Attachment

User's Manual

DIGITAL MOUSE
LYNX98 PLUS
SPECIFICATIONS

for
Microsoft Serial Mouse and PS/2 Mouse
July 1, 1998

QTRONIX CORPORATION

WARNING

Note : This equipment has been tested and found to comply with the limits for a Class B device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However , there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures :

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver in connected.
- Consult the dealer or an experienced radio / TV technician for technician for help.

Notice:

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

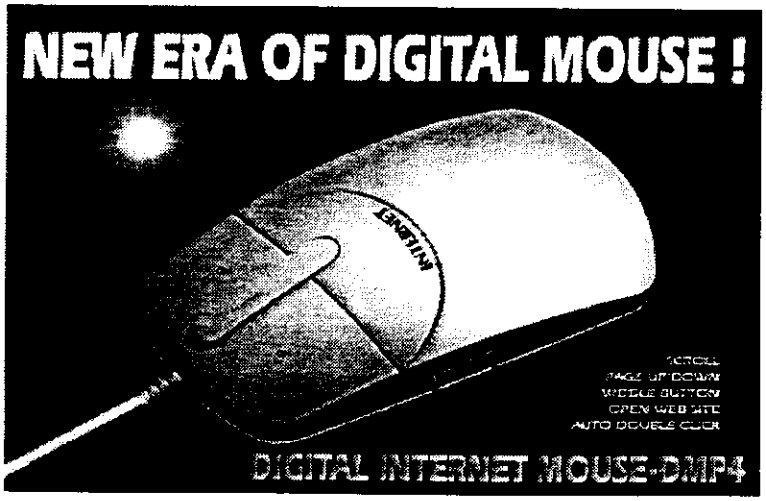
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions : (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

I .SPECIFICATION

The purpose of this specification is to define the general operational, environmental, electrical and mechanical characteristics of the "DIGITAL MOUSE-DMP4 / LYNX 98 PLUS ".

What is "DIGITAL MOUSE"?

Outdated mechanical mice operate on the friction between their rubber-coated ball and the surface of the pad. Friction causes wear and tear as well as frequent cleaning is necessary to maintain the performance. The new advanced DIGITAL MOUSE-DMP4 / LYNX 98 PLUS avoids all these problems with an ultra-high resolution Optical Fiber Engine that delivers exceptional accuracy and responsiveness. With no moving parts or mirrors to get misaligned, it is a frictionless design that is also incredibly rugged. The professional quality DIGITAL MOUSE-DMP4 is the only pointing device available that provides the highest 525DPI resolution necessary to traverse big monitors screens for graphic designs while still allowing pixel-by-pixel level accuracy.



- PATENT PENDING : U.S.A, JAPAN, TAIWAN, CHINA, KOREA

II.GENERAL

Description

The DIGITAL MOUSE-DMP4 is designed for use with the IBM PC XT/AT and PS/2 compatible computers. It is the most advanced mouse for complex CAD and detailed graphic art designers. You need this mouse if you are using monitors with 800 x 600 resolution and above. Designed especially for large 15"to 21 monitors, the DIGITAL MOUSE-DMP4 delivers the highest resolution and accuracy available today. The state-of the art Optical Fiber Engine eliminates the inaccuracies and deficiencies that plague all mechanical computer mice. It has 2 normal buttons and 2 extra buttons having unique functions. The 3rd button (Middle) is designed for switching graphic mode, joystick mode and normal mouse mode. Also you can press just once instead of double clicking the left button. The 4th (Side) button is designed for surfing Internet or browsing long document. After using DIGITAL MOUSE-DMP4, you will find it provides the most versatile functions you need and you will find that scroll a document is never as easy as this method. It is pure optical mouse having 525 dot per inch (DPI). A built in microprocessor uses optical fiber encoders and striped digital pad. Count signals are sent to the host computer where they are translated into motion of the display screen cursor. Multiple interface protocols are provided as follows:

PS/2 Mouse, Microsoft Serial Mouse

The interface connection consists of nine (9) pin D-SUB connector that is used for RS-232C serial output of Microsoft protocol. The interface connection consists of six (6) pin Mini DIN adapter that is used for IBM PS/2 Pointing Device Port (PDP) protocol.

Package Contents

- Mouse Itself
- Utility Software for scroll functions.
- Mouse PAD

Features

- More Accurate – True 525 DPI resolution exceeds all other mice and rivals expensive digitizers.
- More Precise – Frictionless design allows precise positing of your cursor without errors.
- More Reliable – With no moving parts to wear out and a rugged design, this mouse is designed to survive professional usage.
- More Versatile – Graphic mode, Joystick mode, one-touch double click.
- Scroll documents or brows Internet without scrolling the scroll bars.
- Provide both Vertical scrolling (scroll up/down) and Horizontal scrolling (scroll right/left) modes.
- Provide Short cut for Page-up, Page-down.
- Support both Windows 3.1 and Windows 95.
- Fully compatible with Windows applications.
- Easy to use.

