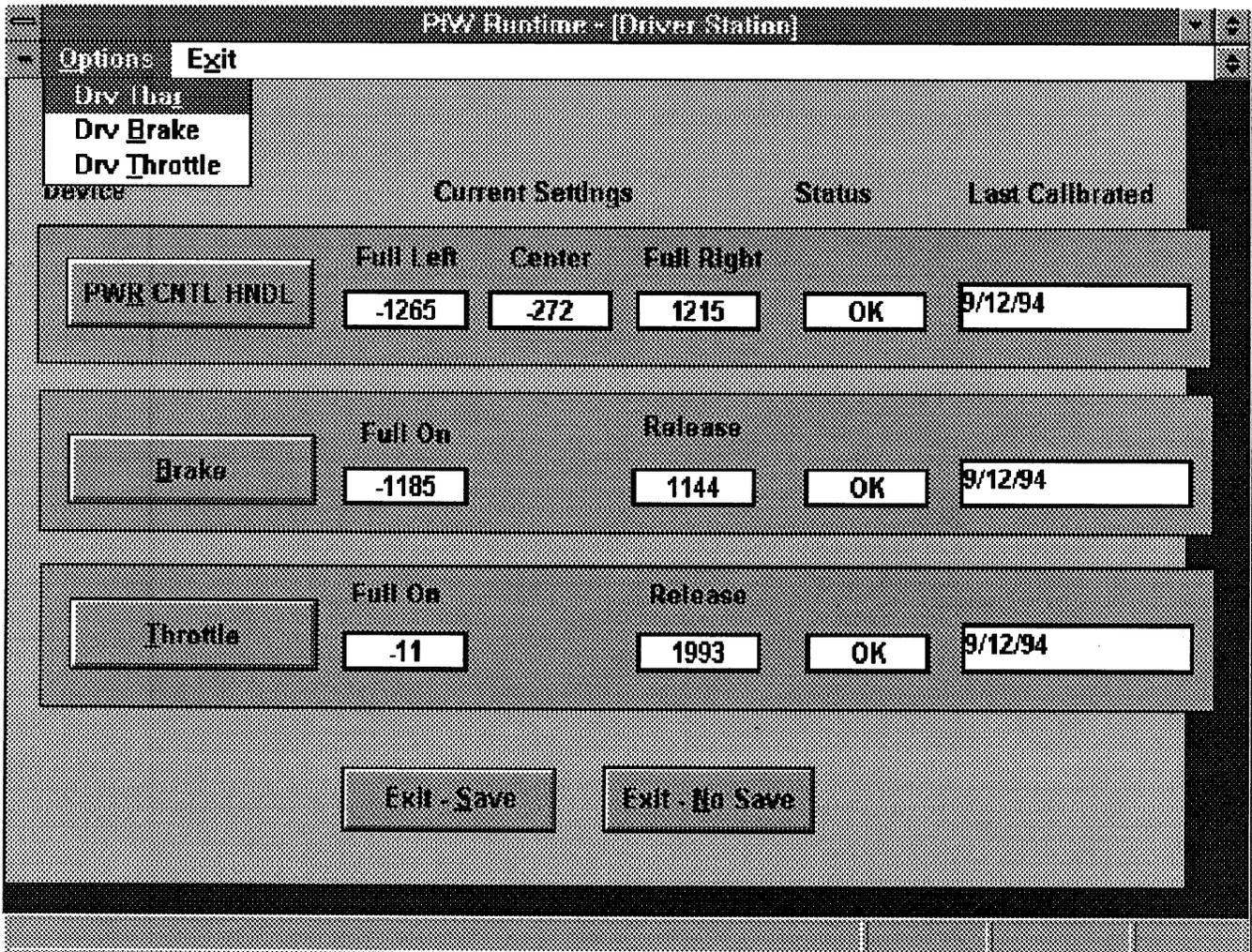


Figure 2-103. Driver Station Screen

- (b) Release. Displays the calibration value for a fully released brake.
- (3) Throttle Current Settings:
  - (a) Full On. Displays the calibration value for a throttle at full speed.
  - (b) Release. Displays the calibration value for a released throttle.
- c. Select the control to be calibrated by clicking on the control button or selecting it from the pull-down Options menu. The calibration screen for the selected control displays. Figure 2-98 shows a typical calibration screen.

### NOTES

The Steer-Throttle Control is used in much the same way as motorcycle handles. To obtain accurate values, the assistant must place the control in position as follows:

- Full Left. Make a hard left turn by extending the right arm fully and contract the left arm fully.
- Center. Release the control handle once it is placed in the center traverse position.
- Full Right. Make a full left turn by extending the left arm fully and contract the right arm fully.

Before calibrating the brake Full On position, adjust the brake sensor until the first calibration value is  $0 \pm 50$ . Then proceed with brake calibration.

- d. Follow the directions in the Instruction Box and call out the control position. As the assistant places the control in

that position, the value displayed for the position changes. Be sure to instruct the assistant to keep the control in position until the next command is given. Be sure to instruct the assistant to release the control handle once the control is placed in the center traverse position.

