TAMAYA DIGITIZING AREA-LINE METER

PLANIX 10S

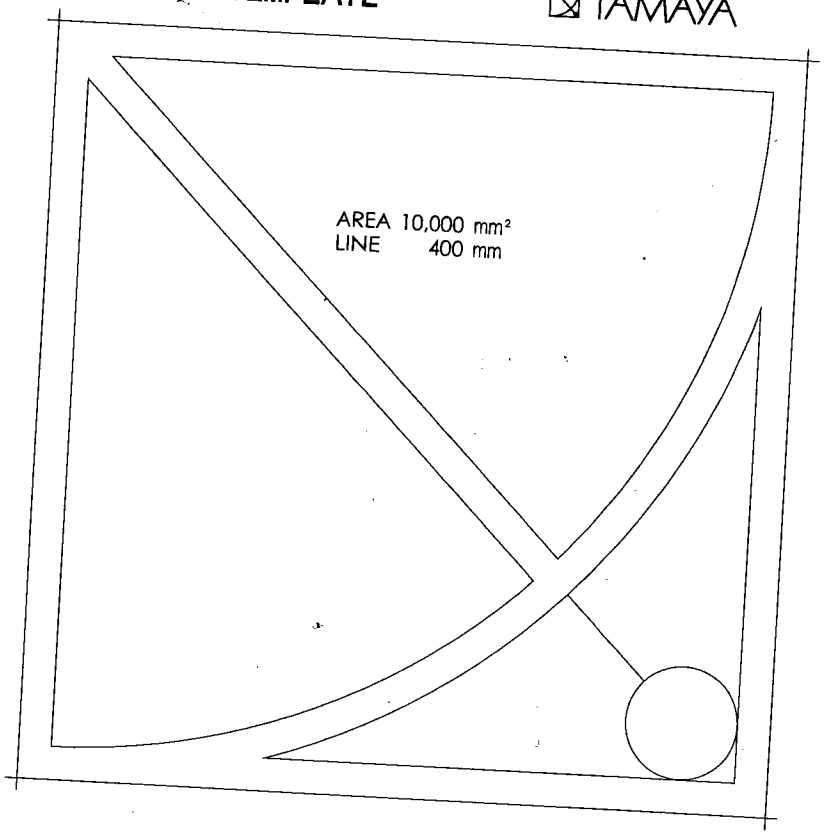
"marble"

Instruction Manual

TAMAYA

GAUGE TEMPLATE

TAMAYA



Contents

Introduction

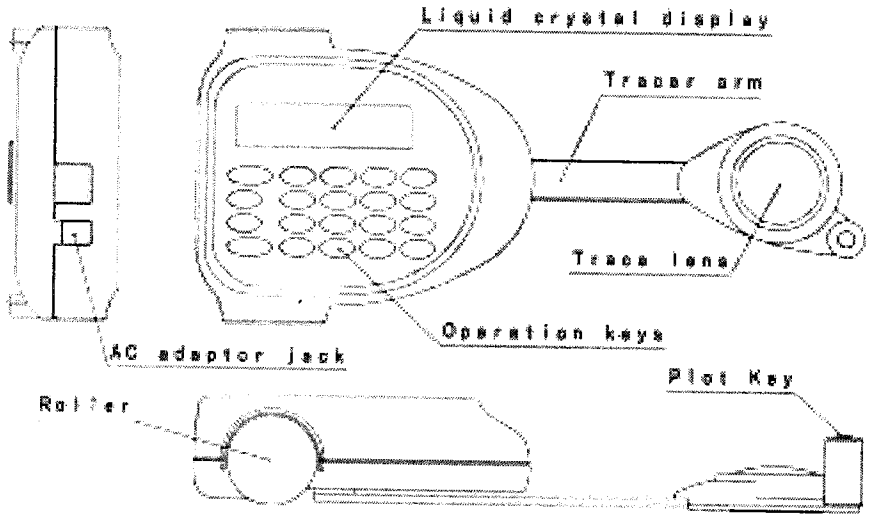
Thank you for choosing the Tamaya Digitizing Area-Line Meter PLANIX10S "Marble".

PLANIX10S "marble" is designed for the accurate measurement of area, line, and lengths of lines on planes, photographs, and drawings. It retains its standard functions but is of completely new design.

