Standard BL

Software Version 9.0

User Manual

Nasan Medical Electronics Pvt. Ltd

Hope you don't require service at all.

But incase you require,

Please contact: 09371039255

For any working days 9.30a.m to 6 p.m

Dear customer,

We take this opportunity to thank you 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 expectations 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.

We are once again giving our contact details_

Nasan Medical Electronics Pvt. Ltd.
Shubham Heights, 'C' wing
Off Mumbai Banglore Highway
Service road, Warje
Pune-411058
Website: www.nasanmedical.com

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NASAN®
SIMPLE. RELIABLE.

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User manual for

ST-Win Standard BL

The complete Window's based Stress Test machine.

1. Introduction-

Nasan Medicals has pioneered PC based medical equipment in India. We thank you for purchasing our ST-Win, a stress test machine.

The system records and enables review of electro-cardiogram, and diagnosis of stress induced ECG.

The distinctive feature of ST-Win 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 ST-Win system-

Nasan's ST-Win 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,

- **Body level amplifier.**
- **Tread mill controller.**

- Interconnection cables
  - **Cable for Body Level Unit to Treadmill Controller**
  - **Cable for Tread mill to tread mill controller(TPC)**
  - **Cable for PC to tread mill controller**
- Patient cable10 lead
- Treadmill
  - ***HF drive –This is serviceable.***

HF drive (High frequency drive) This part is used to drive DC motor (speed) and Actuator (elevation)

- ***Actuator -- Non serviceable on site***
- ***DC motor – Non serviceable on site***
- ***Speed sensor – Non repairable***

- Central processing unit (PC)
- Color monitor
- Keyboard
- Mouse
- Printer

System features-

Nasan's ST-Win 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.

- ***Facility for Rhythm recording at request.***
- ***Online printouts*.**

During the test, the user may request for a raw ECG and Linked median printout at any instant and selected median report at review stage. He will 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. System requirement

Minimum Requirement of PC for ST-Win system:

1. Operating system: Windows 10 professional 64bit and above
2. Motherboard: Intel core i5
3. RAM: 4 GB
4. USB port: working USB port for controller
5. Monitor: 21 inches Color monitor.
6. Hard disk: minimum 500 GB.
7. Display Settings: Resolution- 1024X 768 and above.
8. Keyboard: with 101 keys.
9. Mouse
10. Printer: HP Laser Jet Pro P1108 plus
11. 1 KVA Online UPS for PC and treadmill controller
12. Independent earthing connection for treadmill.
13. Servo Stabilizer 5KV for treadmill

3. Configuring the ST-Win system

WARNING:

System 'POWER ON' sequence:

1. Switch 'ON' PC.
2. Switch 'ON' 'St Win-Treadmill controller' Unit.
3. Switch 'ON' Treadmill.

Strictly follow above sequence for safety.

When the application is started, dialog box as shown in fig. 3.1 is displayed, which asks you to configure the software as per the requirement. It is necessary to configure the system before conducting a test. Configure your PC as per instruction given in the dialog box for the best results.

Fig 3.1: Installation dialog box.

Configuring the System

For configuring the ST-Win system go to **'Configure'** menu or press **'Configure System'** button on **'Welcome to ST-Win system' dialogue box'** which provides allows following tools listed as in fig.3.2,

1. Hospital configuration.
2. Referring Doctor
3. Standard summary report.
4. ST-Win configuration.
5. Treadmill Protocol.
6. Printing details.

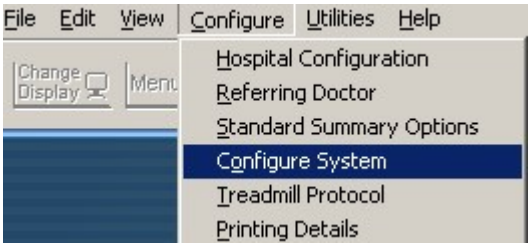


Figure 3.2: Configure Menu.

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.

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. 3.3A.

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.

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

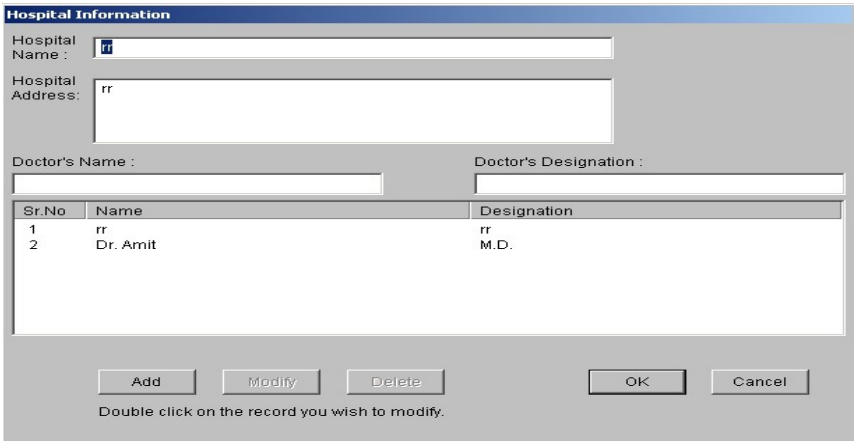


Figure 3.3A: Hospital configuration.

8. After entering the entire information click on "**OK**" to save the contents in the list.

9. Press "**Cancel**", the information will not get saved.

2. Referring Doctor

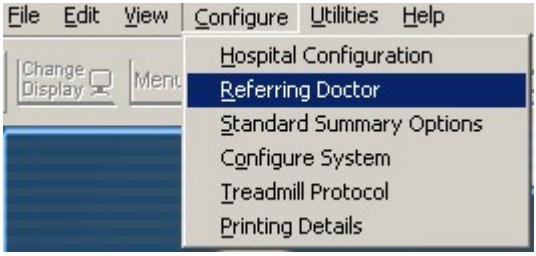


Figure 3.3B: Referring Doctor Configuration

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.

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. 3.3C
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.

10. Press "**Cancel**", the information will not get saved.

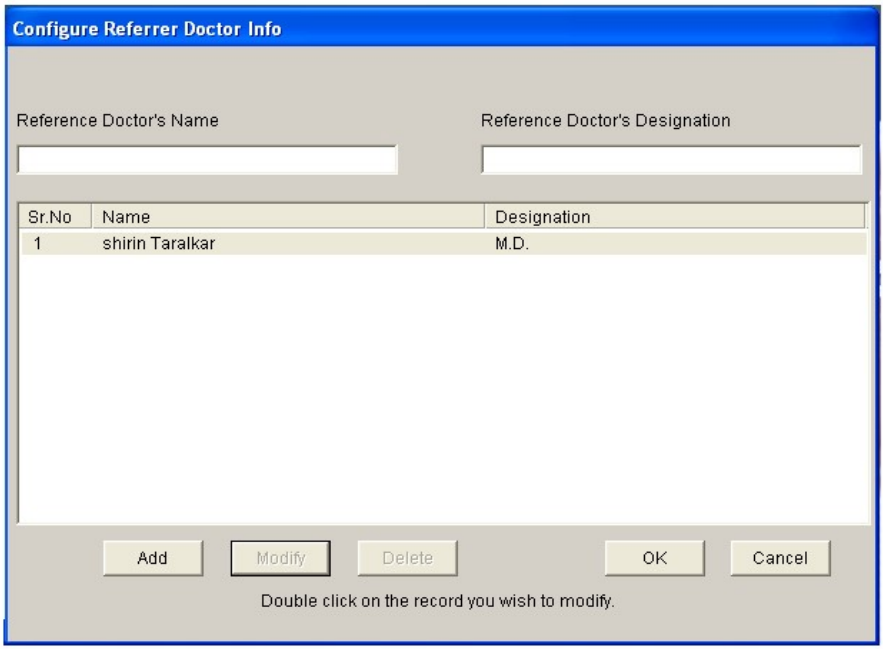


Figure 3.3C: Referring Doctor Configuration

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.

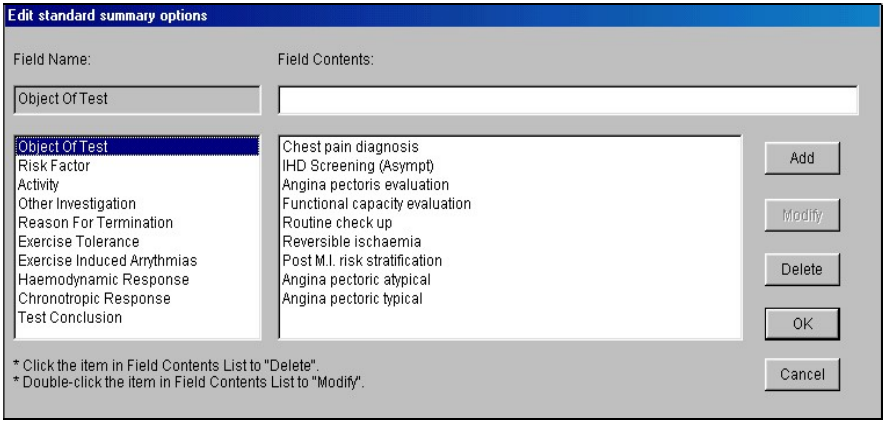


Figure 3.4: Standard summary option editor.

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 ST-Win-

'ST-Win configuration program' allows you to configure different display and print options

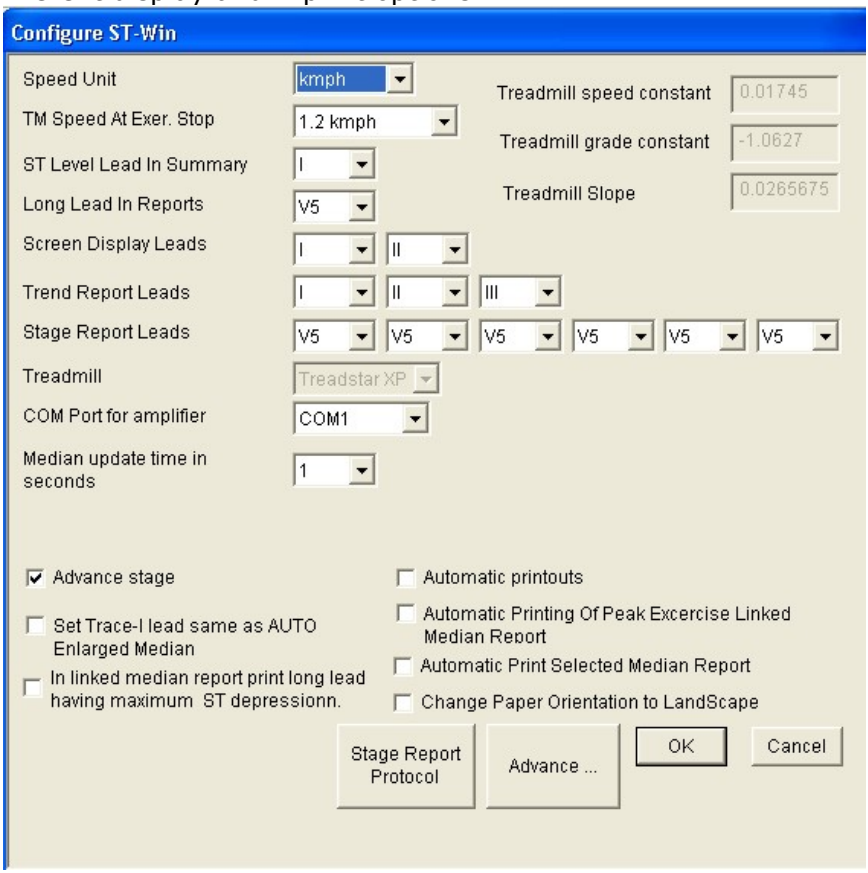


Fig.3.5: ST-Win configuration dialog box.

To configure the system select **'ST-Win configuration'** option from **'Configure'** menu. The screen as shown in fig.3.5 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'** or **'Slow-0 kmph'** or **'Fast-0 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.

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

8. Select the '**COM port**' as COM 1 to COM 8 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. To set the protocol for online printouts click the **'Stage report protocol'** button.

    - A dialogue box as shown in above fig.3.6 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. 3.7 below is displayed.
- To configure printouts at defined interval in Exercise stage, enter interval (either 1 or 2 min) in text box.
- To configure printouts at defined interval in Recovery stage, select interval from dropdown box(either 1,2 or 3).
- Click the check box of '**Grid ON**' to have the grid on the printouts.

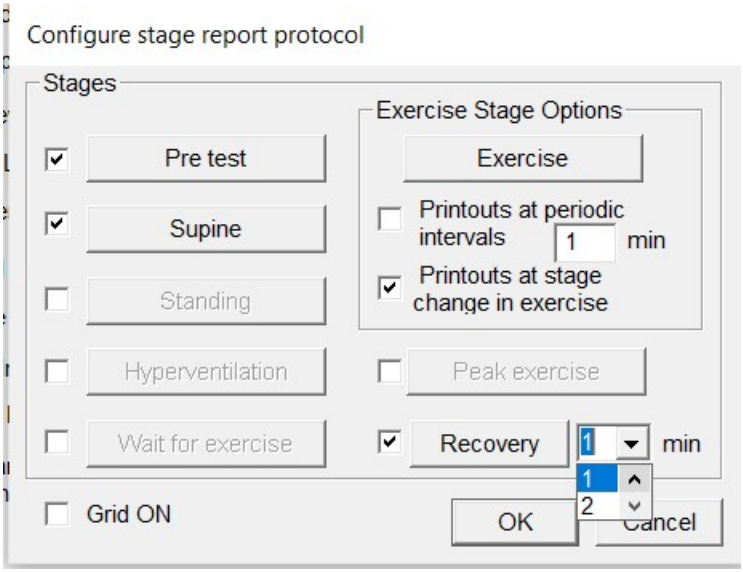


Fig.3.6: Stage report protocol creator.

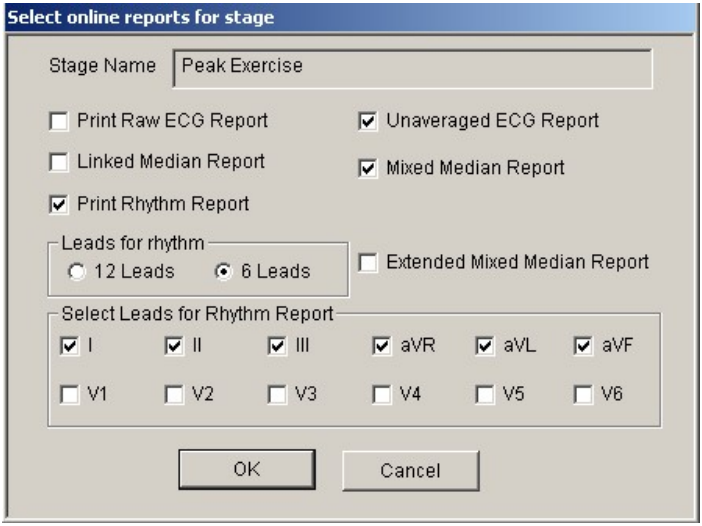


Fig 3.7 Select online report stages

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

15. Advance button is having the constant generated by calibrating the treadmill. Only Nasan service engineer can execute it.
16. Click "**OK"** button of the ST-Win configuration program to save the settings you have made.