- e. When the displayed value stabilizes, click on the Set Value button. The arrow advances to the next calibration value and the screen displays the value for that position.
- f. Repeat Steps d and e for all control positions.
- g. When all settings are calibrated and set with the Set Value button, the calibration message screen for that control, displays. Figure 2-99 shows a typical calibration message screen.
- h. Click on the OK button. The system returns to the DriverScreen.
- i. Click on the Exit - Save button or select Exit-Save from the pull-down Exit menu to exit the Driver Station calibration function and save the new Driver's Station calibration data to the system database.
- j. Click on the Exit - No Save button or select Exit-No Save from the pull-down Exit menu to exit the Driver Station configuration without saving the new Driver's Station calibration data to the system database.

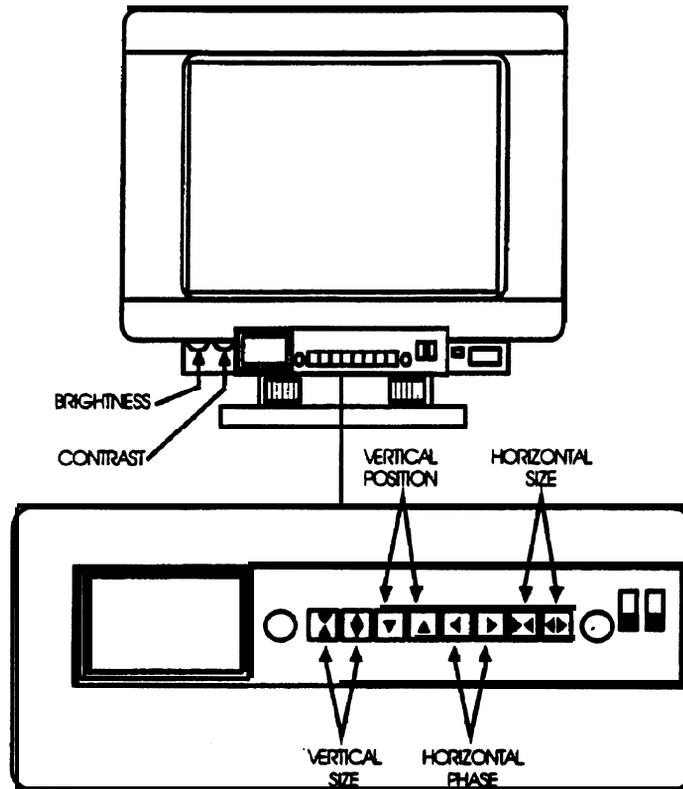
2.6.7.3 Monitor Alignments and GAS CAL Scenario.

Monitor alignments and GAS calibration must be performed when AFIST is first installed to ensure proper views from ports and sights. The I/O aligns the appended monitors based on the direction of personnel inside the tank. Once calibration and monitor alignments are complete, install the monitor light shrouds in accordance with 2.4.10. To prepare for monitor alignments and GAS calibration, perform the following:

- a. At the Calibrate/Recalibrate screen, click on GAS CAL or select GAS CAL from the pull-down options menu. The system runs the GAS CAL scenario, a European scenario with an open barn door in the foreground.
- b. Position the monitor image as follows:
  - (1) Select SABOT on the GPS Control Panel.
  - (2) Set the LRF switch to ARM 1ST RTN.
  - (3) Grasp the Gunner's Power Control Handle Palm switches and lay the GPS reticle on the upper-left corner of the barn door.
  - (4) Lase to the barn to enter a 1200-meter solution.
  - (5) Ensure the GPS reticle is on the upper-left corner of the barn door, then release the Gunner's Power Control Handle Palm switches.
  - (6) At the I/O station press the **Shift-F1** key to FREEZE the system.
- c. Use the monitor Brightness and Contrast knobs to remove any grey-shaded areas from the outer edge of the image. Make the image as bright as possible and the outer edge as black as possible on all monitors.

2.6.7.3.1 CWS Monitor Alignment. Align the CWS monitor as follows:

- a. Verify the monitor is physically aligned with the CWS vision port. Reposition as required.
- b. Have personnel at TC's station verify that the scene in the vision port is centered. Physically align the monitor until the scene is centered.
- c. Ensure the top image of the split screen is approximately 12 inches wide and 3% inches tall. Center the image horizontally. Position the image vertically with the top 1/2 inch down from the top of the monitor screen. If needed, use the controls on the front of the monitor, to adjust the monitor image. To adjust MAG monitors refer to figure 2-104, to adjust Shamrock monitors use the controls shown on figure 2-104a.
  - (1) ▼ (Vertical Size). Press to reduce vertical size of the image.
  - (2) ▲ (Vertical Size). Press to increase vertical size of the image.
  - (3) ▼ (Vertical Position). Press to lower vertical position of the image on the monitor screen.
  - (4) ▲ (Vertical Position). Press to raise vertical position of the image on the monitor screen.
  - (5) ◀ (Horizontal Phase). Press to move the image to the left on the monitor screen.
  - (6) ▶ (Horizontal Phase). Press to move the image to the right on the monitor screen.
  - (8) ◀▶ (Horizontal Size). Press to increase horizontal size of the image.
- d. Use the wing nuts on the outside of the monitor mount mirror housing to move the image left, right, up, and down until it is centered in the CWS vision port.



