TM-2653
TM-2654

AUTOMATIC BLOOD PRESSURE MONITOR

INSTRUCTION MANUAL

INSTRUCTION-TM-2653/TM2654-V.1.A

A&D Company, Limited

508-1A-IE JUNE 1994

The contents of this manual and the specifications of the instrument covered by this manual are subject to change for improvement without notice.

Compliance with FCC Rules
Please note that this equipment generates, uses and can radiate radio frequency energy. This equipment has been tested and has been found to comply with the limits of a Class A computing device pursuant to Subpart J of Part 15 of FCC rules. These rules are designed to provide reasonable protection against interference when equipment is operated in a commercial environment. If this unit is operated in a residential area it might cause some interference and under these circumstances the user would be required to take, at his own expense, whatever measures are necessary to eliminate the interference.
(FCC = Federal Communications Commission in the USA.)

SAFETY TERMS USED IN THIS MANUAL

All safety messages are identified by the following the words "***WARNING***", "***CAUTION***" and "*NOTE*". These words mean the following:

WARNING

Important information to alert you to a situation that might cause serious injury and damage to your property if instructions are not followed.

CAUTION

Important information that tells how to prevent damage to equipment, or how to avoid a situation that might cause minor injury.

NOTE

Important information that helps users operates the instruments.

SAFETY PRECAUTIONS

When using the TM-2653/TM-2654, the following safety precautions should always be followed.

WARNING

- ***GROUNDING***
  To avoid electrical shock, plug the power cord into a properly wired earth grounded receptacle, or ground the GND. binding post before connecting anything else to any of the instrument. A protective ground connection by way of the grounding conductor in the power cord is essential for safe operation when using the AC line power.
- ***FUSE***
  To avoid a fire hazard, use only a fuse of the proper type, voltage and current rating as specified on the rear panel. Never bypass a fuse by shorting across the fuse terminals.
- ***POWER CORD***

  Use only a power cord that is in good condition, designed for the voltage and plug configuration used in your country.
- ***SERVICE***
  Internal service or adjustment to this product should be performed by a qualified person.
- ***TO INTERPRET BLOOD PRESSURE MEASUREMENT***
  Only a trained medical professional is qualified to interpret a user's blood pressure measurements, and no device can replace regular medical examinations by the user's doctor. A doctor should verify the blood pressure measurements before making adjustments to medication.

CAUTION

- ***IN CASE OF EMERGENCY***
  Press the red button labeled "EMERGENCY STOP" located on the front. This releases the air in the cuff, but the automatic cuff takes some time to release. Wiggle your arm to remove it quickly from the housing.
- ***USE BY CHILDREN OR INVALIDS***
  To avoid accidents, supervision is required when this equipment is used by children or invalids.
- ***TO STOP DURING OPERATION***
  Press the " START/STOP" switch located on the display panel to stop the operation. Do not turn off the main power switch.

CONTENTS

ABOUT THIS MANUAL

PURPOSE

This manual provides information for installation and operation of the TM-2653/ TM-2654 manufactured by A&D Company limited.

USE

Users of this manual are expected to have basic knowledge on blood pressure and standard electric practice. However only a trained medical professional is qualified to interpret a user's blood pressure measurements.

ORGANIZATION

Section 1: INTRODUCTION, provides basic information, Features, Specifications, Dimensions, and Parts descriptions for the TM-2653 / TM-2654. Parts descriptions, illustrates and identifies items on the front and rear panels.

Section 2: INSTALLATION, describes suitable locations and procedures for installation.

Section 3: OPERATION, explains the operating procedures and how to set the functions before use.

Section 4: FUNCTION SETTINGS, explains the setting procedures of the functions, including the installation of printer paper.

Section 5: MAINTENANCE, explains how to maintain and clean the equipment. Problem solving, helps users to overcome operating problems.

Section 6: SUPPLIES, lists code numbers of replacement parts and optional parts. Telephone numbers and addresses of the A&D Companies are listed on the back of this manual.

Appendix A: DIMENSIONS, shows the physical size of the instrument.

Appendix B: PRINT SAMPLES, printed out with HIGH SPEED, STANDARD, GRAPH, and TABLE Print format, are listed here.

Appendix C: CONCERNING MEASUREMENTS, provides information on blood pressures and measuring blood pressure.

1 INTRODUCTION

1-1 FEATURES

The TM-2653 / TM-2654 is a blood pressure monitor that measures systolic and diastolic blood pressure and pulse. The TM-2653 is a standard model, the TM-2654 is equipped with a printer unit. The features are as follows:

AUTOMATIC-CUFF SYSTEM / AUTOMATIC-EXHAUST-ADJUSTMENT SYSTEM
The arm cuff is wrapped around the arm by pressing the START/STOP switch and deflation speed is automatically controlled. No special adjustment is required. All you have to do is insert your arm into the arm insertion section to the shoulder and press the START/STOP switch. The rest is done automatically. You can easily and quickly measure your blood pressure. The TM-2653 / TM-2654 is suitable for mass medical check-ups at firms or sports facility.

BUILT IN PRINTER * (TM-2654 ONLY)
the TM-2654 is equipped with a printer unit, which allows measurement results to be printed out for record keeping. The print format can be selected from result only, results with pulse pressure graph or a list of the results.

BUILT-IN CLOCK
The date and time of measurement can be printed along with the measurement results.

COUNTER (UP TO 999999 COUNTS)
It is helpful for maintaining the equipment, to know how often the equipment is used.

SAFETY SYSTEM
TM-2653 / TM-2654 adopts an emergency stop system. In case of emergency, by pressing the EMERGENCY STOP button, the air in the arm cuff deflates and release the winding of Arm cuff, so that the arm can be removed easily. This system also works if there is a power failure.

REPLACEABLE ARM CUFF COVER
Arm cuff cover is easily replaceable.

