

CHAPTER 17**REMOTE TERMINAL/DATALOGGER**

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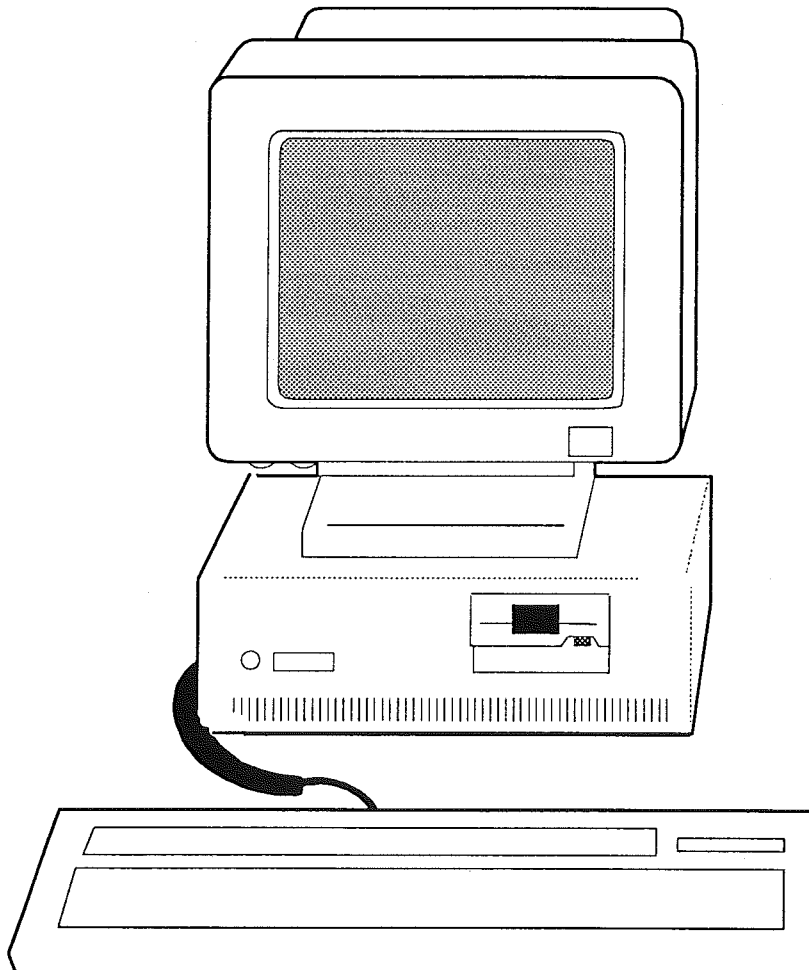


Figure 17.1 - Remote Terminal Personal Computer

DRESSER-RAND-POWER

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1 GENERAL

The Remote Terminal and a Printer together comprise a self-contained system that will provide operational control and monitoring of the Gas Turbine/Generator Unit, with, where configured, a continuously updated permanent record of all analogue values. The function of the Data Logger system is to enable the Operator to obtain complete records of all operational conditions, so that trends can be analyzed, and adjustments made where necessary. Refer to Chapter 18 of this Part of the Technical Manual for details of the Printer and Print Buffer.

The operation of the Remote Terminal is from a conventional Personal Computer type Keyboard. All the program information is contained on an internal 'fixed disk' (Drive C). A Software Program has been provided that will automatically start on System 'Power-up'. This program generates Screen Menus containing the options available to the Operator. The Screen Display and/or Function required is selected by use of the Screen Cursor ('Arrow') and/or alpha-numeric Keys on the Keyboard; this ensures that Operators unfamiliar with the Computer Disk Operating System Commands (DOS) can obtain the desired results.

The analogue values displayed on the Terminal Screen are automatically updated every two seconds. All Alarm conditions are automatically logged by the system.

The System can be used to obtain an automatic print-out of the desired information in addition to printing out information on command from the Operator. The choice can be made between the printing-out of short or long term data. The time intervals between the logging of Data and the Print-outs can be reset by the Operator using the Terminal and Program.

The Long Term Data is logging of data at regular specified intervals; the interval between the logging of data can be specified between one minute and twentyfour hours.

The Short Term Data is logged over a brief period and will normally be logged at intervals of a few seconds (5 to 60). The time interval between short term sampling can be set between one second to one hour. Short Term Data will be kept when close observation of the system is required over a short time span, for example when monitoring abnormal engine conditions.

In the event of a shut-down alarm the short term data will be automatically updated at that time and a print-out generated for permanent reference. This print-out can facilitate the identification as to the cause of the shut-down.

The Data Logger Terminal is a 'Stand alone' Personal Computer that holds the program information on a fixed (non-removable) data disk. This data disk may be reprogrammed, if desired, by copying a new program supplied by **Dresser-Rand Power** onto the fixed disk to overwrite the existing program. In the same manner, should the program on the fixed disk become corrupted in use, then the program can be rewritten to the fixed disk from a 'master disk'. One 5¹/₄ inch and one 3¹/₂ inch floppy disk drives (A and B) are provided as standard in the supplied terminal.

The Data Input from the Turbine Control System is by way of a coaxial cable to a special card (Local Area Network) installed within the Remote Terminal.

The Keyboard is an 101 key 'enhanced' layout for a Personal Computer. The keys functions conforming to the North American layout with 12 Function Keys ('Fn') arranged in a row across the top of the Keyboard.

The Video Display Unit is a colour display where colour is used to highlight the status of operating parameters.

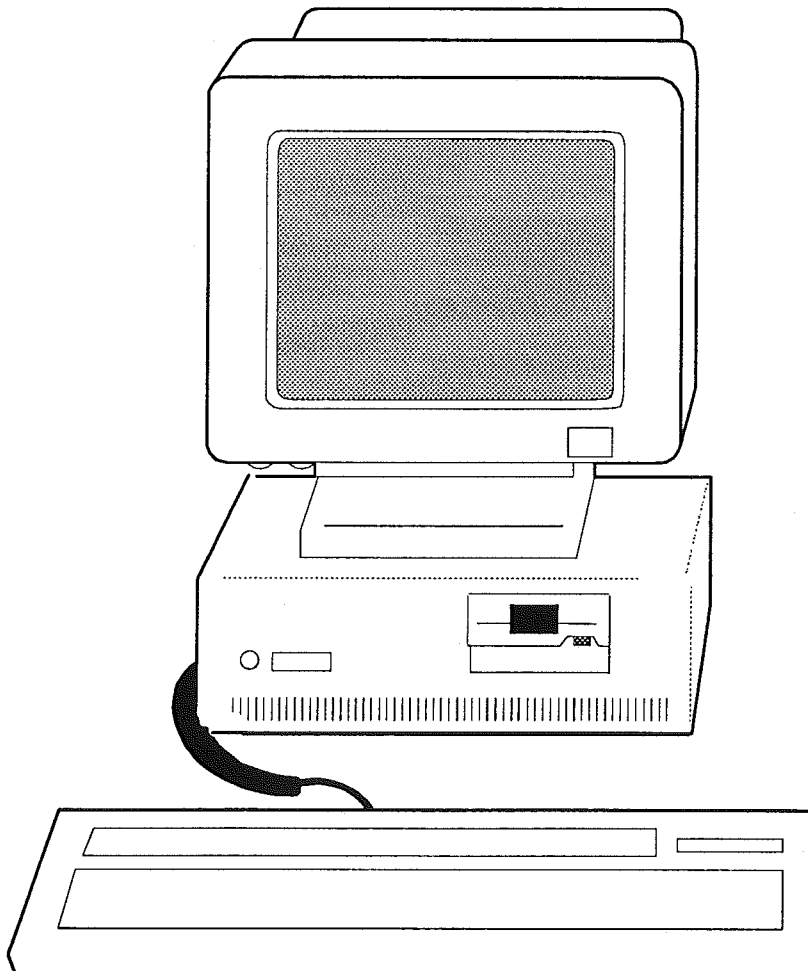


Figure 17.1 - Remote Terminal Personal Computer

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The Operator facilities on the Terminal are as follows:

ON/OFF SWITCH

This Rocker Switch turns the power input to the Terminal 'On' or 'Off'. When turned to the 'On' position the Terminal will automatically go through an internal system check prior to starting the 'software' program to display the first Menu on the Display.

BRIGHTNESS CONTROL

This rotary control enables the brightness of the Display Screen to be adjusted to a level where the display can be easily read under the ambient light conditions. Do not set this control to a higher level than is necessary for comfortable viewing.

CONTRAST CONTROL

This rotary control enables the contrast of the Display Screen to be adjusted to a level where the display can be easily read under the ambient light conditions. Do not set this control to a higher level than is necessary for comfortable viewing.

MONITOR ON/OFF SWITCH

This Push-on/Push-off Switch turns the power input to the Monitor 'On' or 'Off'. This switch would normally be set to the 'On' position as the switching of the power supply to the monitor is performed by the TERMINAL ON/OFF Switch.

