DEDICA

Software Version 6.91

User Manual

Nasan Medical Electronics Pvt. Ltd.

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Dear customer,

We take this opportunity to thank you once again for your patronage. We reiterate our commitment to live up to the confidence you have shown in us. Our continued endeavor is to exceed your expectation by offering you products that have optimum features and reliable, high quality performance backed by prompt technical support.

It is our pleasure to give you this user manual. Please study the same thoroughly before using the system.

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NASAN®
SIMPLE. RELIABLE. **Not only 'Make in India' but 'Made in India'**

User manual for

"DEDICA"

The complete Windows based standalone Stress Test System.

1. Introduction

Nasan Medicals has pioneered PC based medical equipments in India. We thank you for purchasing our Dedica, a stress test machine. The system records and enables review of electro-cardiogram and diagnosis of stress induced ECG. The distinctive feature of Dedica is the full frequency response from **0.05 Hz to 100 Hz**.

INTENDED USE:

The Stress test system is intended to acquire, store, process and analyze ECG of patients undergoing stress during exercise testing.

Doctors or trained medical professionals record ECG and heart rate, analyze the data and produces a final report using the software. It is used for Adult patient.

Nasan's Dedica system-

Nasan's Dedica system(It is a PC based Stress Test System) is a new generation computerized stress test system based on the latest technology. The system is designed to facilitate you to conduct cardiovascular stress testing in a user friendly and precise way.

The system consists of the following modules,

- Dedica Trolley
- Interconnection cables
- Treadmill
- Touch screen monitor
- Printer

System features and Specifications

Nasan's Dedica System is most accurate and economic system with special features as below:

- **Simultaneous-12 lead ECG acquisition and processing.**
- **Digital signal processing for removal of base line wanders and power line noise removal.**
- **Standard, manual and user made Protocol can be used to acquire the ECG.**
- **Automatic or user selectable fiducial points**.

  The user can change the E, J and post J points during acquisition and also while reviewing the test.
- **Facility to record Un-averaged ECG at request.**

  At any instant, user can record un-averaged ECG. A printout may also be requested.
- **Facility for Rhythm recording at request.**
- **Online printouts.**

  During the test, the user may request for a raw ECG and Linked median at any instant and selected median printout at review stage. He can also get printouts according to the pre-configured stage report protocol.

- **Post-test review and editing of results.**
- **Facility for user defined protocols along with standard protocols.**
- **High-resolution printouts on ordinary paper resulting in lower operating cost since the user can take print with or without grid on plane paper.**
- **Editable summary report.**
- **Beep on QRS.**

2. Dedica Keypad

The Dedica keypad consists of Keys as shown in the following fig. 2.1.

Fig 2.1

The key is used to turn Dedica System from OFF state to ON State.
Enter username- Dedica and password as dedica.

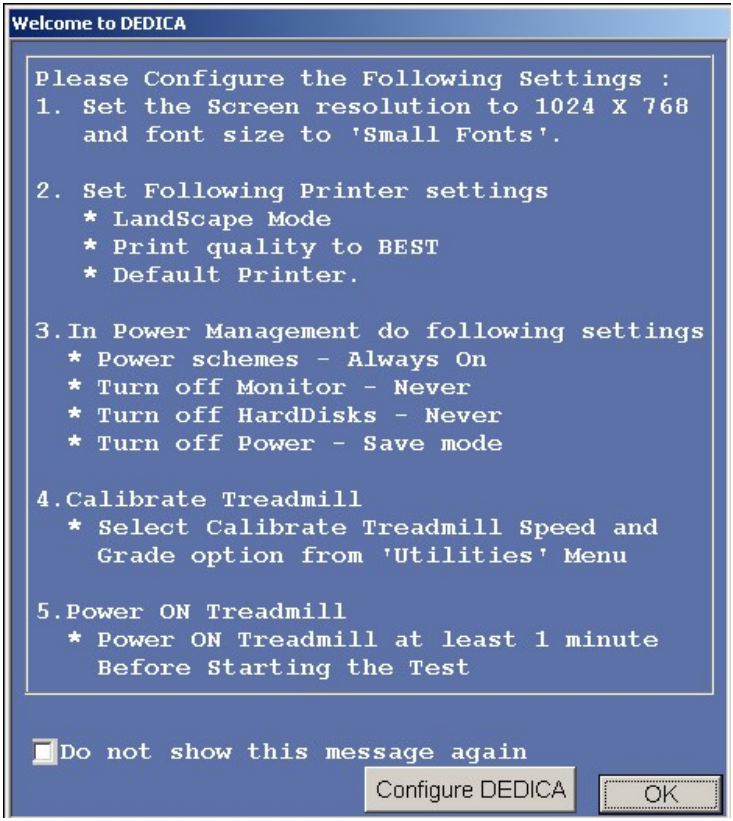
Detailed descriptions of functionality of each key are explained in the chapter no. "4.Conducting a Test"

Speed and Elevation increase decrease keys are at right of Dedica keypad.

Wireless keyboard is part of Dedica Keypad consists of general keys as on our normal 101 keys Keyboard. These keys are used to feed data as text / numbers as patient information and Stress Test comments.

Wireless keyboard with trackball

3. Configuring Dedica System



For configuring the Dedica system go to **'Configure'** menu which provides following tools listed as in fig.3.1,

1. Hospital configuration.
2. Referring Doctor
3. Standard summary report.

4. Configure System.
5. Treadmill Protocol.
6. Printing details.

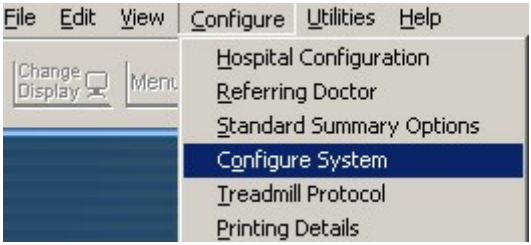


Fig 3.1: Configure Menu.

1. Hospital configuration

This option from the **'Configure'** menu provides facility of storing the list of doctors and the consultant doctors attached to your hospital. This list gets popped up in the Patient details entry dialog box, from where you can select the concerned doctor for the patient.

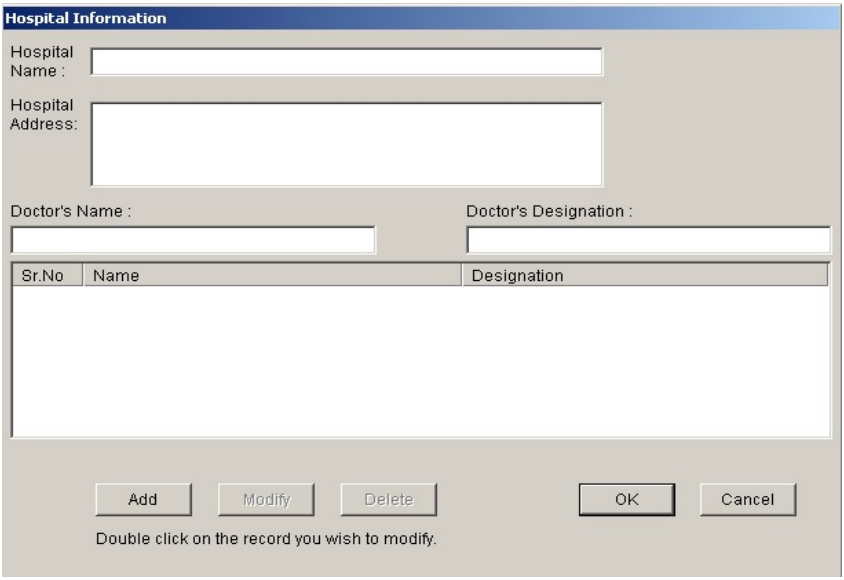


Figure 3.2: Hospital configuration.

For entering the details follow the following steps.

1. Select the **'Hospital configuration**' option from the '**Configure**' Menu.
2. A window will appear on the screen as shown in fig. 3.2.
3. Enter hospital name in the upper edit box.
4. Enter hospital address.
5. Enter the name and designation of a doctor you want to add to your list and click the '**Add**' button.
6. To delete any doctor from the list, select the corresponding Sr. No. and click the 'Delete' button.

   Double-click on Sr. No. to change or modify any doctor's details.

7. After entering the entire information click on "**OK**" to save the contents in the list.
8. Press "**Cancel**", the information will not get saved.

2. Referring Doctor

This option from the 'Configure' menu provides facility of storing the list of referring doctors. This list gets popped up in the Patient details dialog box, from where you can select the concerned referring doctor for the patient.

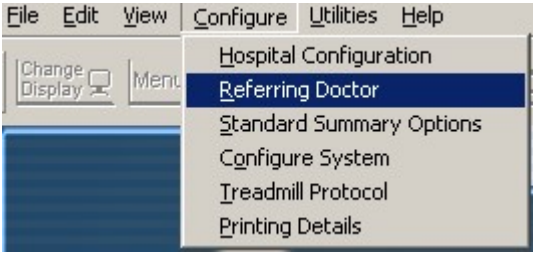


Fig.3.2A .Referring Doctor

For entering the details, follow the steps.

1. Select the '**Referring doctor details** ' tab from the '**Configure**' Menu.
2. A window will appear on the screen as shown in fig. 3.2B
3. Enter the reference doctor's name and designation you want to add to your list and click the '**Add**' button.
4. To delete any doctor from the list, select the corresponding Sr.No and click the 'Delete' button. The selected doctor will be deleted.
5. To change or modify any doctor's details double-click on Sr.No & click the '**Modify'** button.

6. After entering the entire information click on "**Apply**" button to save the contents in the list.
7. Press "**Cancel**", the information will not get saved.

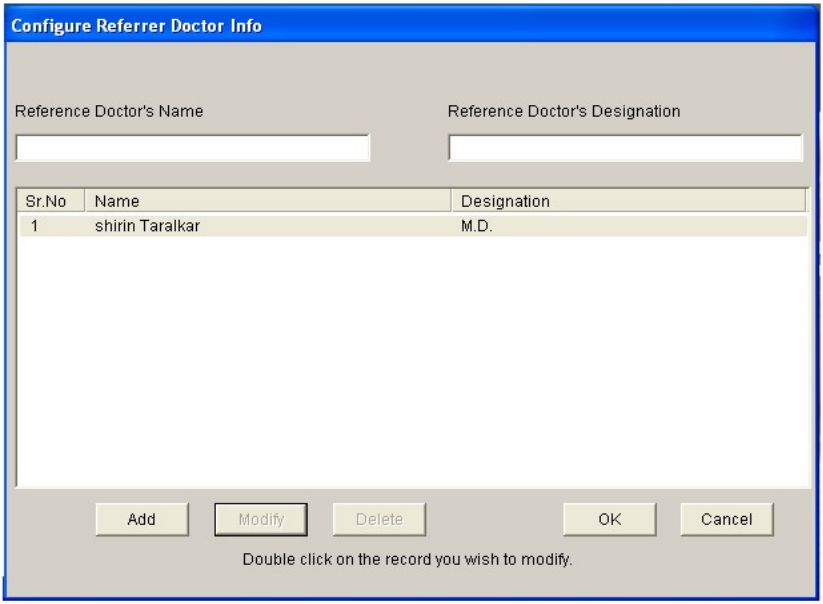


Fig.3.2B .Referring Doctor List

3. Standard summary option editor

Standard options are used while preparing summary report, which can be pre configured using '**Standard summary option editor**'

To use this option, click **'Standard summary option editor'** from **'Configure'** menu. Some standard field contents are already filled for your convenience. To add your personalized field contents in any of the objects, follow the steps given below.

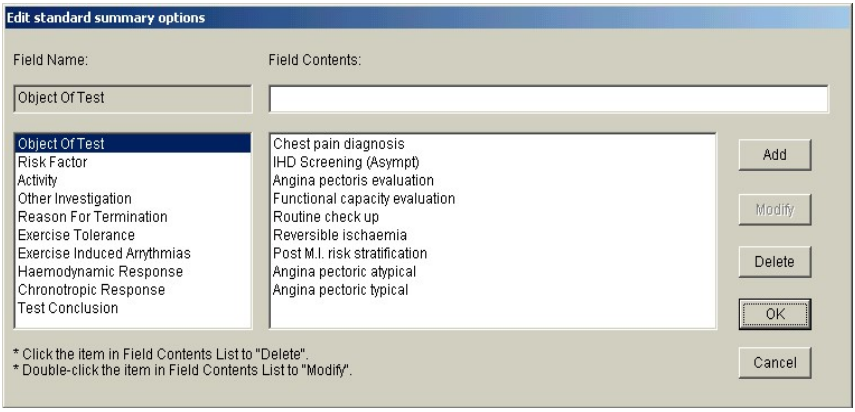


Fig 3.3: Standard summary option editor.

1. Select '**Field name**' from the list and type the new contents in the edit box and press '**Add**' button. Your new field content will get added to the list.
2. In order to modify your field contents **double-click** the item you wish to modify from the list of field contents. The item will appear in the Field Contents edit box. Make changes in the content as per your requirement and press '**Modify**' button. The changed item will appear in the list.
3. To remove any of the personalized field contents item, click the item from the Field Contents list that is to be deleted and press the '**Delete**' button. The item gets deleted from the list after confirmation.
4. To save the changes and exit click on '**OK**' button.
5. Click **'Cancel'** to discard the changes.

4. Configure System

'Dedica configuration program' allows you to configure different display and print options.

To configure the system select **'Configure system'** option from **'Configure'** menu. The screen as shown in fig 3.4 is displayed.

1. Select the speed unit for treadmill to **'Kilometers per hours'** or **'Miles per hours'** as per the requirement of Treadmill.

2. Configure treadmill speed at exercise stop to '**1.2 kmph'**, **'Fast 0 kmph'** or **'Slow0 kmph'** as per the requirements.

3. To configure **'ST level lead in the summary report'**; select the required lead from the 12 leads dropdown list box. ST level lead of the selected lead is displayed in the Summary report.

4. To Configure Trace1 and Trace2 leads on acquisition screen, select required '**Screen display leads**' leads from list of 12 leads.

5. To configure leads for printing ST Slope, ST Level and J-Amplitude trends, select required '**Trend report leads**' from list of 12 leads.

6. **Stage report leads.** This option has 6 drop down boxes. User can select the required leads from the list. This will select the lead for printing.

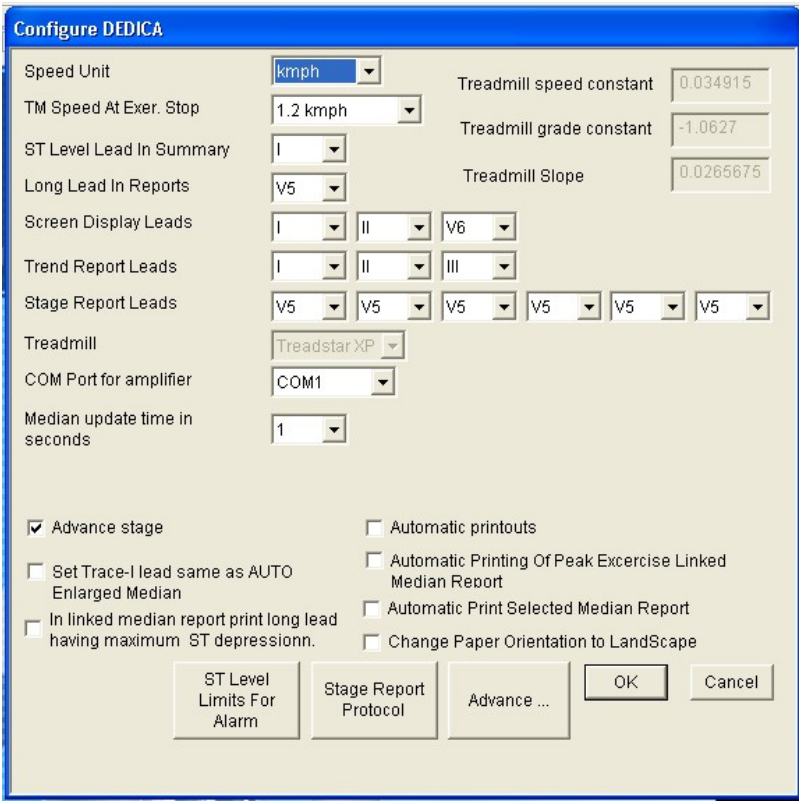


Fig 3.4: Dedica configuration program.

7. Select '**Treadmill**' from the list box, to interface with software. The options available are '**Compact**', '**Trackmaster**', '**Treadstar**' and '**TreadstarXP**'.

8. Select the '**COM port**' as COM 1to COM8 OR USB to which Stress test amplifier is connected.

9. **Median update time in seconds** this option is provide for setting the time to update the median. Select the required time to update the medians from the dropdown box.

10. Check the '**Advanced stage**' check box to have the facility of advancing to the next stages before completing the exercise stage as per the protocol.

11. Check the '**Automatic printouts**' option to print the report as per '**Stage report protocols**' while conducting the test.

12. To print linked median report automatically at peak exercise stage check '**Automatic printout of peak exercise linked median report**' takes the printout when peak exercise stage is over. Check the checkbox for automatic printouts of peak exercise linked median report.

13. To print selected median report automatically at review stage check '**Automatic print selected median report**' takes the printout when review button is pressed. Check the checkbox for automatic printouts of selected median report.

14. Check the '**Set Trace-I lead same as AUTO Enlarge Median**' option to display Trace1 lead automatically same as enlarged median lead.

15. Check the "**Print lead having maximum ST depression as long lead in Linked Median Report**" check box to print long lead with maximum ST depression in linked median report.

16. Check the "**Change Paper Orientation to Landscape**" option to print report in Landscape Orientation.

17. Advance button is having the constant generated by calibrating the treadmill. Only Nasan service engineer can execute it.

18. At the right corner the constants of the selected treadmill are visible.

19. To set the protocol for online printouts click the **'Stage report protocol'** button.

- A dialogue box as shown in fig 3.5 is displayed on the screen.
- Check the stages that you want to include in your protocol for printing. A dialog box shown in the fig 3.6 below is displayed.
- To configure printouts at defined interval in Exercise and Recovery stage, enter interval in text box. Click the check box of '**Grid ON**' to have the grid on the printouts.
- Enter interval time in text box to configure printouts at defined interval in Exercise and Recovery stage.
- Click the check box of '**Grid ON**' to have the grid on the printouts.
- Press the **'OK'** button to '**save and exit**' the protocol settings.
- Press the **'Cancel'** button to exit without saving.

20. Click **"OK"** button of the Dedica configuration program to save the settings you have made.

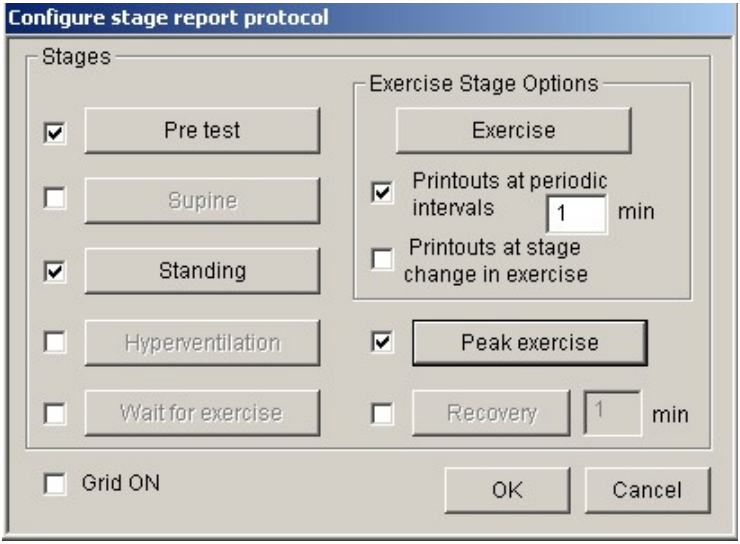


Fig 3.5: Stage report protocol creator.