**Figure 2-104. CWS, GPS, and GAS Monitor 17-Inch ( MAG) Monitor Controls**

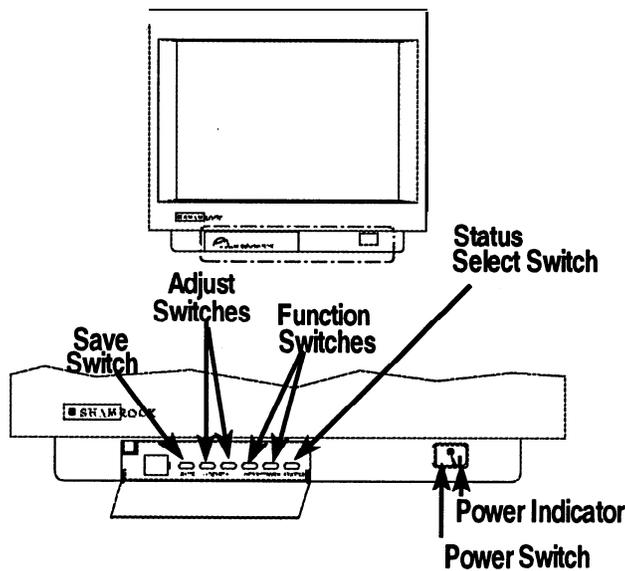
2.6.7.3.2 GPS Monitor Alignment. Align the GPS monitor as follows:

- a. Verify that the GPS collimator lens is securely installed and physically aligned with and centered on the GPS daylight channel. Reposition as required.
- b. Verify that the monitor face is centered with the center of the GPS collimator lens. Reposition as required.
- c. Ensure the image is approximately 8% inches wide and 8% inches tall. Position the image so that the barn is centered in the GPS 10X field of view and none of the black edge around the image can be seen. If needed, use the controls on the front of the monitor, to adjust the monitor image.
- d. MAG Monitor Adjustments
  - (1) ▼ (Vertical Size). Press to reduce vertical size of the image.
  - (2) ▲ (Vertical Size). Press to increase vertical size of image.
  - (3) ▼ (Vertical Position). Press to lower vertical position of the image on the monitor screen.
  - (4) ▲ (Vertical Position). Press to raise vertical position of the image on the monitor screen.
  - (5) ◀ (Horizontal Phase). Press to move the image to the left on the monitor screen.
  - (6) ▶ (Horizontal Phase). Press to move the image to the right on the monitor screen.
  - (8) ◀▶ (Horizontal Size). Press to increase horizontal size of the image.

f. Shamrock Monitor (Figure 2-104a)

- (1) Press the Status Select key twice to access the adjustment menu.
- (2) Press the left Function key six times to highlight the Horizontal Size Icon.
- (3) Press the right Adjust key to increase the size of the image.
- (4) Press the left Adjust key to decrease the size of the image.
- (5) Press the right Function key to adjust Horizontal Position.
- (6) Press the left Adjust key to move the image to the left.
- (7) Press the right Adjust key to move the image to the right.
- (8) Press the right Function key to adjust Vertical Size.
- (9) Press the right Adjust key to increase the size of the image.
- (10) Press the left Adjust key to decrease the size of the image.
- (11) Press the right Function key to adjust Vertical Position.
- (12) Press the left Adjust key to move the image to the left.
- (13) Press the right Adjust key to move the image to the right.
- (14) Press the Save key to save the changes.
- (15) Press the Status key to exit adjustment screen.

- g. Set the GPS diopter ring to 0. When the image is centered in the sight, adjust image clarity by moving the monitor slightly forward and backward. The monitor face should be approximately 18 to 23 inches from the collimator lens,



**Figure 2-104a CWS, GPS and GAS 17- inch (Shamrock) Monitor Controls**

2.6.7.3.3 Driver's Monitor Alignment. Align the Driver's monitor as follows:

- a. Verify the monitor is physically aligned with and as close as possible to the Driver's center vision block. Reposition as required.
- b. Have personnel at Driver's station verify the scene location in the vision block. Adjust the monitor until the scene is centered.
- c. Ensure the bottom image of the split screen is approximately 10% inches wide and 2% inches tall. Center the image horizontally. Position the image vertically with the bottom 1/2 inch up from the bottom of the monitor screen. If needed, use the controls on the front of the monitor to adjust the monitor image. To adjust MAG monitors refer to figure 2-105, to adjust Viewsonic monitors refer to figure 2-105a and to adjust Shamrock monitors use the controls shown in figure 2-105b.

- (1) ▲ (Vertical Size). Press to reduce vertical size of the image.

- (2) ▼▲ (Vertical Size). Press to increase vertical size of the image.

- (3) ▼ (Vertical Position). Press to lower vertical position of the image on the monitor screen.

- (4) ▲ (Vertical Position). Press to raise vertical position of the image on the monitor screen.

- (5) ◀◀ (Horizontal Phase). Press to move the image to the left on the monitor screen.

- (6) ▶▶ (Horizontal Phase). Press to move the image to the right on the monitor screen.

- (8) ◀▶ (Horizontal Size). Press to increase horizontal size of the image.

d. View Sonic Monitor (Figure 2-105a)

- (1) Press the (1) key to access the main menu.

