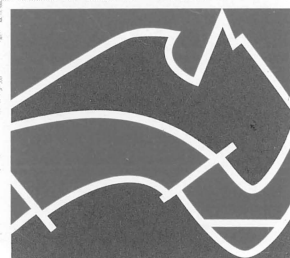AGSO

USER'S GUIDE TO MAPPAD

AND AGSO FIELDPAD FOR

THE APPLE NEWTON

PALMTOP COMPUTER

R.S. Blewett & M.S. Hazell

RECORD 1997/10
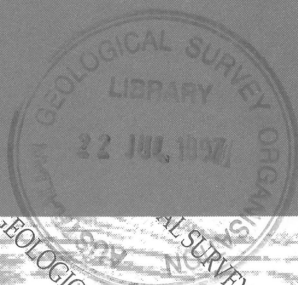
AGSO

AUSTRALIAN
GEOLOGICAL SURVEY
ORGANISATION

AUSTRALIAN GEOLOGICAL SURVEY ORGANISATION

DEPARTMENT OF PRIMARY INDUSTRIES & ENERGY

AGSO RECORD 1997/10

USER'S GUIDE TO MAPPAD AND AGSO FIELDPAD

FOR THE APPLE NEWTON PALMTOP COMPUTER

R.S. Blewett & M.S. Hazell

Minerals Division, Australian Geological Survey Organisation

Table of Contents

Figure Captions

Introduction

The Australian Geological Survey Organisation (AGSO), in collaboration with Resource Industry Associates (RIA) have developed a digital field notebook, called AGSO FieldPad, for recording data digitally at the field site for downloading into a digital database. The digital field notebook operates on an Apple Newton Message Pad 120 or 130 Personal Digital Assistant. The FieldPad design is based on OZROX, AGSO's corporate database for the storage of geological field data. This guide describes the digital notebook system. It will not describe all the functions of the Newton, as these can be found in the Newton operating handbook, but rather some of the most useful functions for geologists. In particular, we will describe the MapPad and FieldPad systems, and the purpose of the data description fields in FieldPad. We will also outline the loading of map packages, and the transfer of data to and from the Newton.

The OZROX field database is a relational database and has been implemented within AGSO using the ORACLE Relational Database Management System (RDBMS). OZROX is the pivotal database for AGSO's system of laboratory databases which include ROCKCHEM (whole rock geochemistry) and OZCHRON (geochronology). By managing field and laboratory data within a relational database data can be made available in flexible but standardised formats; e.g., as hard copy reports, or displayed within geochemical analysis programs or Geographic Information Systems (GIS). More importantly, data security, integrity and consistency are maintained by data validation procedures that have been built into the database. Details of OZROX may be found in Ryburn *et al.* (1993; 1995).

To facilitate the recording and entry of field data into OZROX AGSO developed a structured field notebook and an associated set of coded attributes (Blewett 1993). The notebook follows the format and structure of the OZROX database with each field in the notebook matching a corresponding field in the database forms. Structuring field notes this way greatly speeds the process of entering the data into the database. An added benefit was that the notebooks prompted geologists to record all necessary information at the outcrop. The digital notebook system is a further development and replacement of the standardised analogue notebook system. The major benefit of using a digital system is that geological descriptions are encoded digitally at the outcrop thus obviating the need to later hand enter the descriptions into the database. This greatly speeds the digital data capture process and importantly reduces the possibilities for transcription errors. Other benefits of a digital system include the ability to display various maps linked directly to a GPS and have your position displayed in real time, and to digitally record field sketches along with the field descriptions.

The digital notebook system includes:
- a Newton 120 or 130 running on the OS2 operating system;
- a Global Positioning System (GPS), e.g., Garmin 45;
- 2 or 4 MB flash card for data storage;
- an RS232 cable or infra-red data transmitter and power pack
- supplementary 6V and 240V power supply;
- a protective cover for the Newton (rubber boot).[1]

---

[1] The Newton is **not** waterproof and recommended operating temperatures are 0-40°C. Be careful of leaving the Newton in the sun in a vehicle as damage may occur. It is recommended that the user consult the handbook supplied with your Newtown on care and use of the unit. See Appendix 1 for technical specifications.