It incorporates many features:

- Digital display is expanded to 16 digits on two lines allowing accurate measurement readouts.
- Point/Stream Mode key allows easier measurement on figures with both straight lines and curves.
- Total and Average function keys for more accurate measurement.
- Auto close function helps your measurement close automatically when the instrument recognizes that the space between the first and last points of measurement are no more than 0.5mm away from each other.

Components



Specifications

Display	: 16 characters×2 line LCD
Measurement range	: 300mm×10m
Accuracy	: within ±0.1%
Linear resolution	: 0.05mm
Power	: Built-in NiMH Battery (chargeable by the attached AC adaptor)
Operating Time	: Approx. 20 hours (after approx. 15 hours of charging)
Accessories	: Storage case, AC adaptor, Gauge template, instruction manual
Dimensions of planimeter	: W250×H40×D110
Dimensions of case	: W260×H64×D183
Weight	: Approx. 630g

Power Supply

PLANIX 10S is powered by its built-in NiMH battery.
If the power is turned on and the battery voltage is low, the messages ①~③ below will appear on the display, depending on the voltage.
If a drop in voltage is detected during Measurement Ready Mode, the messages ④ and ⑤ will appear.

① Battery
5.00Volt Normal
(over 4.8V)

② Battery
4.75Volt Low
(over4.7v and less than 4.8v)

③ Battery
4.69Volt Charge
(less than 4.7v)

④ Point Area B
0. m²
Displaying "B"
With alarm
(over4.7v and less than 4.8v)

⑤ Charge Battery !
Charge Battery !
(less than 4.7v)

When such warning appears, please charge the battery immediately with the attached AC adaptor.
At the time of purchase or if the instrument has not been used for a long period of time, voltage of the battery may be low because of natural discharge. In such a case, please charge the battery before use.
Furthermore, for the sake of saving energy, this instrument is designed to automatically turn off its power, when left unused for 20 minutes.

Operation Key

Plot Key : After placing the center of tracing lens on the first measurement point, start measurement by pushing the Plot Key.

POWER : **Power Key**
Power ON/OFF switch.

CAN : **CANCEL Key**
Cancels the last point plotted by the Plot Key and continues the measurement.

P⇄S : **Point/Stream Selection Key**
Switches between Point Mode and Stream Mode.

END : **End Key**
Measurement End key. Ends the measurement by connecting with the starting point.

C/CE : **Clear Key**
Clears measurement results/registered numbers.

[▷] : **Key for Changing Display Modes**
Switches between area, line length, and side length values.

[TOTAL] : **Total Key**
Shows the cumulative area and length.

[AVER] : **Average Key**
Displays the average of measurement results.

[0]~[9] [.] : **Number Keys / Decimal Point Key**
Used to enter numerical values and for selecting decimal places.

[SET] : **Set Key**
This key must be pressed before selecting D.P, Unit, and Scale modes. That is, you would press SET+D.P / SET+UNIT / SET+SCALE to select each mode.

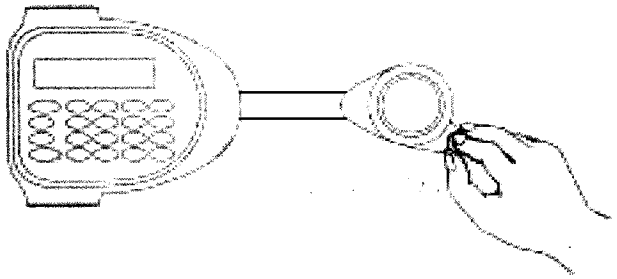
Making Measurements

・Preparing for Measurement

Place the drawings or objects to be measured on a drawing board or other smooth horizontal surface. Set the PLANIX 10S with its roller axle and tracer arm placed at right angle to each other.

The PLANIX 10S is designed so that the tracer is held in the right hand, and the [PLOT] key is pressed by the index finger of the right hand, as shown below.

The result of an area measurement is displayed as a positive number when the figure to be measured is traced clockwise and is displayed as a negative number by tracing in the counterclockwise direction.



・Power On

Press the [POWER] key to turn PLANIX 10S on. As soon as you press the [POWER] key, the following messages will appear on the display:

Display of the program version	Program Version 1.00.00
Display of name of product	AREA-LINE METER PLANIX 10S
Display of current battery voltage	Battery 5.00Volt Normal
Displays the message, "Please pass center point"	Please pass center point

Slightly swing the tracer arm once back and forth, past the imaginary line perpendicular to the roller. The PLANIX 10S is now ready to start measurement.