- (2) Press the right scroll key ▶ five times to highlight the Horizontal Size Icon.

- (3) Press the (2) key to select this function.

- (4) Press the left scroll key ◀ to increase the size of the image.

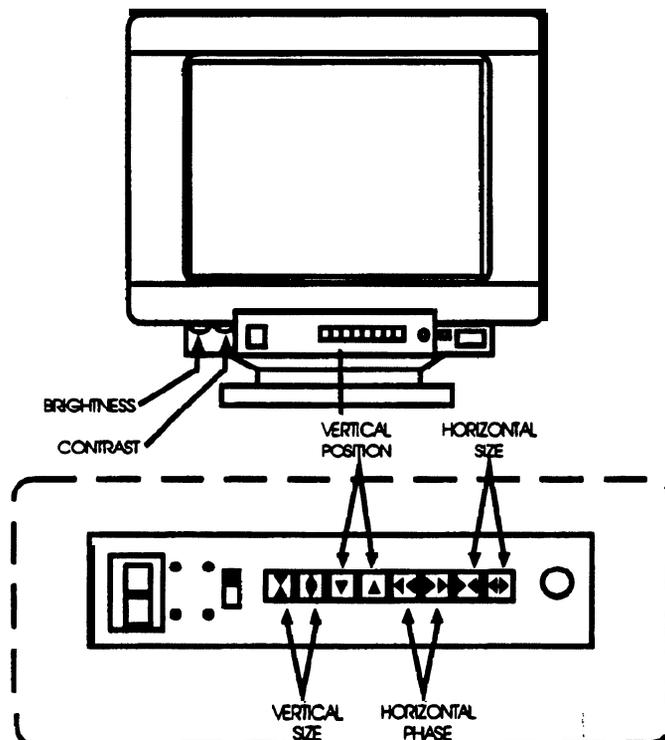
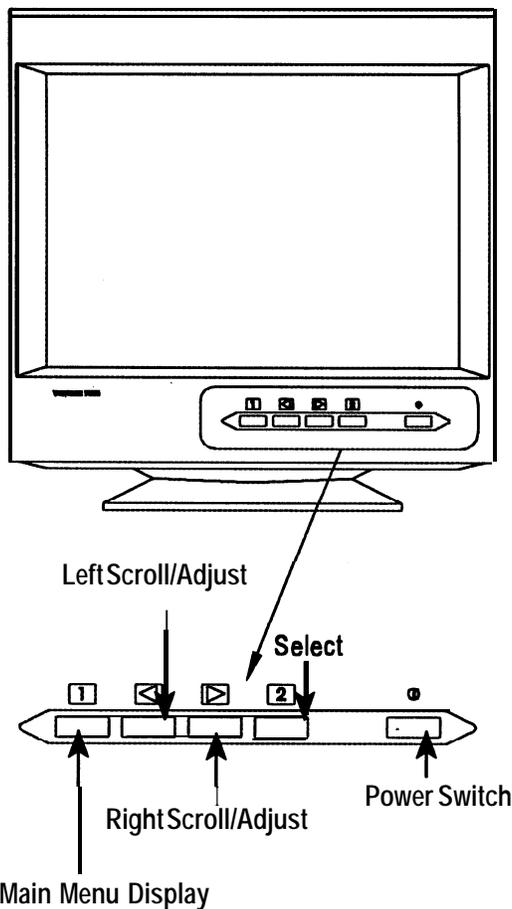
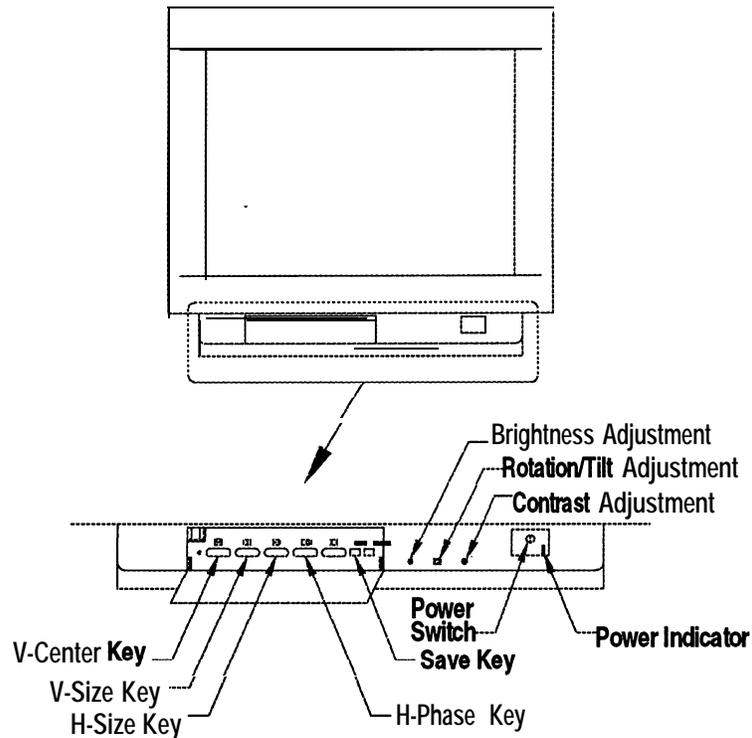