The guide will discuss some of the standard functionality of the Apple Newton, and will provide the user with a manual for the RIA MapPad and AGSO FieldPad software. The Newton can be switched off anywhere in its programmes and on rebooting, will return to the last screen. Programmes are exited by pressing the ⊠ button in the bottom right of the screen.

The OZROX database structure

The OZROX Field Geology Database has seven main data tables; SITES, OUTCROPS, SECTHOLES, INTERIZONS, ROCKS, LITHDATA and STRUCTURES. Currently, the SECTHOLES and INTERIZONS tables are not accommodated by the FieldPad structure. All other tables indicated in Figure 1 below are lookup or authority tables used to validate the classifications and nomenclature used in the main OZROX tables.

The hub of the field database is the SITES table which standardises the way point location data are recorded and ensures that the accuracy and lineage of coordinates are noted. This is logically linked to the OUTCROPS and ROCKS tables via the Originator Number and Site ID. The OUTCROPS table stores data at the outcrop level and includes links to the STRATDAT biostratigraphic database. The ROCKS and LITHDATA tables record lithologies and samples descriptions. LITHDATA is an expandable attributes table for further descriptions of the lithologies and samples described in the ROCKS table.

Figure 1 - The structure of OZROX showing relationships between tables, with 'crows' feet' at the many end of many-to-one linkages. The rounded boxes represent databases used to validate the data in OZROX.
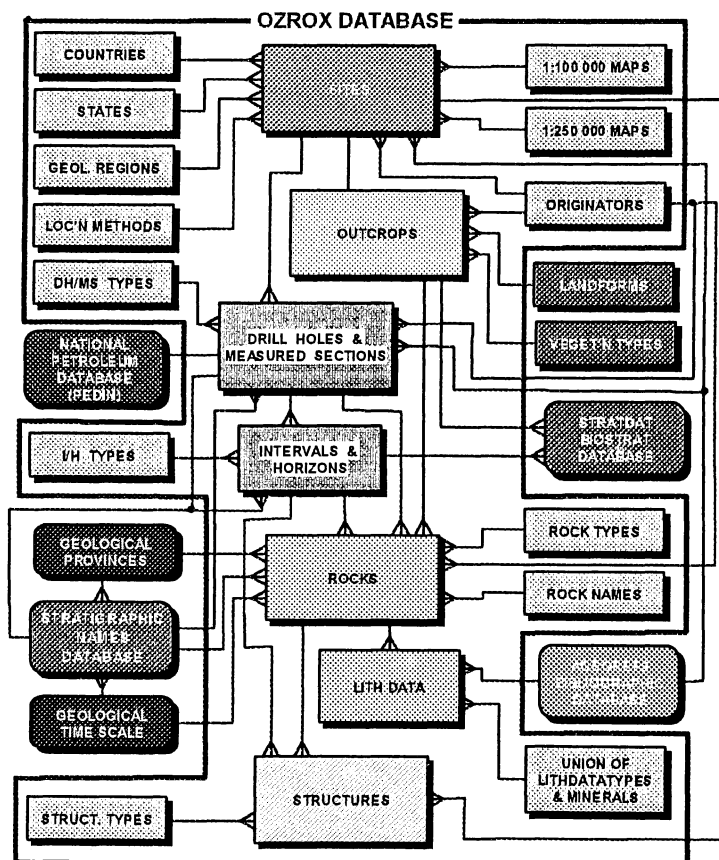
Functions of the Apple Newton 130[2]

The Newton was originally designed as a Personal Digital Assistant (PDA). In this role it has many features and functions which the field geologist will find very useful. Some of these features and functions are listed below.