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 .3.8 is displayed on the screen,

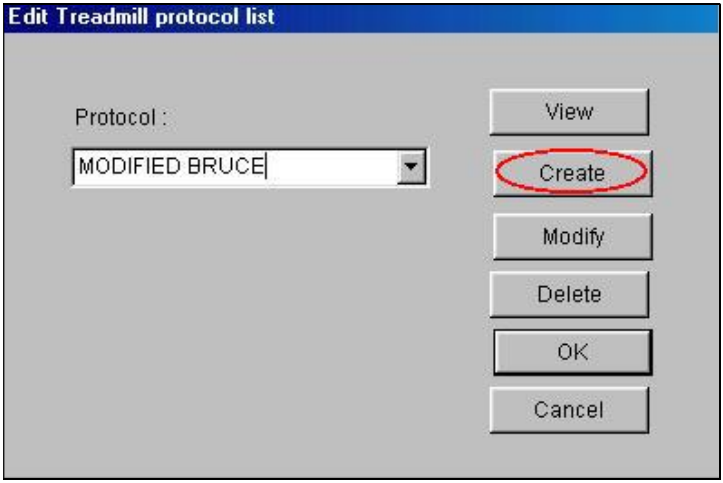


Fig.3.8: Treadmill protocol list.

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.
2. To add new protocol, press '**Create**' button. A dialogue box as shown in figure 3.9 is displayed.

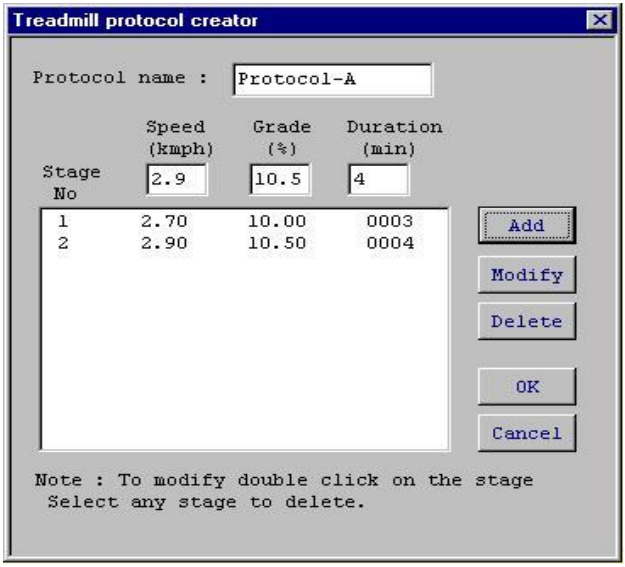


Fig. 3.9: Treadmill protocol creator.

3. 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.
4. To delete the stage, select the required stage number from the **'Stage no.'** list and press '**Delete**' button
5. To modify the stage double click the **'Stage no.'** to be modified, the stage contents will appear in the text boxes. 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.3.9 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 Style.
- Color or black and white printing
- Administrative details with gray background.
- Print admin border

For this purpose select the '**Printing Details**' option from '**Configure**' menu. A dialog box as shown in fig 3.10 is displayed.

To set the font, click the '**Font**' button. A dialog box as shown in fig.3.11 will appear where you can configure

- Font,
- Font color,
- Font style,
- Font size,
- Underline the text.

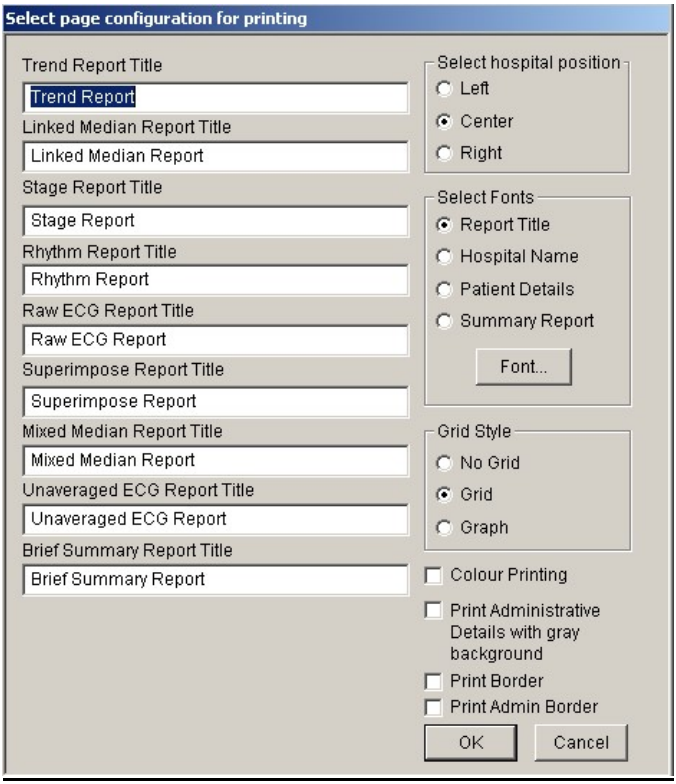


Figure 3.10: Print page details.

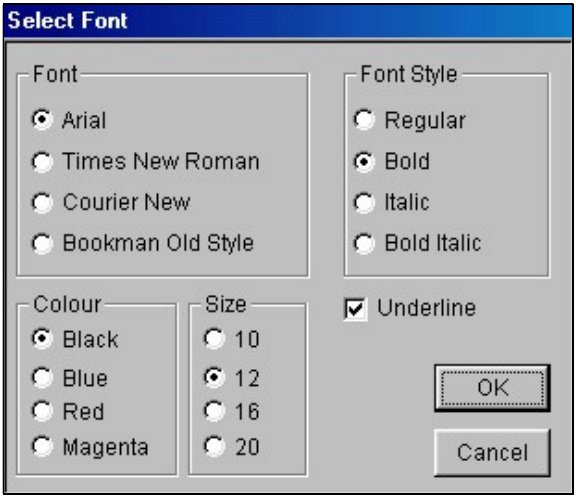


Fig.3.11: Select font.

Press '**OK** button, 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.

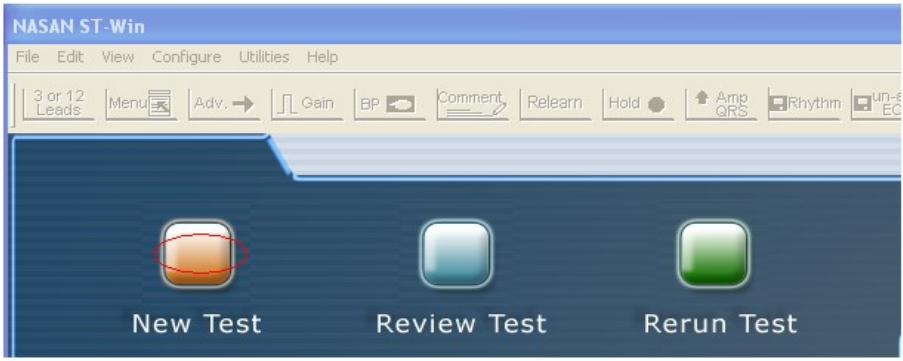


Fig. 4.1 Main screen:

Following patient information dialog box as shown in fig. 4.2 is displayed for entering the patient details.

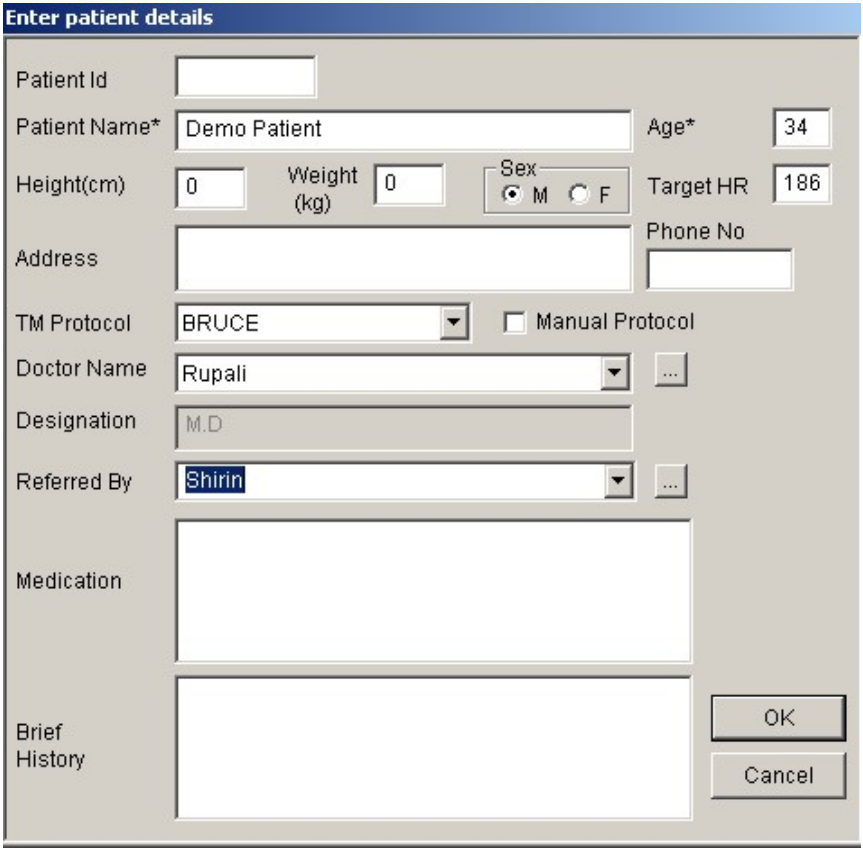


Fig. 4.2: Patient information.

1. Editable target HR facility is given in patient detail dialog box.
2. 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
- 3 running ECG traces.
- 1 enlarged median with E, J and post J points marked.
- 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.

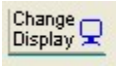
- Beep is sound on every detected QRS. To set QRS beep ON or OFF, press F7 key, QRS beep status is toggled. Bell symbol on screen indicates the ON/OFF status of QRS beep.

Tool bar at the top of the screen have following controls-

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 Test**

Fig.4.4: Tool bar.

1. Change Display



Use this menu to toggle between 3 and 12 lead display mode.

Press **'Change Display'** to view the 12 leads ECG with median as shown in fig 4.5.

Click 'Change Display' button to go back to 3 lead display mode.

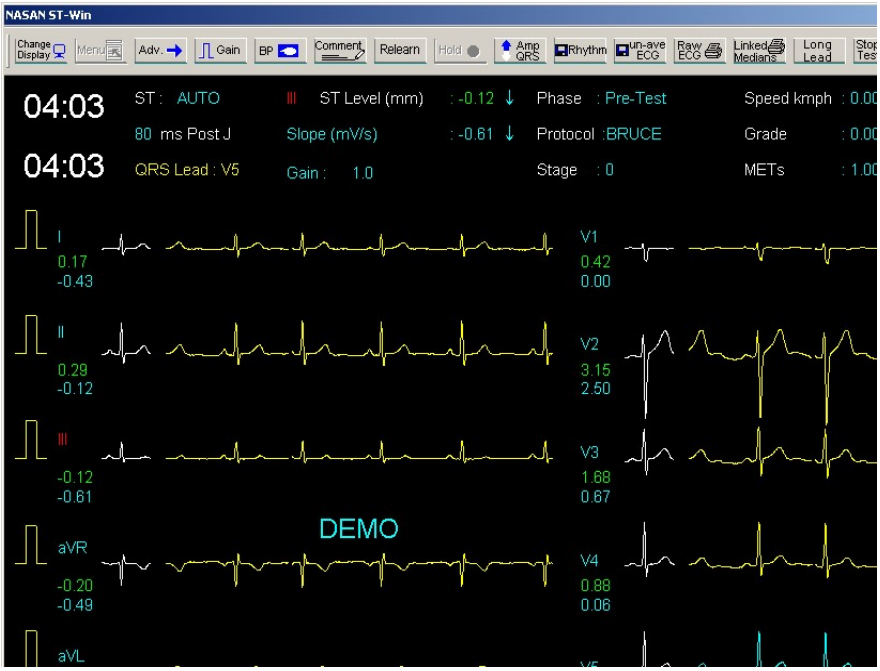


Fig 4.5: 12 lead acquisition.

Fig 4.5: 3 lead acquisition.

2. Menu

Press '**Menu**' button to change the following options given in control bar shown in fig 4.6

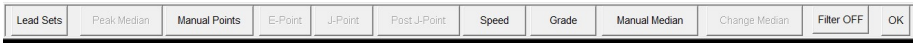
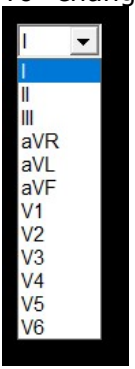


Fig 4.6: Menu bar.

- To change the 1st ECG trace lead, 2nd ECG trace lead



select the lead from dropdown as shown above.

- To change the QRS detection lead (green color trace), **select the lead from dropdown**
- Press **'Lead sets'** to replace all the three traces by the next three consecutive traces.
- 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 4.7

Fig 4.7

- Press **'E-point'** button to change the position of E-point to left or right press the **'<-' or '-> 'button** as shown in fig 4.8 respectively. Similarly press J-point and Post J-point button to change the position of J-point and post J-point respectively.

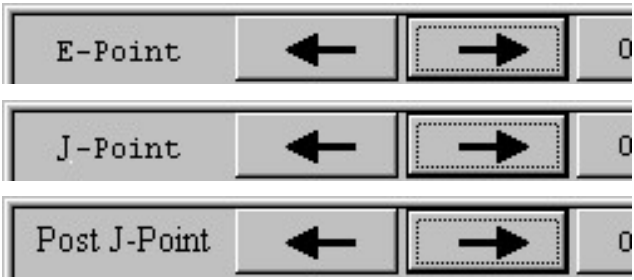


Fig 4.8

- Press manual auto button to toggle the auto or manual selection of enlarged median. To select enlarged median display lead manually, Press **'Manual Median'** button. The caption of **'Manual Median'** button changes to **'Auto Median'** as shown in fig 4.9.