Figure 2-105. Driver's Monitor 14-inch (MAG) Controls

- (5) Press the right scroll key ▶ to decrease the size of the image.
- (6) Press the (2) key to adjust horizontal position.
- (7) Press the left scroll key ◀ to move the image to the left.
- (8) Press the right scroll key ▶ to move the image to the right.
- (9) Press the (1) key to save the changes.
- (10) Press the (1) key to access the main menu
- (11) Press the right scroll key ▶ seven times to highlight the Vertical Size icon.
- (12) Press the (2) key to select this function.
- (13) Press the left scroll key ◀ to increase the size of the image.
- (14) Press the right scroll key ▶ to decrease the size of the image.
- (15) Press the (2) key to adjust vertical position.
- (16) Press the left scroll key ◀ to move the image down.
- (17) Press the right scroll key ▶ to move the image up.
- (18) Press the (1) key to save the changes.



**Figure 2-105a Driver's Monitor 15 inch (View Sonic) Controls**



**Figure 2-105b. Driver's Monitor 15-inch (Shamrock) Controls**

e. Shamrock Monitor (figure 105b.)

- (1) Rotate the Brightness Adjustment dial to desired level.
  - (2) Rotate the Contrast Adjustment dial to the desired level.
  - (3) Press the H-Phase Key to adjust the horizontal position of the image.
  - (4) Press the H-Size Key to adjust the horizontal size of the image.
  - (5) Press the V-Size Key to adjust the image height.
  - (6) Press the V-Center Key to adjust the vertical position of the image.
  - (7) Press the Save Key to save adjustments. The LED will flash 4 times indicating that changes have been saved.
- f. Once the image is positioned on the monitor screen, adjust the Driver's periscope mirror so that the image is centered in the Driver's vision block

2.6.7.3.4 GAS Monitor Alignment. Align the GAS monitor as follows:

- a. **Verify** that the GAS collimator lens is aligned with and centered on the GAS aperture in the turret armor. Reposition if required.
- b. Adjust the GAS reticle by instructing personnel at the Gunner's station to perform the following:
  - (1) Center the GAS EL and AZ boresight knobs in their field of travel:
    - (a) Pull out and rotate the GAS EL and AZ boresight knobs fully clockwise, then seat both knobs.'
    - (b) Slide the rotating scales on both knobs clockwise to setting 9.
    - (c) Pull out and rotate both knobs counterclockwise to setting 0, then seat the knobs.
  - (2) Focus the GAS reticle by looking through the GAS and rotating the GAS diopter ring to obtain the sharpest image possible.
- c. Instruct personnel at the Gunner's station to look through the GAS and direct movement of the monitor forward or backward until the monitor screen holds the sharpest image possible.
- d. Ensure the image is approximately 8 inches wide by 8½ inches tall. Position the image so that the barn is centered in the GAS reticle field of view and none of the black edge around the image is seen in the GAS. If needed' use the controls on the front of the monitor to adjust the image. To adjust MAG monitors refer to Figure 2-104, to adjust Shamrock monitors refer to Figure 2-104a.
  - (1) ▲ (Vertical Size). Press to reduce vertical size of the image.
  - (2) ▲ (Vertical Size). Press to increase vertical size of the image.
  - (3) ▼ (Vertical Position). Press to lower vertical position of the image on the monitor screen.
  - (4) ▲ (Vertical Position). Press to raise vertical

position of the image on the monitor screen.

- (5) ◀ (Horizontal Phase). Press to move the image to the left on the monitor screen.
- (6) ▶ (Horizontal Phase). Press to move the image to the right on the monitor screen.
- (8) ◀▶ (Horizontal Size). Press to increase horizontal size of the image.
- e. If monitor adjustments cannot get the barn on the GAS reticle, slightly adjust the collimator lens.

2.6.7.3.5 GAS CAL Scenario. To align the GAS reticle with the GPS reticle, perform the following:

- a. Using the Gunner's Power Control Handles in the normal mode, center the GPS reticle on the **upper-left** corner of the barn door and lase to verify 1200 meters in range. Release the Gunner's Power Control Handles.
- b. Use the GAS boresight knobs to attempt to position the sabot **1200-meter** stadia line to the upper-left corner of the barn door.
- c. If the boresight knobs cannot position the sabot reticle properly, have an assistant use the controls on the front of the monitor to adjust the monitor picture position.
- d. If monitor controls were used to position the monitor picture, repeat steps a through c until the sabot reticle is on the upper-left corner of the barn door in the GAS.
- e. When the GAS reticle is properly positioned, verify that the settings hold true with HEAT ammunition selected and GAS **HEAT** reticle selected. If the reticle aim does not hold true, attempt steps a through e with the HEAT selections. If a discrepancy still occurs between the sabot and HEAT **reticles**, notify contractor maintenance personnel.
- f. Verify that the targets can be killed using the appropriate ammunition and range line on the GAS. If targets cannot be killed, repeat Steps a through e.

**NOTE**

Ensure the Safe/Arm is in the Armed position.