Built-in organisation functions

- Helps you plan monthly, weekly, and daily activities using the calendar, and manage priorities using the To Do List;
- Allows free-form notes, outlines, lists, and phone logs;
- Includes customisable name and address files, using various business-card formats;
- Offers an assortment of information and productivity tools, such as time-zone maps, a calculator, and currency exchange.

Built-in communications

- Actively assists you in making phone calls, faxing, printing, finding information, and sending and receiving electronic mail;
- Uses an optional wired or wireless modem to send and receive faxes and electronic mail;
- Prints formatted letters and notes using Apple printers or serial or parallel printers with the optional Print Pack;
- Lets you beam notes, messages, packages, schedules, and business cards via built-in infrared communications;
- Backs up all data onto your personal computer and installs software on your MessagePad 130 using the included Newton Backup Utility.

Expandable functions

- Using the optional Newton Connection Utilities, lets you import and export information from your Mac OS- or Windows-based computer, and backs up and synchronises files with your computer;
- Works with PC cards and serial peripherals such as keyboards, modems, pagers, and wireless communications and storage products;
- Offers a large selection of productivity, finance, time and billing, information management, reference, electronic document publishing, and entertainment software.

RIA MapPad

Resource Industry Associates (RIA) have developed MapPad to enable digital mapping in real time and space. It allows full navigation and tracking features. Geological and/or geophysical interpretations, cultural, cadastral, topographic or drainage maps can be loaded into MapPad and displayed. The same map can be loaded at various scales to allow 'pseudozooming' to different levels of detail. When linked to a GPS an active position is presented on screen (Fig. 2). Maps need to be converted to a custom format to be loaded into MapPad. A Windows '95 programme from RIA called Tsmappad.exe will convert .dxf format files to the custom format (see section for loading maps).

---

[2] Functions from Apple's Web Site (http://newton.info.apple.com/newton/solutions/messagepad130ds.html)

Toggle Backlight — Current map and scale — Toggle background map

Hold down pen, wait for beep and draw thick line to measure distance

Double tap on map to create waypoint at tap position

Single tap on map to show coordinates of tap position

GPS status window

GPS position indicator

Create waypoint at GPS position

Draw annotation lines on map

Toggle GPS

Map view scroller

Quit MapPad

Other functions menu

Map chooser menu

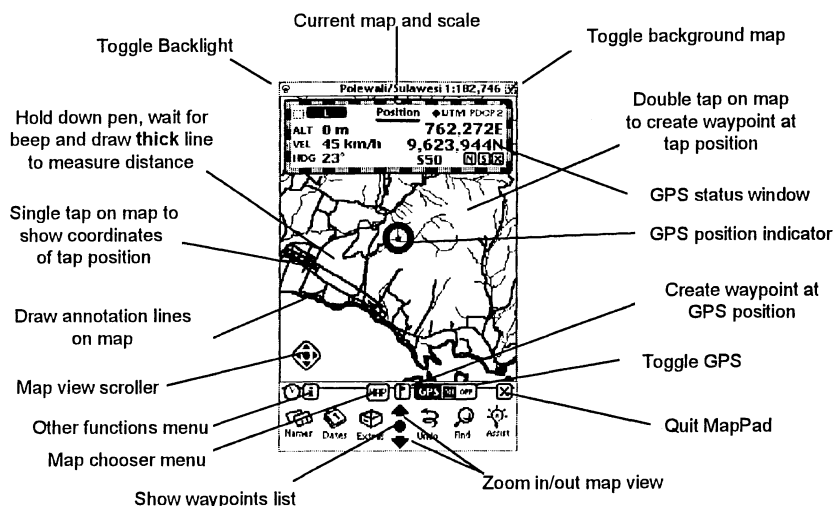Show waypoints list

Zoom in/out map view

Figure 2- Guide to some of the features of the MapPad programme.