  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 4.9

- Press **'OK'** button to go back to main tool bar by saving the changes done in the positions of the points.
- 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 fig 4.10

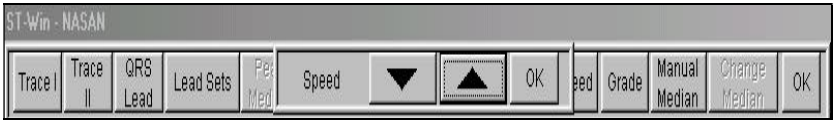


Fig 4.10

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

- When the test reaches to recovery stage **'Peak median'** button gets enabled in menu option, which is visible in 3 lead acquisition screen only as shown in fig 4.11 and fig 4.12. This button provides the facility to compare the current median with the basal median or peak exercise median.

Fig.4.11: Basel median

Fig.4.12: Peak Exercise Median

Adv (Advanced stage)

Press **'Adv'** button to go to the next stage after 8sec. The advanced stage button is used when you want to switch over from present stage to next stage as shown in fig 4.13 & 4.14. It will go to next stage according to the protocol when exercise stage is started

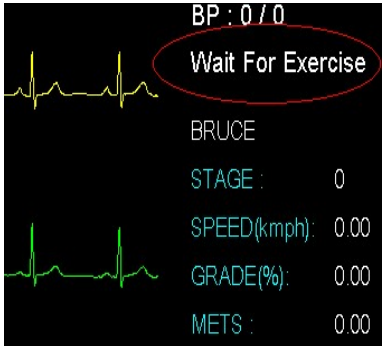
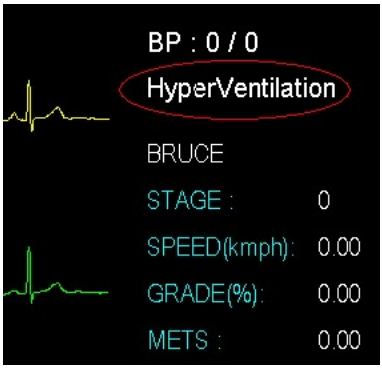
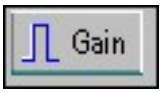


Fig.4.13: Before Advance stage.



SummFig.4.14: After Advance stage.

3. 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. ECG traces and median are drawn with new value of gain.

4. BP

You can enter the BP of the patient when the test is going on by pressing the **'BP'** button as shown in fig 4.15. Fifty Seconds before end of each exercise stage, this BP entry dialog box is automatically shown to enter the BP.

Fig.4.15

5. Comments

When the '**Comment'** button is pressed, a text box is displayed as shown in fig.4.13 .You can enter comments at every stage. Press **'OK'** button to save the comments and **'Cancel'** button to exit as shown in fig 4.16.

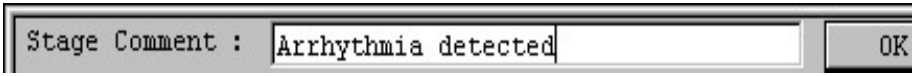


Fig 4.16: Comment dialog box.

6. 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.

7. 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.

8. 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.

9. Rhythm

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

10. 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.

11. 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).

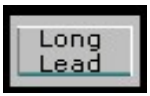
12. Raw ECG

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

13. Linked Median

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

14. 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.

15. Stop Test

Press **'STOP Test'** button to stop the treadmill and also to stop the test. If **'STOP Test'** button is pressed before reaching the exercise stage, the test will not be saved. You can also stop the test by pressing F5 key from the keyboard.

16. Review

When the test reaches the recovery stage **'Review'** button is displayed on the toolbar in place of **'STOP Test'** 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 data recorded after taking a test, select '**Review tes**t' from '**File**' menu (Figure 5.1).

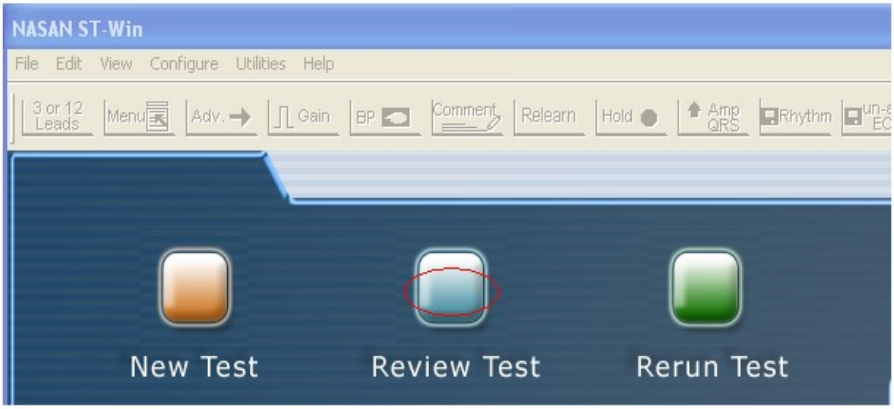


Fig 5.1: Main screen

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.

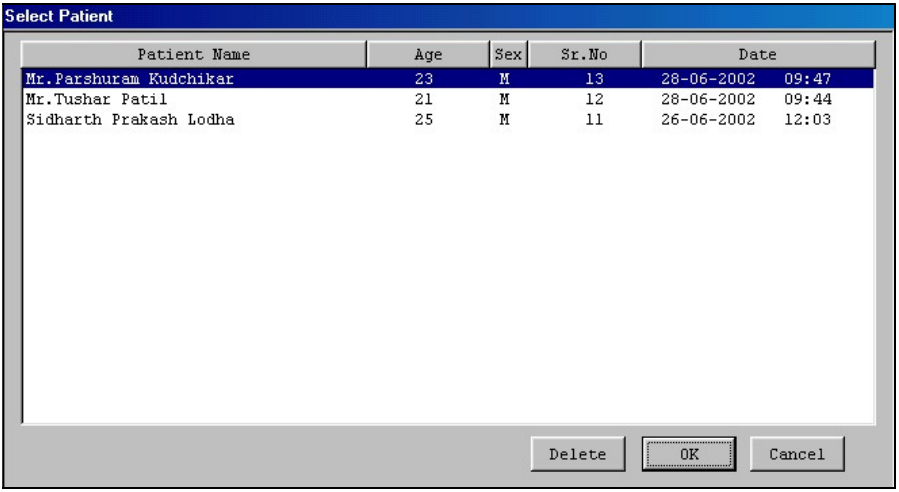


Fig 5.2: Patient Details.

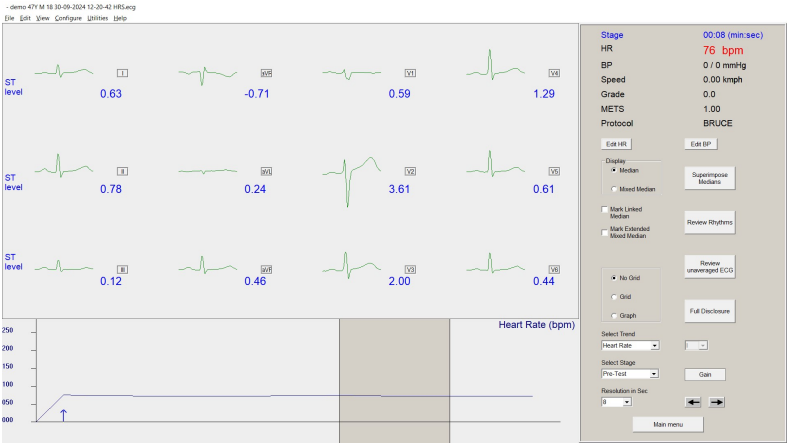


Fig.5.3: Review screen.

Review screen has the following data on the screen,

- Medians of all 12 leads.
- Heart rate trend.
- Review control panel.

Review control panel has following controls on it,

- Time in min. at which the arrow is positioned.
- Heart rate in beats per minutes.
- Blood pressure in mmHg.
- Speed in kmph/mph.
- Grade in %.
- METS.
- Protocol name.

Review Control Panel

1. Edit HR-

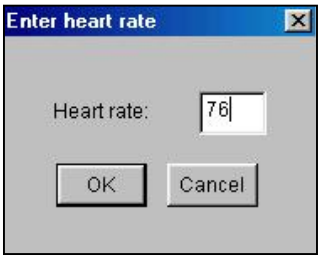


Fig.5.4: Heart rate entry.

Press '**Edit HR**' button to enter the heart rate at arrow position. Dialog box is displayed as shown in fig 5.4. Edit the heart rate and press '**OK**' button to save the edited heart rate value. The trend of Heart rate also gets updated.

2. Edit BP-

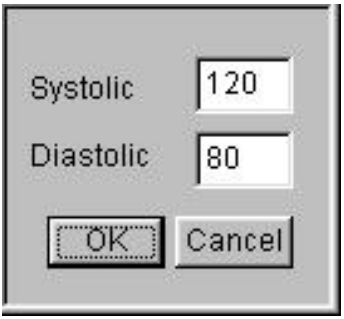


Fig.5.5: Edit BP.

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

2A. Grid display

Use this button to view ECG with grid or with graph

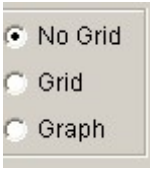


Fig.5.5A: Edit grid.

3. 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.

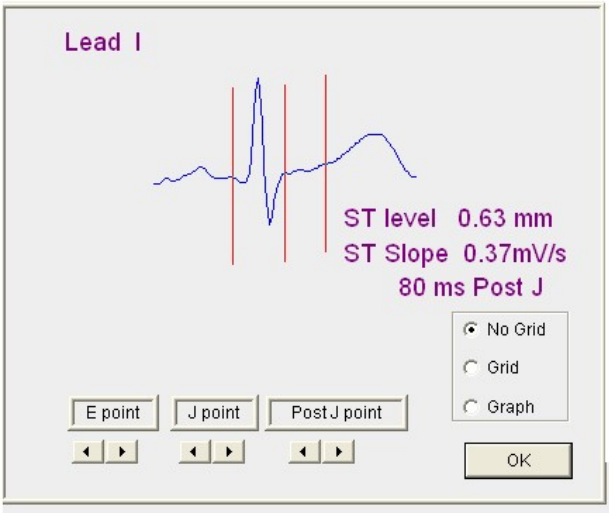


Fig 5.6: Zoom median.

- E, J and post-J points can be edited using arrow keys on the screen.
- Click on the Grid or Graph or No Grid buttons to display the Grid or Graph or No Grid on the screen.
- Press OK to view medians screen.

4. Mixed median-

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

Fig 5.7: Mixed medians ECG screen.

3. Superimpose median-

1. 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.
2. 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.

3. 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.
4. Check the check box named '**Mark Page**' to mark the current page for printing.
5. To view the grid or graph on the current screen click on the Grid or Graph buttons.
6. Press the spin button to move the right side median towards right or left for comparison.

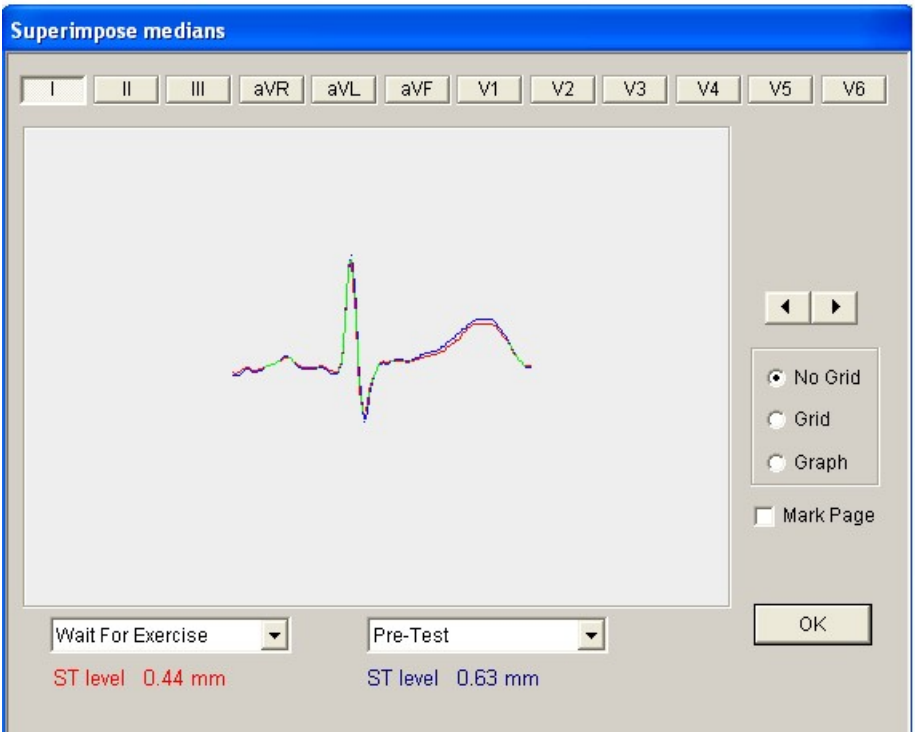


Fig.5.8: Superimposing the median.

7. Press **'OK'** button to exit this screen and go to median screen.1.

4. Review Rhythms-

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,

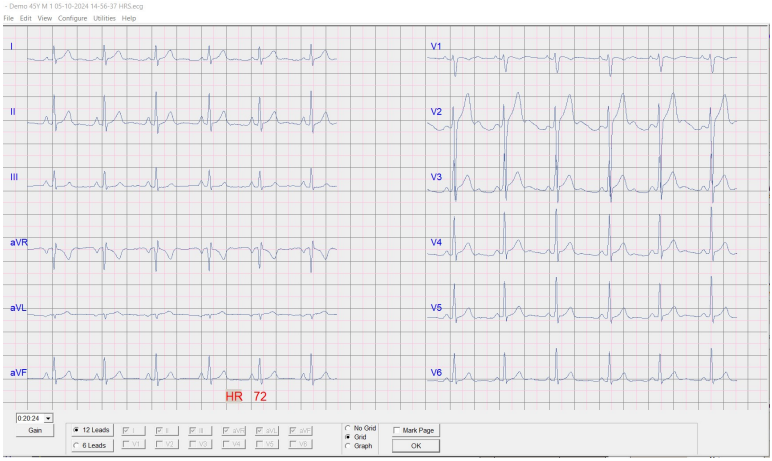


Fig.5.10: Review rhythm screen.

- 12 lead ECG of 4 sec.
- Time in hrs and min. in the left corner of the screen.
- Heart rate of the patient at recorded time.

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 leads 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 or No Grid buttons to display the Grid or Graph or No Grid on the screen.

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

Fig.5.11: 6 Lead review rhythm.