Appearance/Durability

This product is intended for user used in home and office environments. Therefore, the quality of appearance and touch are of great importance. Because of the environmental severity of the home and office place, longevity, durability and resistance to contamination are also of major concern. Good engineering design practices shall be followed throughout, both mechanically and electrically.

Supported Protocols By Model

Protocol / Models	Active Buttons	Microsoft Serial Mouse	PS/2 Mouse
DIGITALMOUSE DMP4-PS / LYNX 98 PM PLUS	4	✓	✓
DIGITALMOUSE DMP4-P / LYNX 98 P PLUS	4		✓

※Remarks : Extended functions are disable in remote mode PS/2 protocol. DIGITAL MOUSE-DMP4 / LYNX 98 PLUS model has four buttons, which emulate the two buttons of a Microsoft Mouse or PS/2 Mouse, and the third button is the toggle switch of graphic mode and joystick mode, normal mouse mode, and the forth button activates scroll functions.

DIGITAL MOUSE-DMP4 LYNX 98 PLUS Control Panel

MouseMax - The Utility Software for DIGITAL MOUSE

DIGITAL MOUSE provides versatile control panel let you have better contro l of mouse. The control panel if very easy to use and there are eight major sections in the control panel:

- SPEED SCROLL + GAIN SETTING
- POSITION SCROLL + GAIN SETTING
- ASSIGNMENT AS A MIDDLE BUTTON FOR AUTOCAD (TM)
- ASSIGNMENT AS A PAGE-UP KEY
- ASSIGNMENT AS A PAGE-DOWN KEY
- BASIC SETTING USING BUILT-IN CONTROL PANEL

*MouseMax is compatible with Windows 95 and most applications run on it.

*MouseMax is Utility software. Installation or special mouse driver is not ne cessary. Users can run/remove MouseMax anytime.

*DIGITAL MOUSE is fully compatible with Microsoft mouse and PS/2 mou se. Be sure that the installed mouse driver is Standard Mouse driver wh ich is compatible with Microsoft mouse driver.

A. Usage of Scroll mode:

Vertical Scroll

1. Check Scroll Mode [Enable] what you want.
2. Press the Scroll Button (Side Button) to enter the scroll mode.
3. MouseMax changes the Cursor to the Vertical Scroll Cursor.
4. Holding down the Scroll Button, move the DIGITAL MOUSE down or up a little bit.
5. The screen starts to move upward/downward respectively.

Horizontal Scroll

1. Enter the Scroll Mode as A. step.
2. Press the middle Button to enter the Horizontal mode.
3. MouseMax changes the Vertical Scroll Cursor to the Horizontal Scroll Cursor.
4. Move the DIGITAL MOUSE as A. step.
5. Release the Middle Button to return to the Vertical Scroll Mode.

* Check Speed Scroll [Enable] button to scroll the screen continuously.
* Check Position Scroll [Enable] button to scroll the screen as amount of mouse's moving distance.
* User can adjust the gain of each scroll mode for steps(1-5).
* To enter Scroll Mode, The Windows under the cursor should have the vertical/Horizontal scroll bar and activated. Otherwise MouseMax tells its invalidation by changing the cursor's shape.

B. Usage of Button Assignment:

S Button

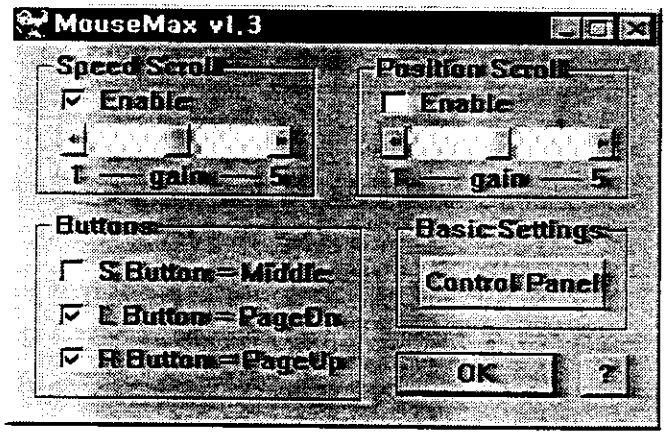
- Check [S Button] to assign the Side button as a 3rd button of 3 button mouse. It's useful for CAD software which can recognize 3rd button, for example AUTOCAD(TM).
- Scroll function is De-Activated temporary when [S Button] is checked.

L Button

- Check [L Button] to assign the Left Button as a Page-Down Key.
- It is effective only under the Vertical Scroll Mode.

R Button

- Check [R Button] to assign the Right Button as a Page-Up Key.
- It is effective only under the Vertical Scroll Mode.



C. Basic Setting

- Click [Control Panel] to execute Windows control panel for adjusting Basic Parameters of the standard mouse driver.