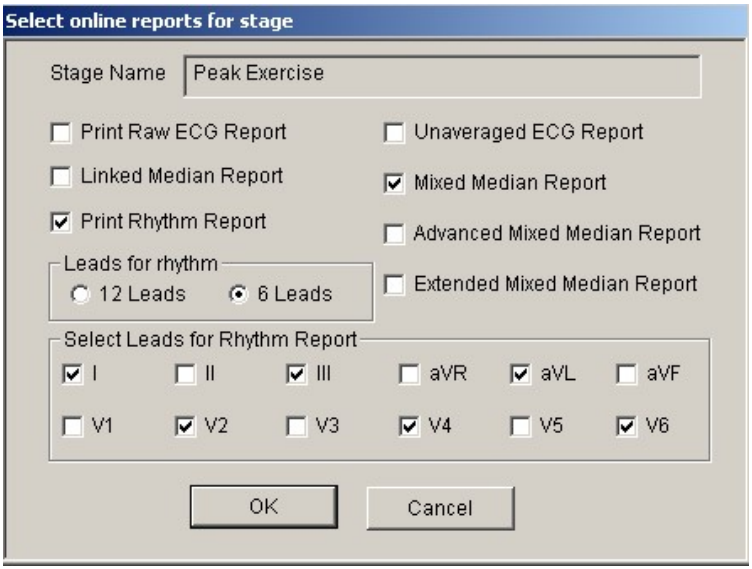


Fig 3.6: Select online report stages.

5. Treadmill protocol

Some standard protocols are pre-configured in the software. But if Doctor wants to use protocol other than the standard one, select '**Treadmill protocol**' option from **'Configure'** menu. A dialogue box as shown in fig 3.7 is displayed on the screen.

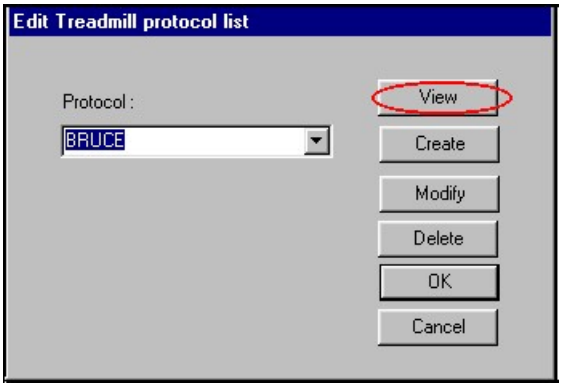


Fig 3.7: Treadmill protocol list.

1. Standard protocols are not to be modified. But the user can have a view over them by selecting a particular protocol from the dropdown list and pressing the '**View'** button to add new protocol, press '**Create**' button. A dialogue box as shown in figure 3.8 is displayed.

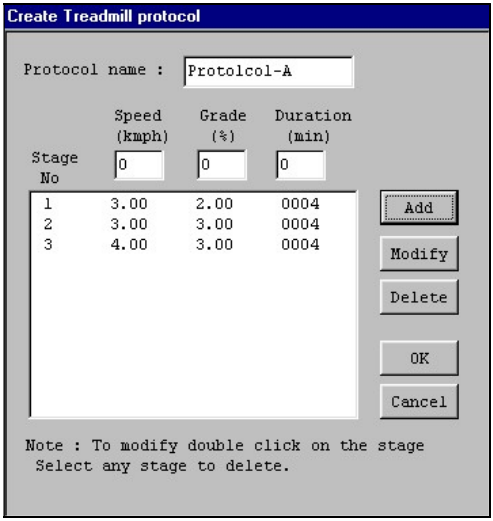


Fig 3.8: Treadmill protocol creator.

2. Enter protocol name in the text box, speed and grade in the respective text boxes. To add this contains in the protocol press '**Add**' button.
3. To delete the stage, select the required stage number from the **'Stage no.'** list and press '**Delete**' button
4. To modify the stage double click the **'Stage no.'** to be modified, the stage contents will appear in the text boxes.
5. After editing the stage, press '**Modify**' button.
6. Press '**OK** to save the change and exit.
7. Press '**Cancel**' to exit without saving.
8. To modify the user defined protocol; select the protocol name from the list and click '**Modify**' button. A dialogue box shown in fig. 2.8 is displayed filled with contents of existing protocol. Make the require changes and press

'**Modify**' button. Press '**OK**' button after doing required modifications.

9. For deleting any protocol from the list, select the protocol you want to delete and press the '**Delete'** button. Selected protocol is deleted after confirmation.
10. Press '**OK** to save the change and exit.
11. Press '**Cancel**' to exit without saving**.**

6. Printing details

To have the printouts of the required report, printing details option is provided. This configuration is used while printing the reports with the require titles, fonts and their sizes and alignments. You can set following details-

- Report title.
- Report title alignment (either center right or left of the page).
- Fonts for report title, hospital name, Patient details and Summary report.
- Grid type.
- Color or black and white printing.
- Administrative details with gray background.
- Print borders for the printouts.
- Print admin border

For this purpose select the '**Printing Details**' option from '**Configure**' menu.

A dialog box as shown in fig 3.9 is displayed.

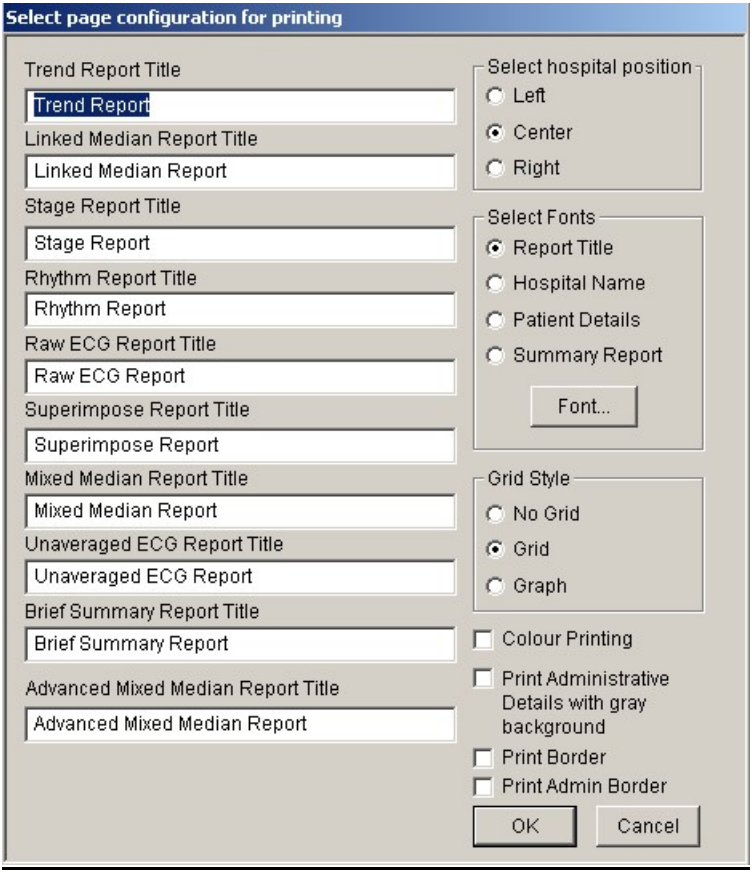


Fig 3.9: Print page details.

- To set the font, click the '**Font**' button. A dialog box as shown in fig 3.10 will appear where you can configure
    - Font,
    - Font color,
    - Font style,
    - Font size,
    - Underline the text.

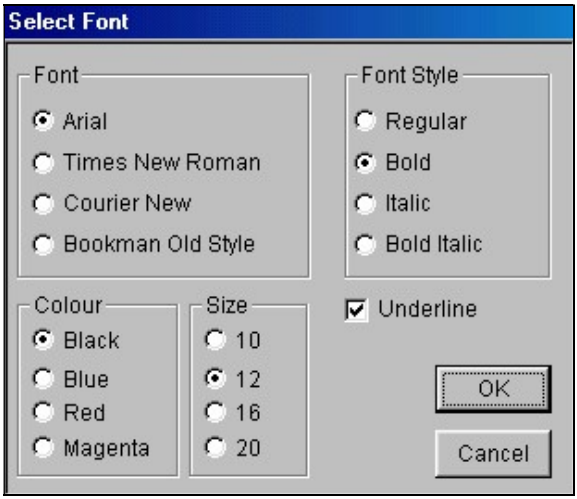


Fig 3.10: Select font.

- Press '**OK** to save the settings and exit.
- Press '**Cancel**' to exit without saving.

4. Conducting a test

To start a new test for a patient, click on the '**New Test'** button present on screen or go to **'File'** menu and select **'New test'** option.

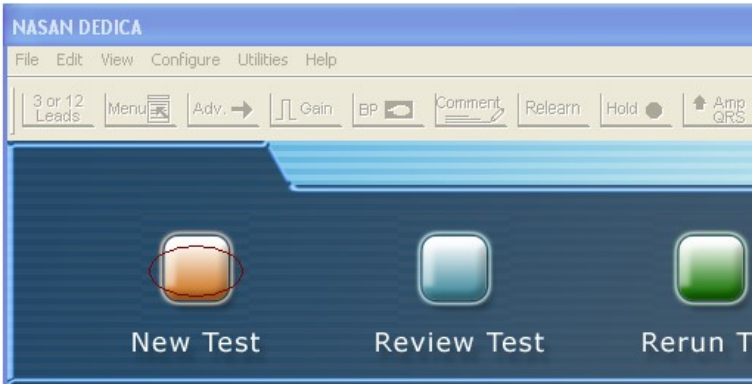
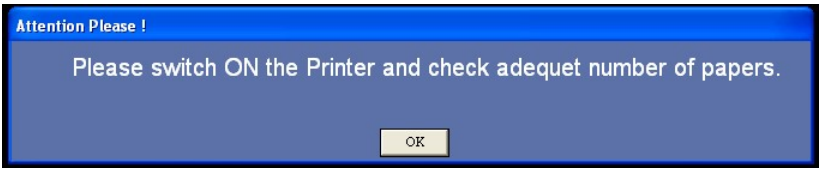


Fig 4.1: Main screen.

Following attention message is displayed on the screen. This attention message is to check the status of printer.



Click 'ok' button. The patient information dialog box as shown in fig. 4.2 is displayed for entering the patient details.

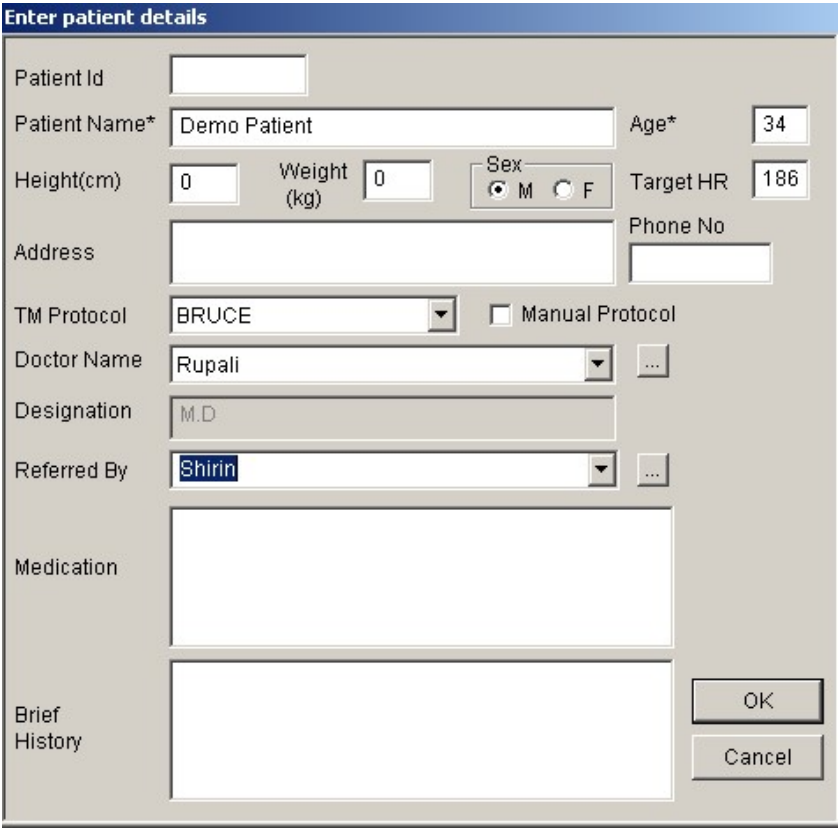


Fig 4.2: Patient information.

1. Check the '**Manual Protocol**' check box to implement the manual protocol in the test.
2. Editable target HR facility is given in patient detail dialog box.
3. Click **'OK'** button to start the acquisition. An acquisition screen is displayed as shown in fig 4.3.

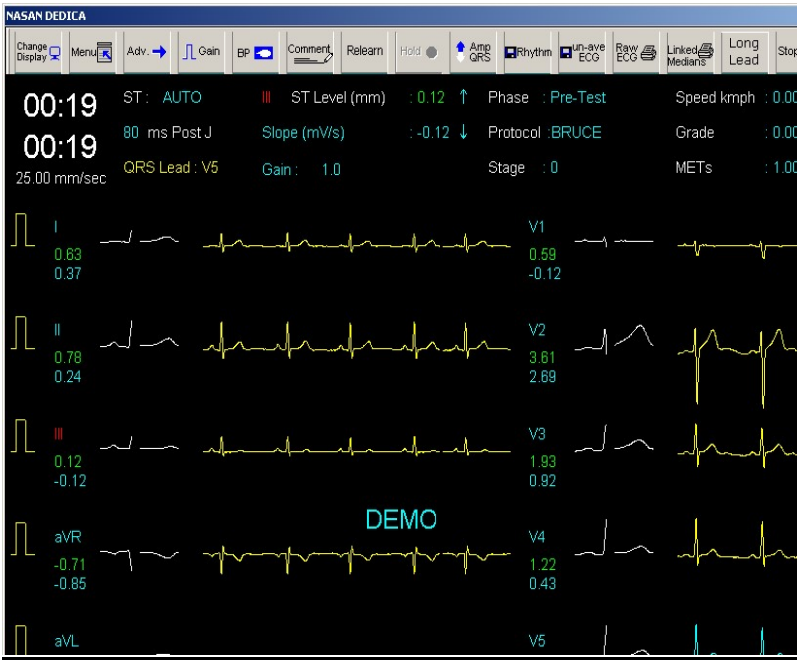


Fig 4.3: Acquisition screen.

You will see following details on Acquisition screen

- Tool bar at the top of screen.
- 12 Leads medians
- 12 running ECG traces of 12 sec.
- All the parameters like gain, Start time, Phase time, ST auto, 80 ms Post J, ST Level, ST slope, HR, QRS Detection lead, Blood pressure, Stage, Protocol name, Protocol stage, Speed, Grade, Mets.
- Beep is sound on every detected QRS. To set QRS beep ON or OFF, press F7 key, QRS beep status is toggled. Bell

symbol on screen indicates the ON/OFF status of QRS beep.

Tool bar at the top of the screen has following controls

Fig 4.4: Tool bar.

1. Change Display.
2. Menu.
3. Adv (Advanced stage).
4. Gain.
5. BP.
6. Comments.
7. Relearn.
8. Hold.
9. Rhythm.
10. Un-avg. ECG (Un-averaged ECG).
11. Amp QRS (Amplify QRS).
12. Raw ECG.
13. Linked Medians.
14. Long lead
15. Stop.

Tool Bar

1. 3, 4 or 12 Leads

Use this menu to toggle 3, 4 and 12 lead display mode. Press **'Change Display'** to view all 12 leads median traces on the screen or 3 lead ECG with a single Enlarged Basal median shown in fig 4.5A or 4 lead ECG as shown in fig 4.5B. Drop down buttons at the left bottom corner are available to change the leads on this screens. Click **Change Display'** **'**button to go back to 12-lead display mode.

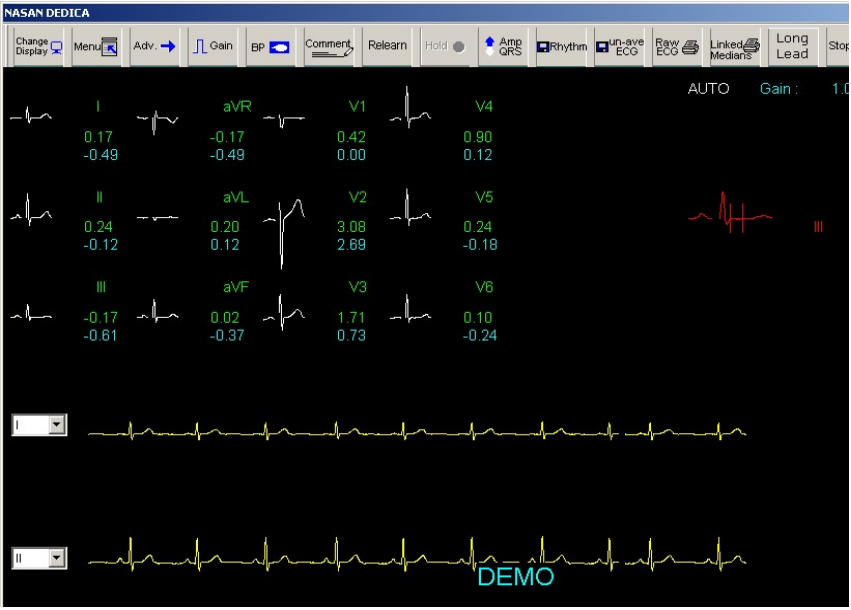


Fig 4.5A: 3 lead acquisition.

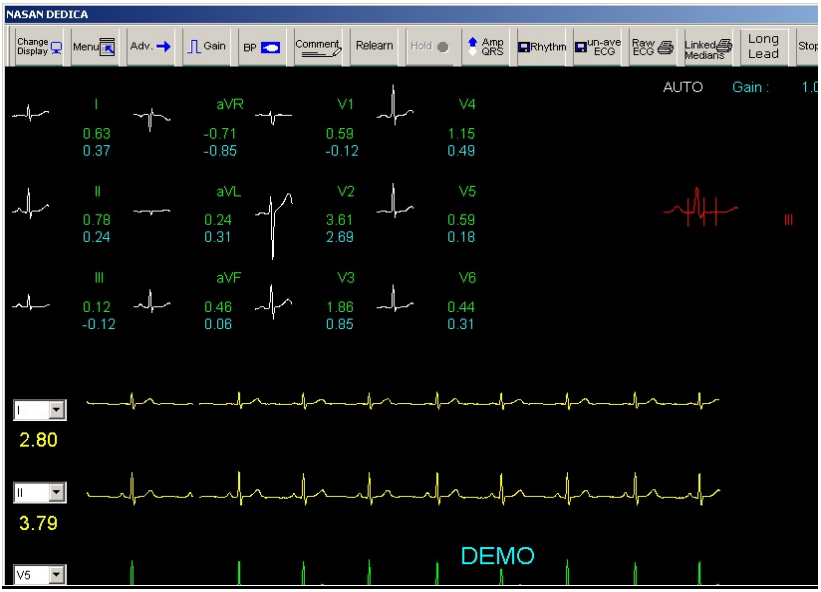


Fig 4.5B: 4 lead acquisition.

2. Menu

If '**Menu**' button is pressed on 3 leads display mode the control panel as shown in fig 4.6

Fig 4.6: Menu bar.

- To select the Enlarged median display lead manually. The caption of **'Manual Median'** button changes to **'Auto Median'**. Click"**Change Median"** button to select next lead. Click **"Auto Median"** button to automatically select enlarged median lead same as the lead having minimum ST level.

Fig 4.7

- To change the position of E, J, Post J points, press the '**Manual points**' button. Three buttons named E-Point, J-Point, Post J Point gets enabled on the menu bar as seen in the fig 4.8

Fig 4.8

- Press **'E-point'** button to change the position of E-point to left or right press the **'<-' or '-> 'button** as shown in fig 4.9 respectively. Similarly press J-point and Post J-point button to change the position of J-point and post J-point respectively.

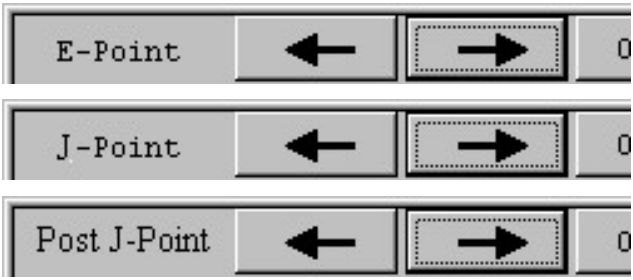


Fig 4.9

- In all stage user can increase or decrease the '**Speed'** and '**Grade'** of the treadmill. Press '**Speed**' or '**Grade**' button to change the speed and grade of the treadmill. Speed and Grade can be varied up to first stage of BRUCE protocol using up and down arrow keys as shown in figure 4.10.