1-2 SPECIFICATIONS

Table 1-1. Specifications

Measurement method	Ocillometric method
Measurement range Pressure Pulse	 30 - 280 mmHg 30 -200 beasts/min.
Accuracy Pressure: Pulse:	 ±4 mmHg ±5 %
Display Measurement value Clock	 Red LED, 3 digits Green LED, 4 digits
Year, month, date, minute	
	(Automatic calendar)
Counter	Up to 999999 counts
Printer	Thermal type (58 mm width)
Arm cuff	Automatic winding mechanism with geared motor
Pressurization method	Automatic pressurization using micro-pump
Deflation method	Speed-controlled deflation using automatic electro-magnetic valve
High-speed deflation method	Automatic high-speed deflation using an Electro-magnetic valve
Protection system	• Stop switch • Emergency stop switch • Automatic high-speed deflation using Electro-magnetic valve at 320 mmHg or higher pressure • High-speed deflation using mechanical safety valve at 350 mmHg
Power source	100/115 220/240 VAC factory preset 50/60 Hz
Power consumption	40 VA
Operating temperature humidity	 10°C to 40°C (50°F to 104°F) 30% to 85% (non condensing)
Storage temperature humidity	 -20°C to 60°C (-4°F to 140°F) 10% to 95% (non condensing)
External dimensions	380 (W) × 287 (H) × 350 (D) mm
Weight TM-2653 TM-2654	 7.6 Kg (approximately 16.7 pound) 8.0 Kg (approximately 17.6 pound)

1-3 PARTS DESCRIPTIONS

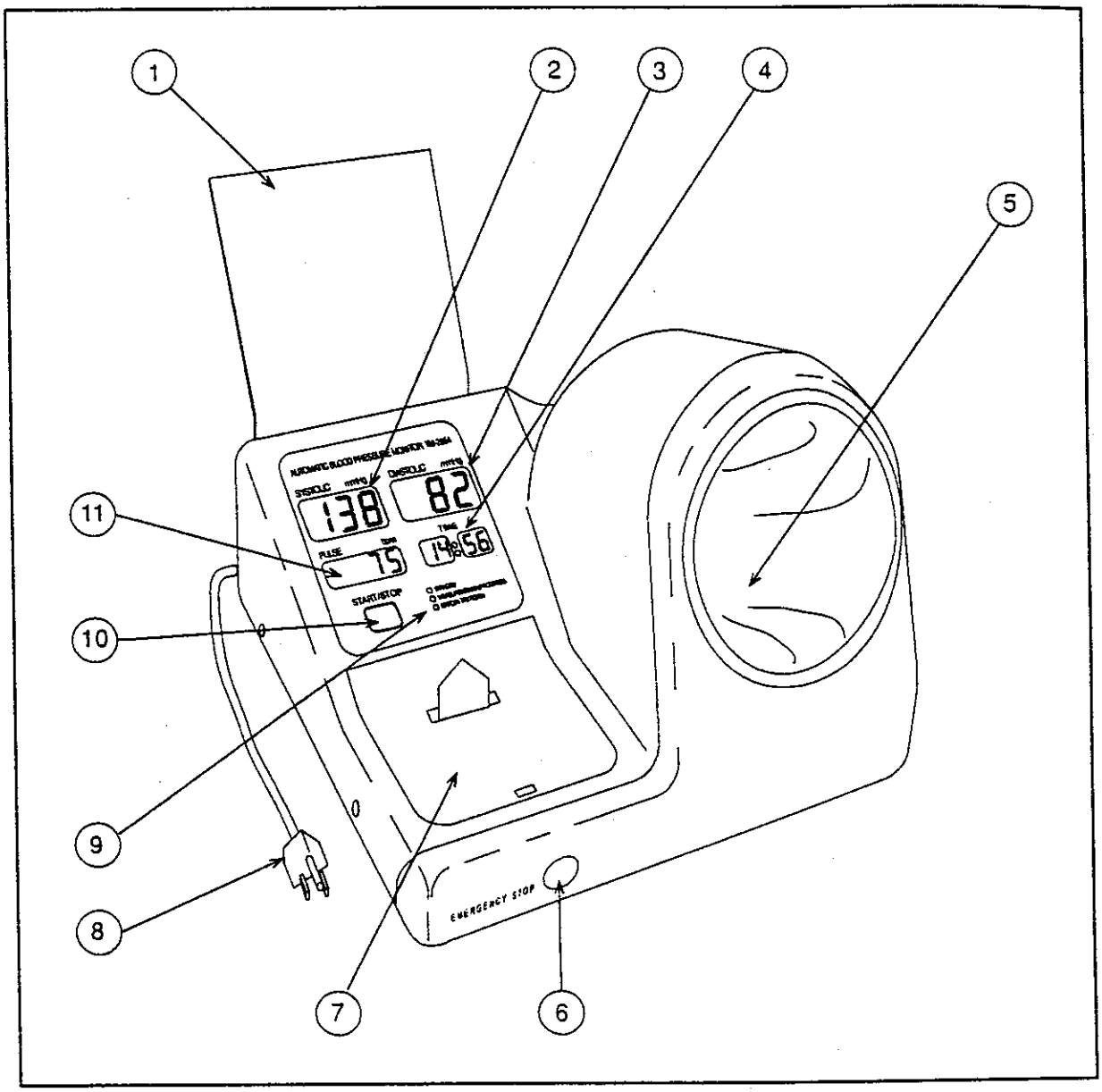
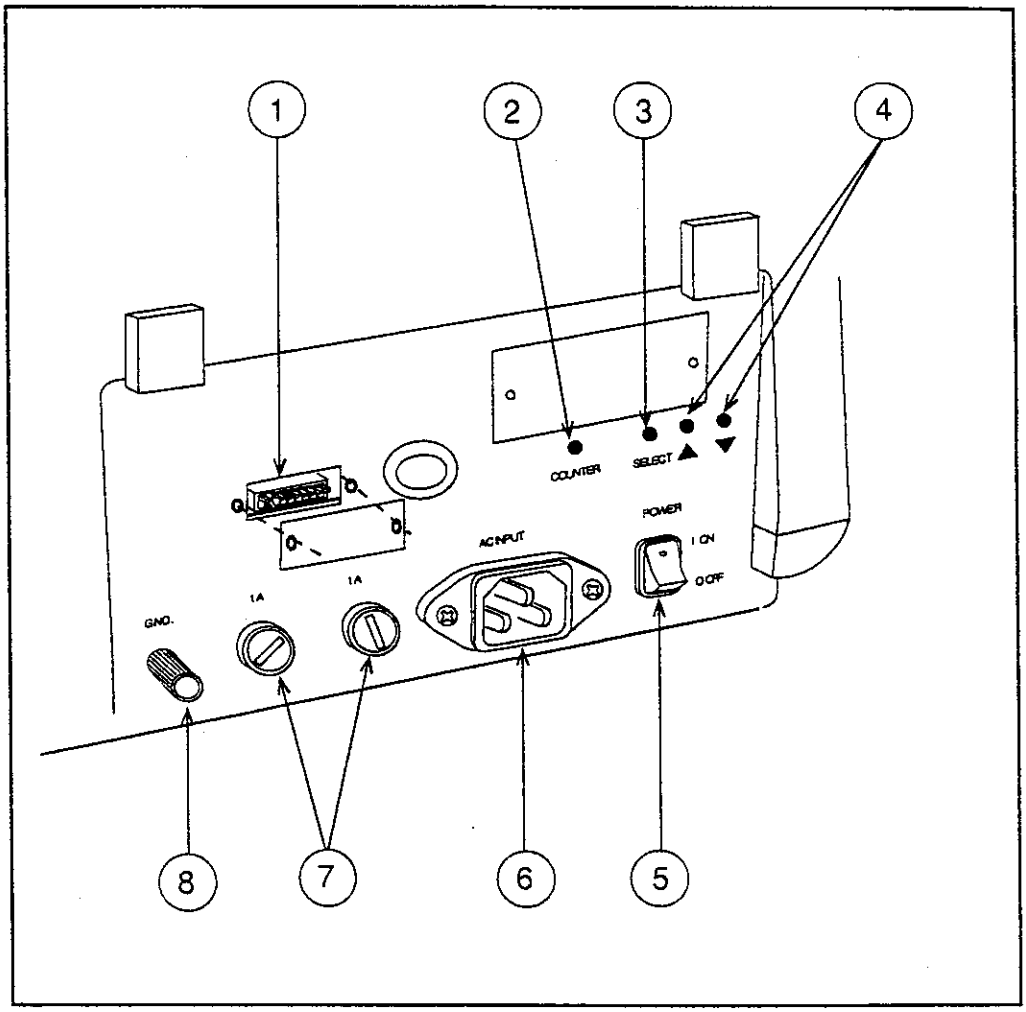