7. Review unaveraged ECG-

To view unaveraged ECG recorded while conducting test, press '**Review unaverage ECG**'

button. Following screen is displayed as shown in the fig.5.12,

This screen has the following details,

1. Heart rate at the current cursor arrow position.
2. Time at the cursor arrow position.
3. Click on the Grid or Graph or No Grid buttons to display the Grid or Graph or No Grid on the screen.
4. '**Mark page**' check box for marking the current page for printing.
5. '**Display medians**' to move back to the main review screen.

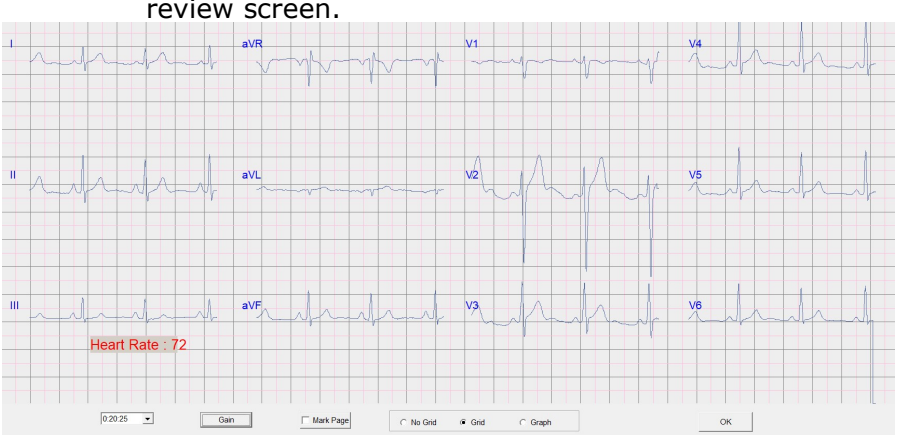


Fig.5.12: Unaveraged ECG.

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.

Figure 5.12, 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** is displayed.
- For viewing previous or next one min. data press left or right arrow buttons.
- Click on 'Gain' button to increase the gain (0.5/1 or 2) of that page only, and on printout is of gain 1 only.

- Click on the Grid or Graph or No Grid buttons to display the Grid or Graph or No Grid on the screen.

- For marking the current page for printing check '**Mark Page**' check box.

- Press '**OK**' to return back to main review screen.

Fig.5.13: Full disclosure.

8. **Mark page**

   This check box is provided for marking the linked median page or the mixed median page for printing.

9. **Select stage**

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

10. **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.

Trends in trend report also get change as per the selection of the resolution.

11. 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 as shown in fig 5.14.

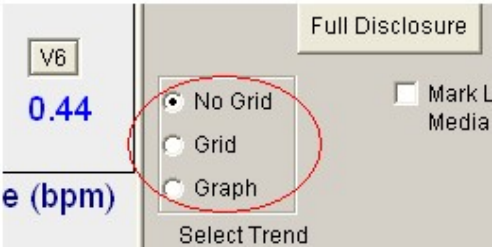


Fig 5.14: Grid.

12. Mark Linked Median-

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

13. 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.

Select trends

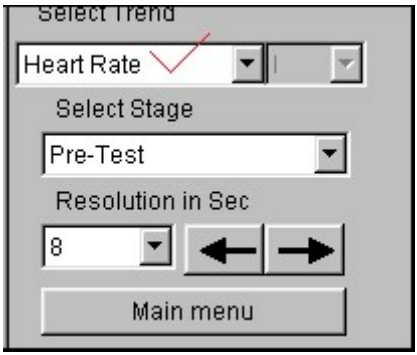


Fig.5.15: Select trend.

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 on the review control panel as shown in fig 5.15

14. 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.

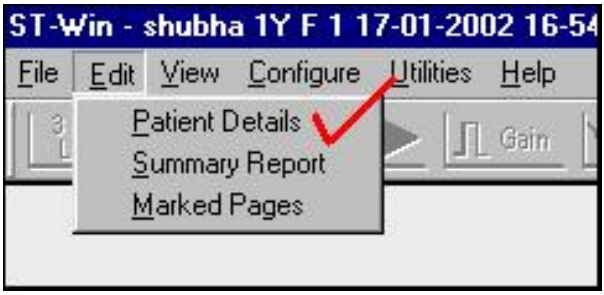


Fig.5.16: Edit menu.

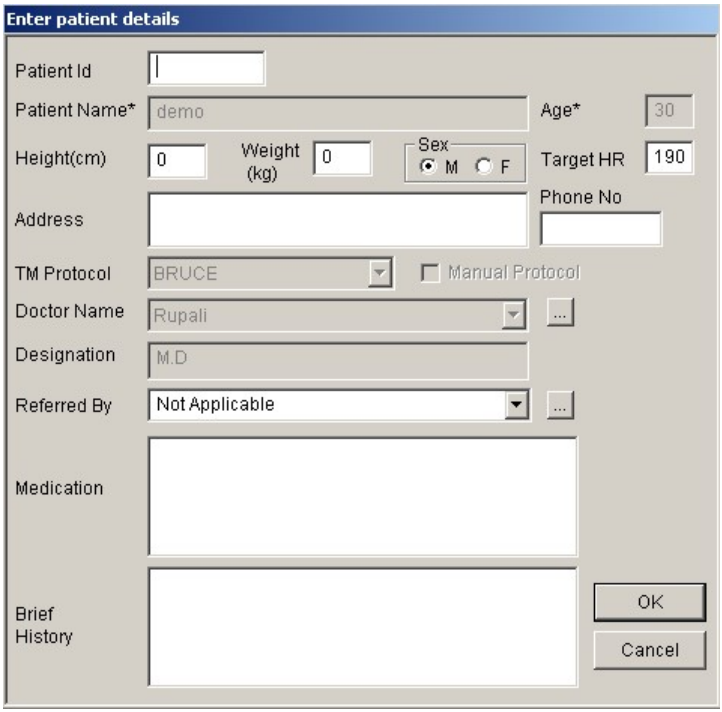


Fig.5.17: Patient detail dialogue box.

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

15. 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.

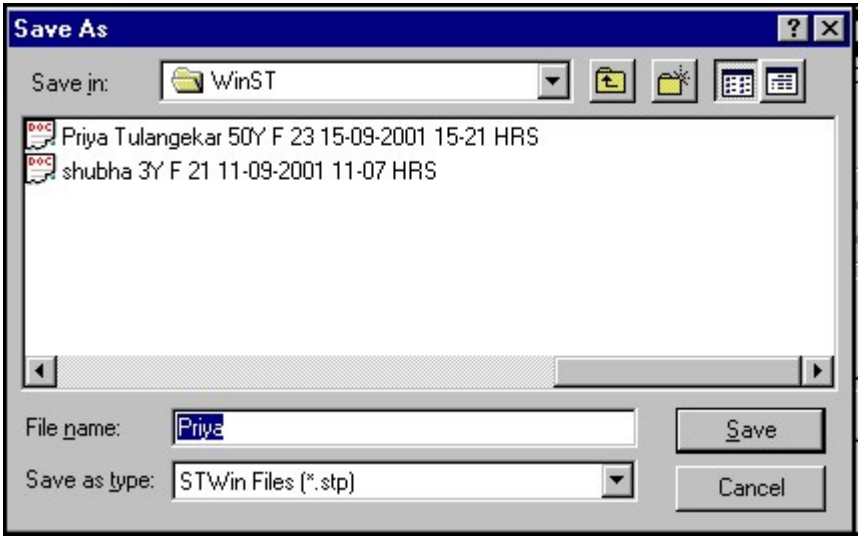


Fig.5.18: Save test.

17. Main menu-

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

6. Printing reports-

1. Print setup

For setting the properties of the printer go to '**File**' menu and then select '**Printer setup**' option.

- Set following properties for the printer

1. Landscape Mode
2. Print quality to '**BEST**'
3. Page size to '**A4**'.

2. Print

To have the printout of the marked pages, click on **'Print'** option from the **'File Menu'** while reviewing the patient data. 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.

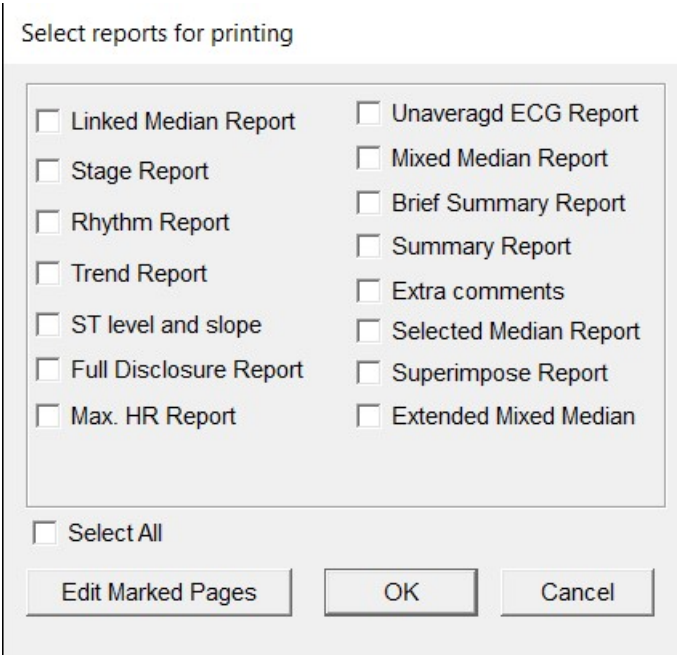


Fig.6.1: Print report selector.

- 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.

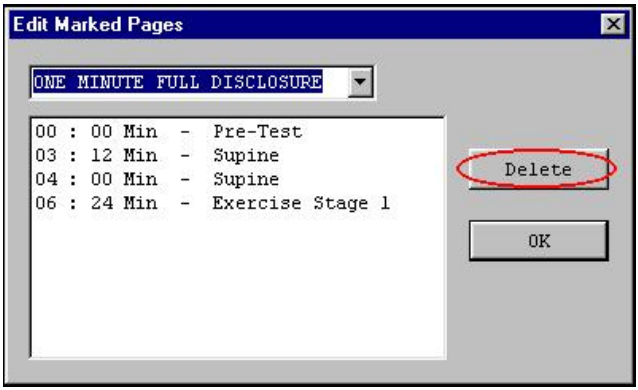


Fig: 6.2 Edit Marked pages.

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 as shown in fig.5.17.
- 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.

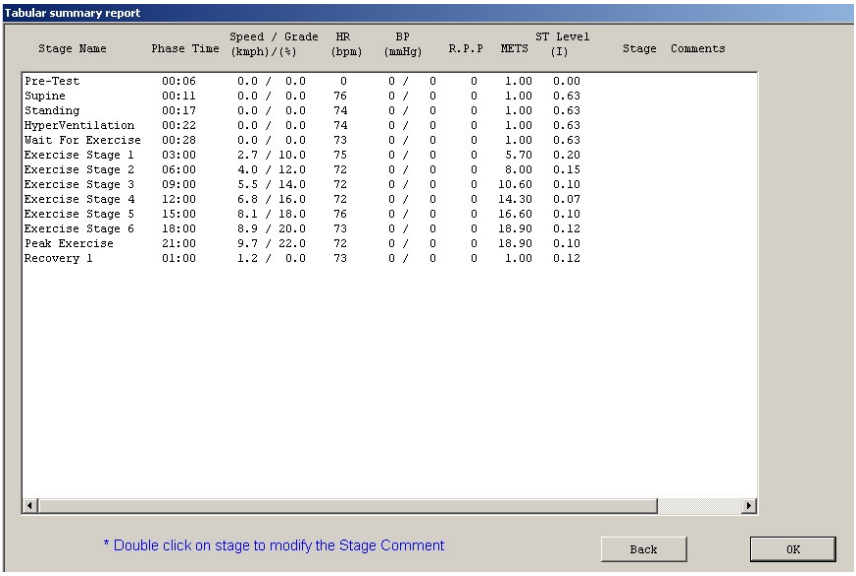


Fig 6.3: Tabular summary report

- In the comment list, the comments entered while acquisition of the test, are displayed. If any comment is suppose to be entered 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.

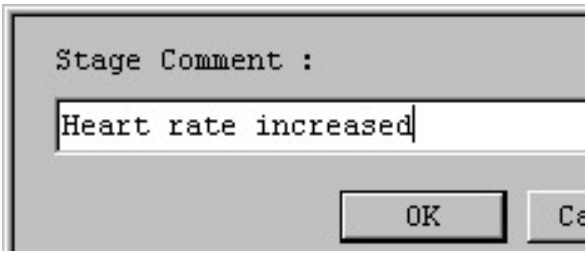
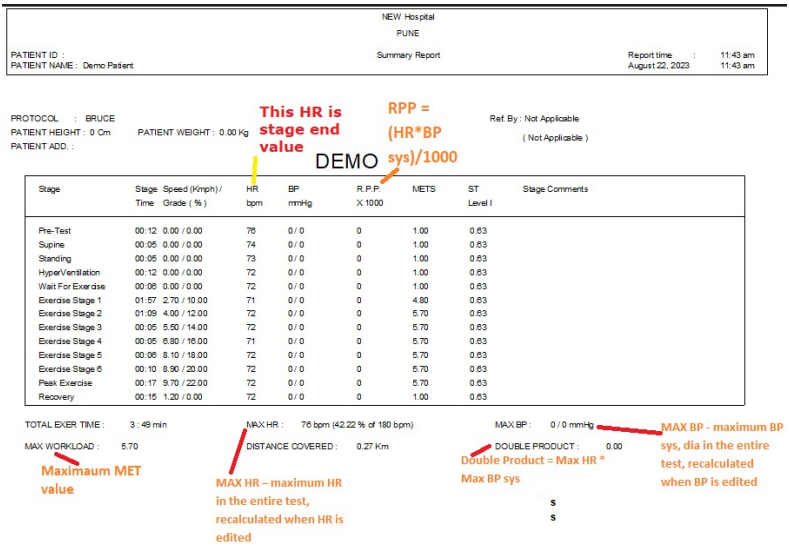


Fig: 6.4 Stage comment.



Summary report A4 printout details

- Click ok to view summary report options dialog box as shown in fig. 6.4. 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.