Fig 4.10: Speed.

By pressing the arrow buttons doctor can increase or decrease the speed and grade of the treadmill.

If '**Menu**' button is pressed on 3-lead display mode the control panel as shown on fig 4.11 is displayed.

Fig 4.11: Menu Bar

- To zoom the medians while acquisition, select the zoom factor to which you want to zoom the medians. Pressing the Move button present on the tool bar can separate the basal median and the current stage median. Two arrow buttons will be displayed. Press these buttons to move the medians.
- Move button provide the facility to move the current median from the basal median in exercise stages and 12 lead ECG screen.
- Press **'OK'** button to go back to main tool bar by saving the changes done in the positions of the points.
- When the test reaches to recovery stage **'Peak median'** button gets enabled in menu option, which is visible in 3 lead acquisition screen only. This button provides the

facility to compare the current median with the basal median or peak exercise median.

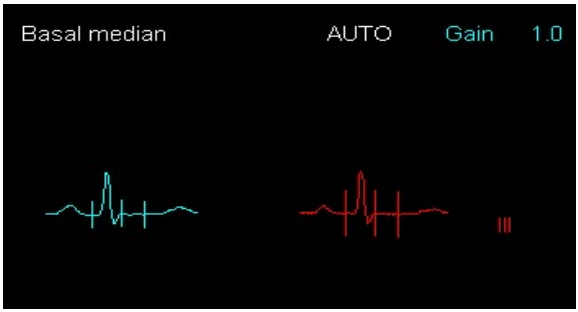


Fig 4.12: Basal median

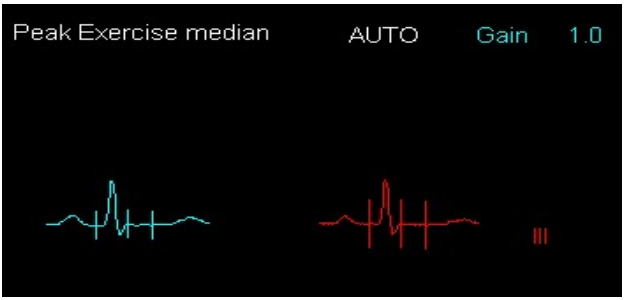


Fig 4.13: Peak exercise median.

3. Adv (Advanced stage)

Press '**Adv**' button to go to the next stage after 8 sec. The advanced stage button is used when you want to switch over from present stage to next stage as shown in fig 4.14 & 4.15. It will go to next stage according to the protocol when exercise stage is started.

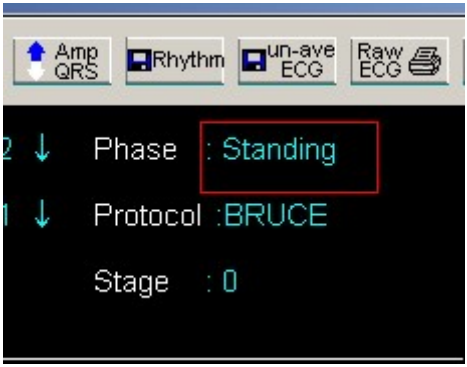


Fig 4.14 Before Advance stage button is pressed

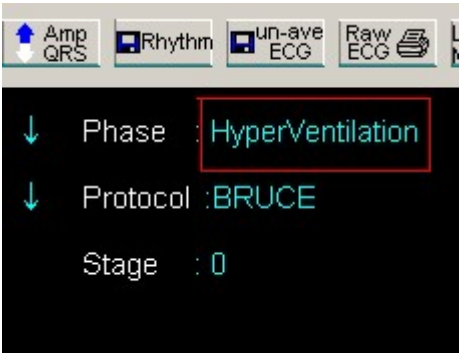


Fig 4.15 After Advance stage button is pressed

4. Gain

Press the **'Gain'** button to change the gain of the traces. Press the gain button, the gain value toggles between 0.5, 1.0 and 2.0. Current gain value is displayed on right corner of the screen as shown in fig 4.16. ECG traces and median are drawn with new value of gain.

Fig 4.16: Increased gain.

5. BP

You can enter the BP of the patient when the test is going on by pressing the **'BP'** button as shown in fig 4.17. Fifty Seconds before end of each exercise stage, this BP entry dialog box is automatically shown to enter the BP.

Fig 4.17: BP dialog box.

6. Comments

When the '**Comment'** button is pressed, a text box is displayed as shown in fig 4.18. You

can enter comments at every stage. Press **'OK'** button to save the comments and **'Cancel'** button to exit.

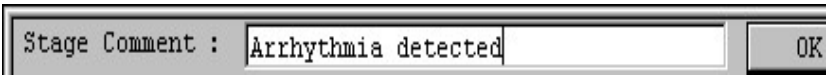


Fig 4.18: Comment box

7. Relearn

If there is noise on ECG traces because of loose electrode or some other reason, median calculations go wrong. Press electrode; wait till traces get stabled and then press '**Relearn**' button to recalculate the medians and heart rate.

8. Hold

Press **'Hold'** button to hold the exercise stage while acquisition. When this button is pressed the present stage duration gets increased until release button is pressed.

9. Release

Release button takes place of '**Hold'** button when a test is hold. It remains in its place until it is pressed to release the test. Then this '**Release'** button is pressed it changes to '**Hold**' button again.

10. Amp QRS (Amplify QRS)

In case of short R-waves heart rate calculations go wrong. Press **'Amp QRS'** button to amplify the QRS-lead for calculations (Display gain will not change).

11.Rhythm

Press **'Rhythm'** button to save 10 sec ECG of all leads. Saved Rhythms can be reviewed in Review

12.Un-Avg (Un-averaged ECG)

Press **'Un-avg. ECG'** button to save 5 sec ECG of all leads. Saved Rhythms can be reviewed in Review.

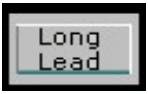
13.Raw ECG

Press **'Raw ECG'** button to take printout of the raw ECG of that particular instance.

14.Linked Median

Press **'Linked Median'** button to take linked median printouts of that particular instance.

15.Long lead



Press Long Lead button. Following menu with lead names will be displayed.

Select desired long lead. Selected lead will be printed in linked median report at the time of acquisition.

16.Stop TM

Press **'STOP'** button to stop the treadmill and also to stop the test. If **'STOP'** button is pressed before reaching the exercise stage, the test will not be saved. Short key "**F5**" is given to stop the test from keyboard.

17.Review

When the test reaches the recovery stage **'Review'** button is displayed on the toolbar in place of **'STOP TM'** button. By pressing the **'Review'** button you can directly go to review screen by completing recovery state of the test

5. Reviewing the test

To analyze the recorded data, select '**Review test'** from '**File**' menu or click on **'Review Test'** button on main screen. Refer (Figure 5.1).

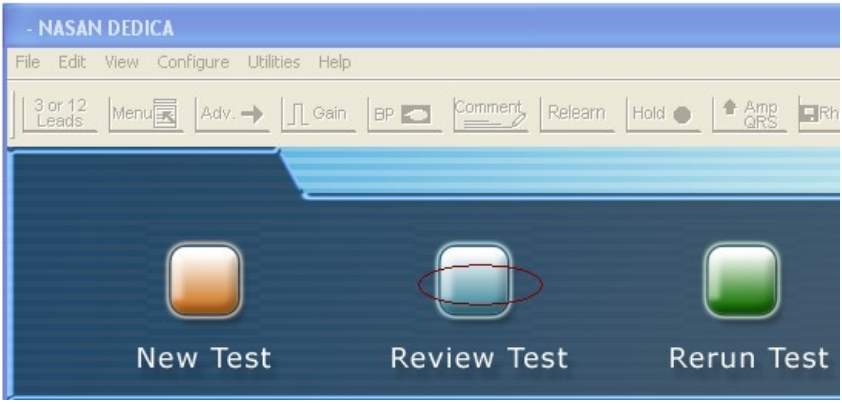


Fig 5.1: Main screen.

Patient list as shown in fig 5.2 is displayed. Select the patient to review and press '**OK**' button. Review screen as shown in fig 5.3 is displayed.

You can delete the test by selecting the patient from the list and pressing '**Delete**' button. The application ask for confirm action before deleting the test.

If you click on '**Patient name**' button then the patient files are sorted alphabetically.

If you click on '**Age**' button then the patient files are sorted according ascending order according to age of the patient.

Similarly you can sort the patient files according to sex, ID and date by clicking respective buttons.

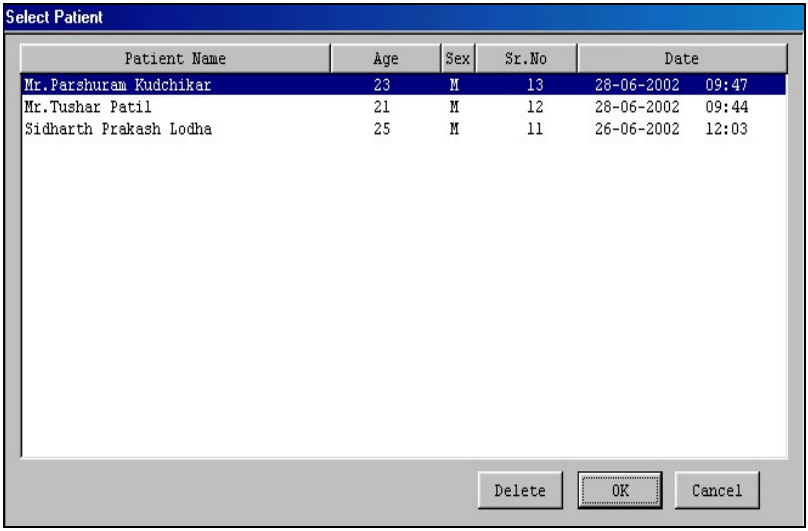


Fig 5.2: Patient Details.

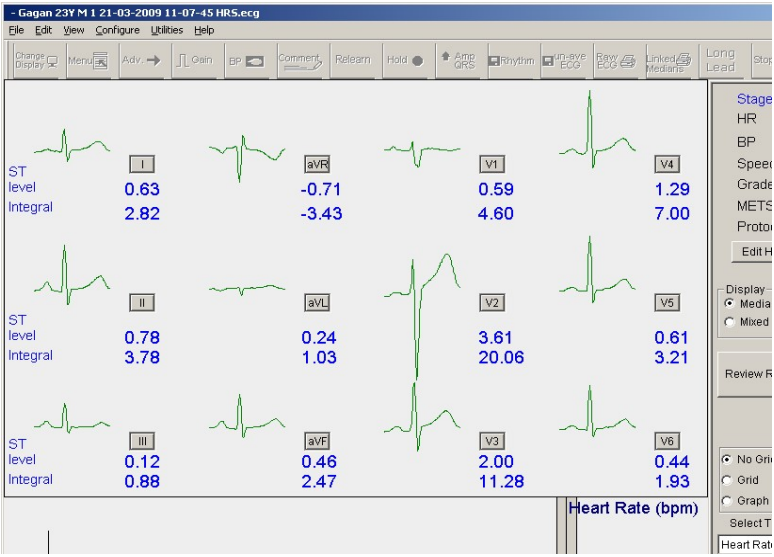


Fig 5.3: Review screen.

Review screen has the following details,

- Medians of all 12 leads with ST levels.
- Median buttons with lead names to display zoom medians.
- Heart rate trend.
- Review control panel.

Review control panel has following information on it,

- Cursor time in mm : sec format.
- Heart rate in bpm.
- Blood pressure in mmHg.
- Speed in kmph/mph.
- Grade in%.

- METS.
- Protocol name.

Review Control Panel

1. Edit HR

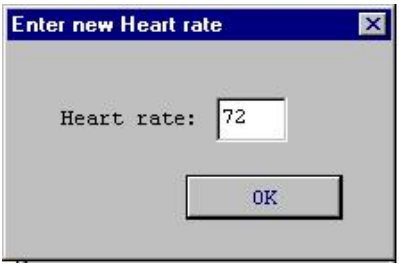


Fig 5.4: Heart rate entry

Press '**Edit HR**' button to enter the heart rate at current cursor position. Dialog box as shown in fig 5.4 is displayed. Enter new Heart rate and press ok to save.

The heart rate trend is updated. Use this button to edit the blood pressure at current cursor position on trend. Dialog box as shown in figure 5.5 is displayed. Enter systolic and diastolic BP values and press OK to save values. BP trend is updated accordingly.

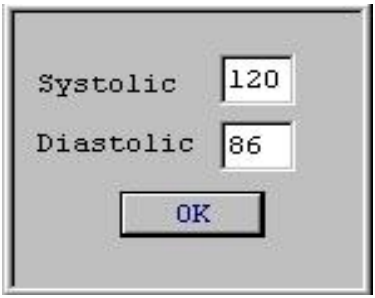


Fig 5.5 Edit BP

2. Zoom median

To view zoom medians and edit E, J and Post-J points, press lead name button adjacent to median. Dialog box as shown in fig 5.6 will appear on the screen. The pressed lead is enlarged and displayed.

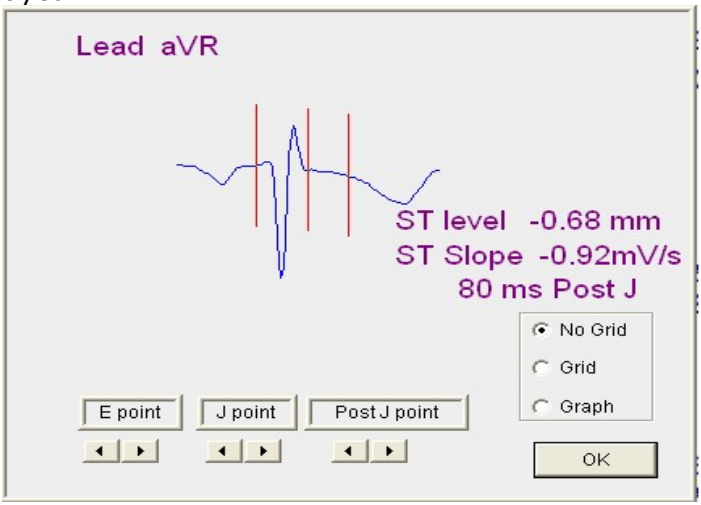


Fig 5.6: Zoom median.

- E, J and post-J points can be edited using arrow keys on the screen.
- Click on the grid or graph radio buttons to view the grid

or graph.

- Press OK to view medians screen.

4. Mixed Median

To view raw ECG with medians, select '**Mixed median**' radio button 2.5 seconds of ECG data of all 12 leads with medians at current cursor position is displayed. ST levels are display below lead names.

Fig 5.7: Mixed median screen.

5. Superimpose median

To compare the two medians of any stages, click '**Superimpose median**' button. Dialog box as shown in fig

5.8 with 'wait for exercise' median on left and median at current cursor position on right is displayed.

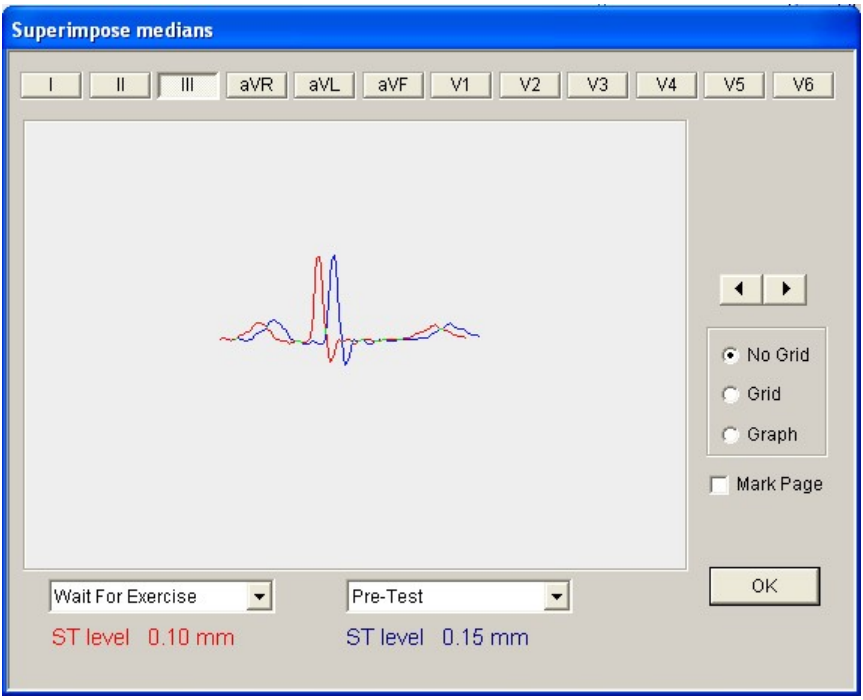


Fig 5.8: Superimposing the median.

Two combo boxes at the bottom of superimpose median screen are provided to select medians of different stages for comparison. Median of any stage can be compared with any other stage.

Using left and right arrow keys, median on right side can be moved to left or right for exact superimposition and comparison. Refer fig 5.8.

1. Check the check box named '**Mark Page**' to mark the current page for printing.
2. To view the grid or graph on the current screen click on the grid or graph radio buttons.
3. Press the spin button to move the right-side median towards right or left for comparison.
4. The changed ECG is shown in the figure 5.9 below.

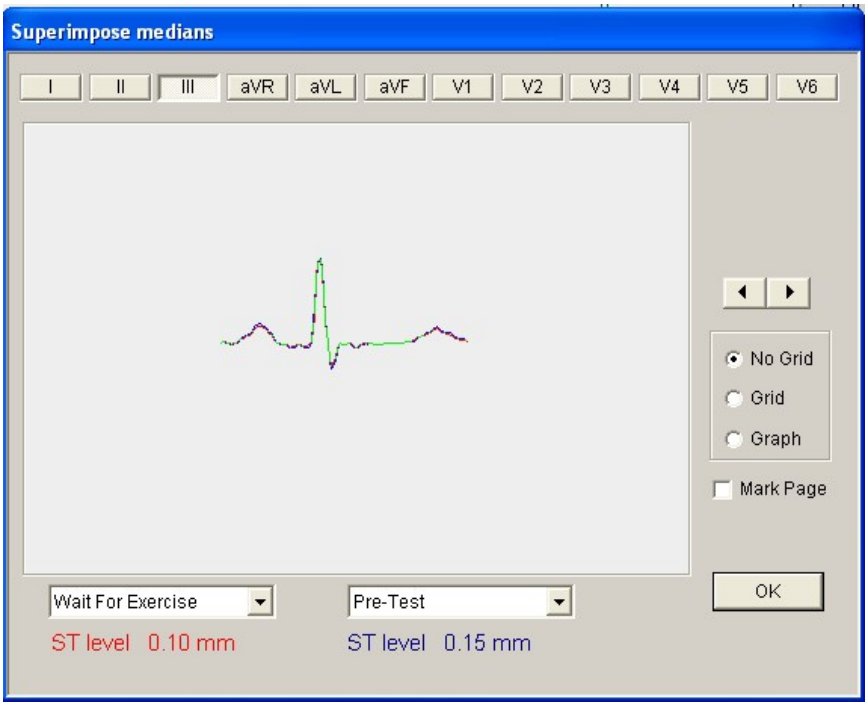


Fig 5.9: Superimposed median.

8. Press **'OK'** button to exit this screen and go to median screen.

Review Rhythm

- Press **'Review Rhythms'** button to view the rhythms recorded while conducting the test. The screen is as shown in fig 5.10. This screen has following details,
- 12-leads ECG of 4 sec.
- Time in hrs and min. in the left corner of the screen.
- Heart rate of the patient at recorded time.

Fig 5.10: Review rhythm screen

You can also select the time of recorded rhythms from the drop down time box to view rhythm stored while acquisition.

To view the ECG of any 6-lead press '**6Leads**' radio button. This will enable the lead panel. Select the leads by checking the boxes provided. The 6 lead screen as shown in the fig 5.11. is displayed.

Click the '**Mark page**' check box to mark the page for printing.

Click on the grid or graph radio buttons to view ECG with grid or graph.

Press **"OK"** button to return back to the main review screen.

Fig 5.11: 6 Lead review rhythm.