2.6.8 Running the Simulation. To run the simulation, select the crew, exercise group, and exercise as described in the following paragraphs.

2.6.8.1 Crew Identification Screen.

**NOTE**

The TC cannot access Records Management functions with the TC keypad. Only the I/O at the IOS can access Records Management functions.

To add and delete tank crews to the database, and to select tank crews for training, perform the following:

- a. At the AFIST Main Screen, select Crew Identification from the Records Management Menu.

The Crew Identification Screen, Figure 2-106, displays with the following data displayed for each crew:

- (1) Crew Number. Displays the alphanumeric identifier assigned by the individual unit to identify a specific crew.
- (2) TC Name. Displays the last name and first initial of the TC.
- (3) Driver Name. Displays the last name and first initial of the Driver.
- (4) Gunner Name. Displays the last name and first initial of the Gunner.

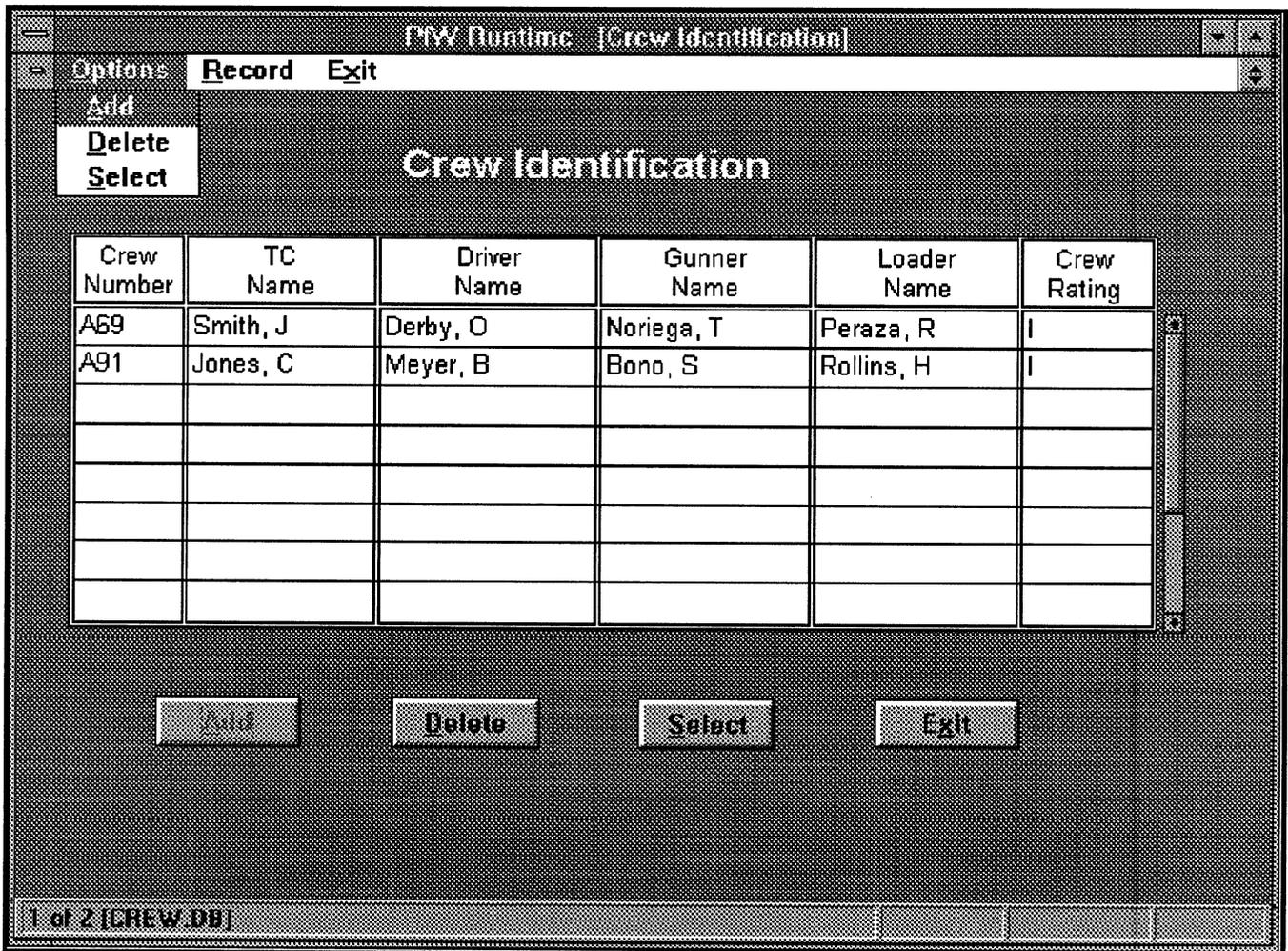


Figure 2-106. Crew Identification Screen

- (5) Loader Name. Displays the last name and first initial of the Loader.
  - (6) Crew Rating. Displays the group level for which the crew is currently qualified. The displayed value is I, II, III, IV, V, VIA or VIB.
- b. To select a crew for training, perform the following:
- (1) Position the cursor over the crew in the Crew Identification list to highlight it. Use the options in the pull-down Records menu, shown in Figure 2-107, to move through the Crew Identification list in the database.
    - (a) Select First to display the first record in the database.
    - (b) Select Last to display the last record in the database.
    - (c) Select Next to display the next record in the database.
    - (d) Select Previous to display the previous record in the database.
  - (2) Click on the Select button or choose Select from the pull-down Options menu. The AFIST Main screen displays with the selected crew identification number in the Crew Number field of the Status Box.