• Unit Selection

In ready mode, press [SET], and then the [6/UNIT] key to select the Unit Selection Mode. There are several systems of measurement -- Metric system, English system, and others. Each system can be displayed alternately by pressing the [SET] key.

Example 1 : Selecting mm as the unit

Key Operation	Display
Measurement ready mode	Point Area 0. m^2
Press [SET] key.	SET 6 3 . UNIT SCL D.P
Press [6/UNIT] The predetermined setting 3 m is selected.	1 2 3 4 5 mm cm m km USER
Press [SET] key again, English system is displayed.	1 2 3 4 in ft acre/yd mi
Press [1] key(mm). Unit mm is indicated.	Point Area 0. mm^2

Example 2 : For other unit systems (Area : Yard/Line : Yard)

Other Unit system may be input by number keys.

Key Operation	Display
Press [SET] and then the [6/UNIT] key for the metric unit selection as the display on the right. The predetermined "m" is set.	1 2 3 4 5 mm cm m km USER
Press [5] key (USER) to select other system.	UA 1. m UL 1. m
Press [0] [.] [8] [3] [6] [1] [2] [7] [3] [6] and [SET] key. Enter as an user-defined unit for Area measurement. (1$yard^2$ =0.83612736m^2)	UA 0.83612736 m UL 0.83612736 m
[0] [.] [9] [1] [4] [4] Enter as an user-defined unit for Line measurement. (1 yard =0.9144m)	UA 0.83612736 m UL 0.9144 m
Press [SET] key. The defined unit is set and brings you back to Measurement ready mode.	Point Area 0. U^2

• Scale Setup

In the ready mode, press [SET] and then the [3/SCALE] key to see the scale and the scale currently stored in memory.
Scale functions include:

KEY - Scale may be input
X and Y scale may be input.

PLOT - Correction by inputting actual, known distances
PLANIX 10S can store actual distances by plotting two points on a drawing. Known distance between two plotted points should be input in PLANIX 10S to put measurements in scale.

POINT - Correction of Coordinates Already Known
If there is a coordinate which is already known in the drawing to be measured, the scale can be set by entering the coordinate value and plotting the point. This is convenient when the drawing has different ratios of reduction in the vertical and horizontal directions.

Example 1 : Scale Setup by Key Input (SX=SY=100)

Key Operation	Display
Measurement ready mode.	Point Area 0. m²
Press [SET] key.	SET 6 3 . UNIT SCL D.P
Press [3/SCALE] key.	1 2 3 KEY PLOT POINT
Press [1] Displays current scale, which is to be changed.	SX 1. SY 1.
Input [1] [0] [0], then press [SET] key.	SX 100. SY 100.<

When X scale is entered, the Y scale will be automatically changed to the same scale as the X scale. If you want X and Y scale to be identical, press [SET] key twice to return to measurement ready mode.
If Y scale is different from the X scale, input the value and press same scale of SX. SY value can be input differently from SX scale value only for area measurement.

Press [SET] key. The instrument will return to measurement ready mode.	Point Area 0. m²

Example 2 : Scale Setup by Actual Measurement Correction

Key Operation	Display
Press [SET] and [3/SCALE] key.	1 2 3 KEY PLOT POINT
Press [2] for measurement based on actual distance on figure.	DX 1. m DY 1. m
Input [1] [0] [0], which is the distance between two points on the X and Y axis. Then press [SET] key twice. (DX=DY=100m)	DX 100. m DY 100. m<
Press [PLOT] when the tracing point is placed on the first point on the X axis.	X-scale PLOT 1st [PLOT]
Press [PLOT] when the tracing point is placed on the second point on the X axis.	X-scale PLOT 2nd [PLOT]
Press [PLOT] when the tracing point is placed on the first point on the Y axis. (When X and Y are the same scale, press [SET] key.)	Y-scale PLOT 1st [PLOT/SET]
Press [PLOT] when the tracing point is Placed on the second point on the Y axis.	Y-scale PLOT 2nd [PLOT]
Completion of Setup. The display is back to measurement ready mode.	Point Area 0. m²

Note: The measurements of line and side length cannot be made when X and Y have different scales.
Only area measurements can be made under this condition.