Figure 1-1. Front Panel Features

Table 1-2. Front Panel Features

ITEM	FEATURE	DESCRIPTION
1	Instruction Panel	Shows brief operating procedures.
2	SYSTOLIC Pressure Display	Indicates measured systolic blood pressure value in mmHg. In the CLOCK setting mode, it shows the month.
3	DIASTOLIC Pressure Display	Indicates measured diastolic blood pressure value in mmHg. In the CLOCK setting mode, it shows the date.
4	TIME Display	Indicates the current time. The clock should be adjusted before use. (See "CLOCK" in the "FUNCTION" section.
5	Arm Cuff Cover	A replaceable cover. There is one extra cover in the accessory package.
6	EMERGENCY STOP switch	Stops operation by shutting down power and the air in the cuff is deflated rapidly.
7	Printer unit (TM-2654 only)	Prints out the measurement results.
8	Power cord	Supplies power to the equipment. Be sure to ground using the grounding receptacle packed in the accessory package.
9	Operation Indicators	Indicates operating information. (STANDBY, MEASUREMENT IN PROGRESS and ERROR - TRY AGAIN)
10	START/STOP Switch	Starts and stops the operation. Power is not turned off using this switch.
11	PULSE Display	Indicates measured pulse value. In the CLOCK setting mode, it shows year.

REAR PANEL



Figurre 1-2. Rear Panel Features

Table 1-3. Rear Panel Features

ITEM	FEATURE	DESCRIPTION
1	FUNCTION Setting Switch	Sets Pressurization value, Print Format, and results display period
2	COUNTER Switch	When pressed, the number of uses is displayed on the SYSTOLIC and DIASTOLIC pressure display. If pressed for more than four seconds, the number is reset to zero.
3	SELECT Switch	When pressed, enters the Clock setting mode from measuring mode. By pressing this, the item selected moves to Year, Month, Date, Hour, and Minute in that order.
4	▼ ▲ Switch	Increases and decreases the number of the selected item (Month, Date, Year, Hour, and Minute)
5	POWER Switch	Turns ON and OFF the units power.
6	AC INPUT Connector	A connector for the power cord.
7	FUSE Holder	1A time lag fuse is contained in each holder.
8	GND. Terminal	A connection point for chassis ground. Connect this terminal to an earth ground point using the ground cable supplied with this instrument

2 INSTALLATION

2-1 INSTALLATION CONDITIONS

To ensure that the TM-2653/TM-2654 works properly, try to meet the following conditions as closely as possible.

Install the TM-2653/TM-2654 in a place where:
- The humidity is less than 85% (non-condensing).
- The temperature range is from 10°C to 40°C (50°F to 104°F).
- It is away from water, dust, flammable chemicals.
- It is not exposed to direct sunlight.

Install the TM-2653/TM-2654 on a table solid enough to support its weight. Use the correct voltage for the power source and be sure to ground the instrument.

2-2 INSTALLATION PROCEDURES

The TM-2653/TM-2654 should be installed as follows.

1 ***PLACE THE TM-2653/TM-2654 ON THE TABLE***
and adjust the height of the chair so that the arm Insertion position is at the user's heart level.

2 ***GROUND THE TM-2653/TM-2654.***
Connect the GND. Terminal on the rear panel to an earth ground point using the accessory Ground Cord.

3 ***PLUG IT IN.***
Connect the Power cord to an AC outlet and the AC INPUT connector on the rear panel.

3 OPERATION

WARNING

- ***INTERPRETATION OF BLOOD PRESSURE MEASUREMENTS***
  Only a trained medical professional is qualified to interpret a user's blood pressure measurements, and no device can replace regular medical examinations by the user's doctor. A doctor should verify blood pressure measurements before making any adjustments to medication.

CAUTION

- ***USE BY CHILDREN OR INVALIDS***
  To avoid accidents, supervision is required when this equipment is used by children or invalids.

OPERATION PROCEDURES

1 TURN ON THE POWER Switch on the rear panel.

When powered on, all the displays light up for several seconds and the blood pressure monitor prepares for measurement.

2 TAKE OFF YOUR JACKET.

If you wear a jacket of thick cloth, take it off for a better measurement.

NOTE

Wearing a jacket of thick cloth may cause measurement to fail or be incorrect. The TM-2653/TM-2654 cannot sense a change in the air pressure in the cuff if you wear heavy materials.

3 ADJUST THE HEIGHT OF the CHAIR AND TABLE

Adjust the height of chair and table so that the arm insertion position is at the same height as the user's heart.

4 INSERT YOUR RIGHT ARM INTO THE ARM INSERTION POSITION.

NOTE

Be sure to insert your arm to the shoulder.
The blood pressure can be measured with a left arm also. However the right arm is recommended for this measurement.

5 REMAIN CALM, QUIET AND STILL.

NOTE

To get better results, remain calm, quiet and still , do not chew gum or smoke while measurements are being taken. Movement of your arm or body during measurement may cause the measurement to fail or be incorrect.