How to use DIGITAL MOUSE-DMP4 / LYNX 98 PLUS

1. Mouse Mode

- It is default mode when power on. By pressing middle button for more than 1 second, you can return to mouse from the other enhanced. modes
- With ultra high precision optical fiber engine installed under your fiber tip, be amazed at how easily zip across the largest monitors and how precisely you can place the cursor on the screen.
- Ergonomically sculpted shape with enlarged buttons and frictionless design lets you work for hours without fatigue.
- Never have to double-click again when you hit the conveniently place middle button.

2. Graphic Mode(Tip for graphic software)

You can slow down the cursor temporarily by pressing the middle button a nd the right button for one second. This mode enhanced an accuracy to provide pixel level pointing for drawing detailed graphics or creating digital signatures.

3. Joy stick Mode (Tip for game software)

When you play virtual reality games, like Doom or Quake. This mode provides directional control for continuous and smooth motion. Hit middle button for sudden stop. Select this mode by pressing middle button for 4 seconds in Mouse mode.

4. Scroll functions (The mouse mode switched to the scroll mode during the side button is pressed.)

- You can switch the mouse mode to the scroll mode by pressing the side button.
- Move the mouse up or down in order to scroll the documents. Be sure that the side button should be pressed during scrolling. By releasing the side button, you can return to the mouse mode anytime.

A. Control the speed of the scroll.

Select this mode using the control panel of MouseMax utility software.

*Vertical Scroll

1. Press the side button to enter the scroll mode • cursor is changed to vertical "Scroll" cursor.
2. Move the mouse (just a little) up for vertical scroll upward or down for downward respectively.
3. The screen starts to scroll continuously.
4. Release the side button to stop and exit.

*Horizontal Scroll

1. In scroll mode, press middle button • The cursor is changed to Horizontal "Scroll" cursor.
2. Move the mouse same as vertical scroll. But move up for scroll to right and down for scroll to left, respectively.
3. Release middle button to stop and to return to vertical scroll mode.

B. Control the position of Scroll

1. Select this mode using the control panel of Mouse Max utility.
2. Do the same procedure as "A". But the amount of the scrolled distanc e is proportional to the movement of mouse.

C. Short cut controls

1. Page –up

   Page-up can be done by clicking the right button in the vertical scroll mode.

2. Page-down

   Page-down can be done by clicking the left button in the vertical scroll mode.

3. Double-click

   Double-click can be done automatically by clicking the middle button once in the mouse mode or graphic mode.

4. Third Button Emulation

- Select this function using control panel
- This selection makes scroll functions disabled.
- The 3rd button (middle button) of "Mouse System Mouse" can be emulated by clicking the side button shortly.
- It is effective only under the software which recognizes 3rd button, for example AutoCAD.

Ⅲ.ENVIRONMENTAL SPECIFICATIONS

Temperature

Operating

The operating temperature range shall be from 0℃ to 50℃. There shall be an operational temperature test of a single cycle, ambient, cold, hot, ambient, with a minimum of a 15-minute dwell (pause) for every 15℃ increment of change. The rate of temperature change shall not exceed 20℃ per hour. The mouse will operate normally throughout the cycle requiring no operator intervention or corrective actions, except to cause normal movement.

Non-Operating

The non-operating temperature range shall be from –10℃ to 60℃. There sha ll be a thermal shock test of five (5) cycle from –15℃ to 55℃ holding for 30 minutes at each extreme. The rate of temperature change shall not exceed 25℃ per hour. Normal mouse operation will be verified before and after the thermal shock test.

Humidity

Operating

The operating relative humidity range shall be from 10% to 85% non consid ering.

Non-Operating

The non-operating relative humidity range shall be from 10% to 85% non considering. The mouse shall withstand an environment varying between 25℃ and 55℃, 85% relative humidity, non considering, for a period of 96 hours.

Performance Specifications (Hardware)

- Compatible : Hardware - IBM PC, Software – Windows3.1 & windows95
- CPU : 8bit, 12MHz
- Transmission Speed : 12,00baud
- Power Supply : None required
- Buttons : 4buttons (2Normal + 1Function +1Scroll button)
- Weight : ≒55gram (Without cord)
- Dimension : ≒110 x 61 x 31mm
- Pad Size : ≒155 x 175mm
- Connector Type : PS/2 Female 6Pin Mini Din Connector (No Converter)
  RS-232C Female 9Pin D-Sub Connector
  PS/2 Cable + Converter (PS/2 to Serial)
- Resolution: 525dpi
- The Length of cable : 1.8M
- Tracking Speed: 500mm/sec
- Encoder: Pure optical using optical-fiber
- Million Cycle Life
- Total Current: Less than 15mA

Vibration

1.5 to 31Hz 0.38mm peak to peak displacement.
Continuous logarithmic rate of 0.5 octave/minute back and forth.

2.32 to 500Hz : 0.75G forth limitation.
Continuous logarithmic rate of 0.5 octave/minute back and forth.

3.5 to 500Hz Random Vibration : 0.01G2/Hz for 30 minutes.
Continuous logarithmic rate of 0.5 octave/minute back and forth.