KEYBOARD

Normal operation of the Data Logger System has been simplified so that the minimum number of keystrokes are required to move from 'Menu' to 'Menu'. Each Menu Screen will have a number of options available to the Operator. To select the desired function move the highlight, where necessary, by moving it down with the 'Down Arrow' Key (The 'Up Arrow' Key will move the highlight up the column). Alternatively, on some menus, the item to be highlighted can be selected by a alpha-numeric Key equal to that displayed alongside the desired item. The highlighted function can then be instigated by depressing the Enter Key. Depressing the Escape Key ('ESC') will return you to the previous level of screen.

The following information on the operator information displayed and the control facilities available to the operator are identical with those at the Local Control Room Terminal.

NOTE: Although the software programs for the Turbine Control Cabinet and the Remote Terminal can be considered identical certain features may not be available at both terminals. Where applicable these differences are noted in the text.

EMERGENCY STOP SWITCH

This push-button switch, situated adjacent to the Remote Terminal, is used to initiate an emergency stop for the Gas Turbine and Generator. All systems will come to a rapid stop without off-load or cooling-down periods.

NOTE: This control should only be used in the event of an actual emergency. It's use under normal circumstances should be strictly prohibited. Shutting-down the systems directly from load may have detrimental effect on components. Any warranty currently in force on the installation or components may be invalidated.

2 VIDEO DISPLAY UNIT

NOTE: The following descriptions are, in general, common to those found within the description of the Video Display and Keyboard for the Local Control Cabinets in Chapter 3 of this Part of the Operating Manual. It may be desired to keep a copy of this and the following Chapter in the vicinity of the Remote Terminal for reference.

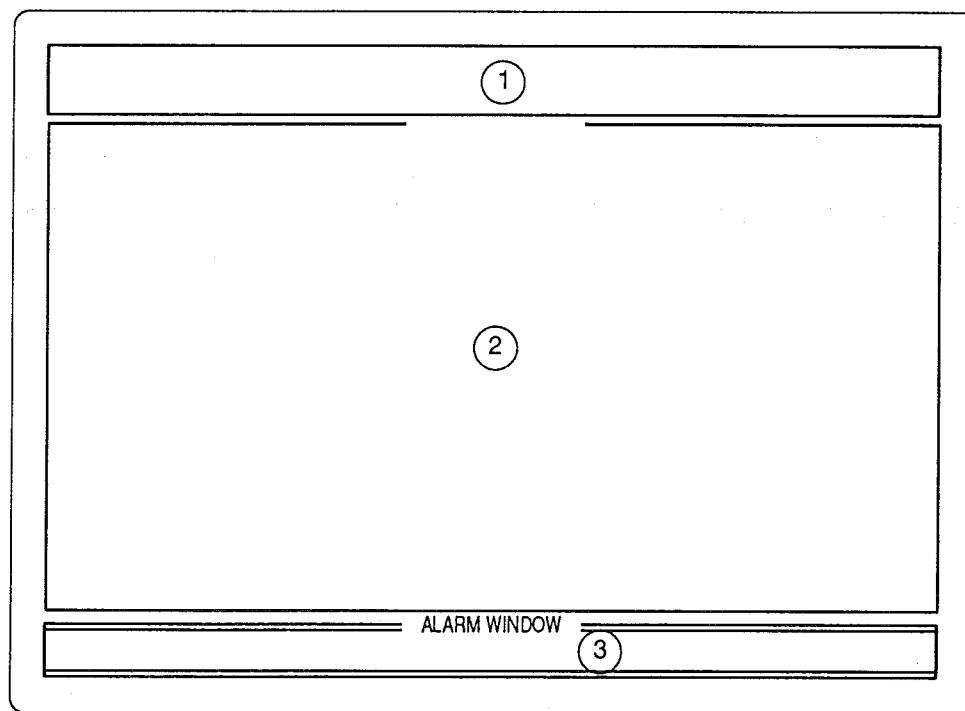


Figure 17.2 - Screen 'Windows'

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The brightness and contrast of the colour display should be set to suit the environmental conditions. The display must be easily read; while at the same time the difference between the various colour and highlighted modes should be discernible without any reservation.

2.1 WINDOWS DISPLAY

The information presented on the display is divided into three areas that are known as 'Windows'.

2.1.1 Speed and Temperature Window (1)

This upper part of the screen is a two line display that contains the current operating speed of the Gas Generator [N1] and Power Turbine [N2] Speeds in revolutions per minute. (The Gas Generator speed [N1] shown has to be multiplied by a factor of 10 to give the true figure). The temperature value identified as PTIT is the average value for the Power Turbine Inlet Temperature.

The second line in this window contains the current time reference in the sequence of Day - Month - Date - Hour:Minute:Second - Year.

If a computer operating system error message is generated it will be displayed in this area. An example of an error message would be that the datalogger printer is not functioning where attempting to activate the history print-out without switching on the Printer.

The border around this window will change colour to red to highlight the message. To acknowledge and cancel the message it is required to depress the Spacebar on the Keyboard. To revert the window border to the original green colour it is necessary to depress the 'F1' Function Key on the Keyboard.

2.1.2 Menu and Page Window (2)

This central window area displays the analogue, discreet and alarm screen pages as selected by the Operator.

The screen can display the alarm, timer and other setpoints. These setpoints can only be modified from the Local Turbine Control Panel modifications are inhibited from the Remote Terminal.

This area of the screen provides a seventeen line display area within the border of the window. The pages may contain many more than the seventeen able to be displayed at the one time. The other lines may be scrolled through or accessed one screen 'page' at a time by Operator's commands from the Keyboard.

The initial page of the display is the MAIN MENU that lists the descriptions of the screen pages available.

2.1.3 Alarm Window (3)

This one line display window shows the last alarm generated with the indication of which 'Alarm Page' the item can be found.

An identification tag 'AL' indicates that the alarm generated is passive and is for the attention of the Operator to instigate an action; whereas the identification tag 'SD' indicates a shut-down alarm has been generated and an automatic shut-down of the unit initiated.