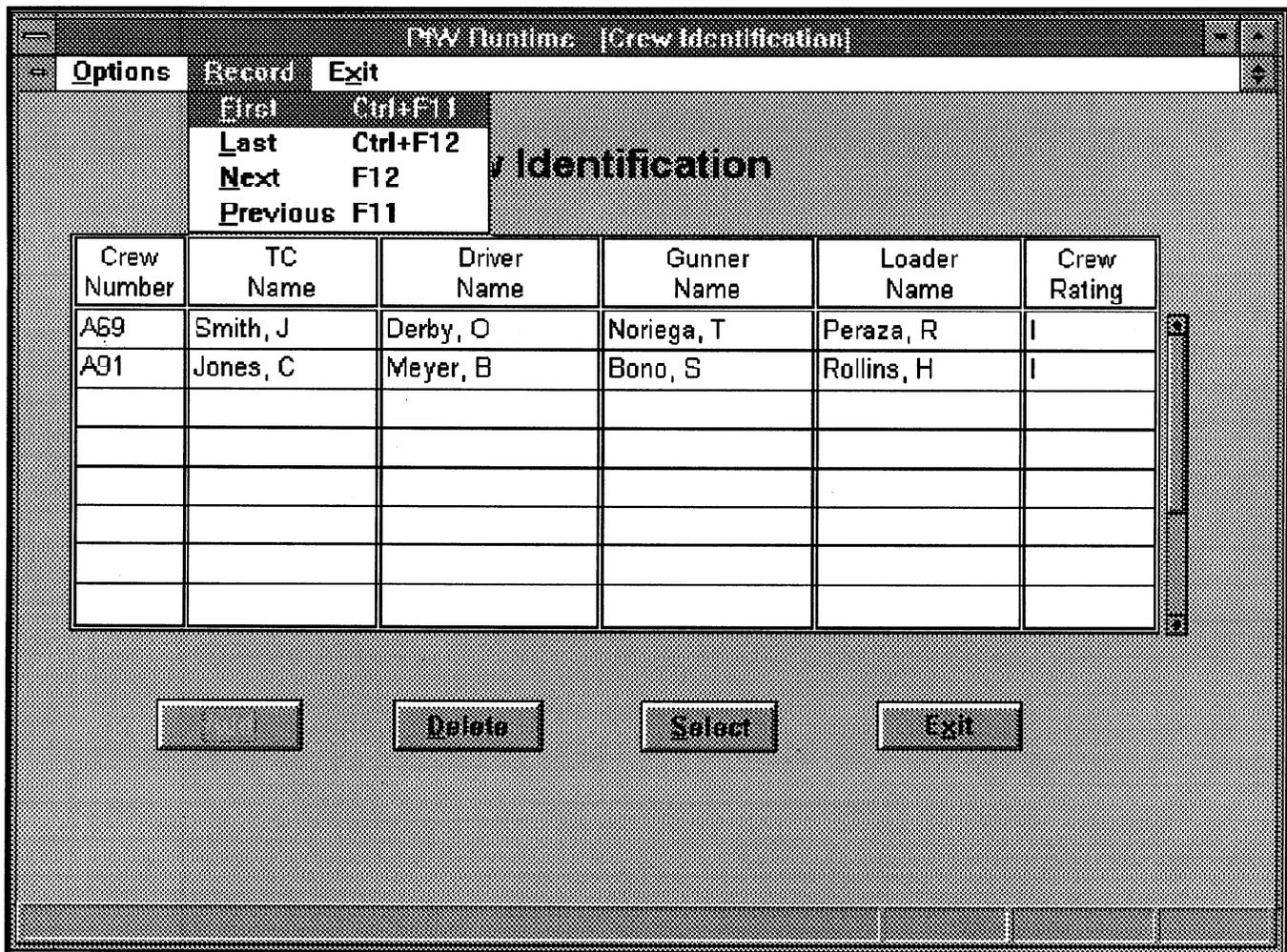


Figure 2-107. Records Menu

- c. If the desired crew is not listed in the Crew Identification list, add it to the database as follows:
  - (1) Position the cursor over the crew in the Crew Identification list to highlight it.
  - (2) Click on the Add button or select Add from the pull-down Options menu. The Add Crew screen, described in 2.6.8.1.1, displays.
- d. To delete a crew from the database perform the following:
  - (1) Position the cursor over the crew in the Crew Identification list to highlight it.
  - (2) Click on the Delete button. The Confirm Delete Screen, described in 2.6.8.1.3, displays.
- e. Click on the Exit button or select Exit from the menu bar to exit the Crew Identification Screen and return to the AFIST Main Screen.

2.6.8.1.1 Add Crew Screen. Add a crew to the database as follows:

- a. At the Crew Identification Screen, click on the Add button or select Add from the Options menu. The Add Crew Screen, Figure 2-108, displays.