To start MapPad switch the Newton on and from the main screen select the *MapPad* icon, or the icon of the map you wish to display (all maps available in MapPad are displayed as separate icons). To switch between maps when running MapPad (e.g., different scales of the same region) select the *Map Chooser* option (Fig. 3). The Map Chooser is accessed by pressing the title bar at the top of the screen, or the *Map* icon at the bottom of the screen (Figure 2). From the Map Chooser select the map you want. Alternatively if you have the same map loaded at different scales use the up and down arrows next to the *Extras* icon to move from one map to another.

Other options are accessed via the *Map* icon are:
1. A control button to let you move to set positions on the map (e.g., centre, left edge, top right corner). At the top of the pop-up menu are a group of radiating arrows with a diamond in their centre. Press any of the arrows to move to that map edge or corner, or the diamond to move to the centre of the map.
2. A choice to change to a larger scale of the current map or to go to the small scale world map.
3. Access to the Waypoints List.

Options accessed through the title bar at the top of the screen are:
1. Toggle waypoints on/off.
2. Toggle track log on/off.
3. Location
4. Header information for the map - i.e., map projection, map units, geographical extent of map boundaries. A thumb nail sketch of the entire map is also displayed with the extent of the current screen view shown.

Scrolling incrementally about the map is achieved by pressing the diamond-shaped scroll tool in the lower left corner of the screen (Figure 2). A single press will scroll the map a single increment. Holding the pen down will scroll the map until the pen is lifted.
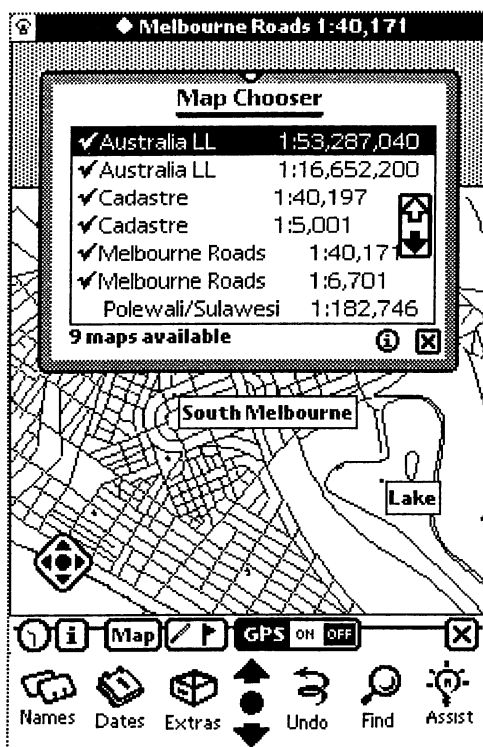
Figure 3 - Pulldown menu of maps for selection.

Linking with the GPS

There are a number of preferences that need setting to enable the GPS to communicate with the Newton. Select the *information* ⓘ button in the bottom left hand corner, and then select *Prefs* from the pop-up menu. The choices available from Prefs include •*General,* •*Global Positioning System,* •*MapView,* •*Waypoints,* •*Navigation,* •*Data Transfer,* •*Current Location.* Pressing any one of these options will take you straight to those preferences, however once you are in the MapPad Preferences window you can scroll through the preferences by pressing the up/down arrow below the bottom of the main window (screen). Pressing the 'dot' (between the up/down arrow) retrieves the menu (Fig. 2). This also works for all other menu lists.

GENERAL - You can restore the default values.
Select the store data on (flash) card option and other start up options.
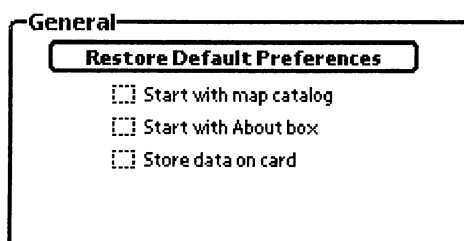
GPS - *Serial Port:* Select between RS232 and infrared connection
Sound effects: Set the sound you would like for particular "actions".
Type: NMEA018 is the data communication standard for the Garmin GPS
Baud: This is usually 9600

Datum: Choose your map datum (e.g., AGD66, WGS84). This must be the **same** as the map that you are using in the Newton. For GIS usage it is critical to record the datum used.