Example 3 : Correction of Coordinates Already Known

Key Operation	Display
Press [SET], and then [3/SCALE] key.	1 2 3 KEY PLOT POINT
Input [3].	1X 0. m Y 0. m
Press [0], [SET], [0] (X=Y=0m)	1X 0. m Y 0. m
Press [SET] and the instrument will ask you to plot on the first point.	1 point PLOT. [PLOT]
[PLOT] After plotting the first point, the instrument will ask you to plot on the second point.	2X 0. m Y 0. m
Input [1] [0] [0] [SET] [2] [0] [0] (X=100m Y=200m)	2X 100. m Y 200. m
Press [SET] and the instrument will store the coordinates. It will now ask you to plot the second point. If you do not need to register the third point, press [END] key.	2 point PLOT. [PLOT]/[END]

You can repeat the above process and enter/plot known points for up to 20 points. Plot the last known point by pressing the [END] key. The instrument will calculate the correction value up to the last known point.

Note: If you have ended the measurement by pressing the [PLOT] key instead of the [END] key, press the [END] key at the next entry mode (for plotting the next known point). The correction value will be set and the instrument will return to the measurement ready mode.

Note: In case the scale is set by known point correction, as the Affine transformation, the instrument will lose its normal concept of scales. The scale of actual correction of points 1 and 2 will be used as a provisional scale (SX=SY).
When the power is turned off, the provisional scale will be saved, but the Affine coefficient will not be saved. In this case, please carry out the procedure of correction of already-known points again.

Example 4 : Scale Check

Key Operation	Display
Press [SET], and then the [3/SCALE] key.	1 2 3 KEY PLOT POINT
Press [SET] to check the scale already Registered.	SX 100. SY 100.
Press [SET] again to return to the previous display.	1 2 3 KEY PLOT POINT

・Setting Decimal Places

In the ready mode, press [SET] and then the [./D.P] key to set the decimal places or to set up as displaying floating decimal places.

1. Set up by **fix**
   Set up using number keys. For display of integers, enter zero(0) for the number of decimal places.
2. Set up by **float** (Floating Decimal Place)
   Set up by selecting "2. float". The instrument will then automatically set floating decimal place.

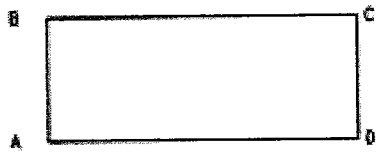
Setup for display of three decimal places

Key Operation	Display
Measurement ready mode	Point Area 0. m²
Press [SET] key.	SET 6 3 . UNIT SCL D.P
Press [./D.P] key. The setting currently registered is float.	dot point set. 1. fix 2. float
Press [1] to select fix mode. Set the number of decimal places (0-9) To three by entering [3]. Using number key, enter the number of decimal places you desire.	decimal places 0-9 0 fig.
Setup is now completed.	Point Area 0.000 m²

・Measurement Examples

1. Area consisting of Straight Lines

Setup: Point mode Unit: m² Decimal Places :3 Scale: X=Y=500

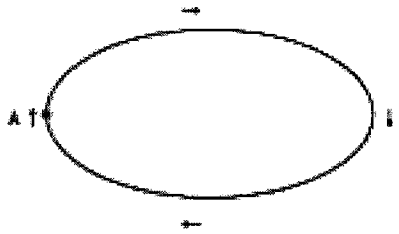


Key Operation	Display
Measurement ready mode	Point Area 0. m²
Press [PLOT]. Tracing point should be placed at point A to start measuring.	Point Area * 0. m²
Press [PLOT] at point B.	Point Area * 0. m²
Press [PLOT] at point C.	Point Area * -27.313 m²
Press [PLOT] at point D.	Point Area * 120.967 m²
Press [END] to end measurement. Result of area measurement will be displayed.	Point Area 147.576 m²
Press [▷] key. Result of line measurement will be displayed.	Point Line 50.24 m
Press [▷] key. Side length will be displayed.	Point Side 10.36 m

Note: Side length is shown every time a side is traced during measurement.