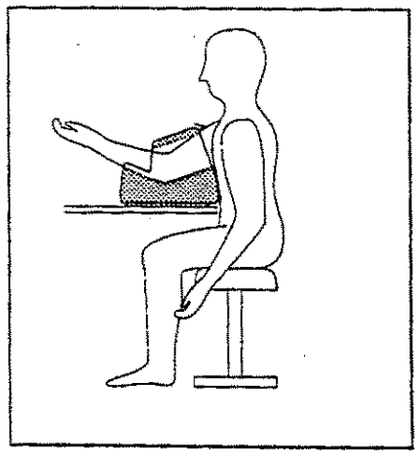


Figure 3-1. Measuring Position

6 press the start / stop switch to start measurement.

7 - - - - measuring- - - - -

CAUTION

- ***IN CASE OF EMERGENCY***
  Press the red button labeled "EMERGENCY STOP" located on the front. This releases the air in the cuff, but the automatic cuff takes some time to release. Wiggle your arm to remove it quickly from the housing.
- ***TO STOP DURING OPERATION***
  Press the " STAET/STOP" button located on the display panel to stop the operation. Do not turn off the main power switch.

NOTE

- *If the TM-2653/TM-2654 fails to measure blood pressure for some reason, it will automatically measure again.*
- *The TM-2653/TM-2654 automatically starts to inflate the arm cuff to thepredetermined pressurization value, then starts to measure blood pressure while deflating. The SYSTOLIC DISPLAY shows the air pressure value during inflating and deflating.*

8 results of measurements

When measurement has completed, the TM-2653/TM-2654 displays the Systolic, Diastolic, and Pulse and prints out the results (Printing is only available for the TM-2654)

9 REMOVE YOUR ARM WHEN THE RESULTS ARE DISPLAYED.

(END OF PROCEDURES)

4 FUNCTION SETTINGS

1 INTRODUCTION

This section describes the functions and the setting procedures for the Clock, Results Display Period, Counter, Pressurization, and Printer in that order. It may be necessary for them to be set to the user's requirements before operating the TM-2653/TM-2654, if factory settings need to be changed. Turn on the ON/OFF.

2 CLOCK

The current time is displayed during the standby mode.

NOTE

Refer to Figure 3.2 Rear Panel Feature for the location of the switches.
The clock is preset to Japan Standard Time when shipped.

TO ADJUST THE CLOCK:

1 Enter into Clock Setting mode./ Select the one to be changed.

Press the SELECT Switch on the rear panel to get into CLOCK Adjusting Mode. Automatically Year is selected. Select the item to be changed by Pressing the SELECT Switch. (the sequence is; Entering Clock Adjustment mode,Year, Month, Date, Hour, Minute, and Exiting the Clock Adjustment mode in that order.

2 Setting the required number

Press the " 4 ≤ or ≥ Switch " on the rear panel to increase or decrease the number. If necessary repeat procedures 1 and 2.

3 Exit from CLOCK Setting mode.

To exit from the CLOCK Setting mode, press the SELECT Switch to exit, after Minute setting.

3 RESULTS DISPLAY PERIOD

The measurement results is displayed for the period set (see table 4-1.)

NOTE

** The Result Display Period is preset to 10 seconds when shipped.*

To change the setting:

1 Remove the panel that covers FUNCTION Switch on the rear panel.
2 Set switches number 5 and 6 as required .

Table 4-1. Results Display Period

	Results Display Period	FUNCTION Setting Switch	
		NO.5	NO.6
	Until the next measurement	UP	UP
	5 seconds	DOWN	UP
*	10 seconds	UP	DOWN
	20 seconds	DOWN	DOWN

4-4 COUNTER

The counter increments each time a measurement is performed, up to 999999. The count is stored in the device's memory and remains until it is reset.

TO DISPLAY THE COUNT:

Press the "2 COUNTER Switch" on the rear panel in the standby mode, it appears on the SYSTOLIC Display and the DIASTOLIC Display of the front panel.

TO RESET THE COUNTER:

Press the "2 COUNTER Switch" for more than 4 seconds in the standby mode to reset to zero.

4-5 PRESSURIZATION VALUE

When the START Switch pressed, the internal pump sends air into the arm cuff to the pressurization value.

NOTE

- *Set the pressurization value 30mmHg to 40mmHg higher than the expected blood pressure value.*
- *If the pressurization value is too low to measure a blood pressure , it will be automatically set 40mmHg higher than the previous pressurization value and the measurement starts again.*

** The pressurization value is preset to 180mmHg. when shipped.*

TO SET THE PRESSURIZATION VALUE:

1 Remove the panel that covers "1 FUNCTION Switch " on the rear panel.
2 Set switches number 7 and 8 as required.

Table 4-2. Pressurization Value

Pressurization Value	FUNCTION Setting Switch	
	NO.7	NO.8
160mmHg	UP	UP
* 180mmHg	DOWN	UP
200mmHg	UP	DOWN
220mmHg	DOWN	DOWN

4-6 PRINTER (TM-2653 ONLY)

The TM-2654 is equipped with a thermal type printer. The printer can print out not only the measurement results, but also the time of measurement and a graph of the measurement results. The print format can be selected from the print format table.

CAUTION

- ***Be sure to install the printer paper straight. Improper installation of the paper may cause poor print-out or damage the printer mechanism.***
- ***The TM-2654 uses a thermal type printer mechanism. Use the correct type of paper (58mm wide) for the thermal printer.***

HOW TO INSTALL THE PRINTER PAPER:

1 Cut the paper as shown to make it easy to insert into the slot.

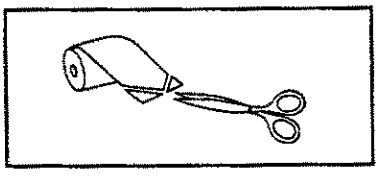


Figure 4-1. Printer Paper set (1/7)

2 Open the printer cover by pressing the place pointed to by the arrow.

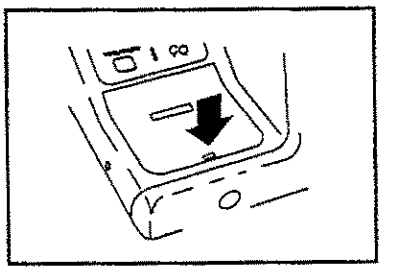


Figure 4-2. Printer Paper set (2/7)