Auto open window: Sets the type of information displayed when the GPS is switched on. *Status* will show the number, status, and signal strength of satellites visible to the GPS. *Position* will show the current position as determined by the GPS. There is also a toggle switch to enable averaging. *Navigation* shows distance, velocity and bearing information for navigation to a particular feature or waypoint.

Timeout: can be selected between never to 1 minute (for battery saving).

```
┌─Global Positioning System────────────┐
│ Serial Port          ◆Type IPS3000    │
│   ◯ RS-232           ◆Baud  9600      │
│   ● Infra-Red        ◆Datum  WGS84    │
│ ☑ Sound effects                       │
│   ◯ Bell             Auto open view   │
│   ◯ Chord              ● None         │
│   ◯ Trill              ◯ Status       │
│   ◯ Xylo               ◯ Position     │
│   ◯ Click              ◯ Navigation   │
│ ◆Timeout 2 minutes    ☑ Check sum     │
└───────────────────────────────────────┘
```

MAP VIEW -

Select the desired option for showing *waypoints, labels, track* information on the map.

Marker: waypoint position markers can display as a small dot or large dot, or not at all.

```
┌─Map View──────────────────────┐
│ ☑ Show waypoints   Marker      │
│ ☑ Show labels        ◯ None    │
│ ☐ Show track         ● Small dot│
│                      ◯ Big dot │
│                                │
└────────────────────────────────┘
```

WAYPOINTS -

A starting number for your waypoints and also a standard prefix can be set up. Increase the starting number by pressing on the top of the number and decrease it by pressing on the bottom of the number. It is suggested you use a similar number system to the AGSO Site ID system (see later). You can also clear all waypoints. The diamond symbol ◆ indicates a pulldown menu for that field (it also applies for any application in the Newton).

Form: toggles AGSO FieldPad system on and off.

```
┌─Waypoints────────────────────────┐
│ ◆Waypoint prefix  WPT............ │
│                                   │
│ Last waypoint #        ┌──┬──┐    │
│                        │  │ 63│   │
│                        └──┴──┘    │
│ 13 waypoints (3K) [ Clear Waypoints ]│
├───────────────────────────────────┤
│ ◆Form None                        │
│ AGSO FieldPad                     │
│ AGSOFieldPad:SoftZone             │
└───────────────────────────────────┘
```
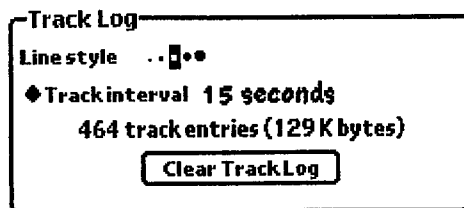
TRACK LOG -   Allows you to set preferences for track logging.

Line Style: Sets the size of the track log position indicators to be displayed in MapPad.

Track Interval: Switches track logging on/off, also sets the interval between each position fix when operating in track log mode. Options range from all position fixes received from the GPS unit up to every 10 minutes.