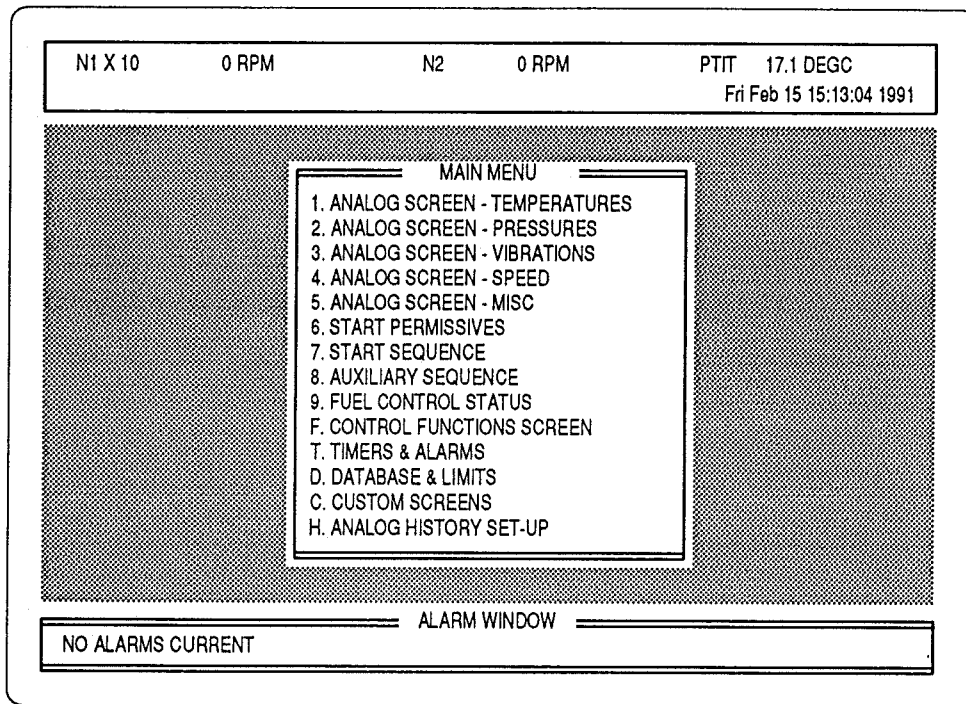


Figure 17.3 - Main Menu Screen

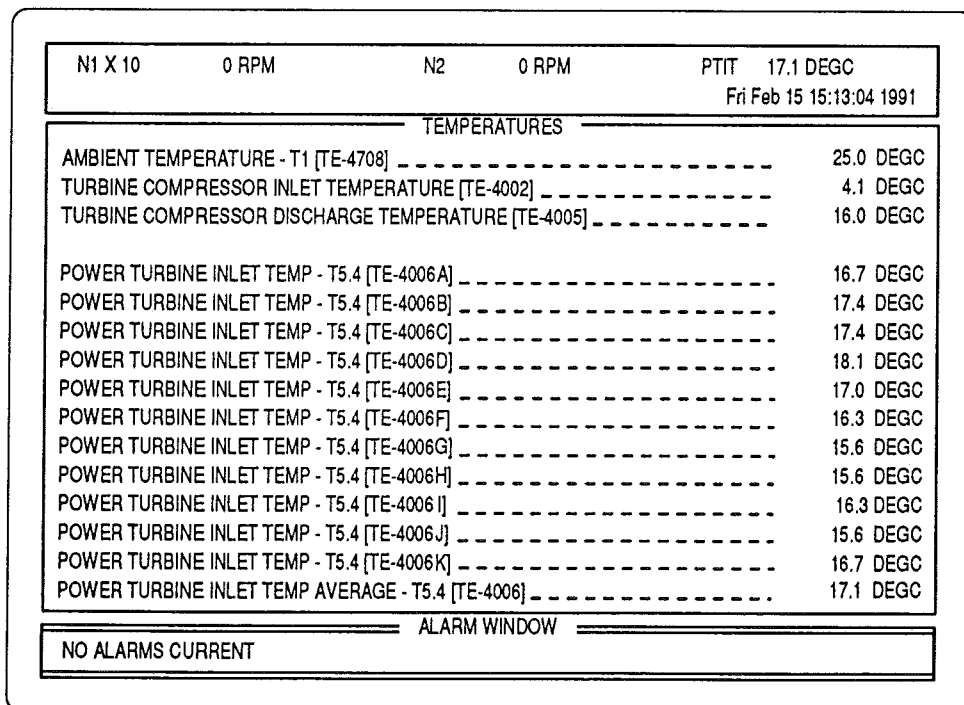


Figure 17.4 - Typical Analogue Screen

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2.2 MAIN MENU

The first screen displayed in the middle window, at the time of initial power-up, is the 'MAIN MENU'. This menu enables the Operator to select the screen displays requires under the general groupings of:

- » Analogue Where specific values are given for each of the monitored operating conditions.
- » Discreet (Permissive, Sequence and Status) Where a 'Yes' or 'No' indication flag is given for the selection and/or operation of a system of function.
- » Control Function The Operator may select and instigate the operating functions for the turbine generator unit.
- » Timers and Alarms This grouping is in two parts. The first enables the operator to view the activation and timing-out of the various timer presets. The second part is the listing on screen of the most recent generated alarms.
- » Database and Limits This grouping is in three parts; each part is only available at the Local Turbine Control Panel to permit the Operator to change the various analogue, computed and timer set-points.
- » Custom Screens The Operator can group together those items most commonly referred to on custom made screens.
- » Analogue History Set-up This function enables the Operator to set the intervals for the data logger print-outs and the time of commencement. As this function requires a local printer, at the time of installation, it can only be activated from the Remote Terminal.

The Keyboard is used by the Operator to select the main menu item desired and call up that screen page (or sub-menu screen). This is achieved by moving the selection bar with the 'UP' and/or 'DOWN' ARROW Key(s) and the depressing the 'ENTER' Key when the desired item is selected. Alternatively the Key representing the alpha-numeric reference to the left of the desired item can be depressed to activate that selection.

2.3 ANALOGUE SCREENS

This series of screens displays the current analogue variables within the categories of:

- » Temperatures This screen provides a listing of all monitored temperatures for the gas turbine gases; generator; lubrication systems; steam systems and water wash.
- » Pressures This screen provides a listing of all monitored pressures for the lubricating oil; gaseous fuel; turbine air inlet; air inlet filter differential and steam injection.
- » Vibrations A listing of the monitored vibrations for the turbine Gas Generator and Power Turbine, and the Generator Drive and Non-drive End Bearings.
- » Speeds This screen lists the monitored speeds for the Gas Turbine Gas Generator and Power Turbine Rotors.

In addition the setpoints for the Generator Electrical Power Output and the Turbine Steam Injection are listed.

N1 X 10	0 RPM	N2	0 RPM	PTIT	17.1 DEGC
Fri Feb 15 15:13:04 1991					
START PERMISSIVES					
RUN MODE				YES	
START NOT INITIATED				YES	
NO MAIN SHUTDOWNS				YES	
RESTART TIMER TIMED OUT				YES	
N1 REFERENCE ON MINIMUM				YES	
NO GOVERNOR ALARMS				YES	
TURBINE L.O. RESERVOIR LOW LEVEL PERMISSIVE				YES	
TURBINE L.O. RESERVOIR TEMPERATURE PERMISSIVE				YES	
TURBINE L.O. RESERVOIR HIGH LEVEL PERMISSIVE				YES	
GENERATOR L.O. RESERVOIR LOW LEVEL PERMISSIVE				YES	
GENERATOR L.O. RESERVOIR TEMPERATURE PERMISSIVE				YES	
GENERATOR L.O. RESERVOIR HIGH LEVEL PERMISSIVE				YES	
FIRE DETECTION SYSTEM PERMISSIVE				YES	
GAS DETECTION SYSTEM PERMISSIVE				YES	
TURBINE ENCLOSURE GAS LEVEL NOT HIGH				YES	
STIG VALVES IN SHUTDOWN POSITION				YES	
ALARM WINDOW					
NO ALARMS CURRENT					

Figure 17.5 - Typical Discreet Screen

N1 X 10	0 RPM	N2	0 RPM	PTIT	17.1 DEGC
Fri Feb 15 15:13:04 1991					
START SEQUENCE					
TURBINE ENCLOSURE VENT FAN START				NO	
HYDRAULIC OIL PUMP 'A' SELECTED AS MAIN				YES	
HYDRAULIC OIL PUMP 'A' START				NO	
HYDRAULIC OIL PUMP 'B' SELECTED AS MAIN				NO	
HYDRAULIC OIL PUMP 'B' START				NO	
GENERATOR L.O. PUMP 'A' SELECTED AS MAIN				YES	
GENERATOR L.O. PUMP 'A' START				NO	
GENERATOR L.O. PUMP 'B' SELECTED AS MAIN				NO	
GENERATOR L.O. PUMP 'B' START				NO	
GAS FUEL PURGE SEQUENCE ENABLED				NO	
GAS FUEL PURGE SEQUENCE COMPLETE				NO	
GAS FUEL LEAK TEST ENABLED				NO	
GAS FUEL LEAK TEST COMPLETE				NO	
GG SEQUENCE PERMISSIVE				NO	
ALARM WINDOW					
NO ALARMS CURRENT					

Figure 17.6 - Typical Discreet Sequence Screen

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- » Miscellaneous This screen lists those items that do not fall within the previous headings and includes electrical values; fuel and steam flow; thermal power content in exhaust; etc.

The screen colour (and mode) of the analogue value displayed will vary according to the status of that value. For example:

- GREEN Value within normal range parameters
- YELLOW Value has exceeded parameter and is in alarm state
- RED Value has exceeded parameter and is in shut-down state
- WHITE A signal failure has been detected and the displayed value will flash

Depressing the 'ESCAPE' Key on the Keyboard will return the display to the MAIN MENU Screen.

2.4 DISCREET (PERMISSIVE, SEQUENCE AND STATUS) DISPLAYS

This series of screens details the operational condition of all functions with a YES/NO flag against the description of the function to indicate current status. These are also known as discrete messages.

Three types of screen are included within this grouping:

- » Permissives This screen lists those discreet values that have to be affirmative prior to permission for the commencement of the start sequence.

All the items listed have to be flagged with a 'YES' indication before a start sequence can be commenced from the CONTROL FUNCTION screen.
- » Sequences These screens list the 'milestones' in the start and auxiliary sequences. The Operator can observe the progress of the Start; Steam Injection and Water Wash sequences.
- » Control This screen lists the fuel control discreet flags.

The normal colour (green) of the flag indication will change to indicate that that signal is false. That is:

- GREEN Represents a true message
- RED Represents a false message

Depressing the 'ESCAPE' Key on the Keyboard will return the display to the MAIN MENU Screen.