3 Lift up the lever indicated by the arrow.

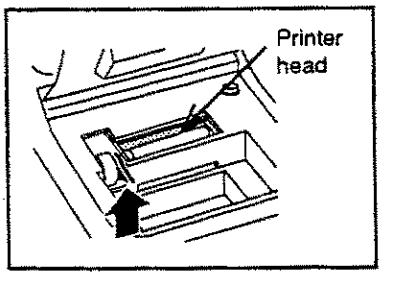


Figure 4-3. Printer Paper set (3/7)

4 Insert the printer paper through the slot under the printer head.

5 Set the roll of paper into the print paper holder.

6 Pull the printer paper up until it comes above the printer cover.

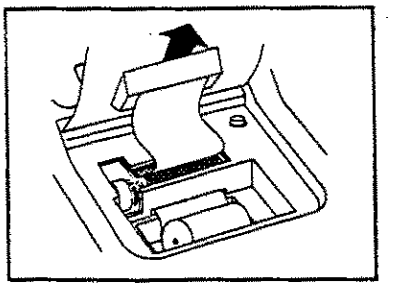


Figure 4-4. Printer Paper set (4/7)

7 Push the lever down to hold the paper.

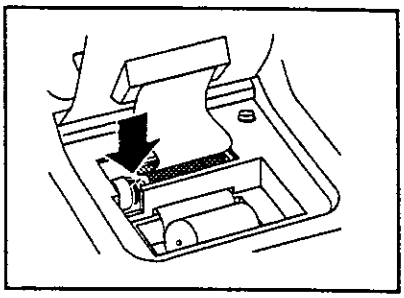


Figure 4-5. Printer Paper set (5/7)

8 Feed the paper by pressing the FEED Switch.

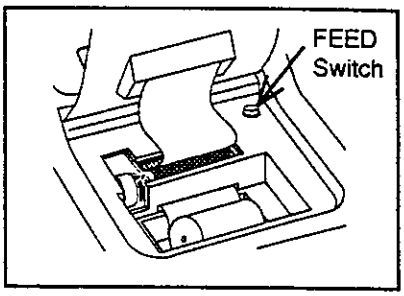


Figure 4-6. Printer Paper set (6/7)

9 Close the printer cover by pressing at the place indicated by the arrow.

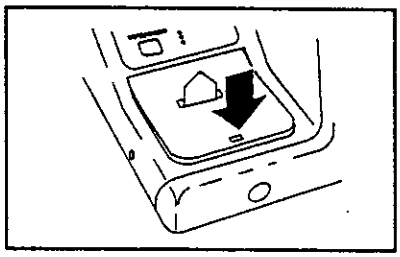


Figure 4-7. Printer Paper set (7/7)

HOW TO CHANGE THE PRINT FORMAT:

NOTE

See APPENDIX for the print samples.
** The Print Format is preset to Standard Print when shipped.*

1 Remove the panel that covers "1 FUNCTION Switch " on the rear panel.
2 Set switches number 1, 2, 3, and 4 as required.

Table 4-3. Print Format

Print Format	Sample NO.	FUNCTION Setting Switch			
		NO.1	NO.2	NO.3	NO.4
No printout	N/A	UP	UP	UP	UP
High-Speed print	Fig. B-1.	UP	DOWN	DOWN	UP
* Standard Print	Fig. B-2.	DOWN	DOWN	DOWN	UP
Graph print	Fig. B-3.	DOWN	UP	UP	DOWN
Table print	Fig. B-4.	UP	DOWN	UP	DOWN

5 MAINTENANCE

5-1 CLEANING

CAUTION

- ***Never immerse the TM-2653/TM-2654 in water for cleaning, that may damage the electronic parts inside.***
- ***Never use thinner or a strong detergent for cleaning, that may discolor or deform the plastic case and display panel.***

HOUSING CASE

Clean the case gently using a soft cloth moistened with water and mild detergent or alcohol for cleaning.

DISPLAY PANEL

Clean the display gently so as not to scratch the acrylic panel surface. Use a soft cloth moistened with water.

ARM CUFF COVER

When the arm cuff cover becomes dirty, remove it from the arm insertion position. Refer to " 4-2 ARM CUFF COVER REPLACEMENT ". Wash the cover with a mild detergent. After drying, put it back in place securely. When it is worn out, replace it with a new one. (One extra arm cuff cover is supplied as an accessory.)

NOTE

if the cover is not installed in the Arm Cuff position properly, it may cause problems in operation.

5-2 ARM CUFF COVER REPLACEMENT

ARM CUFF COVER INSTALLATION.

The arm cuff cover has rings at both ends, one is a plastic ring at the front and the other is a metal ring at the rear. (Figure 5-1.)
Each ring fits into a groove to support the Arm cuff cover. (Figure 5-2.).

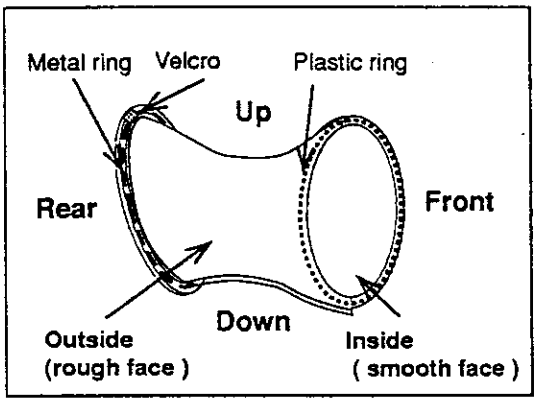


Figure 5-1. Arm cuff cover (1/6)

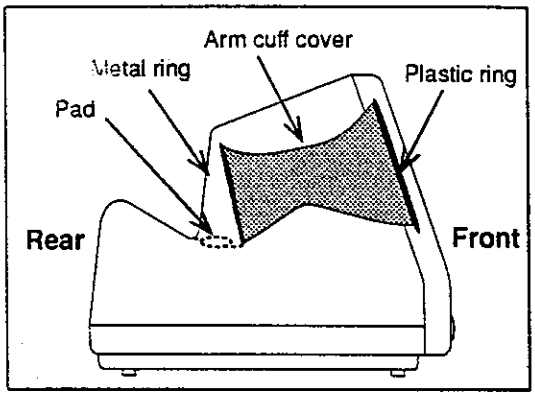


Figure 5-2. Arm cuff cover (2/6)

DETACHMENT

Detach the arm cuff cover using the following procedures.