6. Unaveraged ECG

To view unaveraged ECG recorded while conducting test, press '**Review unaveraged**' but **ECG** on. Following screen is displayed as shown in the fig 5.12.

Fig 5.12: Unaveraged ECG.

This screen shows following details,

- Heart rate of that instance time.
- Time of recording unaveraged ECG.

Click on the grid or graph radio buttons to view ECG with grid or graph.

Check '**Mark page**' check box to mark page for printing.

Press '**OK**' to move back to go to the main review screen.

8. Full disclosure

To view the ECG data of one minute at the current arrow cursor position of the heart rate trend, press '**Full disclosure**' button on Review control panel.

Fig 5.13: Full disclosure.

Full disclosure screen as shown in Figure 5.13, has have the following details,

- 12 buttons having the lead names. By clicking those buttons user can view the ECG of one min. of the selected lead.
- At the right corner of the screen information like **time in hrs and min, heart rate and the current stage** of that particular instance is displayed.
- Click on the grid or graph radio buttons to view the grid or graph.
- For marking the current page for printing check '**Mark Page**' check box.
- For viewing previous or next one min. data press left or right arrow buttons.
- Press '**OK**' to return back to main review screen.

9. Grid and graph

This check box is provided to view the medians with the grid or graph. It draws grid on medians if '**Median**' screen is selected or on mixed medians if '**Mixed Median**' screen is selected.

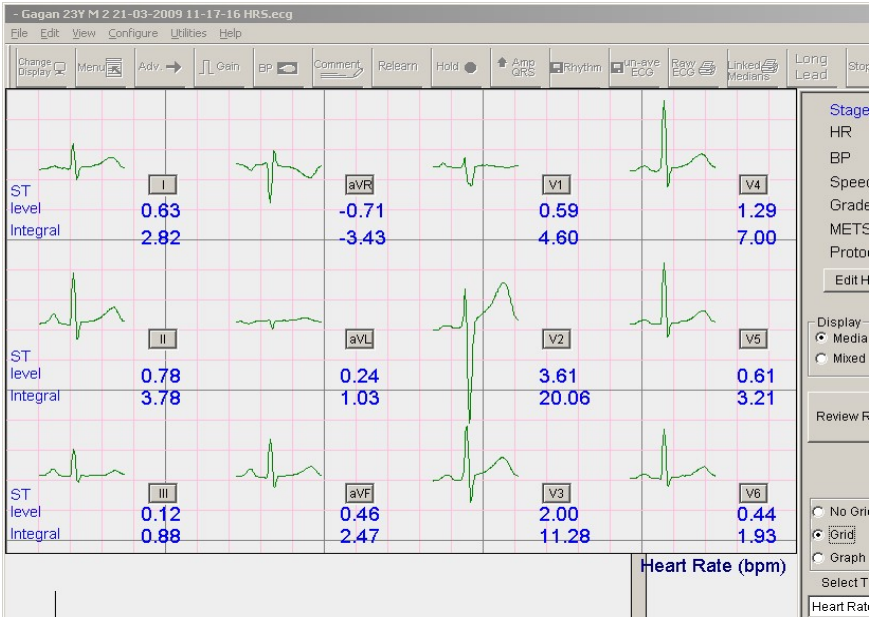


Fig 5.14: Grid.

10.Mark Linked Median

To have printouts of the Link Median at the current cursor position on trend, check '**Mark Linked Median**' check box.

11.Mark Extended Mixed Median

To have printouts of the Extended Mixed Median at the current cursor position on trend, check '**Extended Mixed Median report**' check box.

12.Select trend

To view the different trends like ST slope, ST Level and J amplitude, Blood pressure, select the trend from the select trend drop down list present at the right corner as shown in fig 5.15.

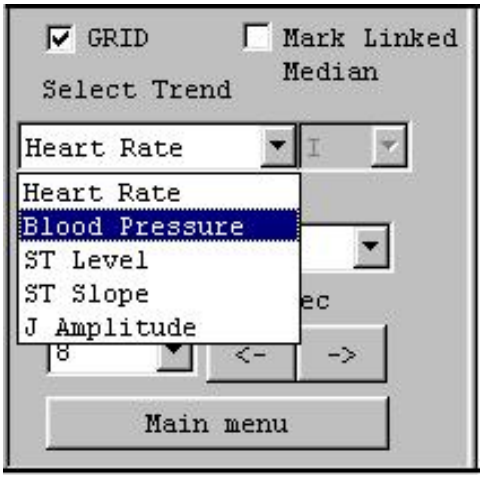


Fig 5.15: Select trend.

13.Select stage

To view median at the end of different stages, select stage from '**Select stage**' combo box.

14.Resolution in sec

To move the arrow cursor on the trend for viewing the medians or ECG of that particular instance, use the arrow buttons. User can select the step of arrow movement using '**Resolution in sec**' combo box. Resolution can be varied in steps of 8,16,32,48 and 56. The resolution selected for printing will also be selected for printing.

15.Edit Patient Details

For making any addition or deletion or any changes in patient details go to '**Edit**' menu and press '**Patient details**' option. A dialog box as shown in fig 5.17 is displayed on the screen.

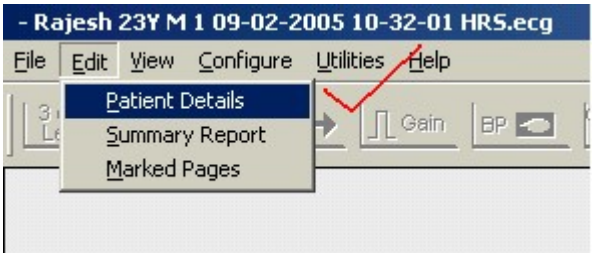


Fig 5.16: Edit menu.

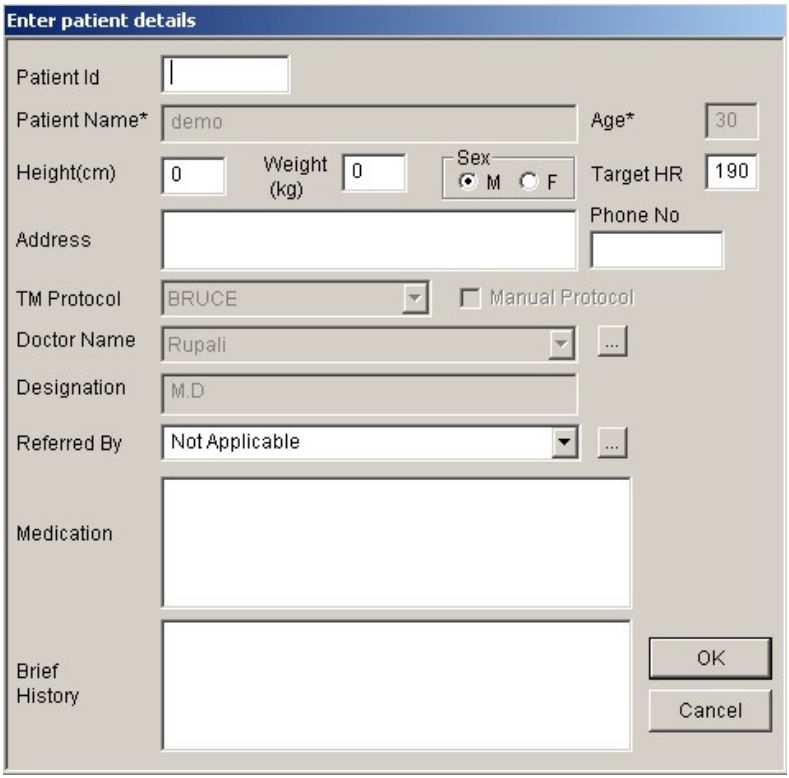


Fig 5.17: Patient detail dialogue box.

You are able do required changes. Press '**OK**' button to save the changes.

16.Save test for back up

You can save the test for backup with the help of '**Save test for back up**' option from **'File'** menu. The test can be saved on the hard disk for later referring purpose. On clicking this option the

screen as shown in fig 5.18 is displayed. Select the folder in which you want to save the test, edit the name of the test and press the **'Save'** button to save.

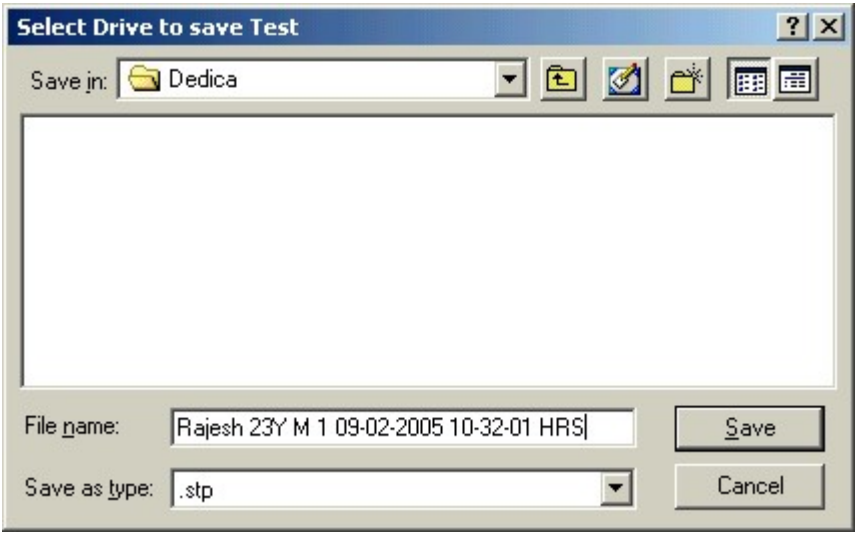


Fig 5.18: Save test.

17.Main menu

To go back to main screen, press **'Main menu'** button.

6. Printing reports

1. Print

To have the printout of the marked pages, click on **'Print'** option from the **'File Menu'** while reviewing the patient data. A dialog box as shown in fig 6.1. is displayed. Select the reports to be printed by checking the respective check boxes. When '**Select All'** check box is checked, all the marked pages of all reports will be selected for printing.

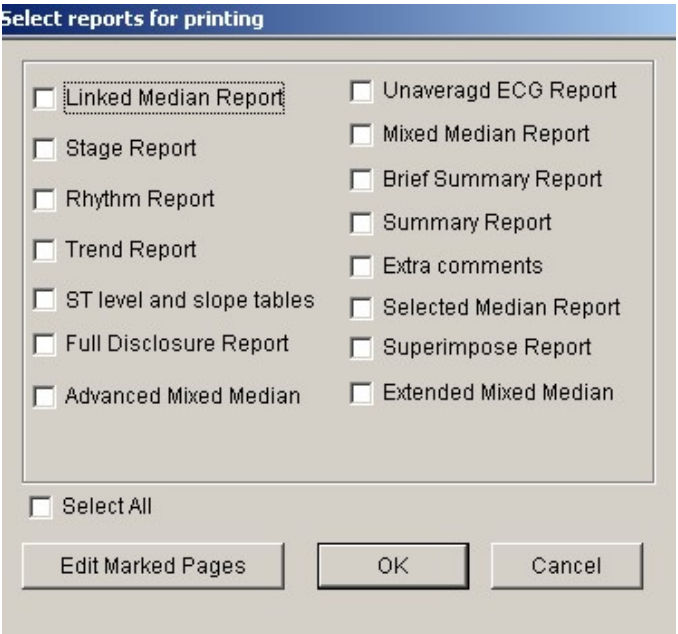


Fig 6.1: Print report selector.

- To edit the pages in the report press '**Edit marked pages**' button. Dialog box as shown in the fig 6.2 will appear on the screen.

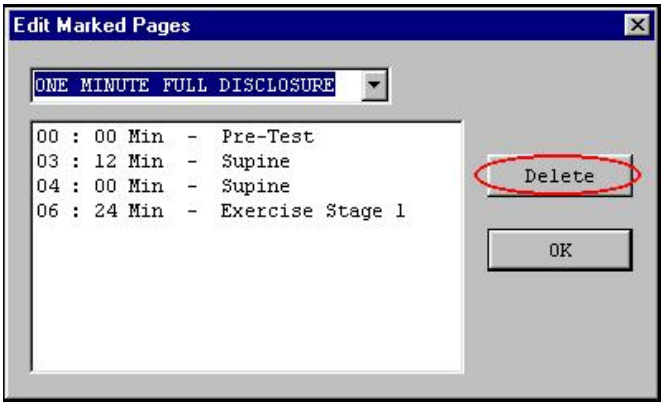


Fig 6.2: Edit Marked pages.

Select the report title from the drop down list view the marked pages of selected report. To delete the page, select the page from list and click on '**Delete**' button. The page is deleted after confirmation. Press **'OK'** to start printing the reports.

Printing Summary Report

For editing the Summary report, go to the '**Edit**' menu and click '**Summary Report**' option.

- The patient detail dialog box is displayed you can change the patient details.
- Press the **'OK'** button to view tabular summary report as shown in fig 6.3. In his report, stage time, speed and grade of the

treadmill, Heart rate in bpm, Blood pressure in mm/Hg., Rate pressure product (R.P.P.), METS, ST level and stage comment of all stages in test are displayed.

Tabular summary report

Stage Name	Phase Time	Speed / Grade (kmph)/(%)	HR (bpm)	BP (mmHg)	R.P.P	METS	ST Level (I)	Stage	Comments
Pre-Test	00:06	0.0 / 0.0	0	0 / 0	0	1.00	0.00		
Supine	00:11	0.0 / 0.0	76	0 / 0	0	1.00	0.63		
Standing	00:17	0.0 / 0.0	74	0 / 0	0	1.00	0.63		
HyperVentilation	00:22	0.0 / 0.0	74	0 / 0	0	1.00	0.63		
Wait For Exercise	00:28	0.0 / 0.0	73	0 / 0	0	1.00	0.63		
Exercise Stage 1	03:00	2.7 / 10.0	75	0 / 0	0	5.70	0.20		
Exercise Stage 2	06:00	4.0 / 12.0	72	0 / 0	0	8.00	0.15		
Exercise Stage 3	09:00	5.5 / 14.0	72	0 / 0	0	10.60	0.10		
Exercise Stage 4	12:00	6.8 / 16.0	72	0 / 0	0	14.30	0.07		
Exercise Stage 5	15:00	8.1 / 18.0	76	0 / 0	0	16.60	0.10		
Exercise Stage 6	18:00	8.9 / 20.0	73	0 / 0	0	18.90	0.12		
Peak Exercise	21:00	9.7 / 22.0	72	0 / 0	0	18.90	0.10		
Recovery 1	01:00	1.2 / 0.0	73	0 / 0	0	1.00	0.12		

* Double click on stage to modify the Stage Comment

Back OK

Fig 6.3: Tabular summary report.

- In the comment list, the comments entered while acquisition of the test, are displayed. If any comment is suppose to be enter or changed, double click on the stage. A dialog box as shown in the fig 6.4 will appear on the screen. Enter the comment or change the comment and press 'OK' button to save the comment.

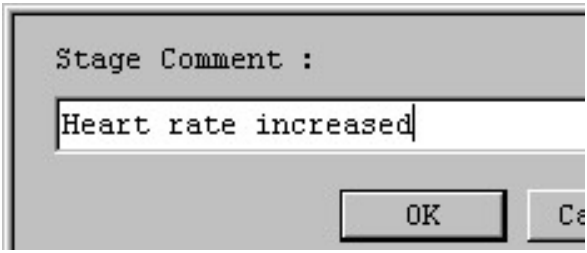
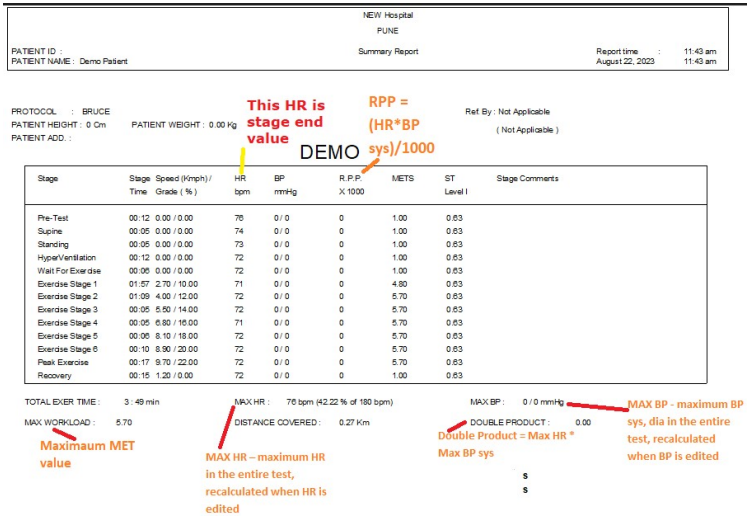


Fig 6.4: Stage comments.



NEW Hospital
PUNE

PATIENT ID :
PATIENT NAME : Demo Patient

Summary Report

Report time : 11:43 am
August 22, 2023 11:43 am

PROTOCOL : BRUCE
PATIENT HEIGHT : 0 Cm
PATIENT ADD. :

PATIENT WEIGHT : 0.00 Kg

Ref By : Not Applicable
(Not Applicable)

This HR is stage end value

RPP = (HR*BP sys)/1000

DEMO

Stage	Stage Time	Speed (Kmph) / Grade (%)	HR bpm	BP mmHg	R.P.P. X 1000	METS	ST Level I	Stage Comments
Pre-Test	00:12	0.00 / 0.00	76	0 / 0	0	1.00	0.63	
Supine	00:05	0.00 / 0.00	74	0 / 0	0	1.00	0.63	
Standing	00:05	0.00 / 0.00	73	0 / 0	0	1.00	0.63	
HyperVentilation	00:12	0.00 / 0.00	72	0 / 0	0	1.00	0.63	
Wait For Exercise	00:06	0.00 / 0.00	72	0 / 0	0	1.00	0.63	
Exercise Stage 1	01:57	2.70 / 10.00	71	0 / 0	0	4.80	0.63	
Exercise Stage 2	01:09	4.00 / 12.00	72	0 / 0	0	5.70	0.63	
Exercise Stage 3	00:05	5.60 / 14.00	72	0 / 0	0	5.70	0.63	
Exercise Stage 4	00:05	6.80 / 16.00	71	0 / 0	0	5.70	0.63	
Exercise Stage 5	00:06	8.10 / 18.00	72	0 / 0	0	5.70	0.63	
Exercise Stage 6	00:10	8.90 / 20.00	72	0 / 0	0	5.70	0.63	
Peak Exercise	00:17	9.70 / 22.00	72	0 / 0	0	5.70	0.63	
Recovery	00:15	1.20 / 0.00	72	0 / 0	0	1.00	0.63	

TOTAL EXER TIME : 3 : 49 min

MAX WORKLOAD : 5.70

Maximaum MET value

MAX HR : 76 bpm (42.22 % of 180 bpm)

DISTANCE COVERED : 0.27 Km

MAX HR – maximum HR in the entire test, recalculated when HR is edited

MAX BP : 0 / 0 mmHg

DOUBLE PRODUCT : 0.00

Double Product = Max HR * Max BP sys

MAX BP - maximum BP sys, dia in the entire test, recalculated when BP is edited

s
s

Summary report A4 printout details

- Click **OK** to view summary report options dialog box as shown in fig 6.5. The dialog box contents the information like
  - Total exercise time.
  - Distance covered.
  - Maximum BP: Max Systolic and diastolic values recorded during the test.

- Maximum heart rate recorded in the test.
- Maximum workload recorded in the test.

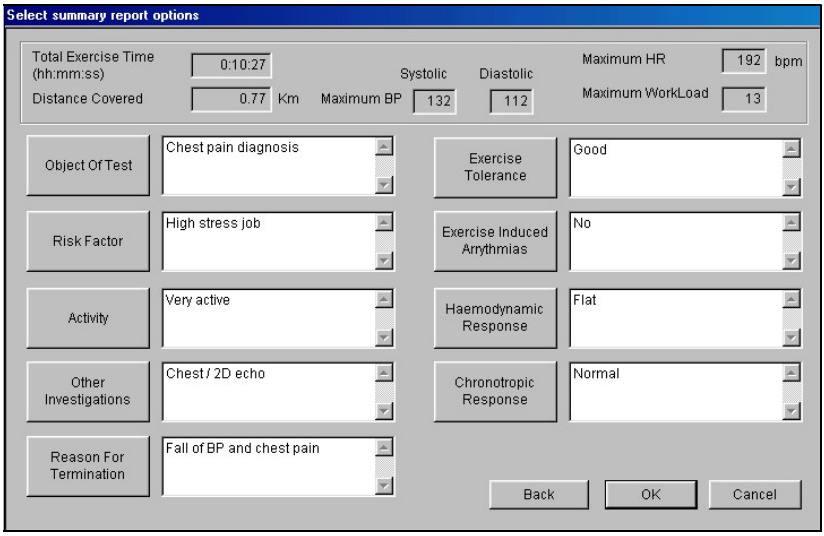


Fig 6.5: Select summary report option.