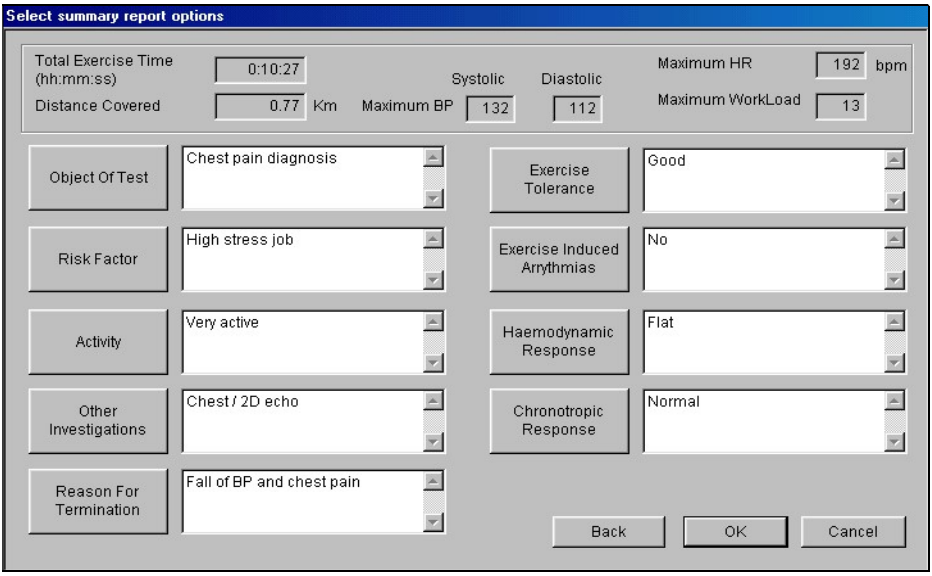


Fig 6.4: Select summary report option.

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.

You can also type the conclusion in the in the text boxes given in front which will appear in the print out.

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.6.5 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 as shown in the figure 6.5.

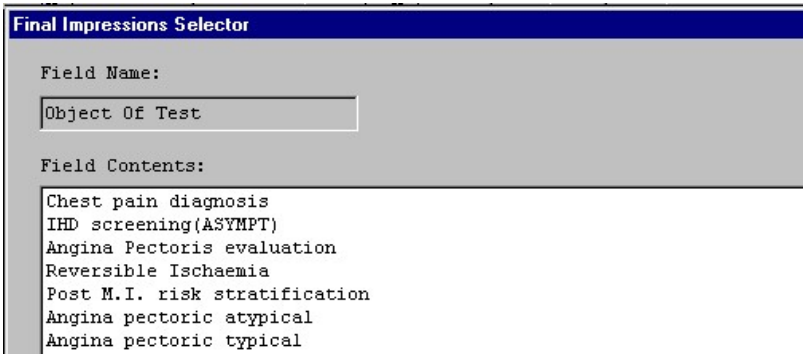


Fig 6.5: Final impression selector.

To select the Risk Factor

Similarly select the risk factor of the patient by pressing **'Risk Factor'** button. Screen as shown in

fig. 6.6 is displayed. Select the appropriate option by clicking on the option and then press **'OK'** button.

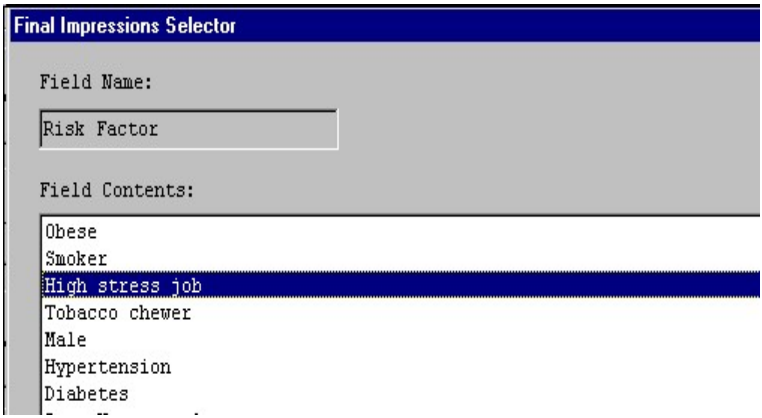


Fig: 6.6. Risk factor.

To select Activities

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

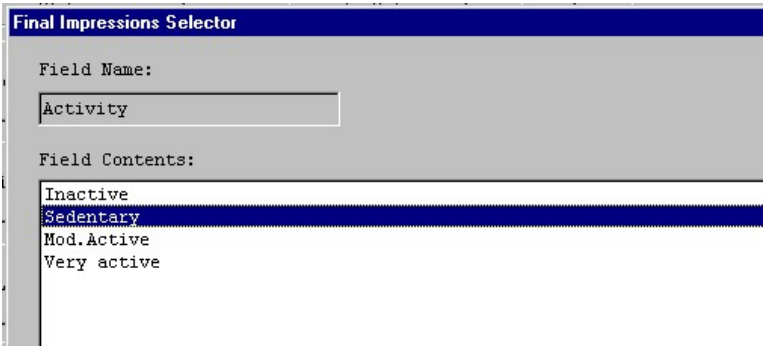


Fig 6.7: Activity.

To select other investigation

To keep the information about the previous test conducted like X-ray etc. before stress test, press the **'Other Investigation'** button the screen as shown in fig 6.8 is displayed, select the option and click on **'OK'** button.

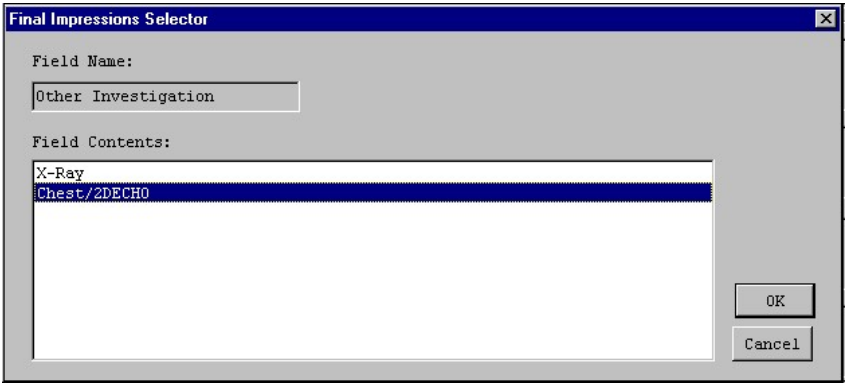


Fig: 6.8. Other investigation

To select the Reason for termination

Press **'Reason for termination'** button to include why you have terminated the test you can select the reason from the list as shown in fig.6.9 such as heart block, Max HR etc.

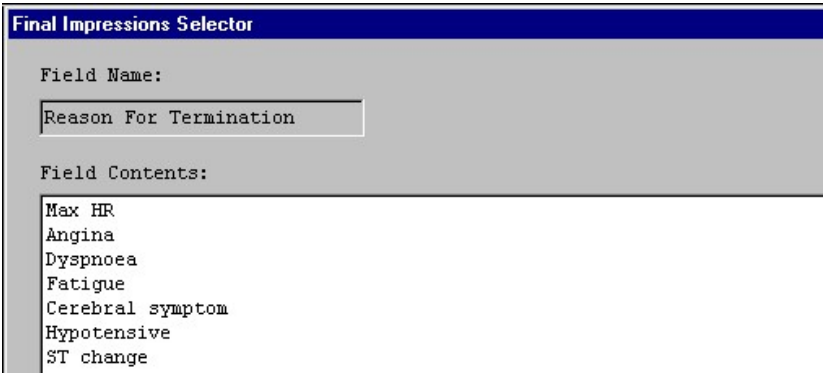


Fig: 6.9. Reason for termination of test

To select the Exercise tolerance

You can also include the exercise tolerance factor by press **'Exercise Tolerance'** button. This is shown in the fig 6.10. Select the tolerance from the list and press '**OK**' button.

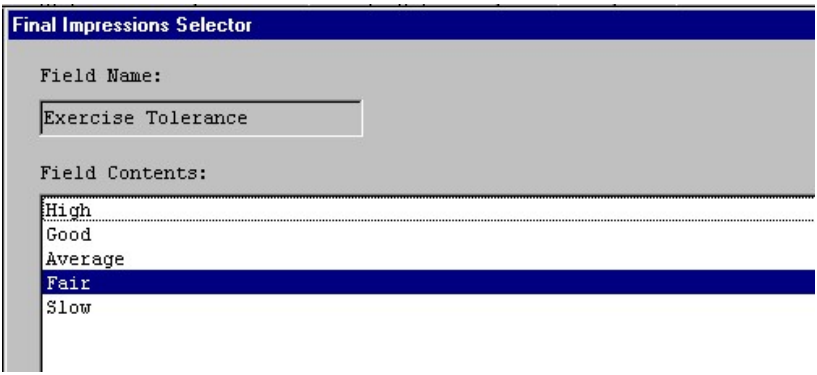


Fig 6.10: Exercise tolerance.

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 6.11 to include in the summary report.

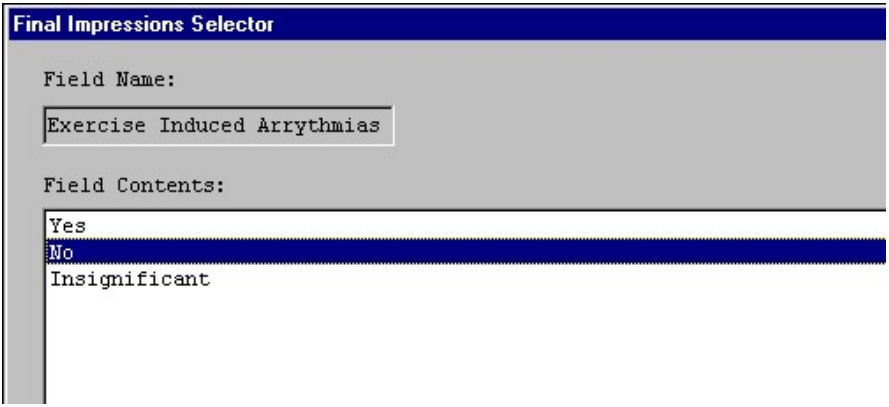


Fig 6.11: Exercise induced arrhythmia.

To select Haemodynamic Response

Press **'Haemodynamic response'** butto1n to select the Haemodynamic response of the patient and to include it into the summary report as shown in fig 6.12. Select the response by clicking the response by the mouse. The response gets added in the summary report.

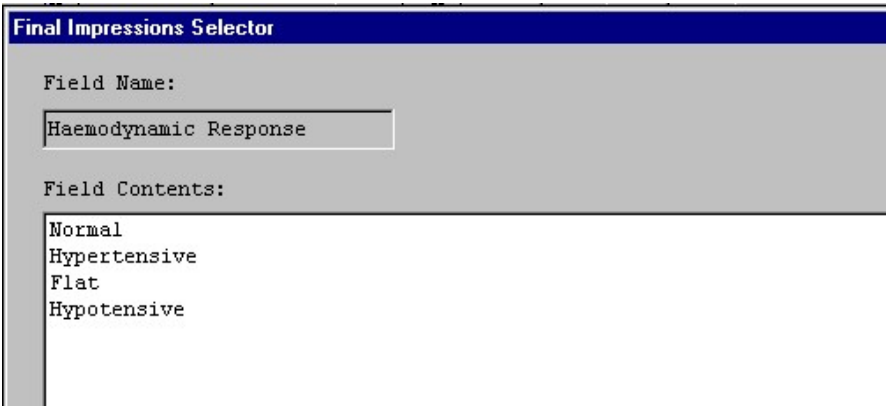


Fig 6.12: Haemodynamic response.

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 6.13

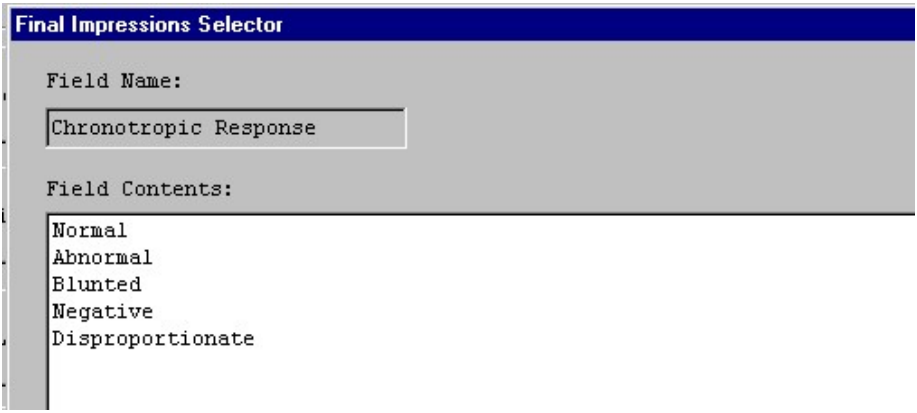


Fig 6.13: Chronotropic response.

Final Impression

Select 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.6.14 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.

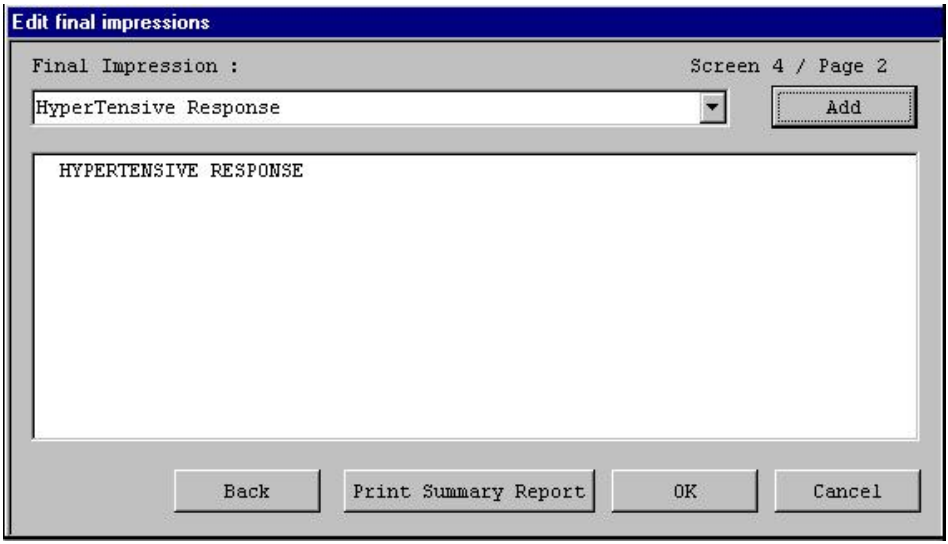


Fig 6.14: Edit Final impression.

When you press the **'OK'** button next option, ST-Level table will appear on the screen, as shown in fig. 6.14.

ST Table

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.