1 Detach the plastic ring at the front of the arm cuff cover from the groove. (See Figure 5-3.)

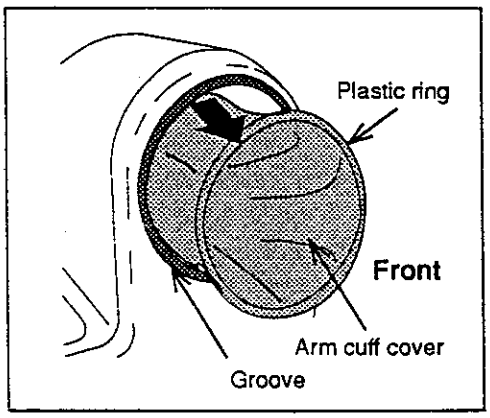


Figure 5-3. Arm cuff cover (3/6)

2 Detach the metal ring at the rear of the arm cuff cover from the groove. (See Figure 5-4.)

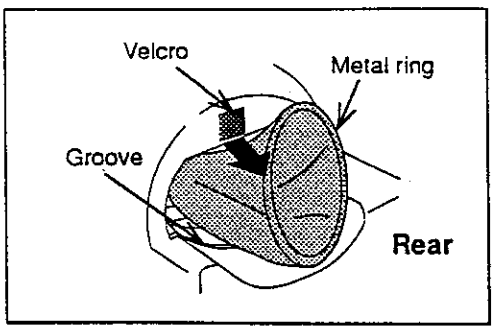


Figure 5-4. Arm cuff cover (4/6)

3 Remove the arm cuff cover from the housing case. (See Figure 5-5.)

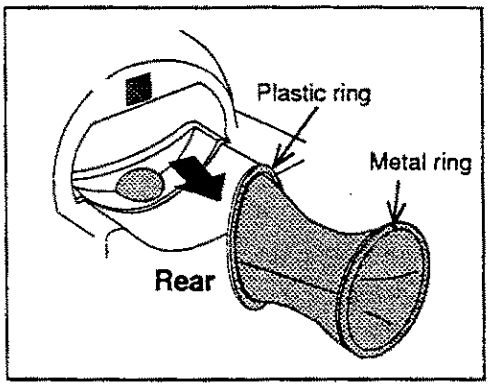


Figure 5-5. Arm cuff cover (5/6)

4 Remove the metal and plastic rings from the cover. There are holes in the cover for the removal of the rings. (See Figure 5-6.)

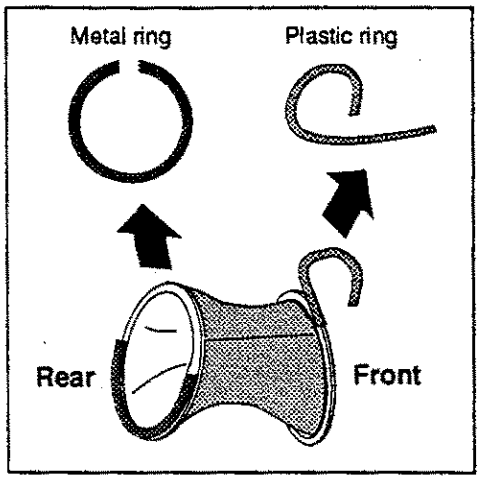


Figure 5-6. Arm cuff cover (6/6)

ATTACHMENT

NOTE

Be sure of the directions and inside/outside of the arm cuff cover before attaching (See Figure 4-1. Arm cuff cover).

Attach a new or washed cover following the procedures below.
Refer to the detaching procedures,

1 Put the metal ring through the hole provided on the rear (the Velcro side) of the cover.
2 Put the Plastic ring through the hole provided on the front of the cover.
3 Hold the front of the arm cuff cover and put it through the housing case.
4 Attach the rear end of the arm cuff cover to the Velcro on the housing case and push the metal ring into the groove.
5 Push the plastic ring into the groove.

5-3 INSTALLING PRINTER PAPER

Refer to " PRINTER " in " FUNCTION SETTING " of Section 3 OPERATION .

5-4 PROBLEM SOLVING

WARNING

Internal service or adjustment of this product should be performed only by a qualified person.

If a problem occurs with the TM-2653/TM-2654, refer to " Table 4-1. PROBLEM SOLVING LIST " to solve the problem. If a problem can not be solved, please contact your nearest dealer or A&D office. A list of A&D addresses and telephone numbers are printed on the back of this manual.

Table 5-1. Problem Solving List

PROBLEM	*SOLUTIONS*
• No display, No reaction when the ON/OFF Switch is turned on.	• Check the power cable for proper connection and fuses for a blown fuse.
• Arm cuff is wound around arm, but released without being pressurized and " Err " is displayed	• Insert your arm into the arm insertion section to the shoulder again. • Adjust the height of the table and chair so that the arm insertion section comes to the height of your heart. • Re-install the Arm cuff cover.
• " Err " (Error) is displayed and remeasurement has started.	• Remain calm and still while the measurements are taken.
• " Err " (Error) is displayed two times and the instruction LEDs, " STANDBY " and " ERROR - TRY AGAIN ", on the display panel lights.	• Insert your arm into the arm insertion section to the shoulder and start again. • If you wear a jacket of thick cloth, take it off and try the measurement again. • Adjust the height of the table and chair so that the arm insertion section comes to the height of your heart. • The error measurement might be caused by a pulse that is too weak to be sensed, arrhythmia or pulse irregularity. Consult your doctor.
• " PE " (Paper Empty) is displayed. • Measurement results is not printed straight.	• Install the printer paper properly. Refer to " PRINTER " in "FUNCTION SETTINGS " of Section 3.
" HU " (Head Up) is displayed.	• Push down the lever of the printer. See Figure 3-7. PRINTER " in the " FUNCTION SETTINGS " of Section 3.

6 SUPPLIES

There are optional supplies and accessories available for the TM-2653/TM-2654 as shown below. Please order parts from your nearest dealer or from one of the A&D offices listed on the back of this manual. Please use the part numbers listed.

REPLACEMENT PARTS

Table 6-1. Replacement parts

ITEM	DESCRIPTION	PARTS NUMBER
Arm cuff cover	5 pieces / set	AX-13B31946-S
Printer Paper	5 rolls / set 58mm (2.3in.) wide	AX-PP147-S

OPTIONAL PARTS

Table 6-2. Optional parts.