Clear Track Log: Press button to clear track log entries. The number of track log fixes recorded and the size of this information in Kilobytes is displayed above the button.
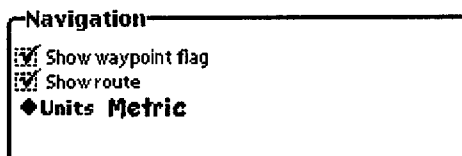
```
┌Track Log──────────────┐
│ Line style   ··■··     │
│ ◆Track interval  15 seconds │
│        464 track entries (129 K bytes) │
│        ┌──────────────┐ │
│        │ Clear Track Log │ │
│        └──────────────┘ │
└───────────────────────┘
```

NAVIGATION -   You have the option to show the *waypoint flag* and *route.*

Units: Sets distance units to metric, statute or nautical.
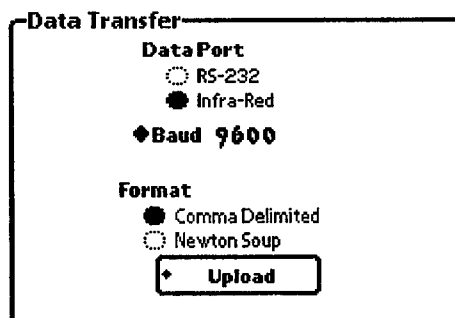
```
┌Navigation─────────────┐
│ ☑ Show waypoint flag   │
│ ☑ Show route           │
│ ◆Units Metric          │
└───────────────────────┘
```

DATA TRANSFER - Data transfer preferences for transfer to a PC or another Newton.

DataPort: RS-232 or Infra-Red.

Baud: Baud rate.

Format: Comma Delimited for ascii output or Newton Soup for transfer to another Newton.

```
┌Data Transfer──────────┐
│     Data Port          │
│       ○ RS-232         │
│       ● Infra-Red      │
│  ◆Baud 9600            │
│                        │
│     Format             │
│       ● Comma Delimited │
│       ○ Newton Soup    │
│       ┌──────────────┐ │
│       │ ◆   Upload   │ │
│       └──────────────┘ │
└───────────────────────┘
```

CURRENT LOC - Gives the current position (or most recent) in degrees and UTM co-ordinates, as well as the altitude in metres.

[icon] This button activates a number of options which control the way users interact with the map displayed in MapPad. The *flag* option is for waypoints. A single tap on the screen will activate the waypoint notebook. (Figure 5). The *XY coord* option will display the coordinates of any location you tap on the screen. The *centre* option will centre the screen around the point you tap on. The *sketch* option allows lines to be drawn on the screen.

From the Waypoint page (Fig. 5) the FieldPad can be accessed by pressing the *AGSO FieldPad*. FieldPad will start with the OZROX Sites form (Figure 7).
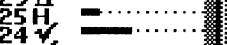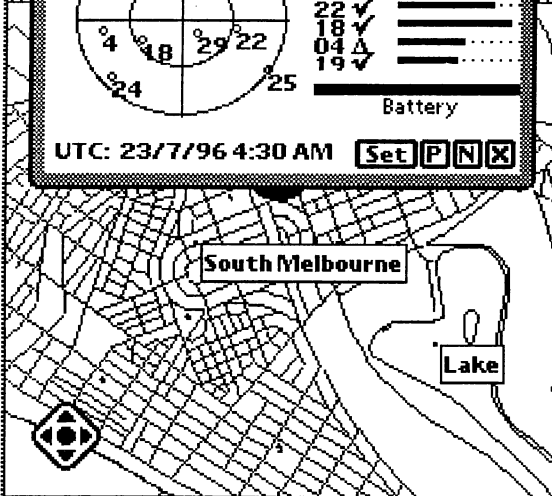
Figure 4 - GPS active screen showing status.

Figure 5 - Waypoint screen showing position.

AGSO FieldPad

The AGSO FieldPad is a digital notebook for storing field geological data. It can be run without MapPad but then the GPS position will have to be entered manually. There are a number of forms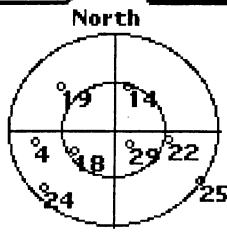 or screens that can be scrolled through by using the up or down arrows located at the bottom of the screen. The dot between the arrows brings up a directory of all the forms. Pressing on the form name will take you straight to the desired form (Figure 6).