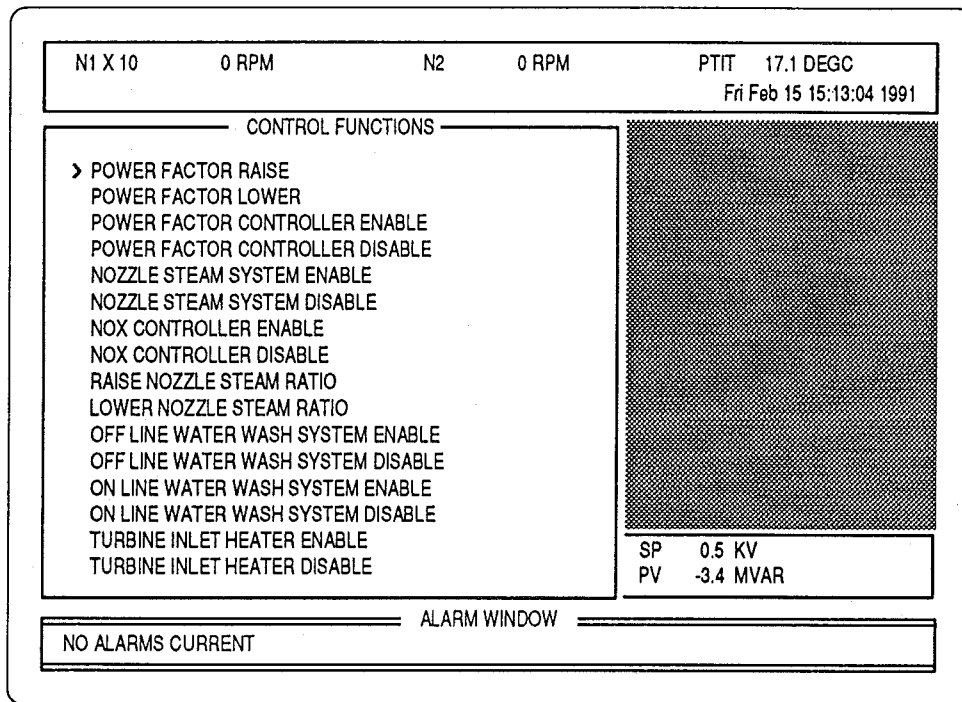


Figure 17.7 - Typical Function Screen

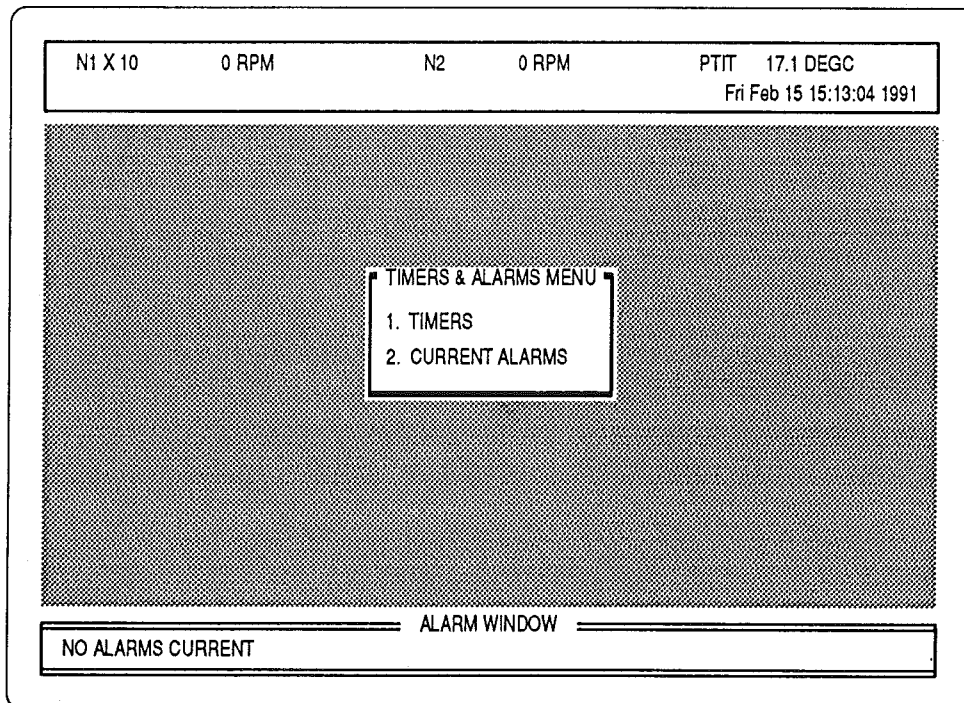


Figure 17.8 - Timers & Alarms Sub-menu

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2.5 CONTROL FUNCTION SCREEN

This screen provides the Operator with the control of all normal functions.

In comparison with the other screens that use a highlight bar to indicate the item selected, on this screen, it is indicated by an '>' indicator to the left of the item. The indicator is moved with the UP and/or DOWN ARROW Key on the Keyboard to alongside the function required and then the ENTER Key on the Keyboard is depressed to instigate that item.

By moving the selection '>' alongside one of those items, that when selected allow the Operator to make adjustments to operating conditions, a secondary window displays the set point (SP) and present value (PV) for that item. The items that will display a secondary window are:

- » N2 (Power Turbine) SPEED RAISE
- » N2 (Power Turbine) SPEED LOWER
- » POWER FACTOR RAISE
- » POWER FACTOR LOWER
- » RAISE NOZZLE STEAM RATIO
- » LOWER NOZZLE STEAM RATIO

When one of the above items are selected by the cursor it is then activated by depressing the ENTER Key on the Keyboard. The Screen will then change to show the listing of limits for that function. The limit to be changed is selected with the cursor bar using the 'UP' and/or 'DOWN' ARROW Keys on the Keyboard. The setpoint to be changed is then selected with the ENTER Key from the Keyboard.

The new value can be entered from the Keyboard and the ENTER Key depressed to activate the change.

The normal colour of the displayed function will change to indicate that that function is currently active.

The reference colours are:

WHITE That function is inactive or reset

YELLOW That function is active

Depressing the 'ESCAPE' Key on the Keyboard will return the display to the MAIN MENU Screen.

2.6 TIMERS AND ALARM SCREENS

Selecting this 'TIMERS & ALARMS' item on the Main Menu Screen will call up a sub-menu screen containing two items:

1. TIMERS**2. CURRENT ALARMS**

The Keyboard is used by the Operator to select the main menu item desired and call up that screen page (or sub-menu screen). This is achieved by moving the selection bar with the 'UP' and/or 'DOWN' ARROW Key(s) and the depressing the 'ENTER' Key when the desired item is selected.

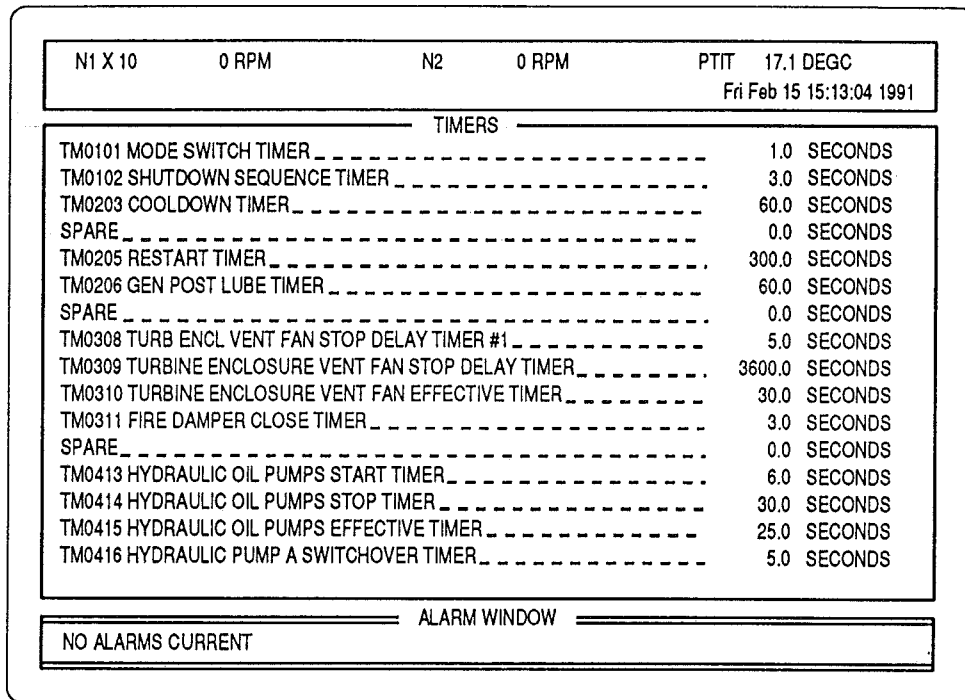


Figure 17.9 - Typical Timers Screen

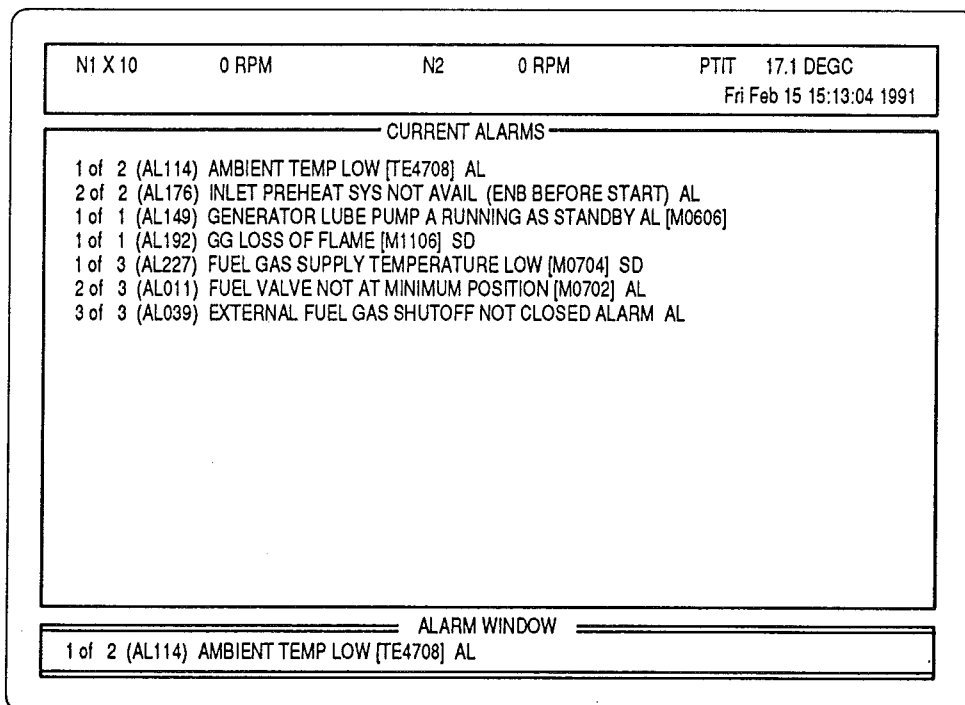


Figure 17.10 - Typical Alarm Screen

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Alternatively the Key representing the numeric reference to the left of the desired item can be depressed to activate that selection.