Along with following buttons,

a. Object of Test.
b. Risk factor.
c. Activity.
d. Other Investigation.
e. Reason for termination.
f. Exercise Tolerance.
g. Exercise Induced arrhythmias.
h. Haemodynamic response.
i. Chronotropic response.

j. Test conclusion.

- **To select the Object of Test**

To add the purpose of conducting the test, press **'Object of Test'** button. The **'Final impression selector'** as shown in fig 6.6 is displayed. Select the object of test from the list given and click on **'OK'** button. Multiple selections are allowed. Your object of test will be included in **'Select summary report option'** dialog box. You can also edit your own sentences in the text box.

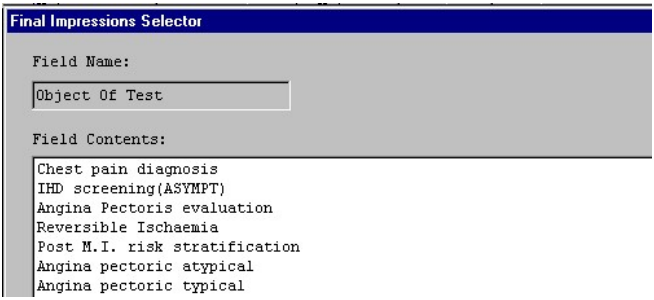


Fig 6.6: Final impression selector.

- **To select the Risk Factor**

Similarly select the risk factor of the patient by pressing **'Risk Factor'** button. Screen as shown in fig 6.7 is displayed. Select the appropriate option by clicking on the option and then press **'OK'** button

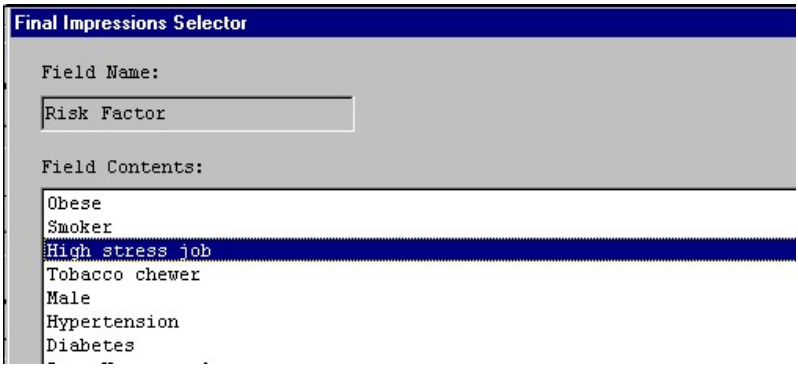


Fig 6.7: Risk factors.

- **To select Activities**

Press **'Activity'** button to add the patient activity in summary report. Select the required parameters and click '**OK**' button.

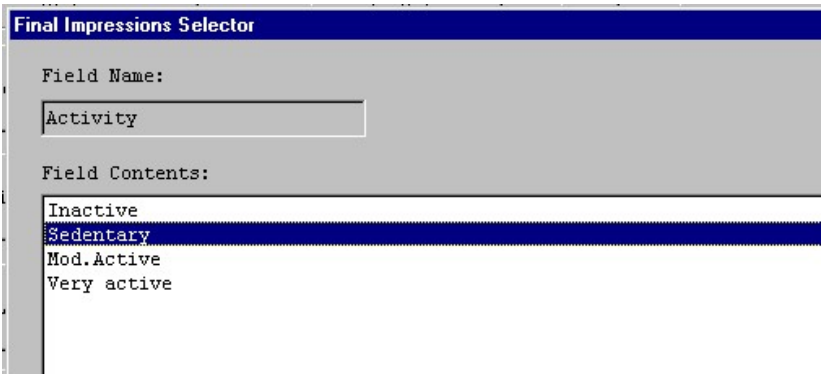


Fig 6.8: Activity.

- **To select other Investigation**

To keep the information about the previous investigations conducted like X-ray etc. before stress test, press the **'Other**

Investigation' button the screen as shown in fig 6.9 is displayed, select the option and click on **'OK'** button.

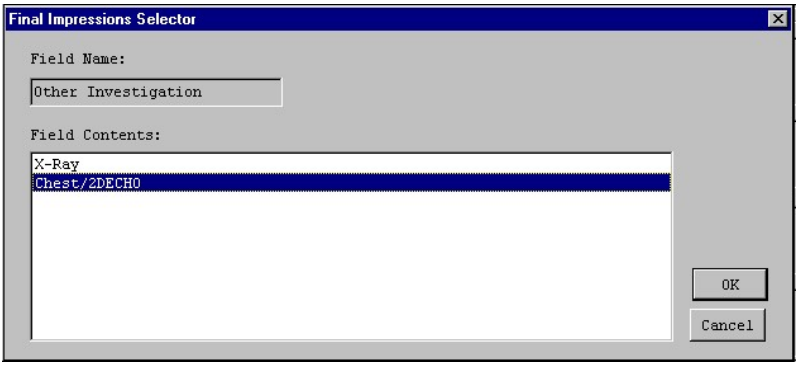


Fig 6.9: Other investigation.

- **To select the reason for termination**

Press **'Reason for termination'** button to include the reasons of terminating the test. You can select the reason from the list as shown in fig 6.10 such as heart block, Max HR etc.

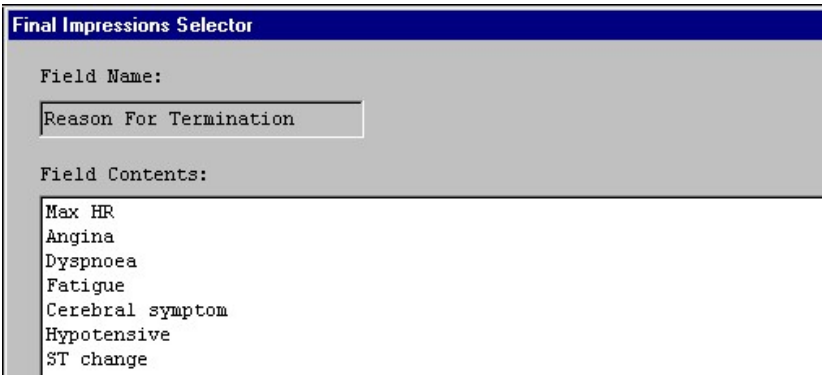


Fig 6.10: Reason for termination of test.

- **To select exercise tolerance**

You can also include the exercise tolerance factor by press **'Exercise Tolerance'** button. This is shown in the fig 6.11. Select the tolerance from the list and press '**OK**' button.

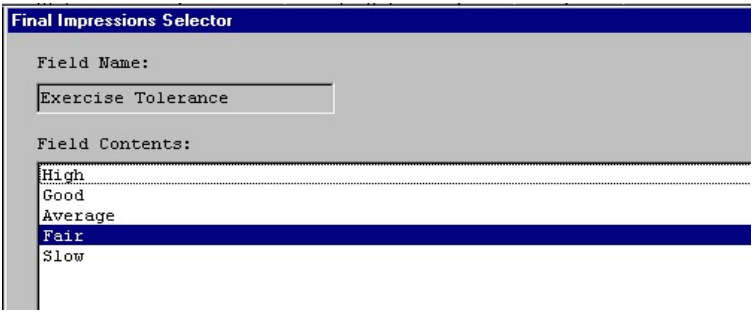


Fig 6.11: Exercise tolerance.

- **To select exercise induced arrhythmia**

Press the **'Exercise induced arrhythmia'** button to save the information of induced arrhythmia. You can select the option from the list given as shown in fig 6.12 to include in the summary report.

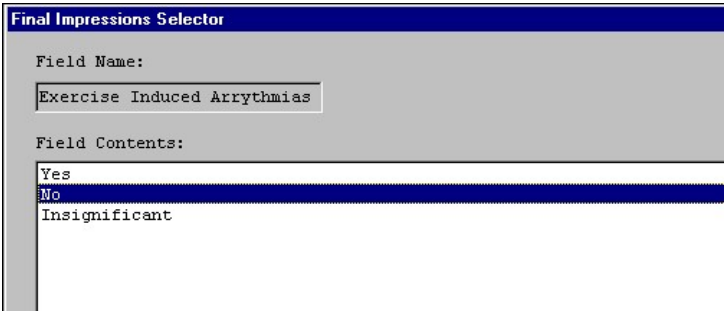


Fig 6.12: Exercise induced arrhythmia.

- **To select Haemodynamic Response**

Press **'Haemodynamic response'** button to select the

Haemodynamic response of the patient and to include it into the summary report as shown in fig 6.13. Select the response by clicking the response by the mouse. The response gets added in the summary report.

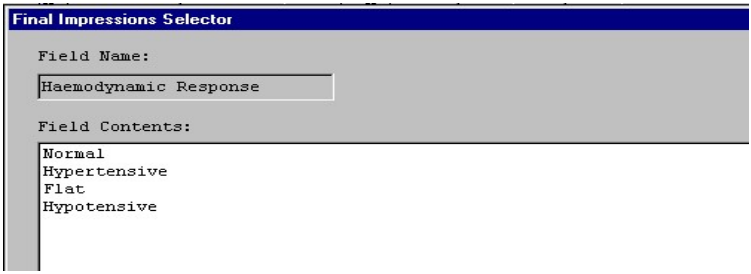


Fig 6.13: Haemodynamic response

- **To select chronotropic response**

Press **'Chronotropic response'** button to select the Chronotropic response of the patient and to include it into the summary report as shown in fig 6.14.

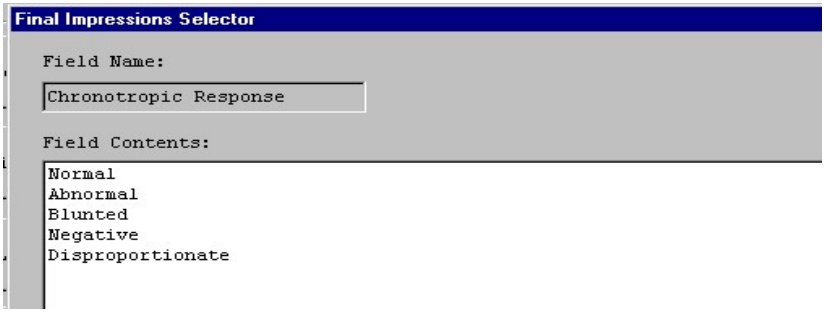


Fig 6.14: Chronotropic response.

- **Final Impression**

After selecting all the details from the **'Select summary report option'**, Press **'OK'** button to save the selections.

When you press **'OK'** button, the dialog box as shown in fig 6.15 is displayed with **'Print Summary Report', 'OK', 'Back' and 'Cancel'** button.

Press **'Print Summary Report'** if you want to print the summary report with all the details entered up till now. Enter the Final impression by selecting the option from the list present at the top of the dialog box and press '**Add**' button. Press '**Back**' button to go to previous stage.

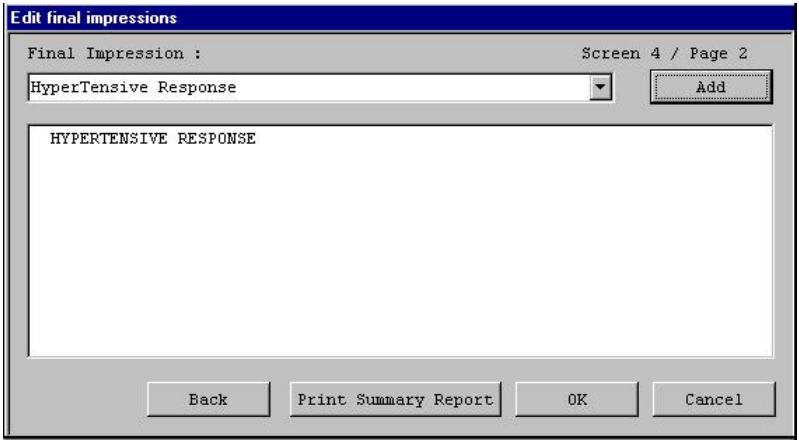
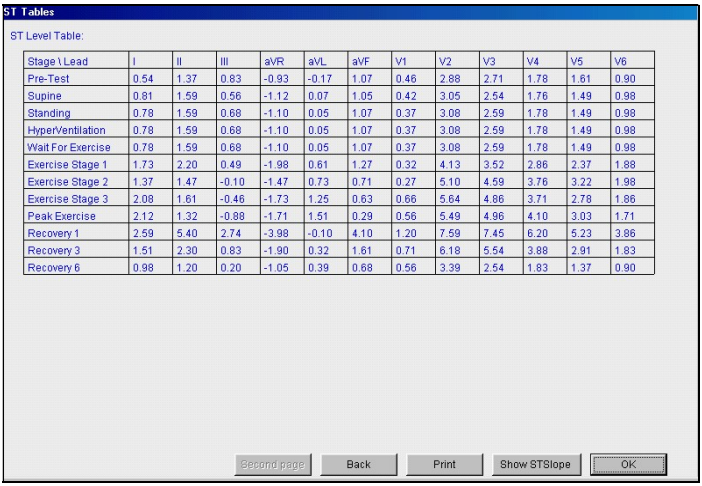


Fig 6.15: Edit Final impression.

When you press the **'OK'** button next option, ST-Level table will appear on the screen, as shown in fig 6.16.

- **<u>ST Table</u>**

This dialog box shows ST-Level of entire stages of all leads for the test, along with the **'Print', 'Show ST-Slope Table', 'Back' and 'OK'** button. You can take the printout of the ST-Level table by clicking the '**Print**' button. Press '**OK**' button to move to next screen.



Stage \ Lead	I	II	III	aVR	aVL	aVF	V1	V2	V3	V4	V5	V6
Pre-Test	0.54	1.37	0.83	-0.93	-0.17	1.07	0.46	2.88	2.71	1.78	1.61	0.90
Supine	0.81	1.59	0.56	-1.12	0.07	1.05	0.42	3.05	2.54	1.76	1.49	0.98
Standing	0.78	1.59	0.68	-1.10	0.05	1.07	0.37	3.08	2.59	1.78	1.49	0.98
HyperVentilation	0.78	1.59	0.68	-1.10	0.05	1.07	0.37	3.08	2.59	1.78	1.49	0.98
Wait For Exercise	0.78	1.59	0.68	-1.10	0.05	1.07	0.37	3.08	2.59	1.78	1.49	0.98
Exercise Stage 1	1.73	2.20	0.49	-1.98	0.61	1.27	0.32	4.13	3.52	2.86	2.37	1.88
Exercise Stage 2	1.37	1.47	-0.10	-1.47	0.73	0.71	0.27	5.10	4.59	3.76	3.22	1.98
Exercise Stage 3	2.08	1.61	-0.46	-1.73	1.25	0.63	0.66	5.64	4.86	3.71	2.78	1.86
Peak Exercise	2.12	1.32	-0.88	-1.71	1.51	0.29	0.56	5.49	4.96	4.10	3.03	1.71
Recovery 1	2.59	5.40	2.74	-3.98	-0.10	4.10	1.20	7.59	7.45	6.20	5.23	3.86
Recovery 3	1.51	2.30	0.83	-1.90	0.32	1.61	0.71	6.18	5.54	3.88	2.91	1.83
Recovery 6	0.98	1.20	0.20	-1.05	0.39	0.68	0.56	3.39	2.54	1.83	1.37	0.90

Fig 6.16: ST-Level.

To view the ST-Slope of different stages press '**Show Slope**' button. The screen as shown in the fig 6.17 will appear.

ST Tables

ST Slope Table:

Stage \ Lead	I	II	III	aVR	aVL	aVF	V1	V2	V3	V4	V5	V6
Pre-Test	0.24	0.61	0.31	-0.73	-0.18	0.43	0.18	2.08	1.71	1.16	1.16	0.49
Supine	0.85	0.61	-0.43	-1.04	0.18	0.18	0.06	2.20	1.71	1.16	0.98	0.85
Standing	0.67	0.73	-0.43	-0.85	0.06	0.18	0.00	2.26	1.89	1.28	0.98	0.85
HyperVentilation	0.67	0.73	-0.43	-0.85	0.06	0.18	0.00	2.26	1.89	1.28	0.98	0.85
Wait For Exercise	0.67	0.73	-0.43	-0.85	0.06	0.18	0.00	2.26	1.89	1.28	0.98	0.85
Exercise Stage 1	1.10	1.53	0.43	-2.69	0.37	1.10	-0.31	2.87	2.50	2.14	1.77	1.47
Exercise Stage 2	0.85	1.22	0.12	-2.81	0.24	0.67	-0.73	2.93	2.75	2.81	2.01	1.47
Exercise Stage 3	1.65	2.01	0.43	-3.66	0.61	1.34	0.06	4.52	4.27	3.11	2.81	1.89
Peak Exercise	2.38	1.89	-0.98	-2.81	0.85	0.37	0.37	5.49	5.01	4.33	3.79	2.32
Recovery 1	0.43	3.48	2.81	-5.98	-1.28	3.36	0.61	-0.31	-0.37	0.12	0.55	1.65
Recovery 3	1.04	1.53	0.67	-3.05	0.31	0.98	0.85	4.82	4.46	3.11	2.26	1.34
Recovery 6	0.85	1.22	0.00	-1.59	0.43	0.73	0.37	3.66	2.81	2.08	1.53	1.04

Second page | Back | Print | Show STLevel | OK

Fig 6.17: ST-slope table.

To view the **'Extra comment'** dialog box click on **'OK'** button of '**ST Slope'** dialog box. You can enter your additional comment as shown in fig 6.18. To have a print out, press **'Print'** button at the bottom. Press '**Back**' button to go 1 step backward. Press **'OK'** button to save the changes.

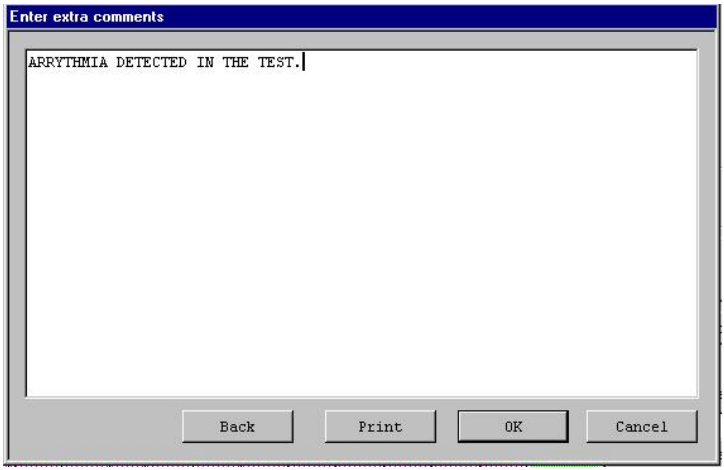


Fig 6.18: Extra comments.

7. Rerun test

If the test was unfortunately terminated by power failure or any other reason press the '**Rerun test**' button on the main menu screen or select '**Rerun test**' option from '**File'** menu. It is demonstrated in the fig 7.1

Fig 7.1: Main screen.

Patient details dialog box with previously filled details of the patient is displayed.
Press 'OK' buttons to start the same test again from first stage i.e. Pre test.

8. Utilities

Go to '**Utilities**' menu to do the following connecting work,

- Test treadmill.
- Test acquisition.
- Calibration grade.
- Calibration speed.
- Delete Printouts from printer queue…

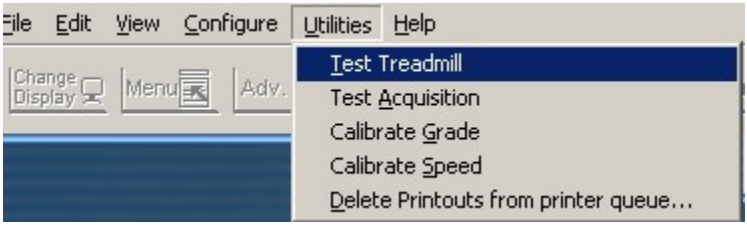


Fig 8.1: Utilities.