Shock

The mouse shall withstand a shock equal to 20G forces, half since wave for 11msec duration in all three (3) orthogonal axes.

Related Document

The mouse shall meet the requirements of FCC Part 15J for Class B Computing Devices.

Contaminants

Dust

The mouse shall be unaffected by the normal accumulation of airborne dust as found in the home or office place. This includes non-metallic dust and grime as mighty be carried into the work place or home from outside sources. Routine cleaning of necessary mechanical components is facilitated through easy access to those mechanical components.

Gases

The mouse shall not be corroded or defaced or otherwise damaged by atmospheres acceptable to OSHA standards for the home and work place. This includes normal amounts of oxygen and ozone.

Ⅳ.MECHANICAL SPECIFICATION

Material

General

- **Mouse Base, Cover and Key Top**: Injection molded ABS Thermoplastic rates UL94HB.
- **PC Board** : Paper Phenolic, Rated UL-94V0
- **Switch Housing** : Thermoplastic

Interconnect Cable

- Jacket: Low durometer PVC, 2.5mm to 4.1mm nominal diameter.
- Shield : Braided shield with 90% coverage ±5%.
- Conductor Insulation : PVC
- Pull Test: Cable shall be permanently secured to mouse housing and connector shell.
- Both shall withstand a 3Kg force applied parallel to cord entry plane for ten (10) seconds.

Standard Connector

D-SUB 9PIN or Mini-DIN 6PIN connector

- Connector shell : Shield, plastic plated, with metallic contact dimples.
- Insulator : Thermoplastic.
- Contacts : Tin flash plated with a minimum of 15micro-inches in contact area.
- Flex and Strain Relief : PVC
- Backshell : Molded PVC

Switch

- Type : Momentary with tactile and audible feedback Contact.
- Configuration : SPST
- Pre-travel : 0.25 – 1.30mm
- Hysteresis : 0.04 – 0.18mm
- Contact Bounce : Switch shall have electronically debounced contacts.
- Actuation Force : 28 – 114gm
- Electromechanical Life : One million cycles at 3 cycles/second with a vertical actuation force of 114gm.

Weight

- The weight of the mouse is 55grams without cord.

Physical Dimensions

The dimension of this mouse is 155 x 61 x 31mm (L x W x H).

Mechanical Life

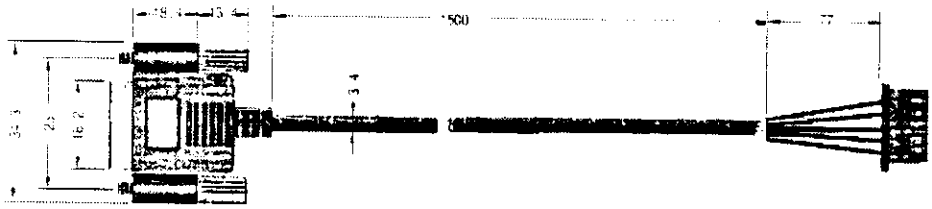
Mechanical life, as measured in distance, shall be 160KM at 20cm/sec with a vertical pressure of 150gm.

Workmanship

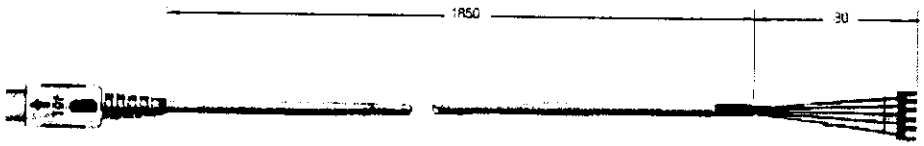
The mouse shall be uniform in workmanship and appearance. There shall be no nicks, scratches, burrs or defects in material that may affect the function, serviceability or appearance of the mouse.

Cable Specification

Serial Mouse Cable



PS/2 Mouse Cable



V.ELECTRICAL SPECIFICATIONS

Components

All component will be of the highest commercial grade and shall be mounted according to IPC and recommended vendor practices. Standard values are to be adhered to at all times. Single sources, unusual values or designs outside specified component ratings shall be avoided.

PC Boards

PC Boards shall be made of UL (Underwriters Laboratories) rated material, 94V-0 or better as per UL 478. Each PC board will have an approved UL manufactures logo visible on one side.

Design Practice

All components shall perform well within their design ratings. Good I.C design with respect to unusual inputs and number of outputs shall be observed. Trace width and spacing shall be conservative wherever possible and shallmeet IPC minimums at all times. Bypass capacitors shall be used liberally and some on board filtering is expected when possible. Power consumption shall be minimized.

Reset

The mouse shall reset on power up. The power supplied to the mouse shall have a rise time of less than 100msec.

Data Format

Microsoft format

BIT#	7	6	5	4	3	2	1	0
BYTE1	1	1	L	R	Y7	Y6	X7	X6
BYTE2	0	0	X5	X4	X3	X2	X1	X0
BITE3	0	0	Y5	Y4	Y3	Y2	Y1	Y0

Where : L= Left Key Status 1= Pressed<R>

R<N>= Right Key Status 0= Released<R>

X0-X7= X Distance LEFT= Negative

Y0-Y7= Y Distance

Data is shifted from byte 1 bit 0 to byte 3bit 7 at the speed of 1200Baud., no party 2 stop bit.