Depressing the 'ESCAPE' Key on the Keyboard will return the display to the MAIN MENU Screen.

The required screen is selected from the menu to access the following.

2.6.1 Timer Pages

Accessing the TIMER page will display a list of the timers in the system. The system can support up to 16 Timers per screen display.

Timers that are active the elapsed time indication will count up from zero to that timer's parameter.

The colour indication of the timer value will indicate the current condition as follows:

GREEN Reset (Non-active)

YELLOW Timing (active)

WHITE Timed-out

Any timers set to a very short duration, may go directly to a timed out (elapsed=preset) indication due to the frequency of the screen refreshing.

Depressing the 'ESCAPE' Key on the Keyboard will return the display to the TIMERS & ALARMS MENU Screen.

2.6.2 Alarm Pages

The ALARM PAGES list those alarms that have been tripped or not reset. The respective items are identified with the indication of it being an alarm or a shut-down condition.

Each alarm as it is instigated will be automatically displayed in a single line banner at the bottom of the current screen page or menu. Therefore only the latest alarm will be displayed at the bottom of the screen and where a shut-down has occurred a series of alarms may be generated.

To enable the 'first-out' alarm to be identified it may be necessary to view this ALARM LIST screen to identify the sequence of events by the date and time record of occurrence.

Up to a total of 75 alarms may be listed on this page with the most recent group of alarms at the top of the page. A total of 16 lines can be viewed at one time on the screen display; to page can be 'scrolled' to view prior items.

Depressing the 'ESCAPE' Key on the Keyboard will return the display to the TIMERS & ALARMS MENU Screen.

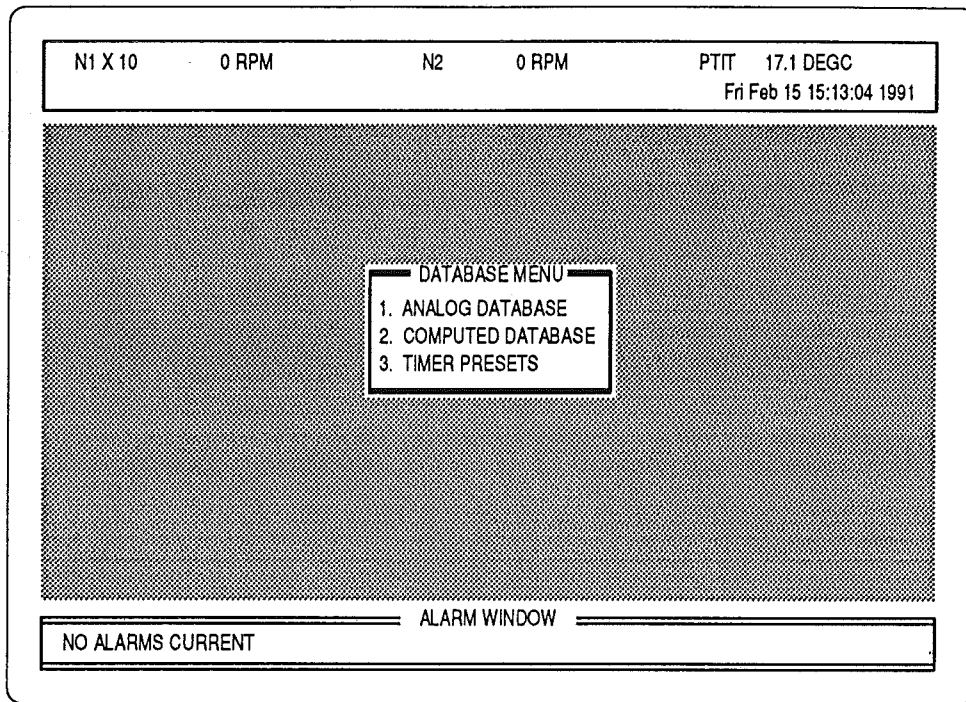


Figure 17.11 - Database Sub-menu Screen

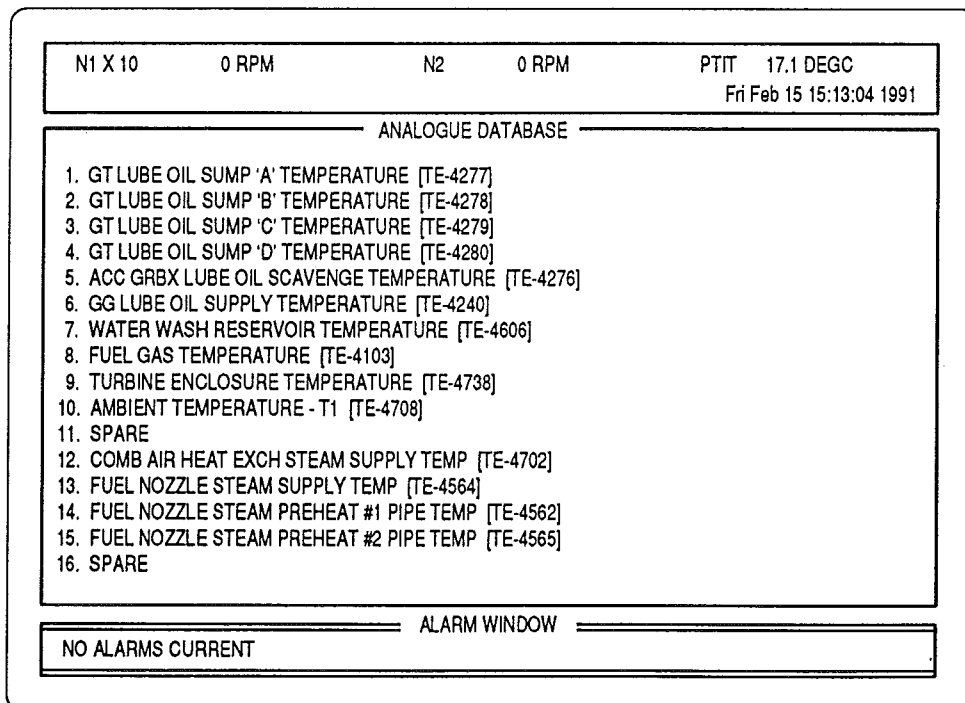


Figure 17.12 - Typical Analogue Limits Screen

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2.7 DATABASE AND LIMITS SCREENS

Selecting this 'DATABASE & LIMITS' item on the Main Menu Screen will call up a sub-menu screen containing three items:

1. ANALOGUE DATABASE
2. COMPUTED DATABASE
3. TIMER PRESETS

NOTE: The resetting of limit values is not permitted from the Remote Terminal. Therefore the procedures discussed here are only viable for the local Turbine Control Panel Operator Interface.

All parameter limits accessible for change from the local Turbine Control Panel are protected by an security access code to prevent unauthorized changes.

The Keyboard is used by the Operator to select the main menu item desired and call up that screen page (or sub-menu screen). This is achieved by moving the selection bar with the 'UP' and/or 'DOWN' ARROW Key(s) and the depressing the 'ENTER' Key when the desired item is selected.

Alternatively the Key representing the numeric reference to the left of the desired item can be depressed to activate that selection.

Depressing the 'ESCAPE' Key on the Keyboard will return the display to the MAIN MENU Screen.

The required screen is selected from the menu to access the following.

2.7.1 Analogue Database

The display screen lists those analogue limits within the categories of Temperature; Pressure; Vibration; and Miscellaneous all contain preset values that may be changed, subject to authorization, due to operating experience.

When one of the items are selected with the cursor bar using the 'UP' and/or 'DOWN' ARROW Keys on the Keyboard. The ENTER Key on the Keyboard is depressed to change the screen to show the listing of limits for that function. The limit to be changed is selected with the cursor bar using the 'UP' and/or 'DOWN' ARROW Keys on the Keyboard. The limit to be changed is then selected with the ENTER Key from the Keyboard.