ITEM	DESCRIPTION	PARTS NUMBER
Chair,standard	460mm ~ 520mm (H) 18.1in. ~ 20.5in. (H)	AD-TM-9312
Chair, Gas shock suspension	410mm ~ 560mm (H) 16.1in. ~ 22.0in. (H)	AD-TM-9315
Table (Large)	700(W) × 713(H) × 430(D)mm 27.6(W) × 28.1(H) × 16.9(D)in.	AD-TM-9311
Table (Small)	380(W) × 700(H) × 350(D)mm 15.0(W)× 27.6(H) × 13.8(D)in.	AD-TM-9322

APPENDIX A: DMENSIONS

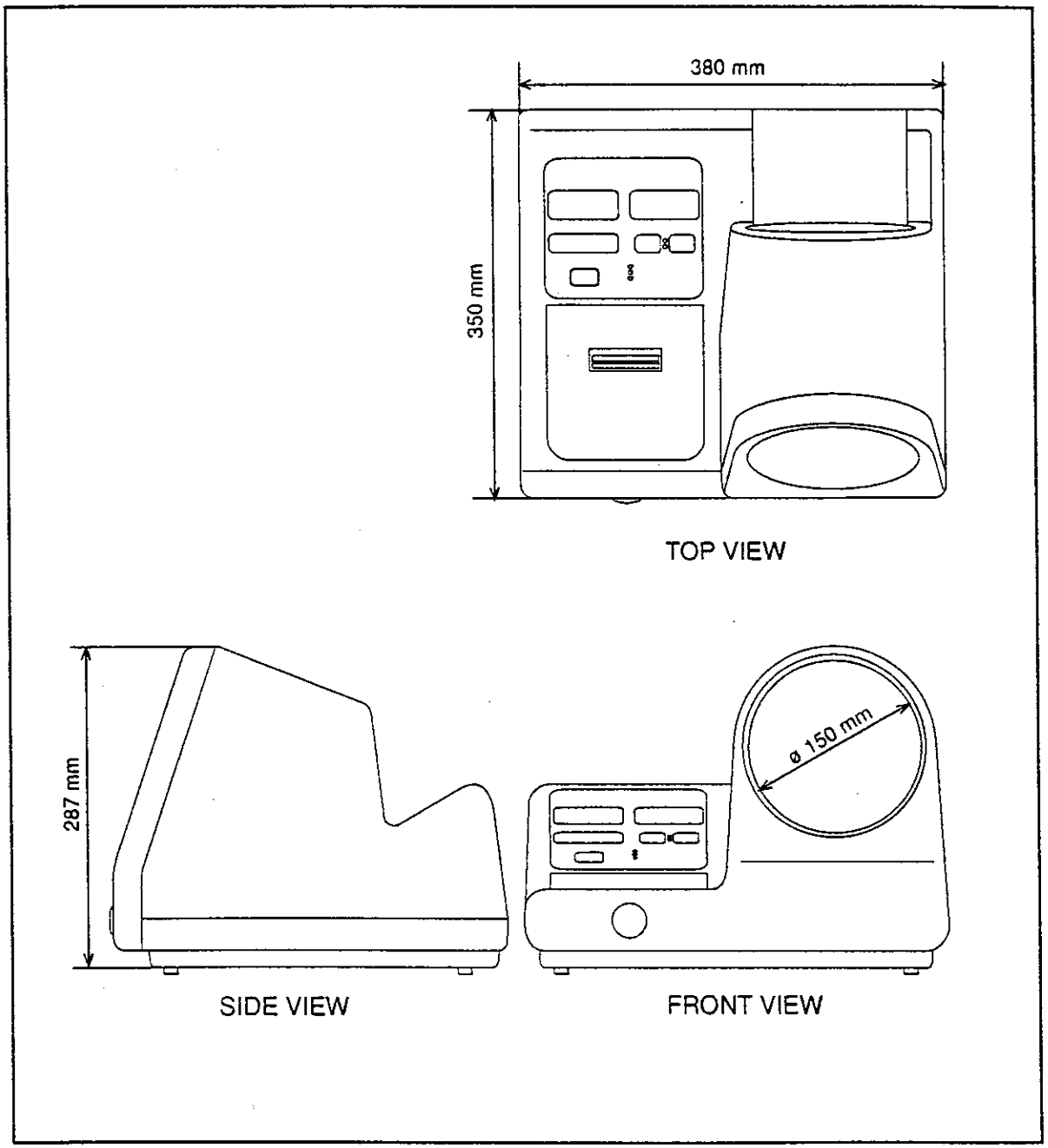


Figure A-1 Dimensions

APPENDIX B: PRINT SAMPLES

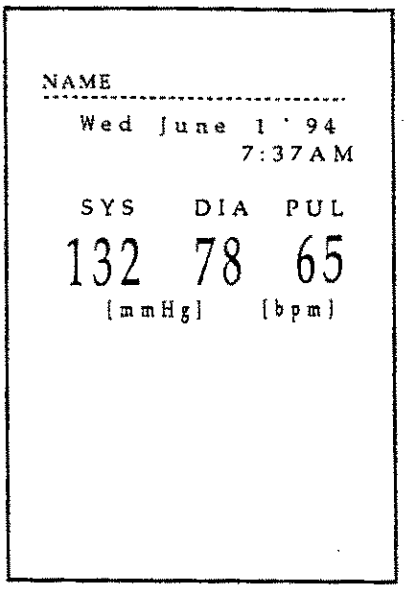


Figure B-1. High speed print

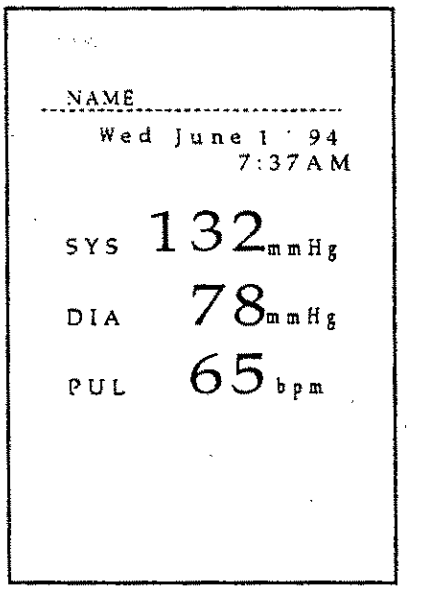


Figure B-2. Standard print

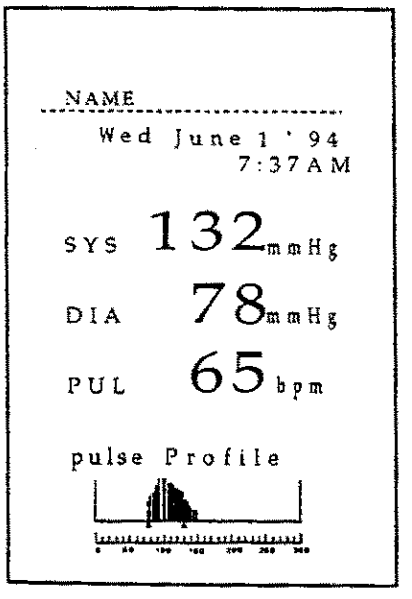


Figure B-3. Graph print

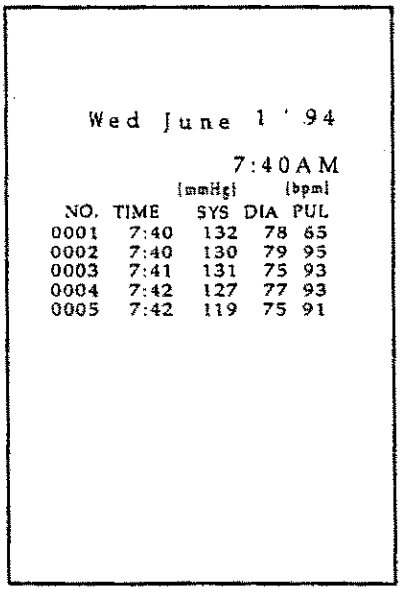


Figure B-4.Table print

APPENDIX C: CONCERNING MEASUREMENTS

WHAT IS BLOOD PRESSURE?

The blood pressure is at its highest levels in the large arteries near the heart and drops off towards the peripheral areas of the circulatory system.

The blood pressure varies with the beating of the heart. When the heart contracts, forcing the blood out, the pressure inside the arteries is said to be systolic. When the heart expands, the pressure of the blood inside the arteries is said to be diastolic.

HYPERTENSION

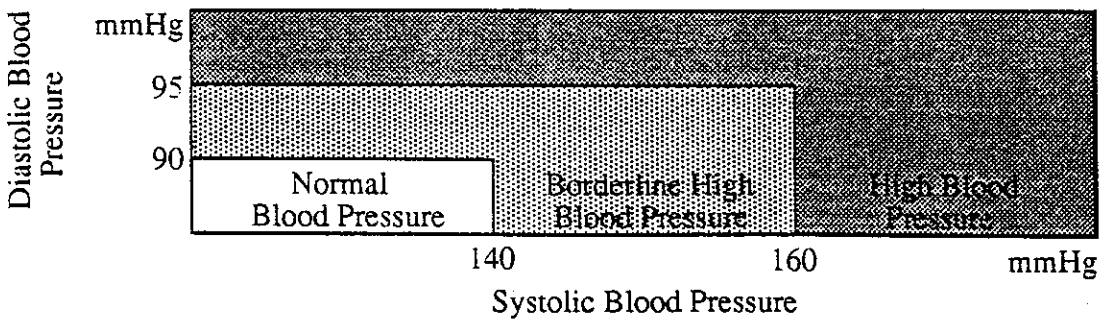
Hypertension, an abnormally high arterial blood pressure, which is most common among older adults, if left unattended, can cause many health problems including stroke, heart attack, etc. It is wise to control the blood pressure to prevent it from becoming high, by reducing salt intake, and by controlling the subject's diet and activities. People who were born with high blood pressure can prevent the progress of heart disease by means of adequate control.