- **Test treadmill**

  For testing the Speed and Grade of the treadmill select the '**Test treadmill**' option from '**Utilities'** option. A dialog box is displayed as shown in fig 8.2 with speed and grade buttons. User can test the treadmill by increasing / decreasing the speed and grade buttons by pressing the arrow button seen on the dialog box.

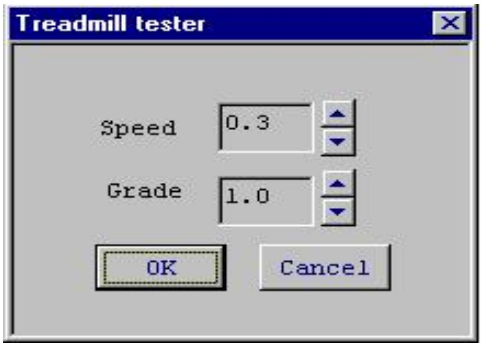


Fig 8.2: Treadmill tester.

- **Test acquisition**

'**Test acquisition**' is used to test the connectivity between the amplifier and PC port. When you click on '**Test acquisition**' option the message should come as "**The hardware unit is working properly**" is displayed.

- **Calibrate grade**

For calibrating the grade of the treadmill go to the '**Utility'** menu and press '**Calibrate grade**' option. A dialog box will appear on the screen as shown in the fig 8.3.

Fig 8.3

1. When the treadmill reaches to it's maximum elevation press '**OK**' button. When '**OK**' button is pressed treadmill starts moving down and following message as shown in fig 8.4 is displayed.

Fig 8.4

2. After the treadmill reaches its minimum elevation press '**OK**' button. When '**OK**' is pressed calibration constants for grade are calibrated and stored. These calibration constants are displayed in Dedica configuration dialog box.
3. If an error is detected this message appear on the screen

Fig 8.5

- **Calibrate speed**

For calibrating the speed of the treadmill go to '**Utility**' menu and select '**Calibrate speed**' option. This will display the dialog box as shown in the fig 8.6 below. Count the number of seconds for 14 rotations and enter the number in the edit box. Do this for one more time and enter the count in the second edit box. Press '**OK**' button to move to next stage of the protocol.

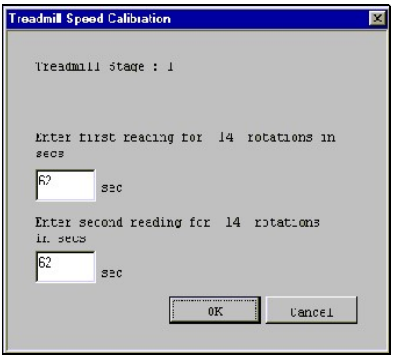


Fig 8.6: Treadmill speed calibration.

The above explained process will be carried out upto 7 stages of BRUCE protocol.

Allowed time for Speed calibration will be as mentioned in table below:

Stage	Speed	Grade	Rotations	Allowed time
	(Kmph)			In (sec)
1	2.7	10	14	55-67
2	4	12	21	55-68
3	5.5	14	28	54-66
4	6.8	16	34	53-64
5	8.1	18	40	52-64
6	8.9	20	44	52-64
7	9.7	22	48	52-64

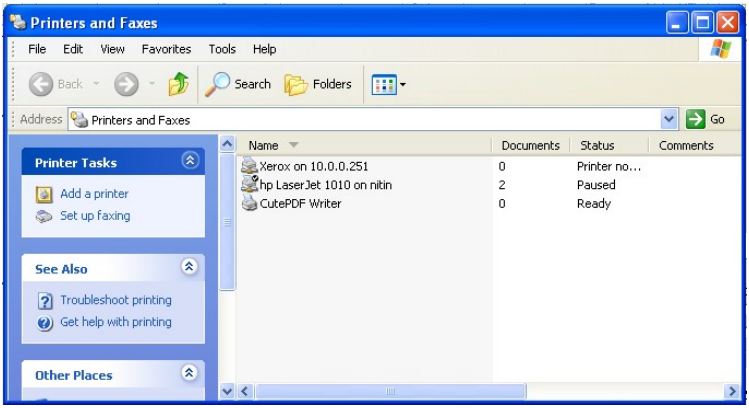
At the end of 7th stage, speed calibration constants are calculated and saved. These constants are displayed in Dedica configuration dialog box.

- **Delete printouts from printer queue**

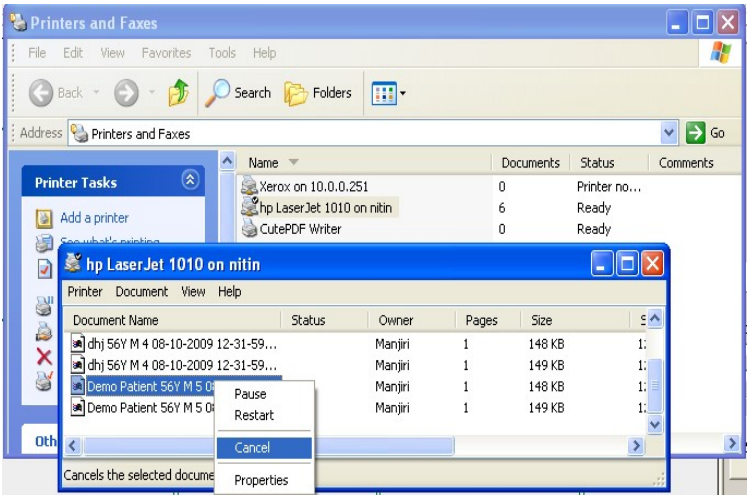
To delete printouts from printer queue go to Utility and select **'Delete printouts from printer queue.**' Option. Following **'Printer and Fax' dialog box** will be displayed.

Select the printer which is connected to ST win unit and double click on it. Following dialog box will be displayed.

It will display that documents stucked in the queue and if those documents in the queue are not required then right click on it and select



'Cancel' option as shown in above figure. It will delete the documents in queue.


Printers and Faxes
File Edit View Favorites Tools Help
Back Search Folders
Address Printers and Faxes
Go
Printer Tasks
Add a printer
Name Documents Status Comments
Xerox on 10.0.0.251 0 Printer no...
hp LaserJet 1010 on nitin 6 Ready
CutePDF Writer 0 Ready
hp LaserJet 1010 on nitin
Printer Document View Help
Document Name Status Owner Pages Size
dhj 56Y M 4 08-10-2009 12-31-59... Manjiri 1 148 KB
dhj 56Y M 4 08-10-2009 12-31-59... Manjiri 1 149 KB
Demo Patient 56Y M 5 0 Manjiri 1 148 KB
Demo Patient 56Y M 5 0 Manjiri 1 149 KB
Pause
Restart
Cancel
Properties
Cancels the selected docume

9. Troubleshooting

- **Traces are not coming?**
  Restart the system. Check all the connections. Contact the system engineer.

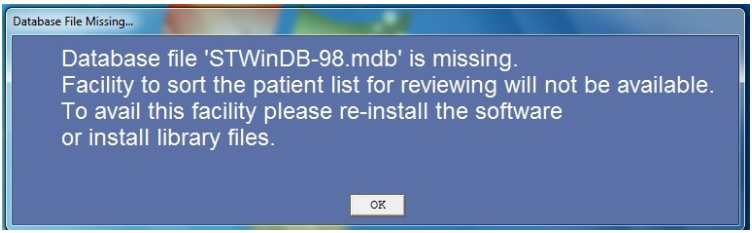
- **Traces coming as straight lines?**
  Check if the patient cable connection is proper or not.

- **Medians are coming as straight lines?**
  This will happen if the QRS detection lead (The third lead in the display) does not have tall R waves. Click **'Amp QRS'** button in toolbar to amplify QRS lead for calculations.

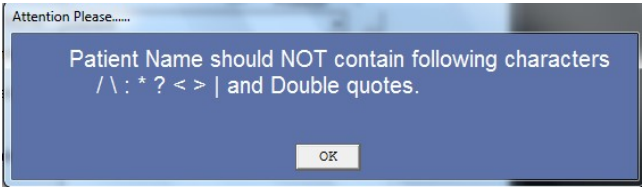
- **Heart rate not coming?**
  This will happen if the QRS detection lead (The third lead in the display) does not have tall R waves. Click **'Amp QRS'** button in toolbar to amplify QRS lead for calculations.

- **Printouts not coming or printing junk?**
  Check if connection is proper between printer and Dedica System.

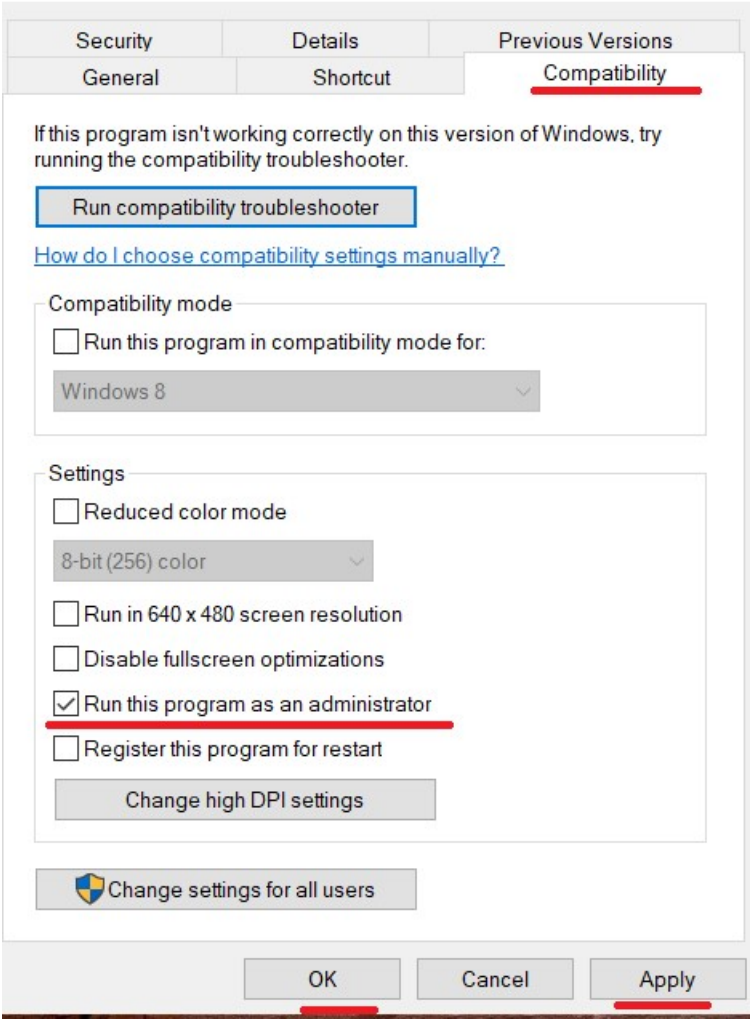
- if ,in some PC's this warning message might be displayed. 'Database file is missing'.



- If this message is displayed then one cannot enter the patient details, and this error is displayed.



1. Then follow the following steps to run the software.
2. Right click on the icon and go to “Properties”
3. Open Properties, Go to compatibiltiy settings



4. Then select "Run this program as an administrator"

5. Check this check box and then press “Apply” and then “Ok”.
6. Then the software will run smoothly.
7. If this error occurs then every time you boot your computer you will have to follow these steps to run the software.

- For Printer set up error refer below link https://support.hp.com/in-en/printer

  https://support.hp.com/in-en/help/windows-10-support-center

10. Comparison of all models

✓ -- Available

✘ --Not Available

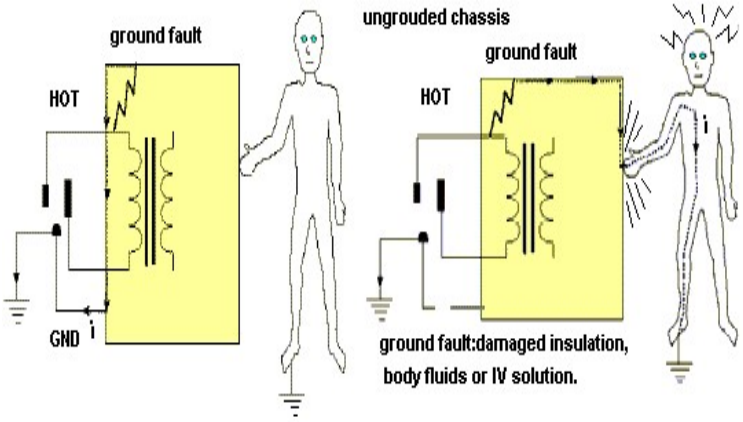
Specification	Basic	Standard	Deluxe	DEDICA
Touch screen	✘	✘	✘	✓
Screen size	15″	15″	17″	17″
Acquisition screen	3 lead	3 lead , 12 lead	3 lead , 12 lead	3 lead ,4 lead 12 lead
Display of Sweep speed	✘	✘	✘	✓
ST Integral	✘	✘	✘	✓
Superimposition of median	✘	✘	✓	✓
Zoom of median	✘	✘	✓	✓
Enlarge median with fiducial point —manual mode	Any of 12 leads	Any of 12 leads	Any of 12 leads	Any of 12 leads
Enlarge median — Auto mode	Lead having max.ST depression	Lead having max.ST depression	Lead having max.ST depression	Lead having max.ST depression

Specification	Basic	Standard	Deluxe	DEDICA
Basal medain	Displayed in Exercise stage	Displayed in Exercise stage	Displayed in Exercise stage	Displayed in Exercise stage
Peak exercise median	Displayed in Recovery stage	Displayed in Recovery stage	Displayed in Recovery stage	Displayed in Recovery stage
Alarm for ST level limit	✗	✗	✗	✓
Manual Online printing—Raw ECG and Link median report	✓	✓	✓	✓
Automatic online printing	✗	✓	✓	✓
Link median report	✓	✓	✓	✓
Mixed median report	✓	✓	✓	✓
Advanced mixed median report	✗	✗	✓	✓
Extended mixed median report	✗	✓	✓	✓
Rhythm(long) lead report	✓	✓	✓	✓
Stage report	✓	✓	✓	✓
Summary report	✓	✓	✓	✓

11. Appendix A

- **Earthing**

The Earthing for the system should be proper. This is to ensure patient safety and for no interference of line voltage fluctuations. For correct Earthing procedure, refer to work order booklet and get it done and approved from licensed electrician only.
If the Earthing is not proper, leakage currents may pass from the amplifier to ground through the patient. If the current magnitude is large, it can be harmful for the patient.



- **Read instruction manual carefully, before you operate the system.**
- Please do not open the instrument. No user serviceable parts inside the unit.

- **Indications for stress test**

Following are the indications for stress testing.

1. Evaluating the patient with chest pain or with other findings suggestive but not diagnostic of coronary disease.
2. Determining prognosis and severity of the disease.
3. Evaluating the effects of medical and surgical therapy.
4. Screening for latent coronary disease.
5. Evaluation of congestive heart failure.
6. Evaluation of arrhythmias.
7. Evaluation of functional capacity and formulation of exercise prescriptions.
8. Evaluation of congenital heart disease.

- **Absolute contraindications for stress test**

1. Patients with an acute myocardial infraction.
2. Patient suffering from acute myocardities or pericardities.
3. Patient exhibiting signs of unstable progressive angina.
4. Patient with rapid ventricular or atrial arrhythmias.
5. Patient with second or third degree heart block and patients with know severe left main disease.
6. Acutely ill patients, such as those with infections.
7. Patient with locomotion problems.

- **Relative contraindications for stress test-**

1. Aortic stenosis.
2. Suspected left main equivalent.
3. Sever ST depression at rest.
4. Sever hypertension.
5. Congestive heart failure.

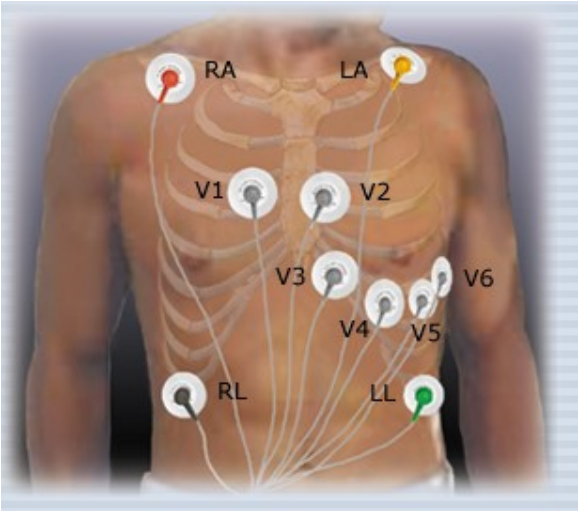
12. Appendix B

a. Patient preparation

Proper patient preparation is the most important factor in obtaining proper results from a Dedica system. If electrodes are applied to improperly prepared skin site then this may result in excessive base line shift and severe artifact while obtaining an ECG.

The skin at 6 chest leads and 4 limbs leads sites has to be prepared.

b. Electrode placement

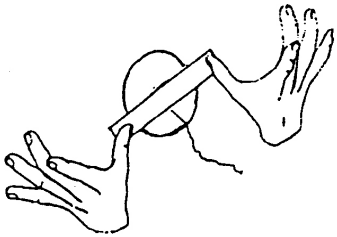


Electrode Placement

Place electrode one by one on selected sites. Press the electrodes from inside to outside covering entire electrode area.

Take care that gelled pad is in firm contact with the skin surface.

Place patient lead on all electrodes as shown in Figure.



Apply Medical adhesive tape (dressing tape / bandage tape) across the electrode.

- Apply some jelly to the electrode site and thoroughly rub the site with gauze till it becomes slightly red. This removes the horny non-conducting layer of the epidermis enabling a good electric contact with the body fluids.
- Remove all the traces of jelly by wiping the abraded site with warm dry cloth and completely dry up the site with dry towel. The skin must be clean, dry and completely free of jelly for the electrodes to remain well in position till the end of ECG acquisition.
- Take and electrode and peel it opens from its plastic backing. Finger contact with the adhesive should be minimized and the jell in the foam pad should not be disturbed. If the jell has dried out then discard the electrode.

- Apply the electrode to the prepared site and run your fingers around the foam pad smoothing it from the center out. Repeat this procedure for all sites

NOTE

We recommend the use of good quality disposable electrode (With one time usage only).

No assurance of quality result can be given if reusable electrodes are used.

c. SYMBOL Description

Symbol	Description
CAUTIONS:	Cautions indicate conditions which may damage or malfunction of the device.
WARNINGS:	Warnings indicate a potential harmful condition that can possibly lead to injury or death.
Note:	Note: Alert the user to pertinent fact and conditions.
Mfg .Lic.No	Manufacturing license number
	Manufacturer symbol,
MD	Medical Device

	Type CF applied part
SN	Serial number
	Keep dry
	Dispose of in accordance with the requirements of your state
	Instruction for use
NON STERILE	Medical device that has not been subjected to a sterilization process.

d. General precautions for using the treadmill

Read this section before operating the treadmill.

- Keep the area underneath the treadmill clear.
- Do not start the treadmill when someone is standing on the belt.
- Do not leave a patient unattended on the treadmill.
- Do not stop the treadmill if someone is walking on it except in case of emergency. Keep speed and grade at minimum when patients are getting on the treadmill.

e. SAFETY WARNINGS AND CAUTIONS

Safety Warnings & Caution that apply to Treadmill 'ST-Win System'

Warnings and cautions are used in this manual to provide additional information to service per

WARNING DEDICA system, Treadmill should be used by trained person only.
WARNING:

Report generated from Dedica software must be reviewed by qualified physician before giving any treatment to patient

WARNING For continued safe use of this equipment, it is necessary that the listed instructions are followed. However instructions listed in this manual in no way supersede established medical procedures concerning patient care.

WARNING For continued protection against fire hazard, replace only with same type and rating of FUSE

WARNING The interconnection of auxiliary equipment with this device may increase the total leakage current. This may result in excessive leakage current, as established by the applicable standards.