2. Area consisting of Curves

Setup: Point mode Unit: m² Decimal Places: 3 Scale: X=Y=500



Key Operation	Display
Measurement ready mode	Point Area 0. m²
Press [P⇄S] key to switch to stream mode.	Stream Area 0. m²
Mark a starting point, say A, anywhere on the outline of the area.	Stream Area * 0. m²
Press [PLOT] key at A and then move the tracing point clockwise along the outline of the area until it returns to the starting point A.	Stream Area * 121.043 m²
Measurement will end automatically when the tracing point comes back to point A.	Stream Area * 268.766 m²
Press [▷] key once to see line length. Press [▷] key twice to see side length.	Stream Line 71.578 m
Note: When measured using the stream mode, the results of line and side lengths will be the same.	Stream Side 71.578 m

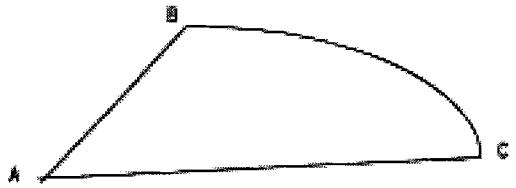
There are two ways in which one can end, automatically, measurement of Area:

Auto Close Function
PLANIX 10S will automatically end measurement if the first and last points measured are within 0.5mm of each other.

Line Help Function
Press [END] Key. PLANIX 10S will then automatically connect an imaginary line from the first point measured to the last point measured and will show the area determined based on that imaginary line.

3. Area consisting of straight lines and curves

Setup: Point mode Unit: m² Decimal Places: 3 Scale: X=Y=500

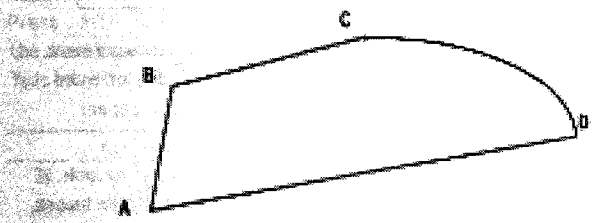


Key Operation	Display
Measurement ready mode. Tracing point should be placed on the starting point A to start measuring.	Point Area 0. m²
Press [PLOT] key and start measurement.	Point Area 0. m²
Move the tracing point to point B. Switch to stream mode by pressing the [P⇄S] key.	Stream Area * 0. m²
Trace the curved line between B and C, and bring the tracing point to C.	Stream Area * 37.831 m²
Press [P⇄S] key to switch back to point mode.	Point Area * 37.831 m²
Press [PLOT] at once again at point A. Measurement will automatically end, and the result of area measurement will be shown on the display.	Point Area 126.751 m²
Press [▷] key once to see the line length and twice to check side length.	Point Line 50.249 m
Note: Side Length is shown every time a side is traced during measurement.	Point Side 15.36 m

4. Side Length Measurement

When Side Length is selected, the side length currently being measured will be displayed. Press [END] key to end measurement.

Setup: Point mode Unit: m² Decimal Places: 3 Scale X=Y=500



Key Operation	Display
Measurement ready mode.	Point Area 0. m²
Press [▷] key twice to select the Side Length mode.	Point Side No data m
Move the tracing point to A and press [PLOT] key to start the measurement.	Point Side * No data m
Press [PLOT] key at point B.	Point Side * 23.534 m
Press [PLOT] key at point C. And press [P⇄S] key to switch to stream mode.	Point Side * 33.854 m
Trace the curve between points C and D.	Stream Side * 0. m
When the tracing point reaches point D, press [P⇄S] key to switch to Point Mode. Press [PLOT] key when you come back to the starting point A.	Point Side * 37.831 m
The side lengths measured will be displayed.	Point Side 66.751 m

Key Operation	Display
Check the area by pressing [▷] key once. Press the [▷] key again to see the length.	Point Line 161.970 m

Note: Side length is shown every time a side is traced during measurement.
When the measurement is started by pressing [PLOT] key or ended by pressing [END] key, the message " No data" will appear.

5. Sum and Average Measurement Modes

Immediately after power on of the instrument and when the **Line** and/or **Area** function is selected, the result of the measurements will automatically be stored in memory upon completion of each measurement. Upon completion of the measurement, press [TOTAL] key to display the number of completed measurements and the sum of the measurements.
Press [AVER] key to display the number of completed measurement and average of the measurements.
To clear the memory, press [C/CE] key.

Key Operation	Display
■ How to clear Total stored memory Measurement ready mode	Point Area 0. m²
[TOTAL] The cumulative measured data for all measurements taken from the time the power was turned on, appears when the [TOTAL] key is pressed.	Total Area N= 6 723.16 m²
Press [C/CE] key to clear the memory.	Total Area N= 0 0. m²
Press [C/CE] again or [TOTAL] key to return to measurement ready mode.	Point Area 0. m²

Note: All data related to average mode are also cleared at this point.