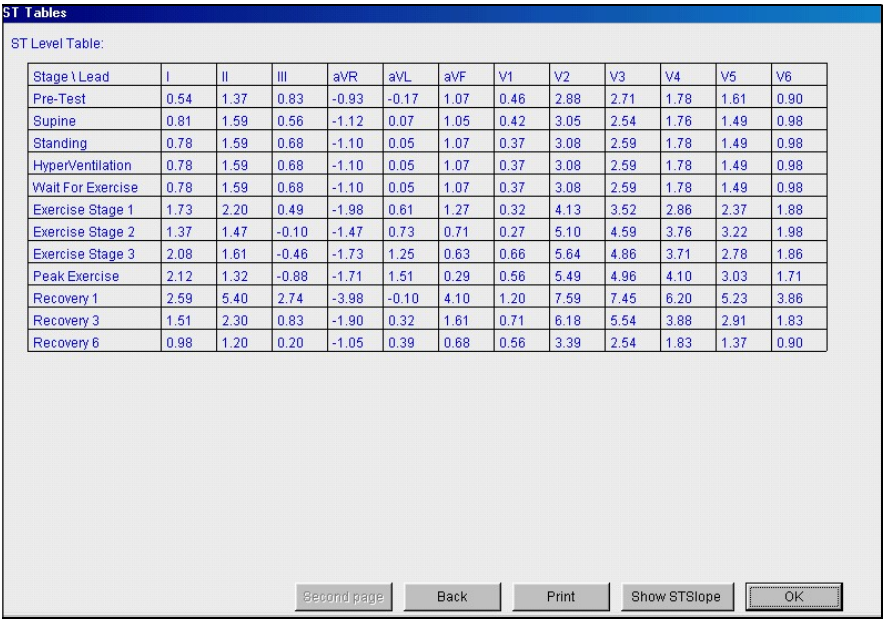


Fig 6.14: ST-Level.

ST Slope

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.

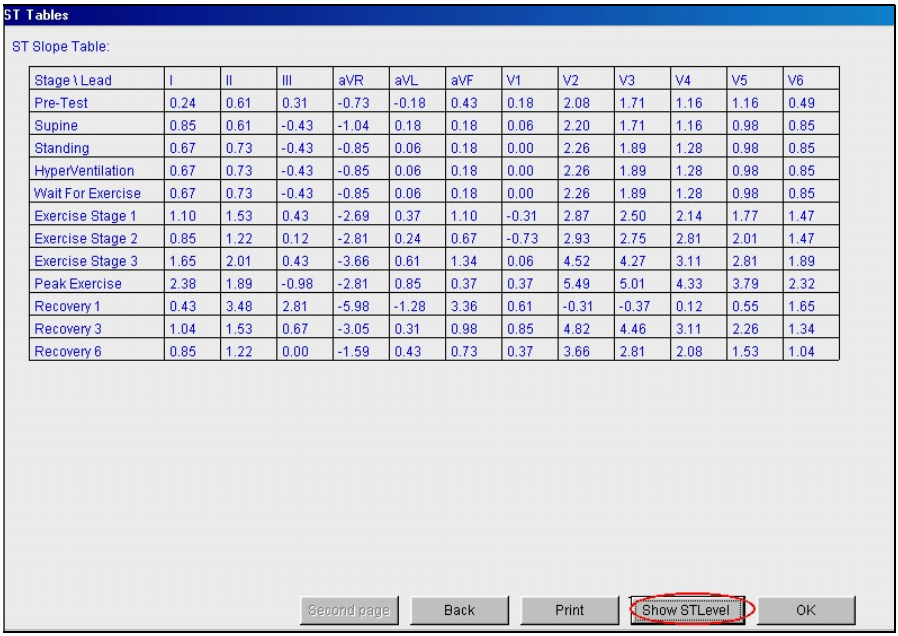


Fig 6.15: ST- slope table.

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 6.16 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.

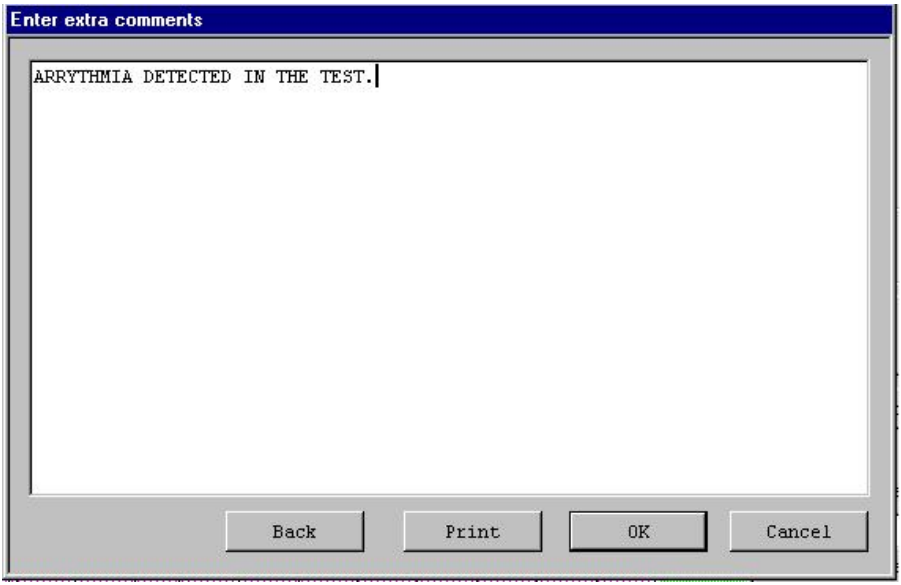


Fig 6.16: Extra comments.

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

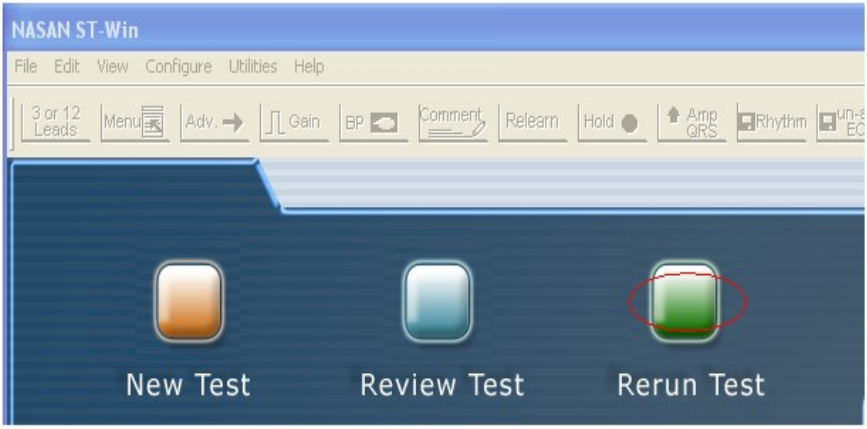


Fig. 7.1: Main screen.

Patient details dialog box with previously filled details of the patient is displayed.

Press '**OK**' button to start 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…

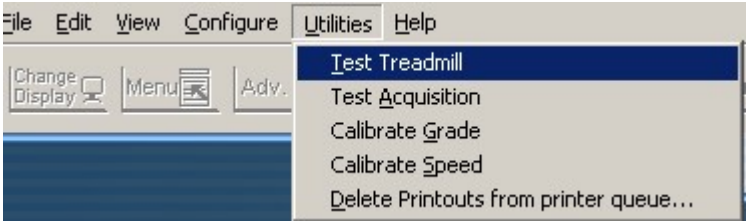


Fig 8.1: Utilities.

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.

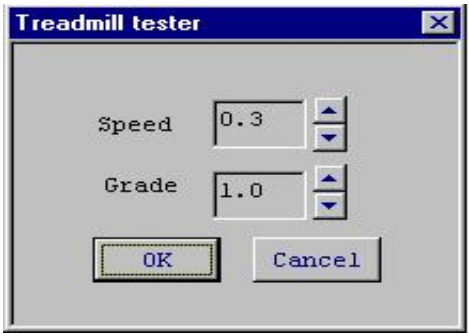


Fig.8.2: Test treadmill.

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 will come **"Please switch ON the amplifier."** In case of any loose contact or other problem, error message "**The hardware unit is not 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 ST-Win 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 figure 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.

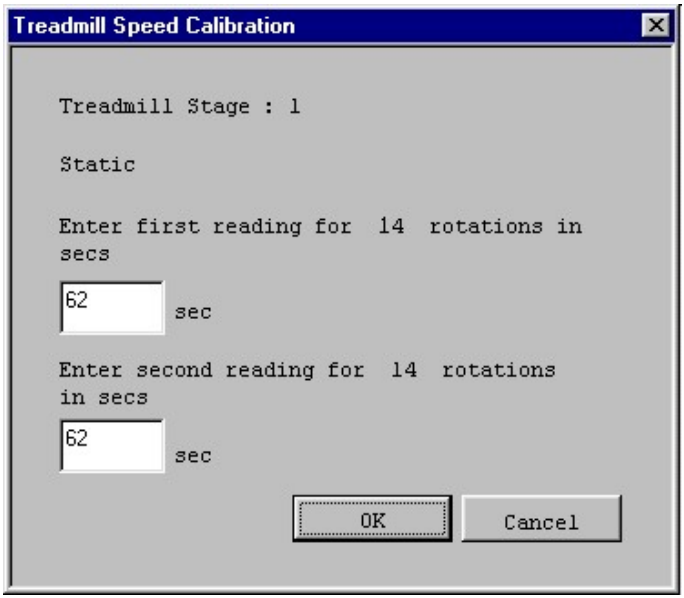


Fig. 8.6: Treadmill speed calibration.

The treadmill will gain speed. The above explained process will be carried out up to 7 stages of BRUCE protocol.

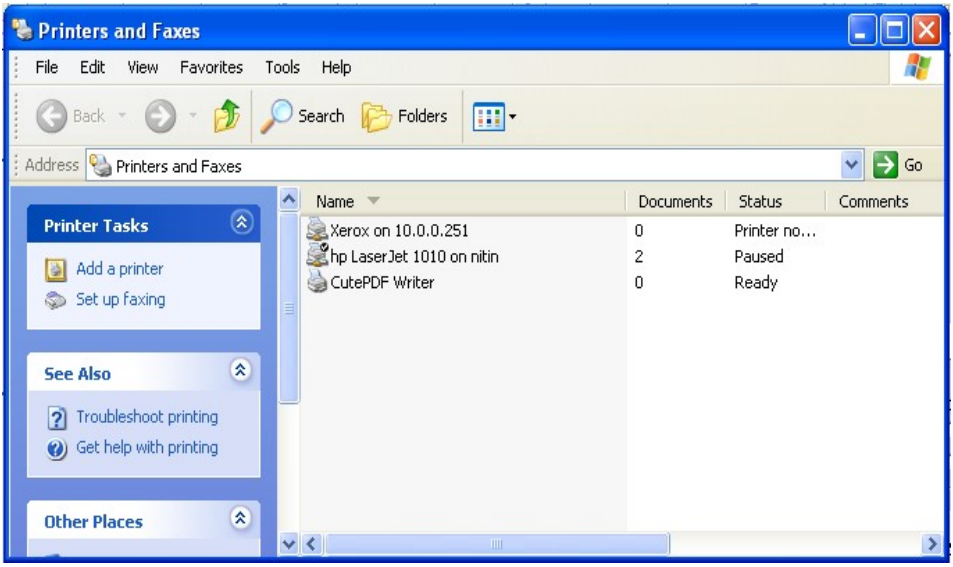
Allowed time for Speed calibration will be as mentioned in table below:

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

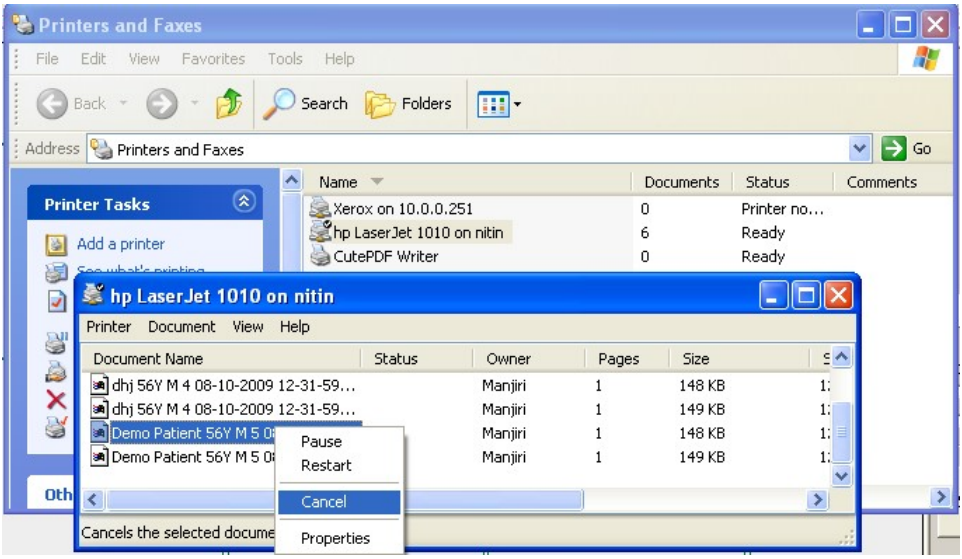
Speed calibration constants are calculated and saved by pressing OK button.

- **Delete printouts from printer queue …**

  To delete printouts from printer queue, go to Utility and select **'Delete printouts from printer queue. .**'option. The 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.

9. Trouble shooting-

- **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. Check if the amplifier is ON 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 and upright R waves. Use parameter **'QRS Amp'** button in the Menu option of the toolbar at acquisition time.

- **Heart rate not coming?**
  If 40 sec have passed and heart rate is not coming, check if medians are coming as straight lines. If so follow help as mentioned in "Medians are not coming as straight lines'.

- **Printouts not coming or printing junk?**
  Check the configure ST-Win for printer type selected i.e. laser or deskjet.

- **Error in establishing communication**

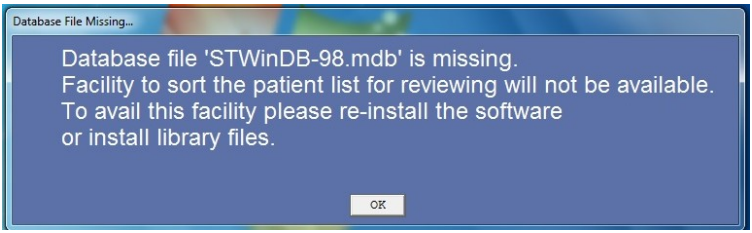
  Check all hardware connection.

  Remove all connection and reconnect it.