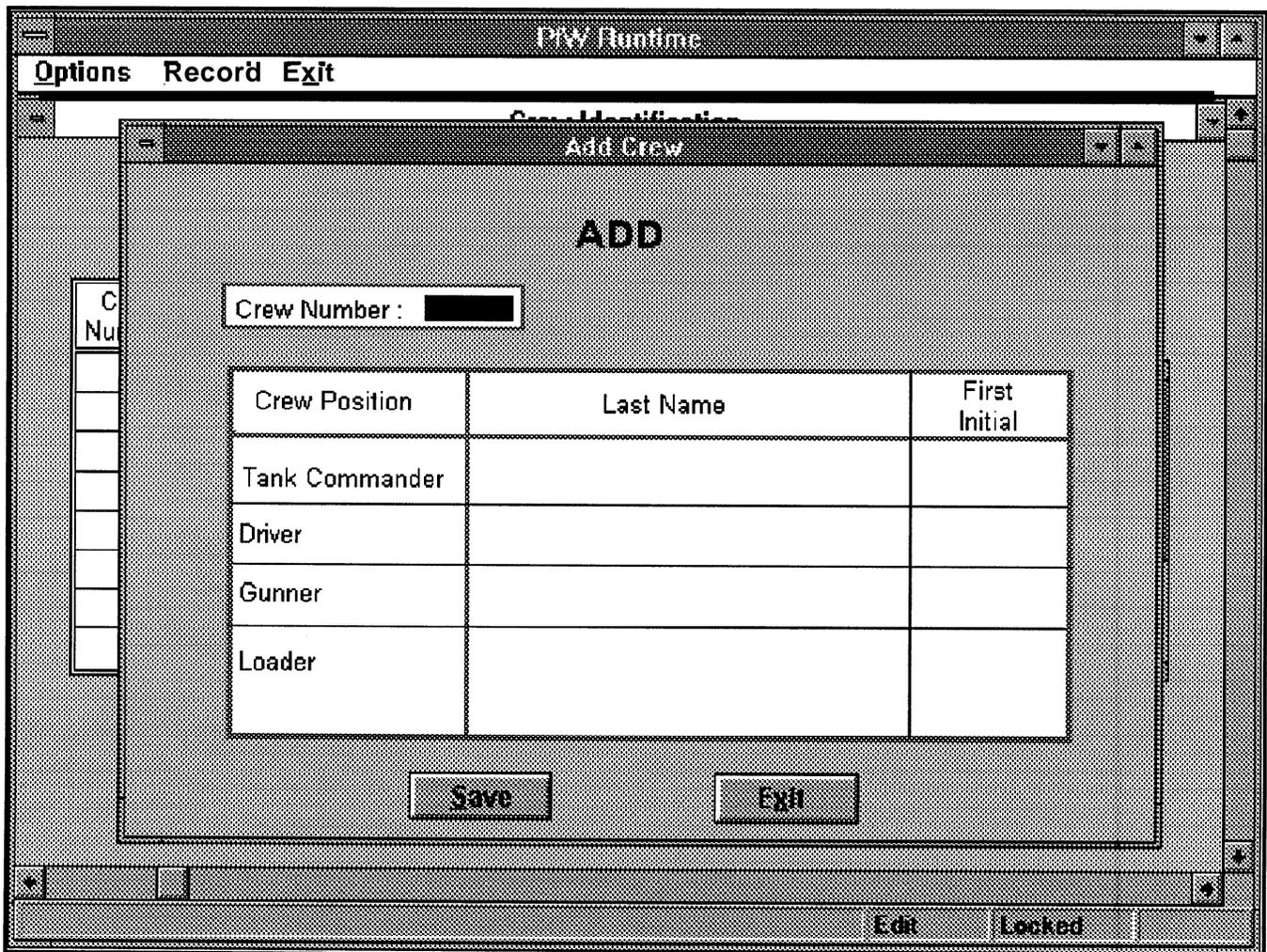


Figure 2-108. Add Crew Screen

- b. Enter the number identifying the new crew in the Crew Number field. The crew identification number is an alphanumeric identifier assigned by the individual unit to identify a specific crew. The number may be a combination of a maximum of five characters. Do not use spaces or special characters ("\*", "%", "?"). The crew identification number may not be duplicated in the database. Each crew identification number must be unique. When an attempt is made to enter a duplicate number to the database, the system displays an error message.
- c. Enter the members of the new crew. Use the mouse, Tab key, or Return key to advance to each field and enter the following information:
  - (1) Tank Commander. Enter the last name and first initial of the Tank Commander in this row.
  - (2) Driver. Enter the last name and first initial of the Driver in this row.
  - (3) Gunner. Enter the last name and first initial of the Gunner in this row.
  - (4) Loader. Enter the last name and first initial of the Loader in this row.

At each field, use the Delete or Backspace keys to correct any typing errors before moving to the next field.

**NOTE**

A last name and first initial must be entered for each crew member. The system displays an error message when an attempt is made to exit the screen with incomplete entries.

- d. Click on the Save button to save the entered crew data and display the Add More Screen, described in 2.6.8.1.2.

**NOTE**

Once a crew record is saved to the database, it cannot be edited.