Data is reported upon key status changed and x, y data change. No change will not cause report.

PS/2 format

BIT#	7	6	5	4	3	2	1	0
BYTE1	YV	XV	YS	XS	1	0	R	L<N>
BYTE2	X7	X6	X5	X4	X3	X2	X1	X0
BYTE3	Y7	Y6	Y5	Y4	Y3	Y2	Y1	Y0

Where : XS, YS = Sign Bit (1=Negative movement)

Overflow Bit (1=Overflow it the X Y data)

1= Pressed<R> 0= Released<R>

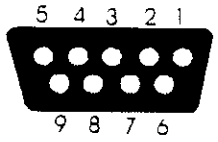
L= Left Key Status R= Right Key status

X Distance Y Distance

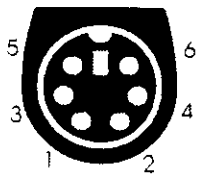
Connector Pin

Assignments be standard Microsoft and PS/2 connector pin out are as follow s:

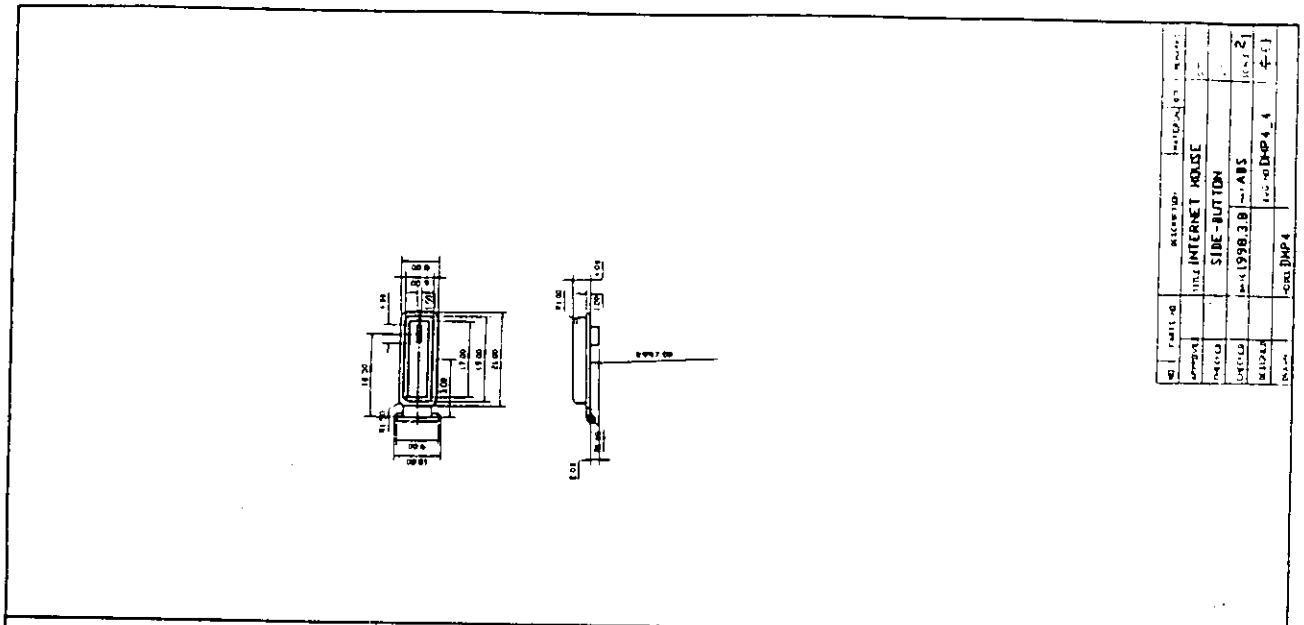
Serial Mouse Port

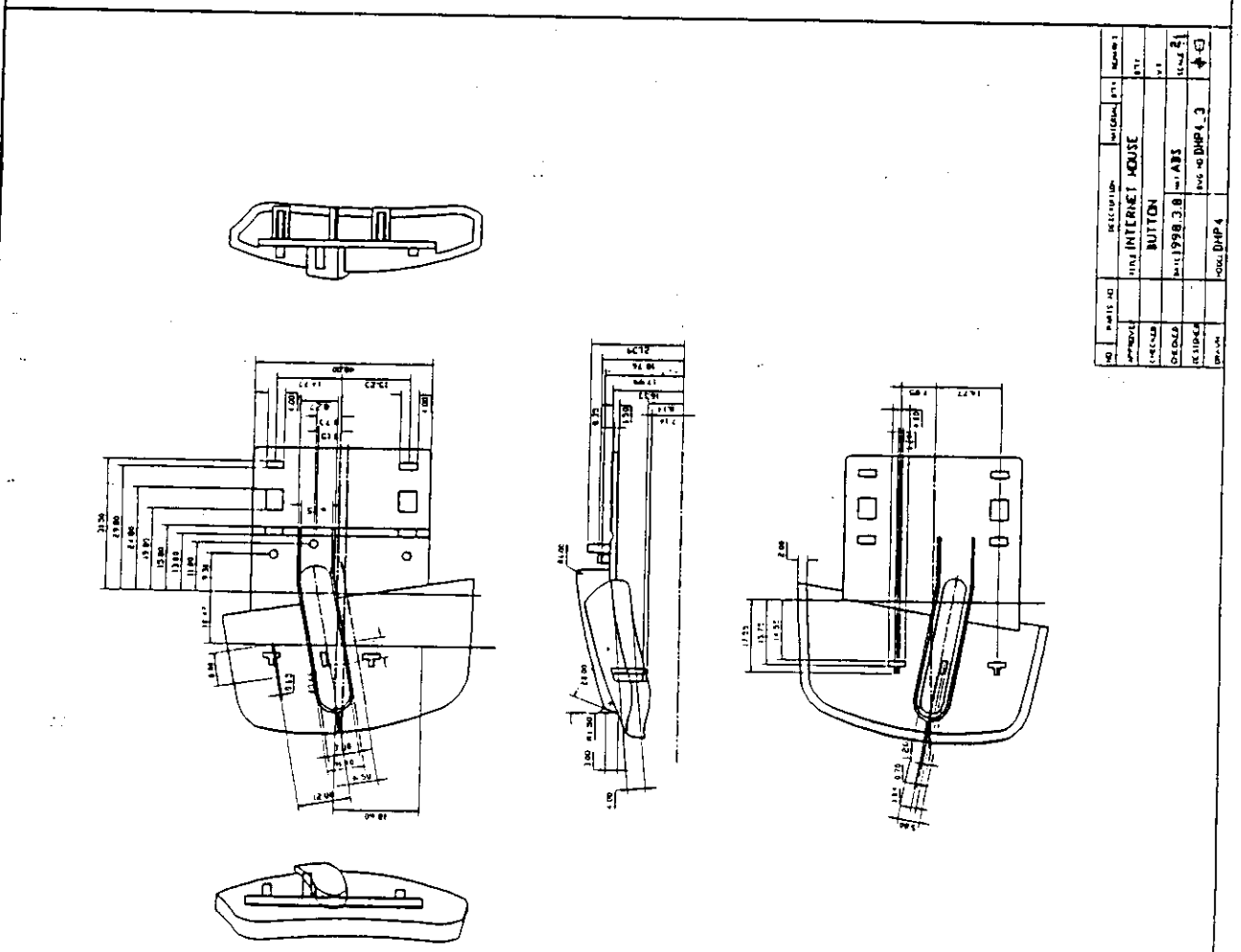


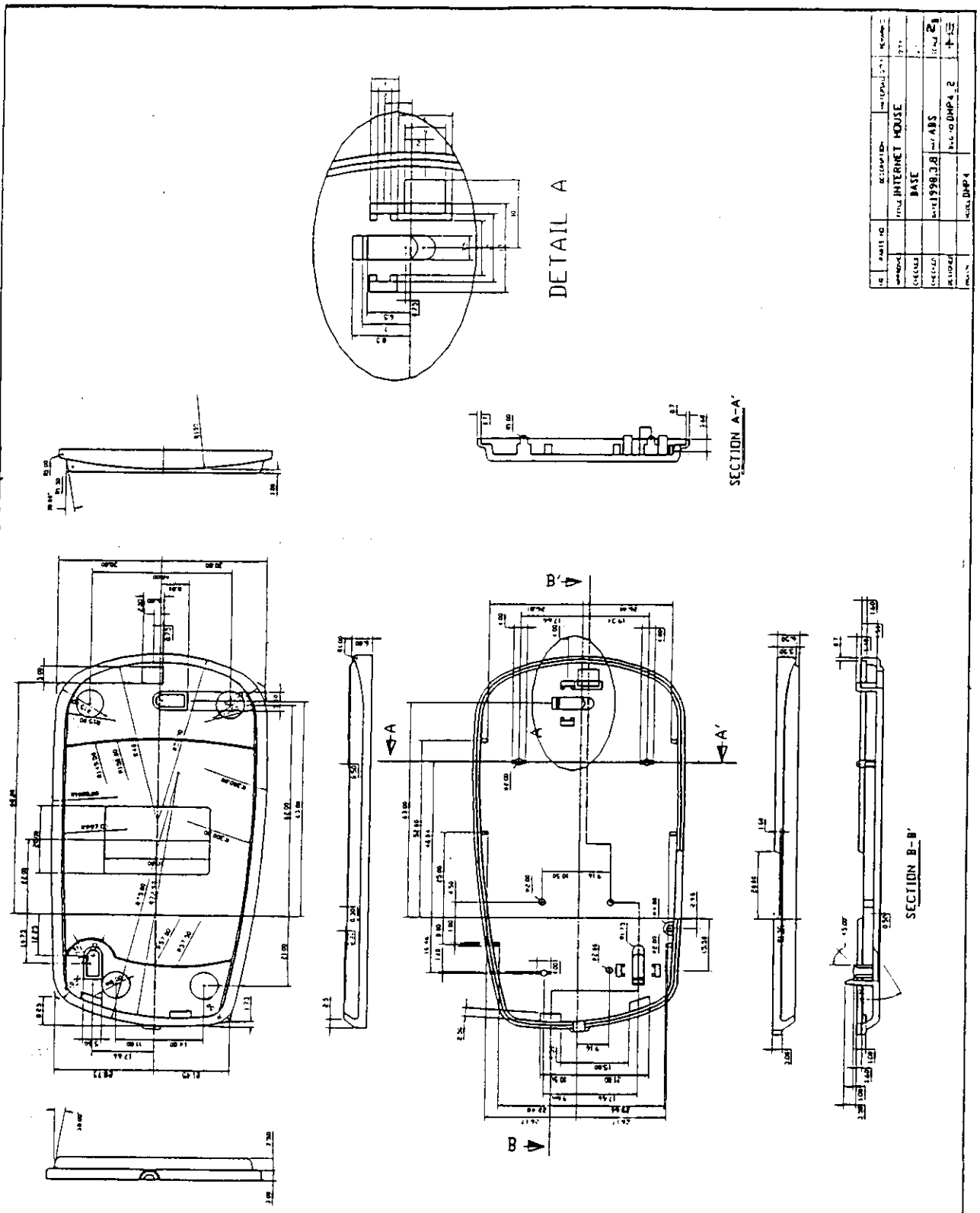
PS/2 Mouse Port



VI LANGUAGE LAYOUT






DETAIL A
SECTION A-A'
SECTION B-B'