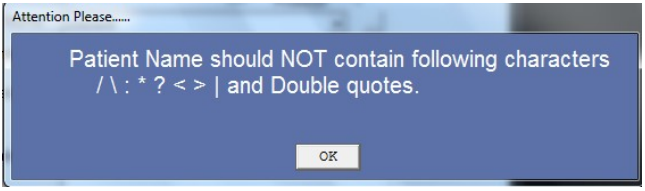
  Check that USB or Proper Comport is selected from Configure-configure system from software.

  Check for driver installation(refer driver installation procedure in Appendix -C)

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

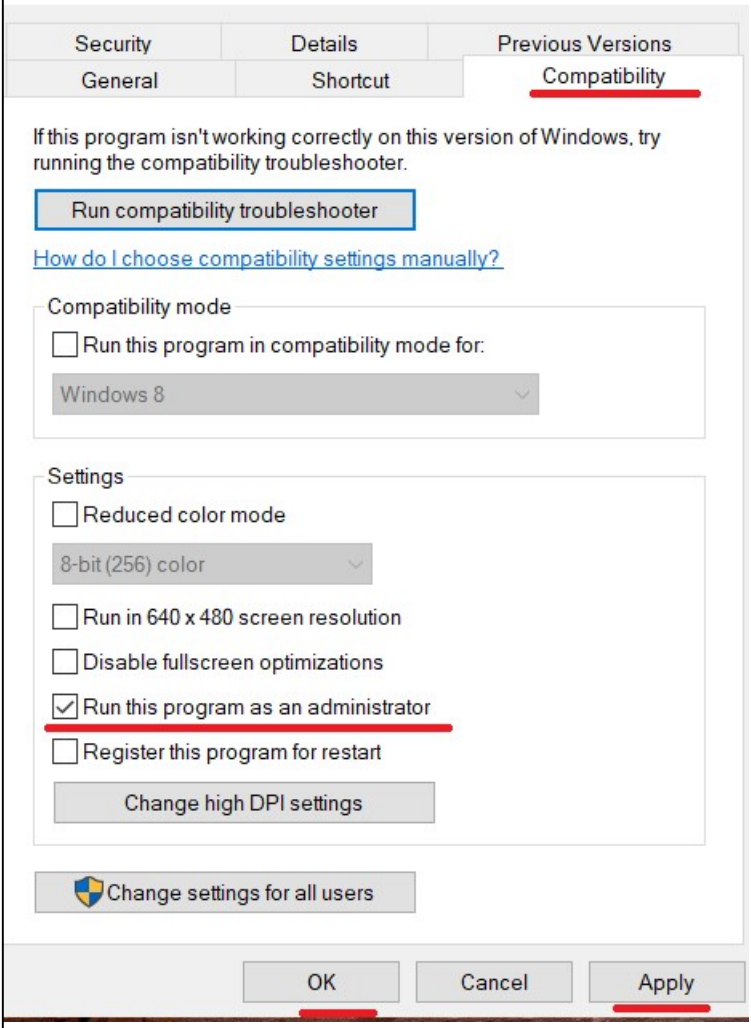


- If this message is displayed then one cannot enter the patient details, and this error is displayed.



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.

- **Due to a damaged software CD, users can download the software from the website as an alternative.**

Visit the official website WWW.nasanmedical.com, If the download fails, check your internet connection ,Use Service information page for contact.

-

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 median	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.

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 contra-indications 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 contra-indications for stress test-

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

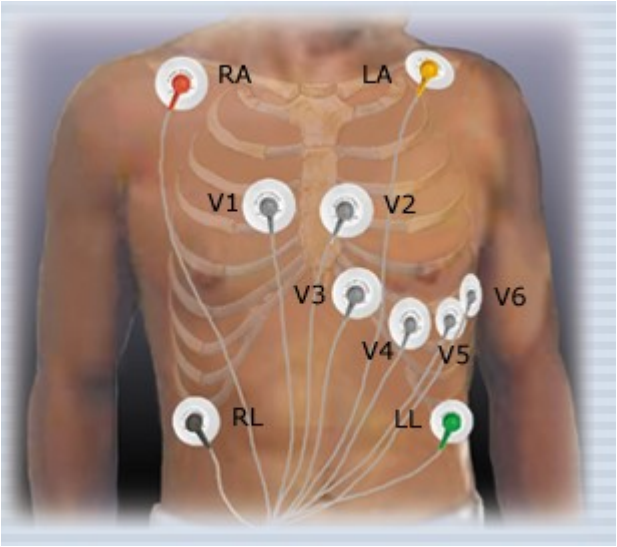
12.Appendix B

a. Patient preparation -

Proper patient preparation is the most important factor in obtaining proper results from a ST-Win system. If electrodes are applied improperly at 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 must be prepared.

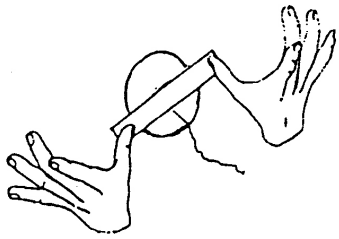
b. Electrode placement-



Electrode Placement

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

Take care that the gelled pad is in firm contact with the skin surface.
Place patient lead on all electrodes as shown in Fig.5.1



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 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 an electrode and peel it opens from its plastic backing. Finger contact with the adhesive should be minimized and the gel in the foam pad should not be

disturbed. If the gel has dried out, then discard the electrode.

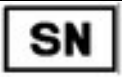
- Apply the electrode to the prepared site and run your fingers around the foam pad smoothing it from the center out.
- Repeat this procedure for all sites.

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,

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

Classification Of Applied parts

Applied part	Degree of protection against electric shock
Patient Cable 10 Lead	CF 

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. SAFTY 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.

NOTE:
ST-Win System, Treadmill should be used by trained person only.
WARNING:

Report generated from ST win Standard 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 Tread Star XP 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.

CAUTIONS 

- 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
  - Frequency respomnce:0.5Hz to 100 Hz
  - Gain: 1000
  - CMRR: >120dB
  - 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

Software Detailed features

- **Acquisition**
  - Body level acquisition of 12 lead ECG
  - Simultaneous acquisition of 12 Leads of ECG @ 250 samples per second per channel with ADC resolution of 12-bit.
  - Frequency Response – DSP filter of 0.05 to 100Hz with notch at 50Hz
  - Leads-Off detection
  - Facility to store 12 lead unaveraged ECG
  - Facility to record rhythm (10 second Rhythm strips of 12 leads)
  - Beep on QRS
  - Facility to Rerun test

- **Acquisition display modes**
  - **12 lead display**
    - Display 12 lead, 4 second ECG on First screen. Enlarged Medians next to each lead are displayed.
    - In exercise stage Basal Enlarged medians and current Medians are superimposed.
    - Facility to move superimposed medians.

  - **3 lead display**
    - 8 seconds display of 2 leads of ECG + 1 QRS detection Lead.
    - Facility to configure 3 leads to any of the 12 ECG leads
    - Display lead sets (I, II, III) OR (aVR, aVL, aVF) OR (V1, V2, V3) OR (V4, V5, V6)
    - 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.)
        - Along with enlarged median, basal median is displayed in exercise stage and peak exercise median is displayed in recovery for comparison

    - **Online display of following parameter in all display modes**
        - Sweep speed
        - METS
        - Heart rate is updated every 4 seconds with symbol and Target heart rate with percentage of completion target heart rate.
        - BP in mmHg
        - ST measurement Mode (Manual / Auto)
        - Current ST Level and ST Slope of enlarged median
        - ECG gain with standardization pulse
        - Test and Phase duration in hh:mm format
        - Exercise protocol stage name

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

- **Automatic Reports**
    - Facility to print selected stage reports automatically

- Linked Median report (12 linked medians with ST Levels 1 long lead)
- 12 lead Unaveraged ECG report
- 12 lead Raw ECG report
- Rhythm report – 12 leads of 5 seconds or 6 leads of 10 seconds
- Mixed Median report with one Median complex + 2.5 seconds ECG of each lead
- Extended Mixed Median Report - One Median complex + One Basal Median complex + 2.5 seconds ECG of each lead
- Selected median report

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

❖ **Acquisition settings**
- Facility to enter BP 50 seconds before end of each exercise stage
- Relearn the median template
- Facility to enter a stage comment in each phase
- Gain: 0.5, 1.0, 2.0 mV/cm
- Change the QRS detection lead

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

❖ **Review**
- Review data of selected patient
- Grid/Graph/No grid option on all review screens
- Facility to edit HR and BP of any stage
- Facility to edit Patient Details

❖ **Review display modes**
- 12 medians screen
  - 12 medians are displayed with ST-level
- Mixed Median report with one Median complex + 2.5 seconds ECG of each lead
- Facility to zoom median of selected lead and edit fiducial points
- Trends
  - Trends of HR, BP, ST Level, ST Slope, J Amplitude
  - 8, 16, 32, 48, 56 seconds resolution.
- 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
- View unaveraged ECG
- Superimpose medians of any 2 stages in different colours.
- Full wave disclosure of 1 minute of any lead
- Edit and print Summary Report using standard edit options

❖ **Reports**
- 12 lead linked median (single / all stages)
- Mixed Median Report
- 6 lead Rhythm report of 10 seconds (single / all stages)

- 12 lead Unaveraged ECG report
- Extra Comments report
- Stage Report
- Brief Summary Report
- Trends Report (HR, BP, ST Levels / ST Slopes, J Amplitude of 3 configured leads
- Full wave disclosure of 1 minute of any lead
- Facility to print superimposed medians of any 2 stages in different colours
- Summary Report (Hospital Address and referring doctor designation to be printed in Summary reports)
- ST-Levels & Slopes Table
- Extended Mixed Median Report
- Selected median report
- Max HR report

❖ **Settings**

- Hospital details
- Referring Doctor list
- Standard Summary report option
- ST-Win system configuration
- Treadmill protocol
  - Available standard protocols
    - BRUCE
    - MODIFIED BRUCE
    - NAUGHTON
    - MODIFIED BALKE
- Printing details configuration
- System configuration
  - Speed in km/hr or m/s
  - TM speed at exercise stop (slow-0 km/hr, Fast-0 km/hr / 1.2 km/hr)
  - ST Level lead in Summary
  - Long lead in reports
  - Screen Display leads (3)
  - 3 Leads in Trend Report

- Stage Report Leads
- Treadmill Support: Compact, Treadstar, TreadstarXP, Trackmaster
- COM Port Selection for amplifier.
- Median update time is configurable to 1 to 8 sec.

❖ **Utilities**

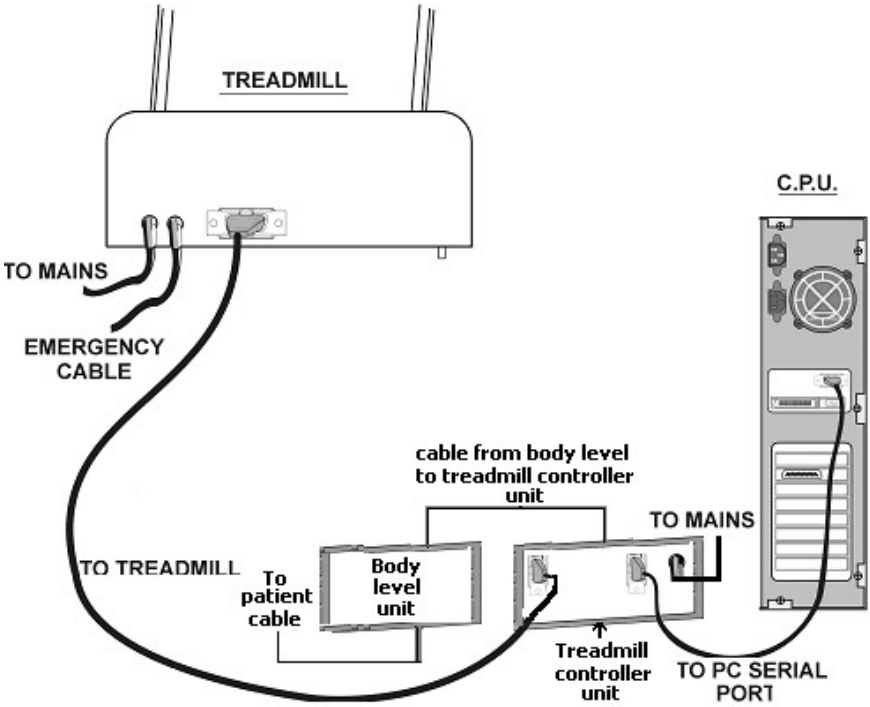
- Test Treadmill
- Test acquisition unit
- Calibrate TM Speed
- Calibrate TM Grade
- Delete printout from printer queue

❖ **Help**

About Stress test system- software version is displayed

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.