NOTES: The system will then request an access code be entered to allow that limit to be changed. Each change of limit will require the entering of the access code. Once the access code has been entered the existing limit should be deleted by depressing the BACKSPACE Key on the Keyboard the required number of times. The new value can be entered from the Keyboard and the ENTER Key depressed to activate the change.

Resetting of parameters at the extreme of the recommended range, to overcome alarm registers, is not recommended. Therefore changes to the parameter settings should only be carried out by, or with the authority of, Dresser-Rand Power.

Depressing the 'ESCAPE' Key on the Keyboard will return the display to the DATABASE & LIMITS MENU Screen.

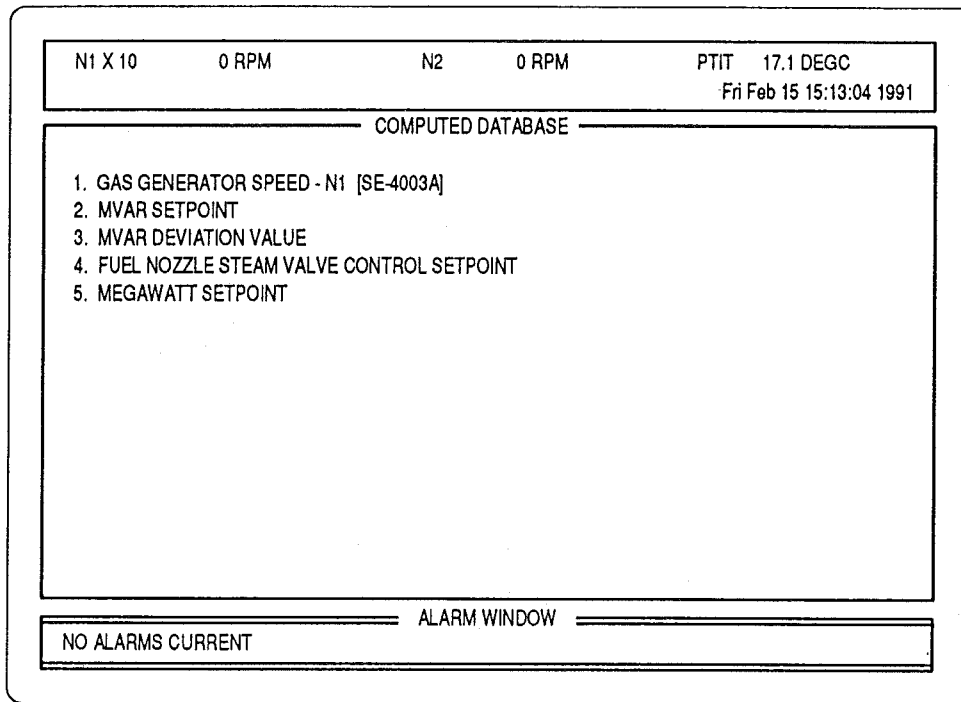


Figure 17.13 - Typical Computed Limits Screen

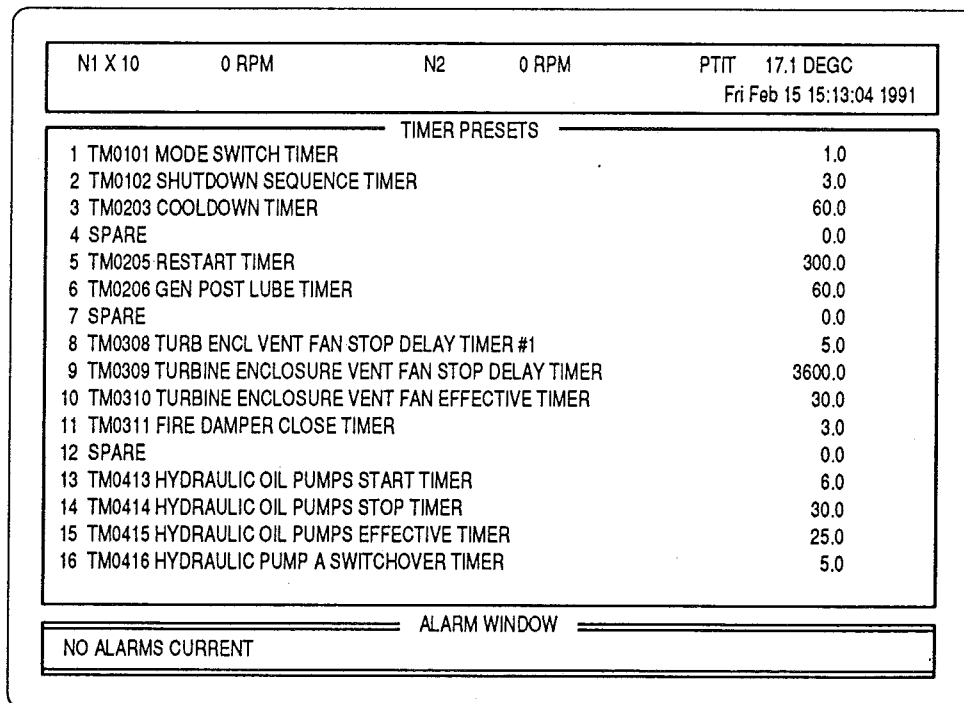


Figure 17.14 - Typical Timer Preset Screen

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2.7.2 Computed Database

The display screen lists those computed limits within the categories of Turbine Gas Generator Speed; MVAR Setpoint; Fuel Nozzle Steam Valve Control Setpoint and Megawatt Setpoint all contain preset values that may be changed, subject to authorization, due to operating experience.

When one of the items are selected with the cursor bar using the 'UP' and/or 'DOWN' ARROW Keys on the Keyboard. The ENTER Key on the Keyboard is depressed to change the screen to show the listing of limits for that function. The limit to be changed is selected with the cursor bar using the 'UP' and/or 'DOWN' ARROW Keys on the Keyboard. The limit to be changed is then selected with the ENTER Key from the Keyboard.

NOTES: The system will then request an access code be entered to allow that limit to be changed. Each change of limit will require the entering of the access code. Once the access code has been entered the existing limit should be deleted by depressing the BACKSPACE Key on the Keyboard the required number of times. The new value can be entered from the Keyboard and the ENTER Key depressed to activate the change.

Resetting of parameters at the extreme of the recommended range, to overcome alarm registers, is not recommended. Therefore changes to the parameter settings should only be carried out by, or with the authority of, **Dresser-Rand Power**.

Depressing the 'ESCAPE' Key on the Keyboard will return the display to the DATABASE & LIMITS MENU Screen.

2.7.3 Timer Limits

The display screen lists the various sequence timers and their set value that may be changed, subject to authorization, due to operating experience.

When one of the items are selected with the cursor bar using the 'UP' and/or 'DOWN' ARROW Keys on the Keyboard. The ENTER Key on the Keyboard is depressed to change the screen to show the limit for that timer. The limit is selected with the cursor bar using the 'UP' and/or 'DOWN' ARROW Keys on the Keyboard. Then depress the ENTER Key on the Keyboard.

NOTE: The system will then request an access code be entered to allow that limit to be changed. Each change of limit will require the entering of the access code.

Once the access code has been entered the existing limit should be deleted by depressing the BACKSPACE Key on the Keyboard the required number of times. The new value can be entered from the Keyboard and the ENTER Key depressed to activate the change.

NOTE: Resetting of the timer parameter at the extreme of the recommended range, to overcome alarm registers, is not recommended. Therefore major changes to the timer settings should only be carried out by, or with the authority of, **Dresser-Rand Power**.

Depressing the 'ESCAPE' Key on the Keyboard will return the display to the DATABASE & LIMITS MENU Screen.