MEASURING BLOOD PRESSURE

Having one's blood pressure measured in a hospital or a clinic, tends to stimulate nervousness in the subject and may even cause high blood pressure. Also blood pressure varies in accordance with a variety of conditions, so it is not possible, on the basis of a single measurement, to make an accurate judgment of the hearts condition.

WHO BLOOD PRESSURE CLASSIFICATIONS

Standards for assessment of high blood pressure, without regard to age, have been established by the World Health Organization (WHO), as shown in this chart.

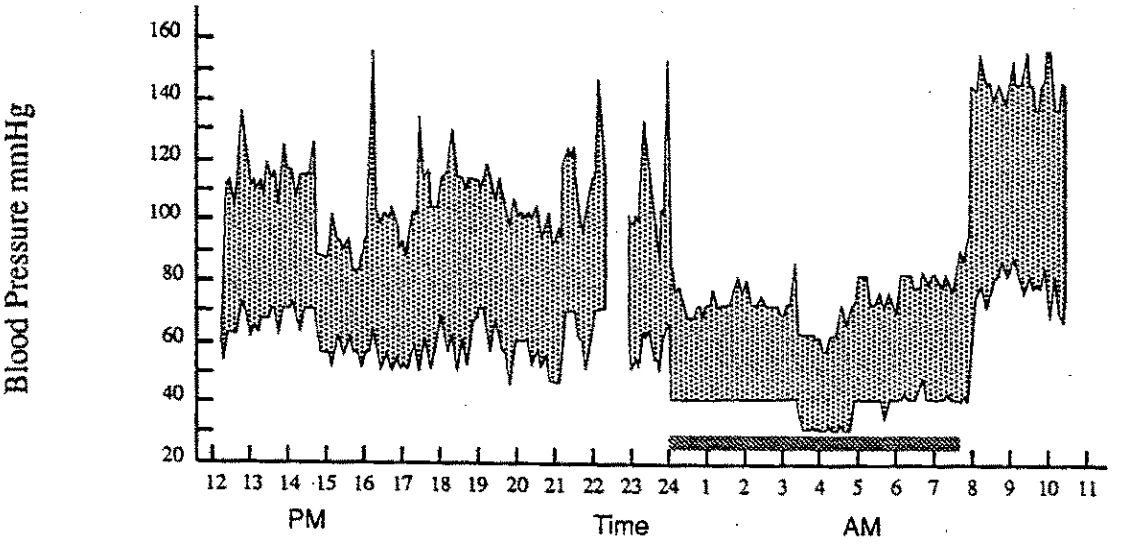


Reference Material: Investigation into Adult Diseases Report by the Ministry of Health and Social Security,1971.

Figure C-1. Systolic & Diastolic Table

VARIATIONS IN BLOOD PRESSURE

Individual blood pressures vary greatly both on a daily and a seasonal basis. These variations are even more pronounced in the hypertense patients. Normally the blood pressure rises while at work and is at its lowest during the sleeping period.



Shown is data for measurements taken every 5 minuets. The thick line represents sleep. The rises in blood pressure at 4PM (A in the graph) and 12PM (B in the graph) correspond to an attack of pain and sexual intercourse. (Beven,Honour & Scott: Clin. Sci. 36:329, 1969)

Figure C-2. Variation in Blood Pressure

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