WARNING The Treadmill belt will stop suddenly and may cause injury to the patient if TREADMILL STOP IS pressed, a power outage happens, or a hardware or software failure occurs to the equipment controlling the Treadmill.

WARNING The Treadmill is a potentially dangerous piece of equipment. The motor is capable of bringing the treadmill

belt to the maximum speed in only a few seconds. Because of this, a great deal of care must be exercised in starting and stopping the treadmill. It is extremely hazardous to have a person standing on the treadmill when starting the treadmill at speeds above few Km per hour. Severe bruise and skin abrasions can result from failing on the belt with the treadmill operating at the higher speeds.

WARNING High Voltage exists in the equipment. Refer service to qualified service personnel. To prevent electric shock, be sure to use insulated tools when working on the unit. In addition, it is suggested that any jewelry be removed and that only one hand be used when working on the equipment whenever possible.

WARNING When working on the treadmill with the hood removed, there are various moving parts that can catch and pull loose clothing (like ties, scarves, and jewelry), and long hair in. This can cause serious injury. Remove or secure loose clothing and jewelry. Secure long hair to keep it from dangling into the treadmill.

WARNING CONNECTION TO MAINS —The mains plug must be connected to an appropriately grounded power supply.

WARNING DEFIBRILLATOR PRECAUTIONS — Do not come into contact with patients during defibrillation. Otherwise, serious injury or death could result.

WARNING MAGNETIC AND ELECTRICAL INTERFERENCE Magnetic and electrical fields are capable of interfering with the proper performance of the device. For this reason make sure that all external devices operated in the vicinity of the device comply with the relevant EMC requirements. X-ray equipment or MRI devices are possible sources of interference as they may emit higher levels of electromagnetic radiation.

⚠ CAUTION

- Failure on the part of the responsible individual, hospital, or Institution employing the uses of this equipment to implement a satisfactory maintenance schedule may cause undue equipment failure and possible health hazards.

- To reduce the risk of electric shock, do NOT remove cover. Refer servicing to qualified personnel.

- Refer servicing for equipment under warranty to NASAN Authorized service personnel, Any attempt to repair equipment that is under warranty may void that warranty.
- When handling printed circuit board, remember to take static precautions.

- Solder multilayer and surface mount circuit boards at your own risk! Improper methods of repairing these boards may damage boards even further.

- NASAN recommends that only properly qualified service personnel with the proper equipment attempt soldering on multilayer and surface mount circuit boards.

- PROPER LEADWIRE CONNECTION: Improper connection will cause inaccuracies in the ECG.
- Dispose of waste material according to local regulations and laws regarding medical

- Check lead wires (ECG cable), the cable between the PC and the treadmill, and treadmill controller, power cords daily for any worn or cracked insulation to ensure that no inner conductive material is exposed. Discard worn accessories and replaced them.

f. Maintenance and Cleaning Instruction:

Recommended Maintenance

A regular equipment maintenance program helps prevent unnecessary equipment and power failures and also reduces possible health hazards. This chapter contains instructions for the following recommended maintenance:

1. **Inspecting and cleaning**
2. **Domestic Electrical safety test**
3. **Calibration**

Required Tools and Supplies

To maintain and repair the treadmill, you will need the following:

- **Standard hand tools**
- **Digital multimeter**
- **Clamp meter**
- **Anti-septic cleaner**
- **Dust remover**
- **Silicon oil**

1. Inspection and cleaning

Visual Inspection

Regularly inspect the AC power cord and all other cords and cables for fraying or other damage. Perform safety tests on any repaired line cords.
Inspect all plugs, cables and connectors for bent prongs or pins.
Verify that all cords, components, and connectors are securely seated.
Inspect the following for excessive wear or damage:

- **Walking belt**
- **Drive belt**
- **Handrail and hardware**
- **Test the stop switch assembly monthly**

Cleaning

Before cleaning ensure that the treadmill controller and treadmill system is off.

- Wipe off the sweat from the handrail and the deck anyone using it after every test.
- Demanding you wipes all the germs off the machine
- Use antibacterial wipes or sanitizer before and after use.
- Clean the exterior surfaces with a clean, soft cloth and Colin.
- Vacuum around and under the treadmill to pick up dust and debris that could get under the belt or in the electrical component.

- Complete any pre-service procedures prior to opening the unit or performing

any interior cleaning. Clean the unit as needed, but at least once per quarter.

Approved Cleaning Solutions

a. Mild soap and water

⚠**CAUTIONS:** Do not use strong solvents or abrasive cleaning materials. Do not use any of the following to clean the machine:

a. Acetone

b. Iodine-based cleaners

c. Phenol-based cleaners

d. Ethylene oxide sterilization

e. Ammonia-based cleaners

Treadmill controller and body level amplifier and patient data cable should not be autoclaved, ultrasonically cleaned, or immersed.

2. Domestic Electrical safety test

AC Line VoltageTest

This test verifies that the domestic wall outlet supplying power to the Equipment is properly wired.

1. Voltage between G- N --- should be <5Vac.
2. Voltage between L- E ---- should be from 220V to 240V.
3. Voltage between L- N --- should be from 200V to 240V.

3. Calibration

Refer utilities -Calibrate grade and speed in Chapter 8 from this manual

13. Appendix C-

ST-Win unit specifications-

❖ ECG Amplifier

- Input dynamic range: +/-5mVAC+/-500mVAC
- Gain: 1000
- CMRR: >120dB
- Frequency respomnce:0. 05Hz to 100 Hz
- Patient Isolation: Through optocoupler
- Resolution: 12 Bit
- Sampling rate: 250 samples per second simultaneous
- 256 pole DSP filter for removal of noise and base line wonder
- Acquisition and filtering using DSP

❖ Electrical:

- Operates on 230 VAC+/- 10% @ 50Hz mains, 1.5A, single phase
- Power consumption:0.35KVA

❖ Environmental:

- Operating temperature range: -5 to 50°C
- Humidity: 0 to 95% Non condensing

Detailed features

1. **Acquisition display modes**
   a. **12 lead display**

i. Display 12 lead, 4 second ECG on First screen. Enlarged Medians next to each lead are displayed.
ii. Configurable zoom factor for enlarged median: 2, 3, 4 times.
iii. In exercise stage Basal Enlarged medians and current Medians are superimposed.
iv. Facility to move superimposed medians.

b. **3 lead display**

i. 8 seconds display of 2 leads of ECG + 1 QRS detection Lead.
ii. Facility to configure 3 leads to any of the 12 ECG leads
iii. Display lead sets (I, II, III) OR (aVR, aVL, aVF) OR (V1, V2, V3) OR (V4, V5, V6)
iv. An enlarged Exercise median of the minimum ST level lead with fiducial points marked is displayed. (The enlarged median can be any of the 12 leads in Manual Mode. In Automatic mode, the lead having maximum ST Depression is displayed by the system.)
v. Along with enlarged median, basal median is displayed in exercise stage and peak exercise median is displayed in recovery for comparison
vi. Facility to compare medians side by side and superimposing on each other by moving median
vii. Printer status check message

c. **4 lead display**

i. 8 seconds display of 3 leads of ECG + 1 QRS detection Lead.
ii. Facility to configure 4 leads to any of the 12 ECG leads
iii. ST Integral display
iv. Enlarged median of the lead having minimum ST depression with fiducial points marked displayed along with basal or peak exercise median

d. **Online display of following parameter in all display modes**
   i. Sweep speed
   ii. METS
   iii. Heart rate is updated every 4 seconds with symbol and Target heart rate with percentage of completion target heart rate.
   iv. BP in mmHg
   v. ST measurement Mode (Manual / Auto)
   vi. Current ST Level and ST Slope of enlarged median
   vii. ECG gain with standardization pulse
   viii. Test and Phase duration in hh:mm format
   ix. Exercise protocol stage name
   x. Detection of **P**remature **V**entricular **E**ctopic

e. **Online printouts**
   Facility to print selected online reports
   i. Linked Median report (12 linked medians with ST Levels of selected long lead)
   ii. 12 lead Raw ECG report

f. **Automatic Reports**
   Facility to print selected stage reports automatically

i. Linked Median report (12 linked medians with ST Levels 1 long lead)
ii. 12 lead Unaveraged ECG report
iii. 12 lead Raw ECG report
iv. Rhythm report – 12 leads of 5 seconds or 6 leads of 10 seconds
v. Mixed Median report with one Median complex + 2.5 seconds ECG of each lead
vi. Advanced mixed median report.
vii. Extended Mixed Median Report - One Median complex + One Basal Median complex + 2.5 seconds ECG of each lead
viii. Selected median report

g. **Stage reports configuration includes**
   i. Reports at stage end
   ii. At set interval in 'EXERCISE' and 'RECOVERY' stage
   iii. Automatic 'PEAK EXERCISE' Linked Median printout
   iv. 6 leads of 10 seconds OR 12 leads of 5 seconds selection for Rhythm Report
   v. Automatic 'PEAK EXERCISE' Linked Median printout (10 seconds after Exercise is stopped).
   vi. Grid On/Off

h. **Acquisition settings**
   i. Facility to enter BP 50 seconds before end of each exercise stage
   ii. ECG sweep speed: 12.5, 25, 50 mm/sec
   iii. Relearn the median template
   iv. Facility to enter a stage comment in each phase
   v. Change the QRS detection lead

vi. Automatic/Manual detection of fiducial points (E, J, Post J)
vii. Hold/Release treadmill stage
viii. QRS beep On/Off
ix. NASAN filters ON/OFF

2. Recovery

a. Facility to compare basal median is displayed in exercise stage and peak exercise median is displayed in recovery stage

3. Review

a. Review data of selected patient
b. Grid/Graph/No grid option on all review screens
c. Facility to edit HR and BP of any stage
d. Facility to send reports through mail
e. Facility to edit Patient Details
f. 12 medians screen
g. 12 medians are displayed with ST-level and ST-Integral
h. Mixed Median report with one Median complex + 2.5 seconds ECG of each lead
i. Facility to zoom median of selected lead and edit fiducial points
j. Trends
k. Trends of HR, BP, ST Level, ST Slope, J Amplitude, R-Wave amplitude, METs, PVC per minute & RPP
l. 8, 16, 32, 48, 56 seconds resolution.
m. View and print rhythm strips marked during acquisition. Facility to select 12 leads of 5 sec. OR 6 leads of 10 seconds for each printout
n. View unaveraged ECG
o. Superimpose medians of any 2 stages in different colours.
p. Full wave disclosure of 1 minute of any lead
q. Edit and print Summary Report using standard edit options

2. Reports

a. 12 lead linked median (single / all stages)
b. Mixed Median Report
c. 6 lead Rhythm report of 10 seconds (single / all stages)
d. 12 lead Unaveraged ECG report
e. Extra Comments report
f. Stage Report
g. Brief Summary Report
h. Trends Report (HR, BP, ST Levels / ST Slopes, J Amplitude of 3 configured leads, R-Wave amplitude, METs, PVC per minute & RPP
i. Full wave disclosure of 1 minute of any lead
j. Facility to print superimposed medians of any 2 stages in different colours
k. Summary Report (Hospital Address and referring doctor designation to be printed in Summary reports)
l. Advance Mixed Median Report
m. ST-Levels & Slopes Table
n. Extended Mixed Median Report
o. Selected median report

- **Configuration mode**
  i. Hospital details
  ii. Referring Doctor list
  iii. Standard Summary report option
  iv. ST-Win system configuration
  v. Treadmill protocol
  vi. Available standard protocols
    1. BRUCE
    2. MODIFIED BRUCE
    3. NAUGHTON
    4. MODIFIED BALKE
  vii. Printing details configuration
  viii. System configuration
    1. Speed in km/hr or m/s
    2. TM speed at exercise stop (slow-0 km/hr,Fast-0 km/hr, 1.2 km/hr)

3. ST Level lead in Summary
4. Long lead in reports
5. Screen Display leads (3)
6. 3 Leads in Trend Report
7. Stage Report Leads
8. Treadmill Support: Compact, Treadstar, XP, Trackmaster
9. COM Port Selection for amplifier and for treadmill.
10. Median update time is configurable to 1 to 8 sec.

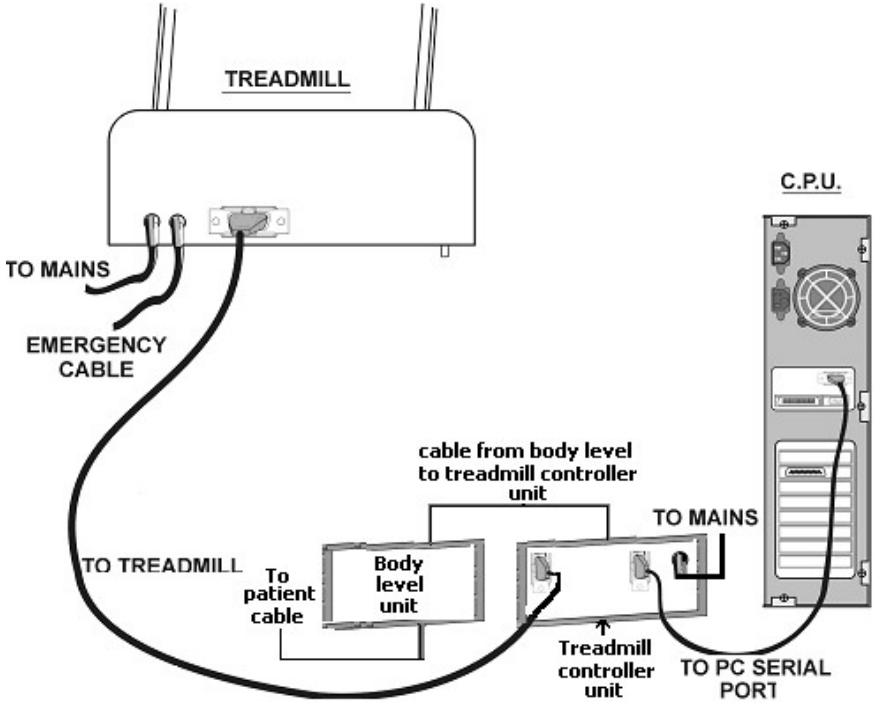
- **Utilities**
  a. Test Treadmill
  b. Test acquisition unit
  c. Calibrate TM Speed
  d. Calibrate TM Grade
  e. Delete printout from printer queue

- **Hotkeys:**

Following hotkeys are provided for fast and easy operation

- ON/OFF
- Change display(Select display mode: 3 or 4 or 12 lead mode)
- Relearn template
- Amplify QRS
- Print Raw ECG report
- Print Linked Median report
- QRS Beep ON / OFF
- Enlarge median
- Stop Test
- Treadmill – Speed ↑↓ and Grade ↑↓

Interconnection diagram- ST WIN with Body level unit



WARNING:

DO NOT CONNECT OR REMOVE ANY CABLE WHEN INSTRUMENT IS POWERED ON.

Note: Always connect Body level amplifier while taking new test and Calibration of treadmill.

Note: This product should be used by trained person only.

Software Installation:

NOTE:

Software link on NASAN website is https://nasanmedical.com/download-centre.html
Whenever you download the software from NASAN website, ensure that WINZIP software is installed on customer PC.
After downloading the software from NASAN website, it is in zipped folder then unzip (For unzip WINZIP software is required) it, then install the software

To install the Software in PC, follow the steps mentioned below:

- Open the folder 'disk1' and double click the '**Setup** 'icon as shown below in figure

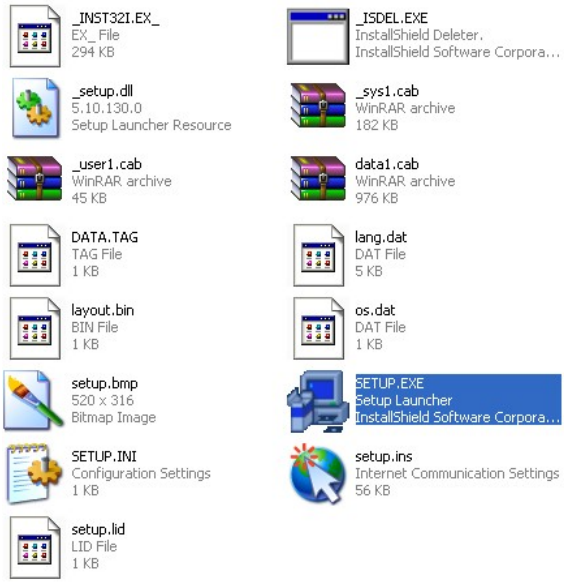


Fig: Installation setup.

- Run '**Setup**.**exe**' (Setup icon) and follow the installation steps.
- Double click on the icon on the desktop to run the software

Driver Installation Procedure

Note: copy ST WIN software and FTDI driver for all OS to desktop or any drive(drive D or drive E) from \Utility\FTDI driver for all OS to install it on PC

a. Initially install ST WIN software on your PC.

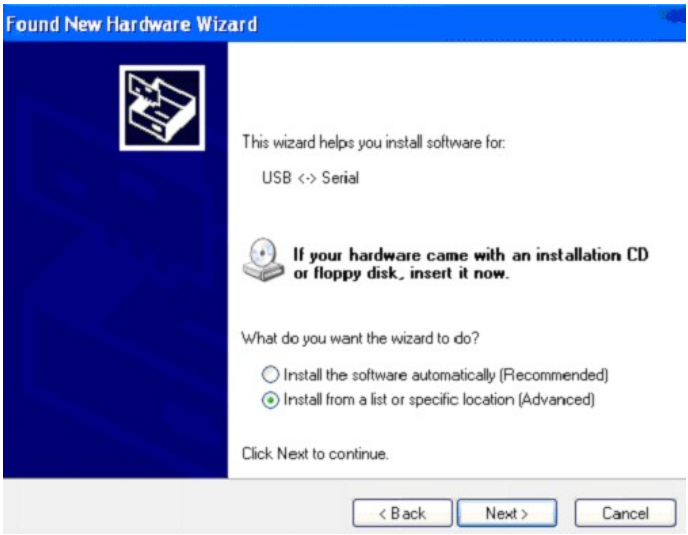
b. Connect Treadmill controller unit to USB Port of PC.

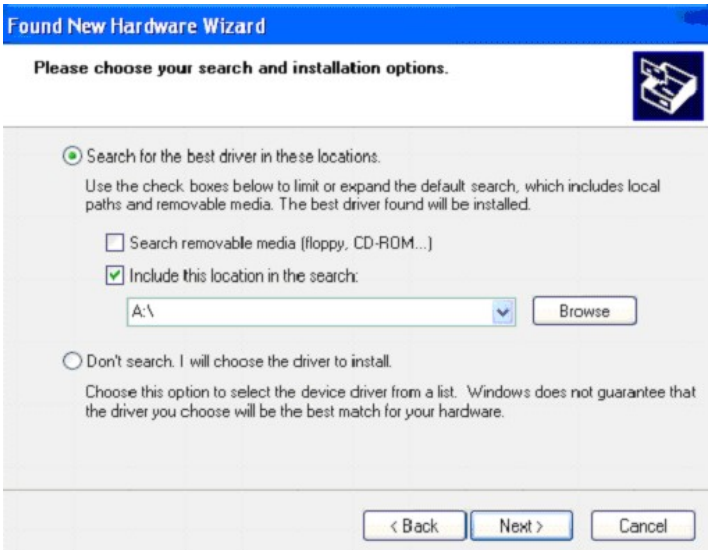
c. Following message will be displayed at the bottom right-side corner on the PC screen.

d. The following dialog box will be displayed on the screen. Follow the instruction on wizard to continue the installation.