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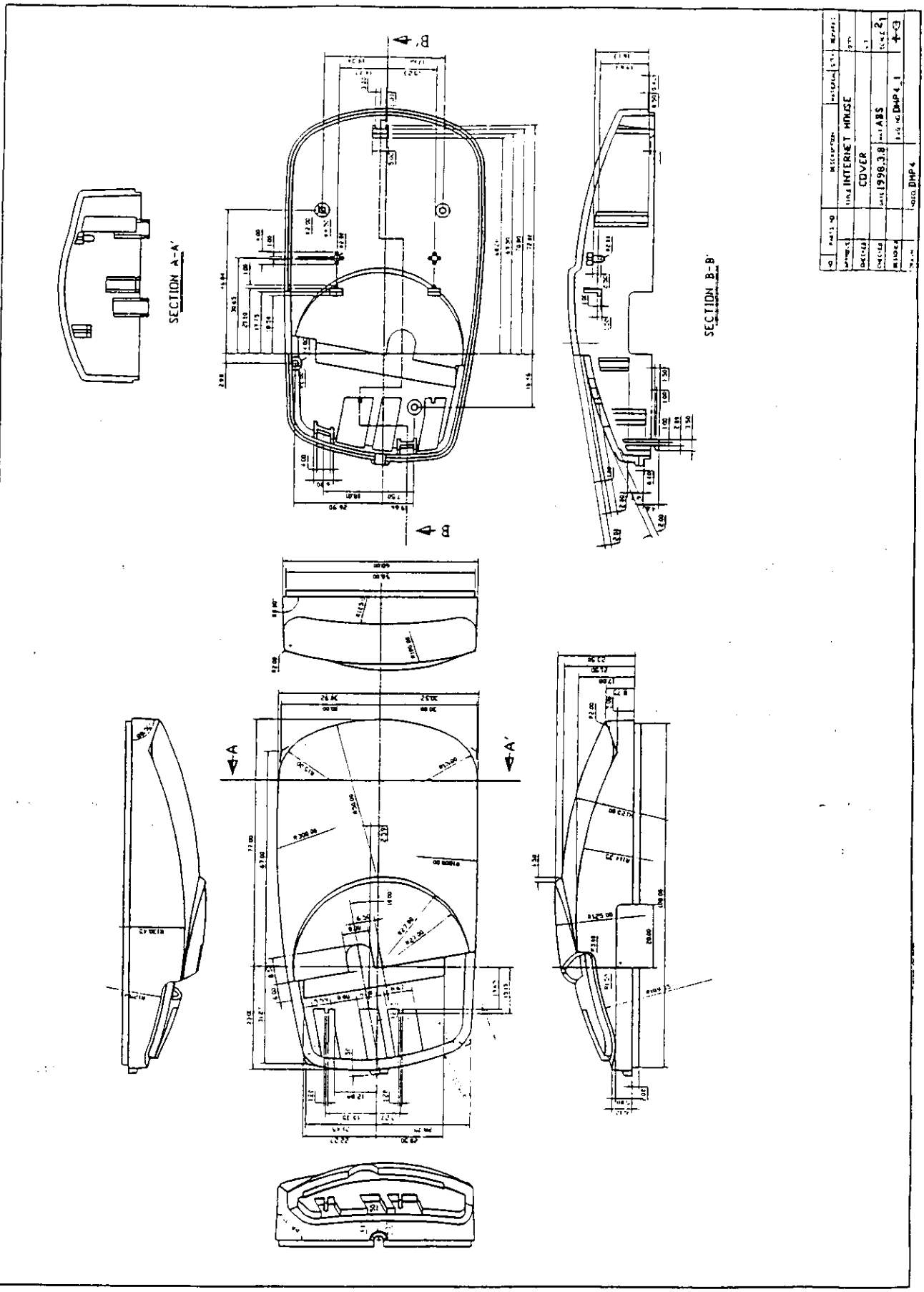
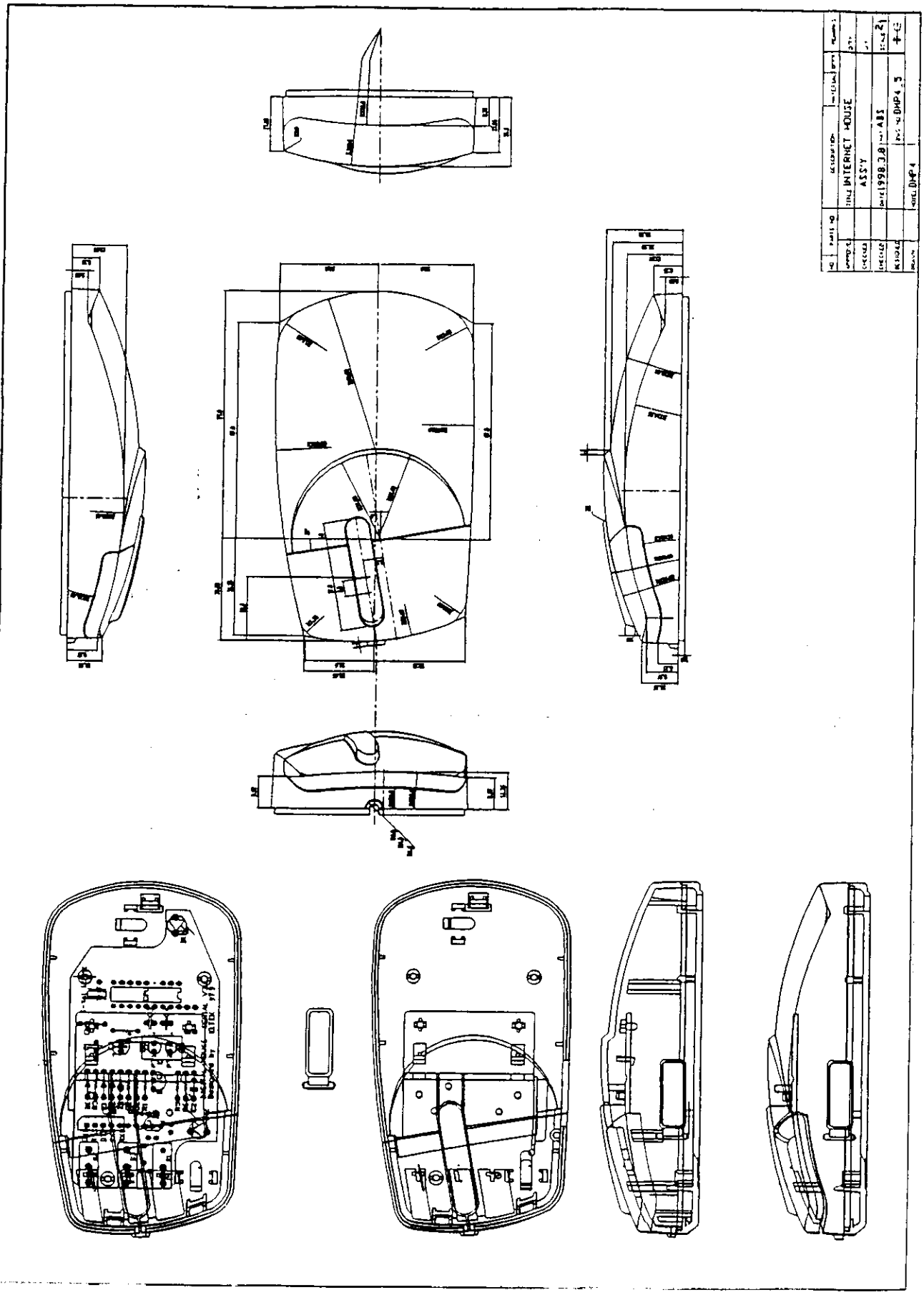
B'
INTERNET MOUSE
BASE
ABS
DMP4_2
DMP4


SECTION A-A'
SECTION B-B'
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A'
INTERNET MOUSE
COVER
1998.3.8
ABS
DMP4_1
DMP4