Key Operation	Display
■ How to clear Average stored memory [AVER] The average of the measured data for all measurements taken from the time the power was turned on, appears when the [AVER] key is pressed.	Aver Area N= 6 120.53 m²
Press [C/CE] once to clear the memory.	Aver Area N= 0 0. m
Press [C/CE] again or [AVER] key to return to measurement ready mode.	Point Area 0. m²

Note: All data related to cumulative measured data are also cleared at this point.

Check the Cumulative Total/Average

Key Operation	Display
Measurement ready mode	Point Area 120.48 m²
The cumulative measured data for all measurements taken since the memory was cleared, can be displayed by [TOTAL] key.	Total Area N= 6 723.16 m²
Press [▷] key to display the cumulative total of the line length. Press [▷] key to show cumulative total Of area and line length, alternately.	Total Line N= 6 246.56 m
Press [AVER] key at this point, you can check the average of results. Press the [▷] key to see average of area and line lengths, alternately.	Aver Area N= 6 120.52 m²
Press [TOTAL] key to return to measurement ready mode for continuing measurement.	Point Area 120.48 m²

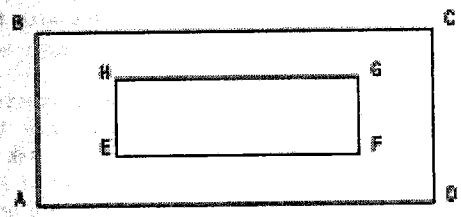
Note: The [TOTAL] and [AVER] keys do not show side length measurement.

6. Measurement of Doughnut-Shaped Area

The area inside a figure may be measured as a negative value by changing the direction of tracing (tracing counterclockwise).

Finding area (A-B-C-D) and deducting area (E-F-G-H) from it.

Setup: Point mode Unit: m² Decimal places: 3 Scale X=Y=500



Key Operation	Display
Measurement ready mode. Press [TOTAL], [C/CE], [C/CE] keys to clear the stored measured memory. Start measuring in a clockwise direction from point A. Press [PLOT] key when tracing point is placed on B, C and D.	Point Area 0. m²
Press [END] key to complete measurement. Sum of area measurement will be displayed and automatically stored in memory	Point Area 261.685 m²
Press [PLOT] key while tracing point is placed on E. Start measuring in a counterclockwise direction. Press [PLOT] key while tracing point on F, G and H. Press [END] key to end measurement. Sum of area measurements will be displayed and automatically stored in memory.	Point Area -37.130 m²
Press [TOTAL] key to retrieve data from memory. Sum of areas measured will be displayed.	Total Area N= 2 112.277 m²
[AVER] key can be used for displaying average of area after several measurements.	Aver Area N= 1 112.277 m²

・Precautions

If nothing is displayed even when the power is turned on.

After turning off the power, insert the AC charger supplied, and turn the power on again after about 3 minutes.

① If you see anything on the display, it means that the battery is low on power. Please continue charging with the power turned off.

② If a message "Charge Battery" appears immediately even after the battery is fully charged, you can assume that the built-in battery has reached the end of its life. Ask your local dealer immediately for battery replacement. Use of batteries other than those used for PLANIX 10S may cause trouble or damage to the instrument.

If a strong shock is accidentally applied to the instrument:

Even if the display shows normal operation, accuracy may have been reduced. Please ask your local dealer for repair.

Others

Do not place your ***PLANIX 10S "marble"*** in direct sunlight or near heating equipment.

Always handle your ***PLANIX 10S "marble"*** with care. Avoid hitting the unit and do not pick up the equipment by the tracer arm.

Do not clean your ***PLANIX 10S "marble"*** with thinners, benzene, other volatile solvents, or water. Use a clean, dry, soft cloth.

Warranty

PLANIX 10S "marble" is warranted against defects in materials and workmanship for one (1) year from the date of delivery to the original purchaser. During the warranty period, TAMAYA TECHNICS INC. will repair, or replace components that prove to be defective. This warranty does not apply if the ***PLANIX10S "marble"*** h as been damaged by an accident, through misuse, as a result of service repairs, or m odification by any person other that at TAMAYA's authorized service facility. No o ther warranty is expressed or implied. TAMAYA is not liable for consequential damages.