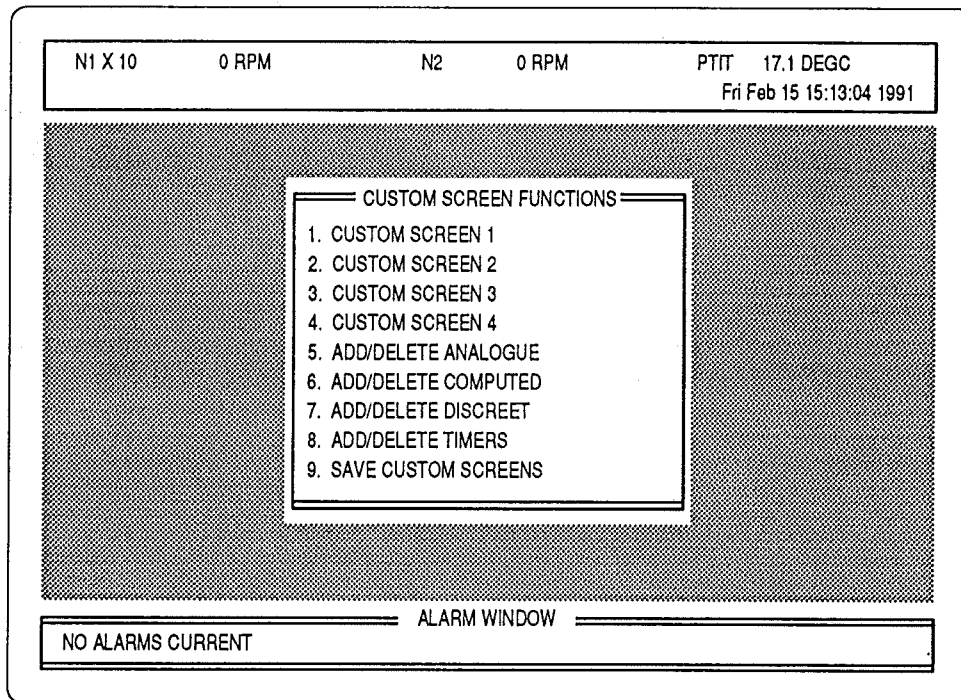


Figure 17.15 - Custom Screen Menu

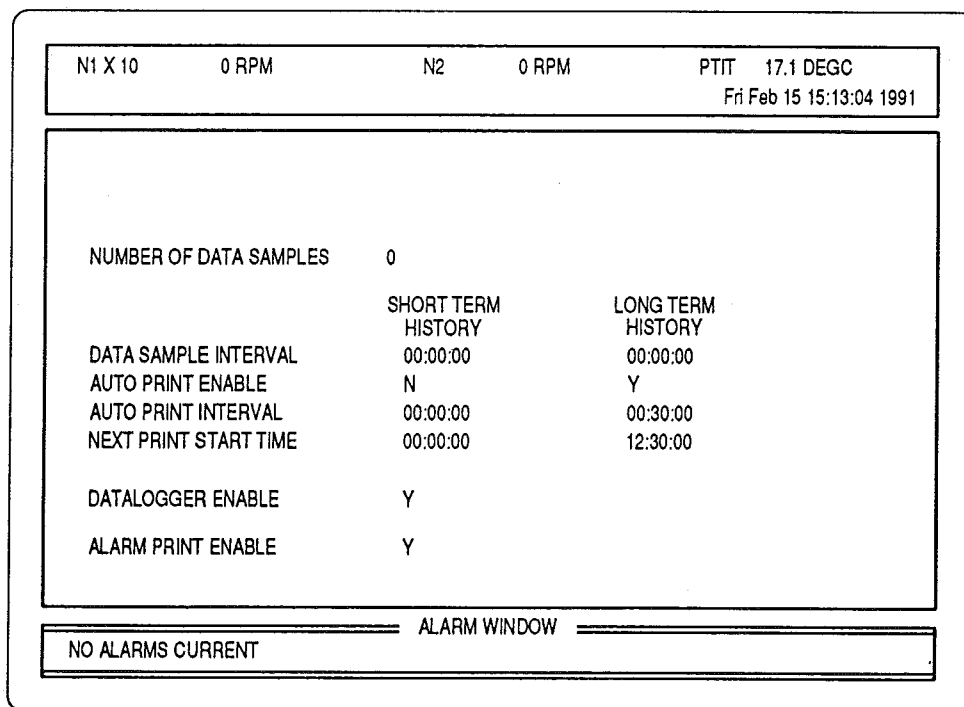


Figure 17.16 - Data Logger Configuration Screen

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2.8 CUSTOM SCREENS

The Operator can group together those analogue and discrete items most commonly referred to on custom made screens. Selecting this item will call the CUSTOM SCREEN FUNCTIONS MENU to the screen. The Operator may select to view the Custom Screens already built or edit Custom Screen(s).

Depressing the 'ESCAPE' Key on the Keyboard will return the display to the MAIN MENU Screen.

The first four entries are to view the Custom Screens 1 through to 4 which are the maximum number of screens that can be built.

The Operator may select to add or delete an Analogue; Computed; Discrete or Timer item to a Custom Screen. When instigating an editing function by selecting the item with the cursor bar using the 'UP' and/or 'DOWN' ARROW Keys on the Keyboard. Then depress the ENTER Key on the Keyboard. The screen will display the listing of the selected type. Use the 'UP' and/or 'DOWN' ARROW Keys on the Keyboard to highlight the required item.

To add the item to a Custom Screen depress the Number Key (1 - 4) on the Keyboard to indicate the screen you wish to add that item to. The item will change colour and the screen page number will appear highlighted.

To delete the item from a Custom Screen depress the DELETE Key followed by the Number Key (1 - 4) on the Keyboard to indicate the screen you wish to delete that item from.

Depressing the 'ESCAPE' Key on the Keyboard will return the display to the CUSTOM SCREEN FUNCTIONS MENU Screen. Select the 'SAVE CUSTOM SCREENS' entry to save the Custom Screen Changes.

2.9 ANALOGUE HISTORY SET-UP

This facility enables the Operator to set the real time of commencing the data logging print-out and the intervals for short and long term print-outs.

As this facility requires a local printer, at the time of installation, is only functioning from the Remote Terminal. Any attempt to carry out this procedure from the local Turbine Control Panel will result in an error message in the top screen window that the Printer is not connected/functioning.

On selecting this option the logging screen will be displayed. Select the item required with the cursor bar using the 'UP' and/or 'DOWN' ARROW Keys on the Keyboard. The new value is entered in the format Hours : Minutes : Seconds.

The Long term history is to provide a regular status print-out over a long time period. The Short Term History is automatically printed at the time of a shut-down and is intended to give a record of conditions at the time of the shut-down. By setting the number of Data Samples and a suitable sample interval the record can be used to show the trend a few minutes prior to the actual shut-down alarm.

The AUTO PRINT ENABLE entry has to be set to 'Y' (Yes) to enable the respective History Print-out to be produced.

NOTE: The Printer and Print Buffer also have to be switched 'On' and be indicating that they are 'On Line' to receive data.

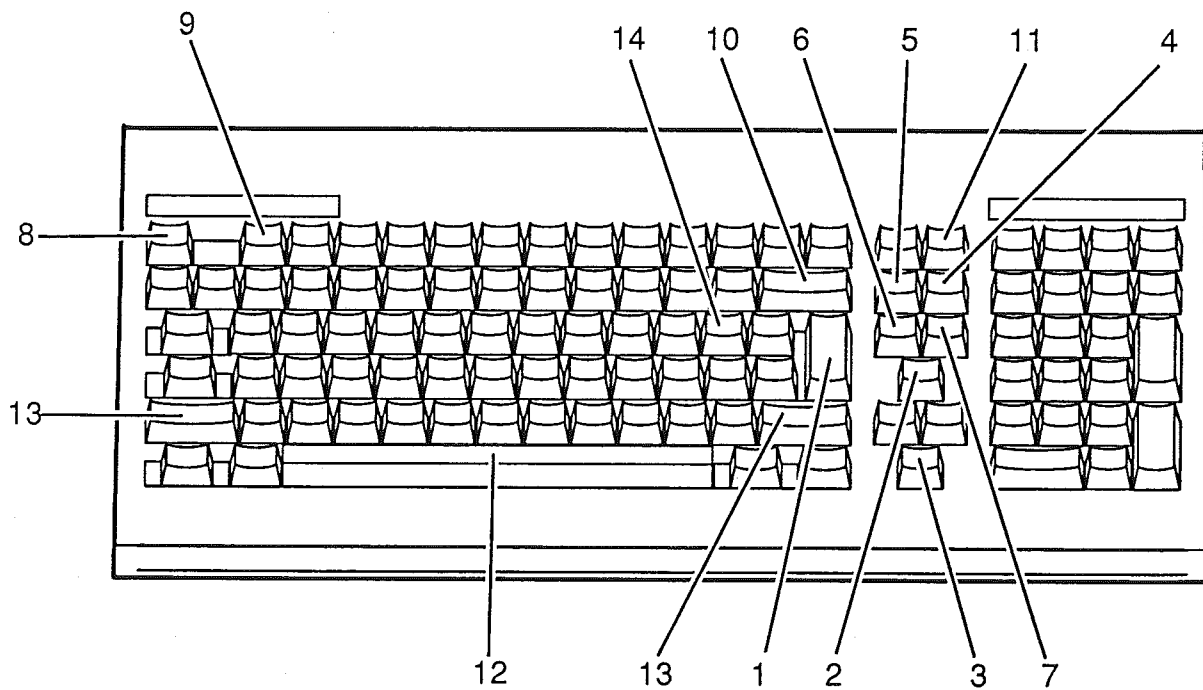


Figure 17.17 - Keyboard

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3 KEYBOARD

The keyboards at the remote terminal is used to 'call-up' the required information display on the respective video display unit. The keyboards are of a conventional computer terminal key-switch type having alpha-numeric and numeric keypads with additional special function keys.

The alpha-numeric keys are used to select the page to be displayed or for entering new setpoints. Note that numerals are to be entered from those keys along the top row of the alpha-numeric keypad; the numeric keypad to the right of the keyboard cannot be used to enter numerals.