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel

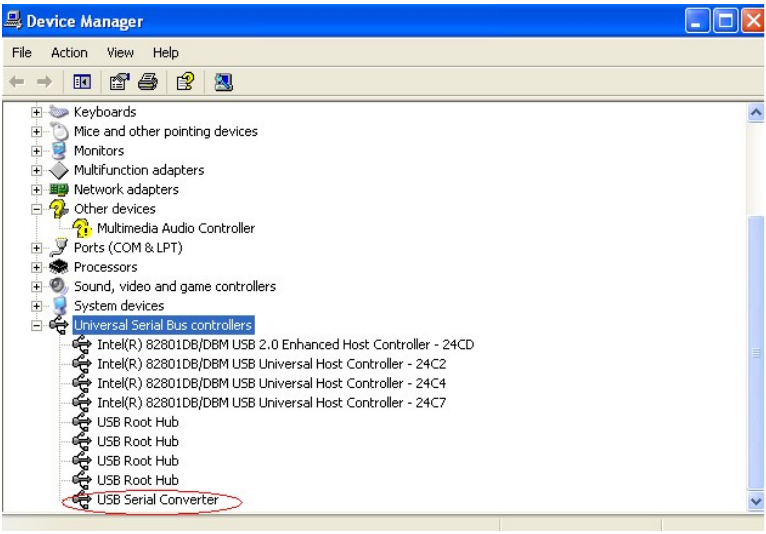

Found New Hardware Wizard
This wizard helps you install software for:
USB <-> Serial
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel


Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
A:\
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel

Click the Browse button and give the FTDI driver path **from copied drive. FTDI driver for all OS**

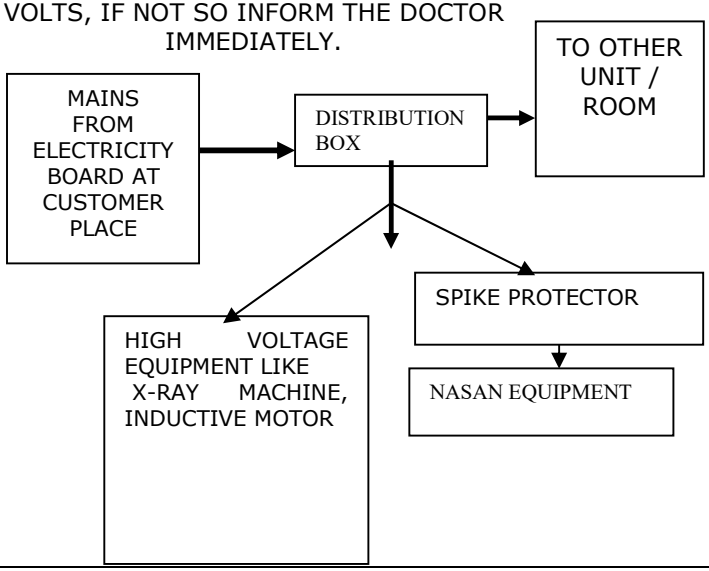
e. Click NEXT button.

f. By examining the **device manager** located in **control panel** then select the **Hardware** tab and click **device manager**. The device appears as a "USB serial converter" as shown below. Thus driver installation is complete.


Device Manager
File
Action
View
Help
Keyboards
Mice and other pointing devices
Monitors
Multifunction adapters
Network adapters
Other devices
Multimedia Audio Controller
Ports (COM & LPT)
Processors
Sound, video and game controllers
System devices
Universal Serial Bus controllers
Intel(R) 82801DB/DBM USB 2.0 Enhanced Host Controller - 24CD
Intel(R) 82801DB/DBM USB Universal Host Controller - 24C2
Intel(R) 82801DB/DBM USB Universal Host Controller - 24C4
Intel(R) 82801DB/DBM USB Universal Host Controller - 24C7
USB Root Hub
USB Root Hub
USB Root Hub
USB Root Hub
USB Serial Converter

14.Training & installation

POINTS COVERED DURING TRAINING

Sr	POINTS	SIGN
1	UNPACK THE TREADMILL	
2	REPORT TO H.O. FOR ANY PHYSICAL DAMAGE	
3	UNPACK ALL BOXES & INFORM H.O. IF MATERIAL IS NOT AS PER PACKING LIST OR NOT AS PER PRODUCT REQUIREMENT.	
4	ENSURE THAT SEPARATE EARTHING IS PROVIDED AND VOLTAGE BETWEEN EARTH AND NEUTRAL IS BELOW 3 VOLTS, IF NOT SO INFORM THE DOCTOR IMMEDIATELY. 	
4 A)	ENSURE THAT THE LINE GETTING DISTRIBUTED FROM THE DISTRIBUTION BOX DOES NOT HAVE ANY HIGH VOLTAGE MACHINE IN PARALLEL WHERE THE NASAN MACHINE HAS TO BE CONNECTED. IN THIS CASE CHANGE EITHER PLACE A SPIKE PROTECTOR AS SHOWN OR CHANGE THE LINE.	
4 B)	ALSO ENSURE THAT THE AC MAINS HAS VOLTAGE RANGE IN BETWEEN 230 V ac + / - 10 %, IF THE VOLTAGE	

	FLUCTUATES THAN USE SERVO STABILISER 5KV for TREADMILL TO MAINTAIN THE VOLTAGE.	
5	ENSURE THAT SUPPLY FOR TREADMILL, PC AND TREADMILL CONTROLLER IS TAKEN FROM ONE AND SAME ELECTRICAL EXTENSION BOARD	
6	ENSURE THAT ALL ELECTRICAL POINTS HAVE PHASE ON YOUR RIGHT SIDE, NEUTRAL ON LEFT SIDE.	
7	FIX HANDLES AND ENSURE THAT INDEPENDENT TEST OF TREADMILL IS OK	
8	CONNECT TREADMILL TO TREADMILL CONTROLLER, CONNECT TREADMILL CONTROLLER TO PC SERIAL /USB PORT .Connect Body level amplifier to Treadmill controller.	
9	WHILE TESTING TREADMILL INDEPENDENTLY, ENSURE THAT THE CONVEYOR BELT IS NOT TOUCHING EITHER SIDES OF THE TREADMILL	
11	ENSURE THAT PRINTER WITH DRIVER SOFTWARE IS AVAILABLE, LOAD DRIVER S/W, SET PAPER SIZE TO 'A4' AND MODE TO 'LANDSCAPE'	

Sr.	TRAINING JOB CARD	**SIGN**
1	Click Power ON button on keboard to start DEDICA	
	Enter user name -Dedica and password -dedica	
	Dedica software will get opened.	
	Note: Always connect Body level amplifier while taking New test and Calibration of treadmill.	
2	SET THE TREADMILL TYPE (TREADSTAR XP) AS PER REQUIREMENT	
3	Switch on the treadmill and treadmill controller.	
4	Ensure that usb option is selected from Dedica-configure-configure system	
5	Test the communication of treadmill controller and treadmill with pc by selecting test acquisition option from dedica software utility-test acquisition	

6	Do speed calibration and ensure that speed is correct in protocol	
7	Do elevation calibration and ensure that elevation is correct in protocol	
8	Enter the hospital details and name of doctor	
9	Do printer settings in stwin and in printer driver s/w	
10	Prepare demo patient and do one test	
11	If dummy test is ok call doctor for training	
12	Explain the printout settings in stage report protocol to doctor	
13	Explain what will happen if automatic printouts button is clicked (all printouts which are enabled in stage report protocol, will get printed during test)	
14	Explain what will happen if adavance stage button is not clicked(dr. Will not be able to advance exercise stage manually)	
15	Ask the doctor to conduct test indpendently until he is confident.	
16	Take prints and take installation report duly signed by doctor	
17	Press 'exit' button on screen to shut down the complete dedica system.	

HOW TO CONDUCT STRESS TEST WITH LIVE PATIENT		
Sr.	**STEP**	**SIGN**
1	EXPLAIN HOW TO PREPARE THE PATIENT WITH SPIRIT SOLUTION, ASK TO SHAVE THE PATIENT IF HE IS HAIRY	

2	RUN STWIN SOFTWARE ,(NEW TEST) , FILL IN PATIENT DETAILS, ASK DOCTOR TO SELECT THE REQD PROTOCOL AND EXPLAIN IMPORTANCE OF AGE WITH RESPAECT TO TARGET HEART RATE	
3	CHANGE QRS LEAD TO ANY LEAD NOT HAVING TALL R WAVE AND EXPLAIN EFFECT ON HEART RATE. (GO TO MENU, AND CLICK CHANGE QRS LEAD BUTTON TILL THE QRS LEAD APPEARS AS REQD)	
4	LET THE PATIENT BE SEATED ON CHAIR, START TEST AND EXPLAIN HOW TO CHECK ECG QUALITY IN PRE TEST STAGE. IF ECG QUALITY IS NOT GOOD, PREPARE THE PATIENT AGAIN.	
5	EXPLAIN WHAT IS MEANT BY MEDIANS DISPLAYED AT RIGHT HAND CORNER	
6	EXPLAIN THE TIME DISPLAYED ON THE RIGHT HAND CORNER	
7	EXPLAIN ABOUT THE AUTO MEDIAN SETTING AND HOW TO SET IT TO MANUAL MEDIAN, GO TO MENU, CLICK MANUAL MEDIAN BUTTON AND GO ON CLICKING CHANGE MEDIAN BUTTON TILL THE REQD MEDIAN IS DISPLAYED ON SCREEN	
8	AGAIN SET THE MEDIAN TO AUTO MODE, AND SHOW THAT THE LEAD HAVING MAXIMUM ST DEPRESSION IS DISPLAYED AS ENLARGED. ALSO EXPLAIN THAT THE ST LEVEL AND ST SLOPE IS DISPLAYED ON SCREEN.	
10	EXPLAIN ABOUT TARGET HEART RATE AND HOW IT IS CALCULATED	
11	EXPLAIN ABOUT THE QRS DETECTION LEAD AND ITS IMPORTANCE OF TALL R WAVE	
12	ADVANCE THE STAGE TO STANDING	
13	EXPLAIN HOW TO ENTER THE COMMENT PER STAGE	
14	EXPLAIN HOW TO CHANGE 3 LEAD MODE TO 12 LEAD MODE	
15	EXPLAIN THE MARKING OF E , J, POST J POINT IN AUTO MODE , TELL THE DOCTOR HOW TO CHANGE THESE POINTS IN MANUAL MODE. HERE GO TO MENU , CLICK 'MANUAL POINTS' , CLICK 'E' POINT AND SHOW HOW TO SHIFT IT TO LEFT OR RIGHT. ALSO EXPLAIN HIM THAT IN MANUAL MODE HE SHOULD CONFIRM THAT THE MARKINGS ARE CORRECT, AND AT HIGHER HEART RATES HE SHOULD CHANGE THE 'POST J' POINT TOWARDS RIGHT DIRECTION IF NEEDED	

16	ADVANCE TO SUPINE STAGE , HERE THE PATIENT SHOULD BE IN RESTING POSITION ASK HIM TO MEASURE THE BP AND ENTER IT IN PC BY CLICKING BP BUTTON. IF AUTOMATIC PRINTOUT IS ENABLED IN CONFIGURE MENU, AND PRINTOUT IS SELECTED FOR PRE-TEST STAGE IN STAGE REPORT PROTOCOL, ONE AUTOMATIC PRINT WILL COME AS PER PRINTOUT SETTINGS DONE.	
17	ADVACE TO STANDING STAGE , NOW THE PATIENT SHOULD BE IN STANDING POSITION, ASK DOCTOR TO ENTER THE BP, SAME AS IN SUPINE STAGE	
18	ADVANCE TO HYPERVENTILATION STAGE, NOW ASK THE PATIENT TO BREATH FAST AS FAR AS POSSIBLE, HERE ASK DOCTOR TO OBSERVE ANY ABNORMAL CHANGES IN ECG	
19	NOW ADVANCE TO WAIT FOR EXERCISE STAGE , NOW ASK THE PATIENT TO STAND ON CONVEYYOR BELT, SWITCH ON TREADMILL AND ENSURE THAT THE EMMERGENCY STOP SWITCH IS IN RELEASED CONDITION, CLICK MENU BUTTON , CLICK SPEED BUTTON , AND INCREASE THE SPEED SLOWLY . IN THIS STAGE DOCTOR CAN TEACH THE PATIENT HOW TO WALK ON TREADMILL WHEN THE BELT STARTS ROTATING	
20	ADVANCE TO STAGE 1 , NOW ASK THE PATIENT TO REMAIN AT THE CENTRE OF THE BELT,OTHERWISE THE PATIENT MAY FALL DOWN	
21	IN STAGE ONE ASK THE DOCTOR TO KEEP WATCH ON ST LEVELS OF ALL LEADS	
22	EXPLAIN THE DOCTOR ABOUT TWO TIMINGS BEING DISPLAYED AT TOP, FIRST IS THE TOTAL TIMIMG OF THE TEST, AND THE BOTTOM ONE IS THE TIMING OF THE CURRENT STAGE	
23	AFTER TWO MINUTES A BEEP WILL BE HEARD AND BP ENTERING WINDOW WILL BE DISPLAYED. ASK DOCTOR TO TAKE BP OF THE PATIENT AND ENTER THE SAME IN THIS WINDOW	
24	AFTER THREE MINUTES THE STAGE WILL ADVANCE TO STAGE 2 , HERE TELL THE PATIENT THAT NOE THE SPEED WILL INCREASE AND HE HAS TO WALK FAST	
25	EXPLAIN THE DOCTOR THE USE OF RECORD RHYTHM BUTTON. IF PATIENT HAS ANY ARRYTHMIA, DOCTOR CAN RECORD THIS RHYTHM BY CLICKING RECORD RHYTHM BUTTON.	
26	EXPLAIN USE OF RECORD UN-AVARAGED ECG BUTTON. BY CLIKING THIS BUTTON DOCTOR CAN RECORD THE UN-AVARAGED ECG AT THE PERTICULAR INSTANT	

27	LIKEWISE CONTINUE THE TEST TILL THE DOCTOR ASKS TO STOP THE TEST. FOR THIS, DOCTOR CAN CLICK STOP TEST BUTTON OR HE CAN PRESS F5 KEY ON THE KEYBOARD	
28	HERE THE PRESENT STAGE WILL BECOME PEAK EXERCISE STAGE, AND AFTER THIS RECOVERY 1 STAGE WILL START.	
29	AS SOON AS TREADMILL DE-ELEVATES TO BOTTOM AND THE BELT SPEED BECOMES ZERO, ASK THE PATIENT TO COME DOWN FROM TREADMILL AND SIT ON CHAIR.ASK DOCTOR TO PRESS EMMEGENCY STOP SWITCH	
30	NOW THE PATIENT IS IN RECOVERY 1 STAGE, AFTER THREE MINUTES RECOVERY 3 WILL START, AFTER FISRT SIX MINUTES RECOVERY 6 WILL START.	
31	IF THE DOCTOR WANTS TO STOP THE TEST , ASK HIM TO CLICK REVIEW TEST BUTTON	
32	ASK DOCTOR TO REMOVE THE PATIENT CABLE AND THE ELECTRODES	
33	SHOW DOCTOR HOW TO EDIT SUMMARY REPORT (CLICK EDIT AND CLICK SUMMARY REPORT)	
34	EXPLAIN THE DOTOR THAT HE CAN TAKE ALL THE PRINTOUTS IN REVIEW MODE, IF HE DON'T WANT ANY ON LINE PRINTOUTS.	

FOLLOWING MENU'S SHOULD BE COVERED IN THE SOFTWARE TRAINING

Sr.	POINTS	SIGN
1	EXPLAIN EACH OF FOLLOWING OPTIONS TO DOCTOR WITH THEIR IMPORTANCE	
2	**FILE:** NEW TEST	
3	REVIEW TEST	
4	RERUN TEST	
5	SAVE TEST FOR BACKUP	
6	REVIEW SAVED TEST	
7	PRINT PREVIEW	
8	PRINT SETUP	
9	**EDIT:** PATIENT DETAILS	
10	SUMMARY REPORT	
11	MARKED PAGES	
12	**CONFIGURE:** HOSPITAL DETAILS	
13	STANDARD SUMMARY OPTIONS	
14	CONFIGURE SYSTEM	
15	TREADMILL PROTOCOL	
16	PRINTING DETAILS	
17	**UTILITIES:** TEST TREADMILL	
18	TEST ACQUISITION	
19	CALIBRATE GRADE	
20	CALIBRATE SPEED	
21	DELETE PRINTOUTS FROM PRINTER QUEUE…	
23	**LIVE TEST:** 3 OR 12 LEAD MODE	
24	TRACE 1	
25	TRACE 2	
26	QRS LEAD	
27	LEAD SETS	
28	MANUAL POINTS	
29	MANUAL MEDIAN	

30	AUTO MEDIAN	
31	CHANGE MEDIAN	
32	ADV	
33	GAIN	
34	BP	
35	COMMENTS	
36	RELEARN	
37	AMP QRS	
38	RHYTHM	
39	SAVE-UN AVE ECG	
40	SAVE-RAW ECG	
41	**PRINT-** LINKED MEDIAN	
42	**PRINT-** RAW ECG	
43	**CONFIGURE-**STAGE REPORT PROTOCOL	
44	EDIT HR	
45	EDIT BP	
46	DISPLAY MEDIAN	
47	DISPLAY MIXED MEDIAN	
48	SUPERIMPOSE MEDIAN	
49	REVIEW RHYTHM	
50	REVIEW UN AV ECG	
51	FULL DISCLOSURE	
52	SELECT TREND	
53	SELECT STAGE	
54	RESOLUTION	

FEEDBACK FORM AFTER TRAINING: -

Tick mark (✓) the selected one

Sr	POINTS	GOOD	BETTER	BEST
1	HOW WAS THE TRAINING			
2	COMMUNICATION SKILL OF TRAINER			
3	PROMPTNESS OF CONDUCTING TRAINING			
4	WAS THE TRAINER ABLE TO ANSWER ALL YOUR QUERIES			
5	DID THE TRAINER MADE THE PRODUCT USER FRIENDLY			

THIS IS TO DECLARE THAT MYSELF DR

HAVE GONE UNDER THE TRAINING AND HAVE UNDERSTOOD THE
POINTS COVERED IN THE TRAINING.

NAME OF THE SERVICE ENGINEER - _____

NAME OF THE DOCTOR - _____

SIGNATURE OF THE SERVICE ENGINEER - _____

SIGNATURE OF THE DOCTOR - _____

15. Appendix D-

Defragmentation of the hard disk is a recommended job to do at least once in 3/4 months. This is because as the number of test conducted get increased doctors stats deleting the tests. The tests are stored randomly on the hard disk. This creates delay to open any of the applications. By Defragmentation of the hard disk all the files are arranged in sequence. Thus helps in making PC faster.Following steps can do this,

- Click 'Start' button
- Go to 'Program' then 'Accessories'
- Go to 'System Tool'
- Select 'Disk Defragmentation'

After selecting the Defragmentation option it ask for the drive to select. Select the drive as per your requirement and click the 'OK' button of that screen. As soon as the button is click Defragmentation starts and the dialog box as seen below will appear on the screen.

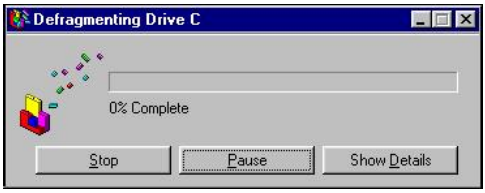


Fig: 13.1 Defragmentation

This will take several hours to complete as per the data stored in the Hard disk.

NOTE: - Please do not carry on any application will Defragmentation is on.

16. Appendix E

A. Supplies and Accessories: List of Accessories

NOTE: Do not store any consumables after its expiry date.

-	Material Name	Qty.	
1.	Patient Cable 10 Lead	1	Detachable
2.	Fuse 500mA Fast Blow	1	-
3.	Manual	1	-
4.	Carrying bag for Body Level Amplifier	1	-
5.	Cable for Body Level Unit to Treadmill Controller	1	-
6.	USB cable, Male A To Male B, 1.5-meter length	1	-
7.	PAPERS – LASER GRAPH	500	-
8.	Treadmill controller unit	1	-
9.	Body level amplifier unit	1	-
10.	Treadmill to treadmill controller cable	1	-
11.	Treadmill	1	-

Warning:

Use only the patient cable and accessories as supplied. Substitutions may cause the ECG machine to function improperly. If you wish to replace the accessories, then contact our Service personnel (Refer Service Information)

B. Environmental protection

Disposal of the Equipment:

NOTE:

Then dispose of the device and supplies in accordance with your state regulations.

Disposal of the product:

The product described in this user manual must not be disposed of as unsorted municipal waste and must be collected separately.

Please contact an authorized representative of the manufacturer for information concerning the decommissioning of your equipment.

C. Servicing Information

The service life of machine is 7 years.

Warning:

Authorized personnel should only open this device as there are no user serviceable parts inside.

For servicing contact an authorized NASAN Medical Electronics Pvt. Ltd. Service Engineer.

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:service@nasanmedical.com

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