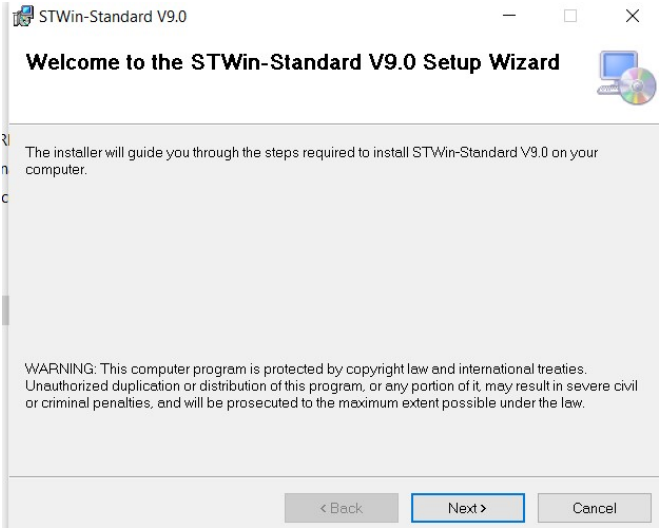
Software Installation:

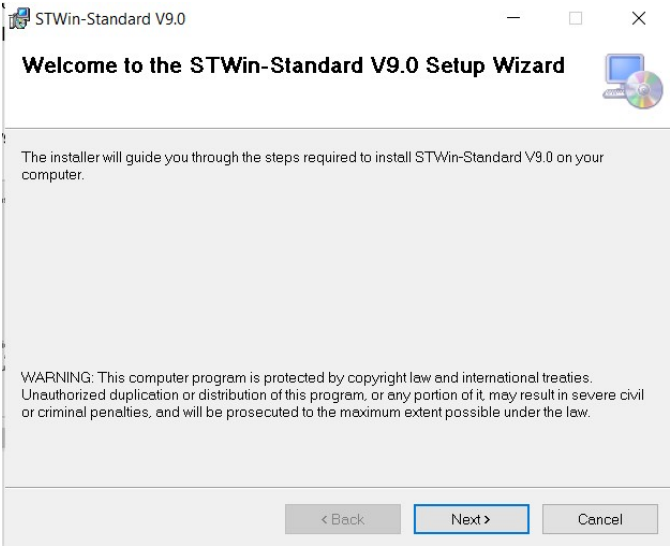
NOTE:
Software link on NASAN website is https://nasanmedical.com/download-centre.html
Whenever you download the software from NASAN website, ensure that WINZIP software is installed on customer PC.
After downloading the software from NASAN website, it is in zipped folder then unzip (For unzip WINZIP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

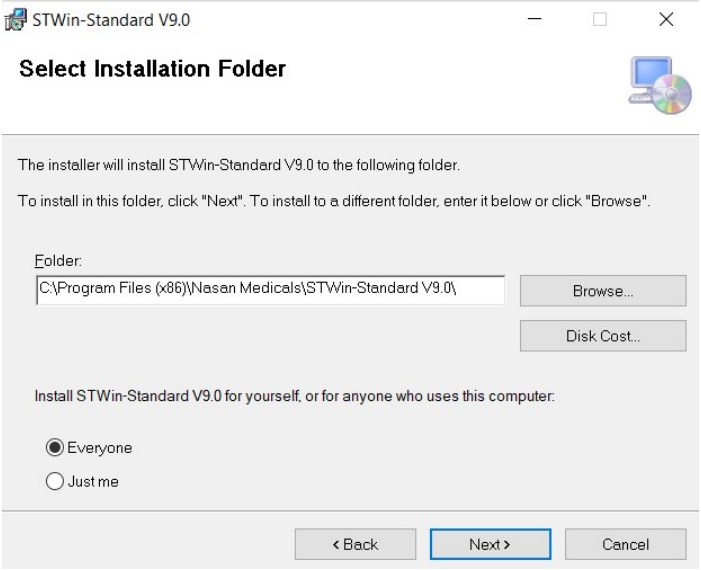
To install the Software in PC, follow the steps mentioned below:

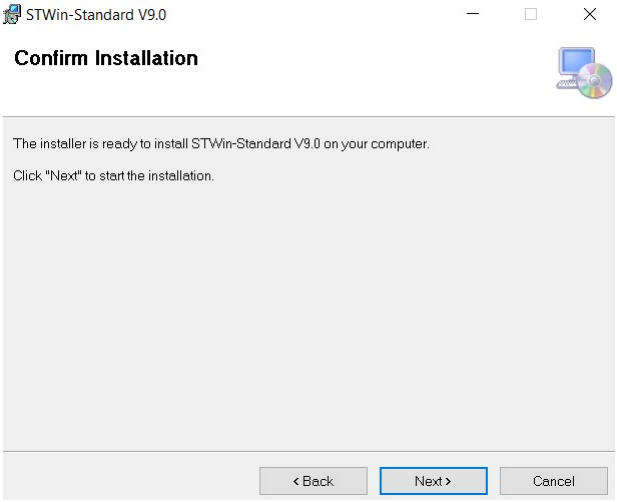
- Run 

and follow the installation steps.


STWin-Standard V9.0
Welcome to the STWin-Standard V9.0 Setup Wizard
The installer will guide you through the steps required to install STWin-Standard V9.0 on your computer.
WARNING: This computer program is protected by copyright law and international treaties. Unauthorized duplication or distribution of this program, or any portion of it, may result in severe civil or criminal penalties, and will be prosecuted to the maximum extent possible under the law.
< Back
Next >
Cancel


STWin-Standard V9.0
Welcome to the STWin-Standard V9.0 Setup Wizard
The installer will guide you through the steps required to install STWin-Standard V9.0 on your computer.
WARNING: This computer program is protected by copyright law and international treaties. Unauthorized duplication or distribution of this program, or any portion of it, may result in severe civil or criminal penalties, and will be prosecuted to the maximum extent possible under the law.
< Back
Next >
Cancel


STWin-Standard V9.0
Select Installation Folder
The installer will install STWin-Standard V9.0 to the following folder.
To install in this folder, click "Next". To install to a different folder, enter it below or click "Browse".
Folder:
C:\Program Files (x86)\Nasan Medicals\STWin-Standard V9.0\
Browse...
Disk Cost...
Install STWin-Standard V9.0 for yourself, or for anyone who uses this computer:
Everyone
Just me
< Back
Next >
Cancel


STWin-Standard V9.0
Confirm Installation
The installer is ready to install STWin-Standard V9.0 on your computer.
Click "Next" to start the installation.
< Back
Next >
Cancel

- user control dialog box will be display ,click on ‘Yes’ then installation will be complete.

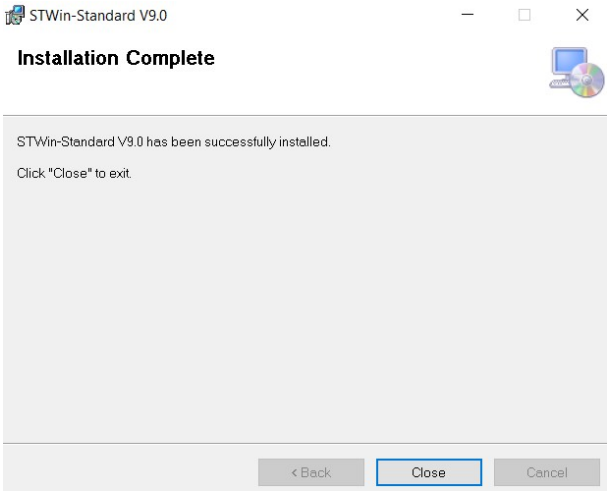
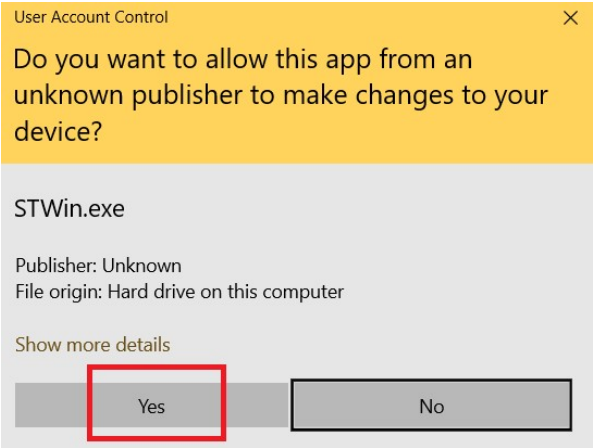


Fig: Installation setup.

- Double click on the icon on the desktop to run the software, following user control will be display ,click on ‘Yes’ to open the software.



Driver Installation Procedure

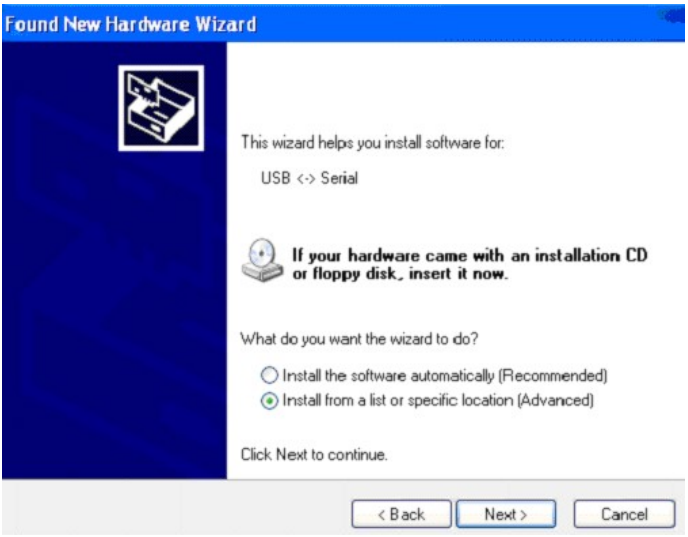
Note: copy ST WIN software and FTDI driver for all OS to desktop or any drive(drive D or drive E) from \Utility\FTDI driver for all OS to install it on PC

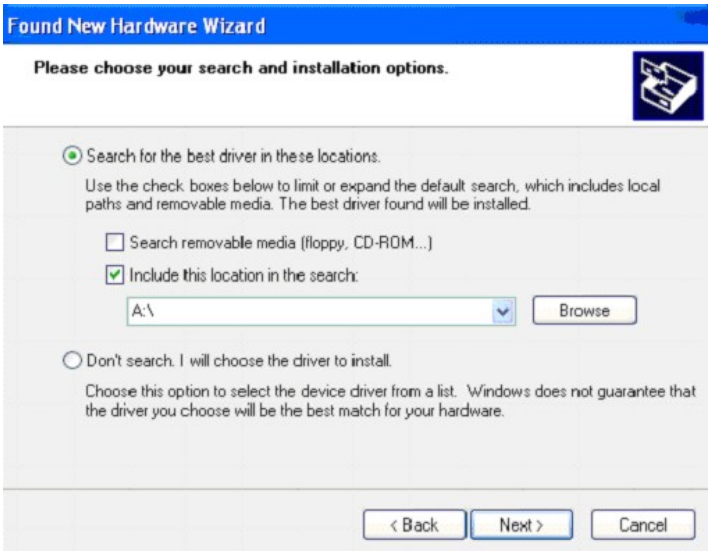
a. Initially install ST WIN software on your PC.

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.

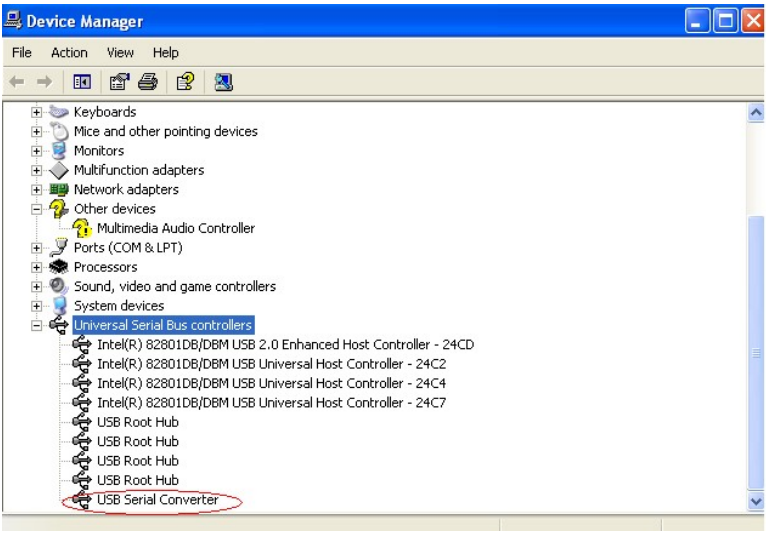

Found New Hardware Wizard
This wizard helps you install software for:
USB <-> Serial
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click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

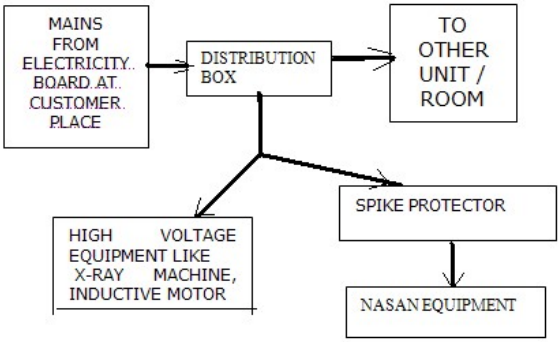
Click the Browse button and give the FTDI driver path **from copied drive. FTDI driver for all OS**

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

TRAINING & INSTALLATION

S. NO	POINTS COVERED DURING TRAINING	SIGNATURE
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 ,MONITOR 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	Insert the fuse in fuse holder of treadmill controller.	
9	CONNECT TREADMILL TO TREADMILL CONTROLLER, CONNECT TREADMILL CONTROLLER TO PC SERIAL /USB PORT . CONNECT BODY LEVEL AMPLIFIER TO TREADMILL CONTROLLER.	
10	WHILE TESTING TREADMILL INDEPENDENTLY, ENSURE THAT THE CONVEYOR BELT IS NOT TOUCHING EITHER SIDES OF THE TREADMILL	
11	IF PC IS SUPPLIED BY DOCTOR, ENSURE THAT 9 PIN SERIAL PORT / USB PORT IS AVAILABLE	
12	IF PC IS SUPPLIED BY DOCTOR, ENSURE USB PORT IS AVAILABLE	
13	ENSURE THAT SOFTWARE IS DOWNLOADED FROM NASAN WEBSITE AND SAVED IN D:OR ANY OTHER DRIVE OF PC.	
14	ENSURE THAT PRINTER WITH DRIVER SOFTWARE IS AVAILABLE, LOAD DRIVER S/W, SET PAPER SIZE TO 'A4' AND MODE TO 'LANDSCAPE'	
15	ENSURE THAT PC IS with OPERATING SYSTEM **WINDOWS 10 PROFESSIONAL,64 bit**	

		RE.
1	INSTALL STWIN S/W	
	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 ST WIN SOFTWARE -CONFIGURE-CONFIGURE SYSTEM	
5	TEST THE COMMUNICATION OF TREADMILL CONTROLLER AND TREADMILL WITH PC BY SELECTING TEST ACQUISITION OPTION FROM ST WIN 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	

HOW TO CONDUCT STRESS TEST WITH LIVE PATIENT

S.NO	STEP	SIGNATURE.
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.	

9	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)	
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.	
34	Press the Exit button on idle screen of software to close the software. Turn OFF the ON-OFF switch on treadmill controller to turn it OFF. Turn OFF the mains supply of treadmill & treadmill controller.	

FOLLOWING MENU'S SHOULD BE COVERED IN THE SOFTWARE TRAINING

SR NO	POINTS	SIGNATURE

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 Printout 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. NO.	**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: -

SIGNATURE OF THE SERVICE ENGINEER

NAME OF THE DOCTOR:-

SIGNATURE OF THE DOCTOR

14. 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 in fig will appear on the screen.

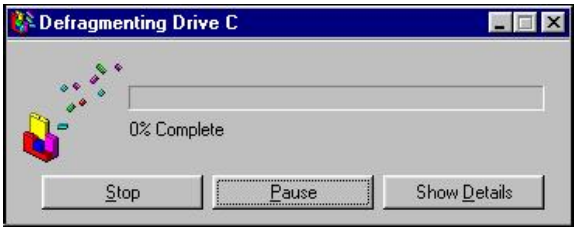


Fig: Defragmentation

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.

15. Appendix -E

A. **Supplies and Accessories: List of Accessories**

NOTE: Do not store any consumables after their 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:**

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

NOTE:

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

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.

Contact us:
All INDIA SERVICE (Mobile) : 09371039255
Email address : service@nasanmedical.com
Website : www.nasanmedical.com