The other keys on the keyboard having prescribed functions are as follows:-

ENTER (1)

This key is used to 'enter' the following:

- » The cursor selected 'Menu' item for the desired display Menu or Page.
- » To activate a selected function
- » To confirm the entry of new values - where permitted

UP ARROW (2)

This cursor control key is used to move the screen cursor, in an upward direction, for the selection of an item. The menu item, parameter or status selected with the screen cursor can then be activated (or modified where this facility exists). When the top line of the screen window is reached will scroll that screen one line at a time to the top of the 'Page'.

DOWN ARROW (3)

This cursor control key is used to move the screen cursor, in a downward direction, for the selection of an item. The menu item, parameter or status selected with the screen cursor can then be activated (or modified where this facility exists).

PAGE DOWN KEY (4)

This key is used at a screen page that is longer than 16 items to go through the page listing downward one screen at a time for each depressing of this key.

PAGE UP KEY (5)

This key is used at a screen page that is longer than 16 items to go through the page listing upward one screen at a time for each depressing of this key.

HOME KEY (6)

This key is used at a screen page that is longer than 16 items to go directly to the top of the page listing.

END KEY (7)

This key is used at a screen page that is longer than 16 items to go directly to the bottom of the page listing.

ESCAPE (Esc) KEY (8)

This key is used to go back to the previous level of screen 'Page' or 'Menu'.

F1 FUNCTION KEY (9)

This function key is used to cancel to colour change for the upper window when a computer operating system error message has been displayed and acknowledged by the Spacebar (12)

BACKSPACE KEY (10)

This key is used to delete a limit entry in preparation for keying in the new value.

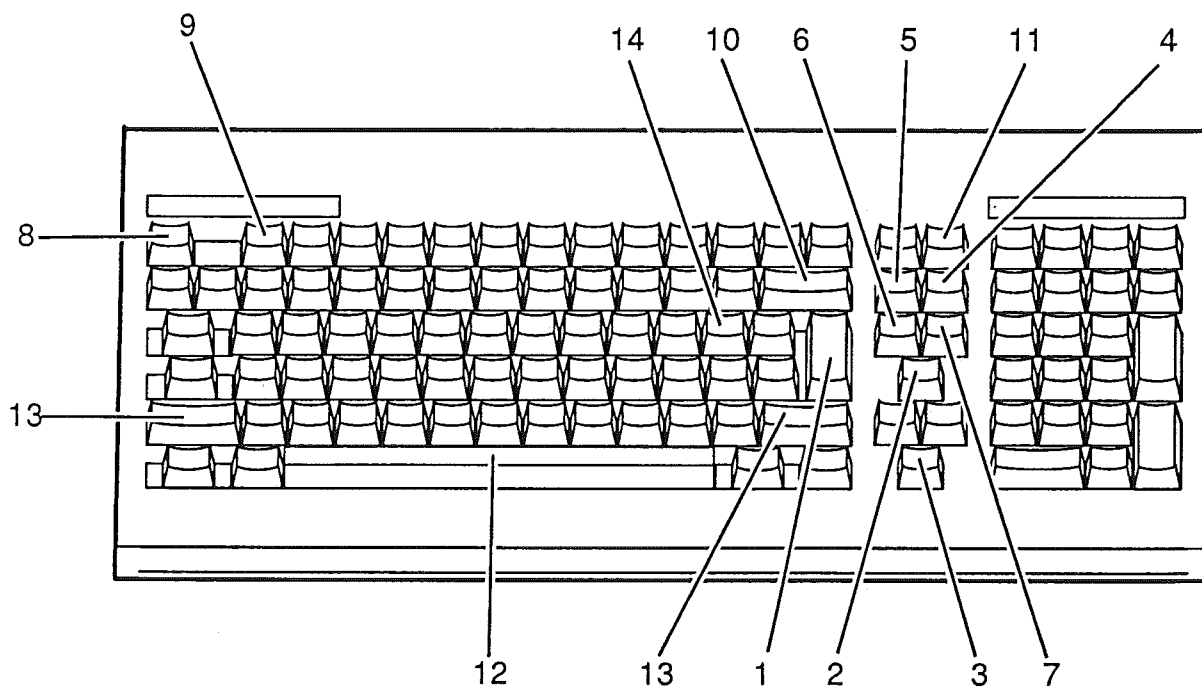


Figure 17.17 - Keyboard

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DELETE KEY (11)

This key is used to in conjunction with a numeric key to delete items from the Custom Screens.

SPACEBAR (12)

This key is used to acknowledge and cancel computer operating system error messages that are displayed in the upper window of the screen display.

SHIFT KEY(S) (13)

This duplicated key is used simultaneously with the [Key to exit the Operator Interface Program to the DOS Operating System of the Computer. It is required to enter 'OP' from the screen prompt to return to the Operator Interface Program.

[KEY (14)

This key is used simultaneously with a SHIFT Key to exit the Operator Interface Program to the DOS Operating System of the Computer. It is required to enter 'OP' from the screen prompt to return to the Operator Interface Program.

4 SOFTWARE FACILITIES AND OPERATION

When initially switching on the power to the respective Operator Interface Computer the Video Display Unit will display the MAIN MENU Screen.

NOTE: At the local Turbine Control Panel it is necessary to depress the Computer Reset Button inside the cabinet and below the Video Display Unit when first switching on the unit.

4.1 STARTING THE PROGRAM

When the screen display, that it is desired to view, is determined from the Menu description either:

Use the UP or DOWN ARROW Key on the Keyboard to move the highlight bar to the desired item and then depress the ENTER Key.

or

Depress the alpha-numeric Key indicated to the left of the desired item on the Menu. This method of selection only requires a single key-stroke to carry out the operation.

The same method of entry may be used at all Sub-menu Screens.

To return to the previous level of 'Menu' or 'Page' any screen depress the ESCAPE (Esc) Key.

4.2 CHANGING THE STATUS OF A SYSTEM

The status of 'Duty' and 'Standby' systems may be changed at that screen page identified as CONTROL FUNCTIONS.

Select the Control Functions page from the Main Menu. Move the screen cursor '>' using the UP and/or DOWN ARROW Keys on the Keyboard until it is at a 'Select' entry for the appropriate system. Change to the selected entry by depressing the ENTER Key on the Keyboard.

Some status indications have a simple ENABLE or DISABLE indication. These will also be found on the CONTROL FUNCTIONS screen page. Examples of which are the TURBINE INLET HEATER and the NOX CONTROLLER.

Current date is Mon 9 - 16 - 1991
Enter new date (mm-dd-yy):

Figure 17.18 - Changing the System Date

Current time is 15:11:06.51
Enter new time:

Figure 17.19 - Changing the System Time

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4.3 STARTING THE TURBINE GENERATOR UNIT

Prior to starting the Turbine Generator Unit all the Start Permissive have to be affirmative. The START PERMISSIVES Screen can be selected from the MAIN MENU and view to ensure that all parameters are flagged with a 'YES' indication. When all conditions are met depress the ESCAPE Key to return to the MAIN MENU and select the CONTROL FUNCTIONS Screen.

Select the START item on the Control Functions Screen with the '>' Cursor and depress the ENTER Key to commence the Start Sequence.

The progress of the Start Sequence can be observed by depressing the ESCAPE Key to return to the MAIN MENU. Select the START SEQUENCE item to call to the screen the Start Sequence Page. As each segment of the sequence becomes active and is completed the indication flag will change to the affirmative ('Yes').

The progress of each stage can also be observed by selecting the TIMERS Screen from the TIMERS & ALARMS Sub-menu.

Each stage of the operation of the unit can be commenced from the CONTROL FUNCTION Screen and the progress observed at the SEQUENCE and/or TIMER Screens.

4.4 CHANGING THE DATE AND TIME

To set or change the system date and/or time it is required to exit the software to the DOS operating system. This is achieved by simultaneously depressing the SHIFT (↑) Key and the '[' Key on the Keyboard. The screen will clear and the prompt C:> will appear in the top left-hand corner.

To change the date:

From the Keyboard type DATE and then depress the Enter Key. The message will appear 'Current date: YY-MM-DD' where the then current system date is shown.

Enter the required date from the Keyboard in the same format as displayed. Depress the ENTER Key on the Keyboard.

To change the time:

From the Keyboard type TIME and then depress the Enter Key. The message will appear 'Current time: HH-MM-SS' where the then current system time is shown. Enter the required time from the Keyboard in the same format as displayed. Depress the ENTER Key on the Keyboard.

NOTE: Depressing the ENTER Key will enter the new value and commence the new time from the point of entry. Therefore for setting the exact time it will be necessary to key in the time a few seconds ahead and delay depressing the ENTER Key until the actual time and that entered coincide.

Once the new date and/or time have been accepted by the system type 'OP' from the Keyboard. Depress the ENTER Key on the Keyboard to return to the operating software at the screen that it was exited.

NOTE: Each Computer has its own date and time calendar. Therefore when the clocks are seasonally adjusted it is necessary to carry out this operation at the local Turbine Control Panel and at the Remote Terminal.