Data entry into the AGSO FieldPad is either via pulldown lists of acceptable values or as free text. Tapping the diamond beside the name of each field will display either a list of values or a clean page into which a description can be hand written. Although the FieldPad will not prevent you from writing as much as you like into the free-text fields it will only store the number of characters that the OZROX database can store. In most cases this is 64 characters, and therefore any extra characters will be truncated. Where a pulldown list exists for a field, data entry can only be from the pulldown list. The following descriptions of the forms state whether the fields are free text or have lists of attributes attached. In the case of free-text fields, the number of allowable characters is given.
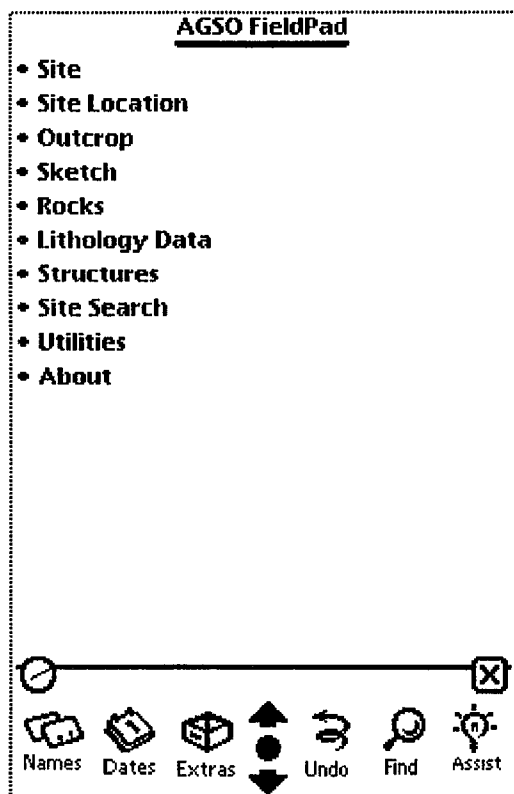
Figure 6 - AGSO FieldPad selection screen

Site

Figure 7 - site entry form

The Site Form corresponds to the OZROX SITES table. The form is primarily for surface location data relating to field geological, geochemical and geophysical observations. For example, an entry in the SITES table may be for observations at an outcrop, for sample data, a drill hole location, a scintillometer reading, or all four.

DATE/TIME - Derived automatically from the Newton, however, it can be changed if desired.

SITE ID - Mandatory field of up to 16 characters for a user-supplied number or ID for the site. Any combination of numbers and letters may be used, but the Site ID must be unique to the originator. Most AGSO geologists use 8 digit "AGSO" registered numbers for Site ID e.g., 96834000 - where 96 = year, 83 = project, 4000 = block of numbers allocated to R. Blewett (4000 ⇨ 5999). Once set up the Site ID will increment by one for each new site described.

ORIGINATOR - Mandatory number unique to each geologist (in some cases also used for an institution, e.g., 'GSWA', 'RSES'). Once an originator has been selected it will be the default until changed (*Pulldown menu*).

COUNTRY - Default country is Australia (*Pulldown menu*).

STATE - The State in Australia. Mandatory if country is Australia. Once a state has been chosen it will be the default until changed.(*Pulldown menu*).

REGION - Geographical regions on the map of Australia, analogous to geological provinces e.g., Yilgarn Block. As for other defaults, the province selected from the menu will be the default until changed (*Pulldown menu*).

GEOG AREA - Optional free-text field of 64 characters for the geographic area the site is in (e.g., valley, plain, mountain range). Examples include 'Hay Plain', 'Tuggeranong Valley' and 'Selwyn Range'.

1:100K MAP - The 1:100 000 map sheet-area on which the site falls. Mandatory if the country is Australia. (*Pulldown menu*).

1:250K MAP - The 1:250 000 map Sheet area on which the site falls - e.g., 'SF5402' (*Pulldown menu*).

BIB REF - Optional free-text field of 9 characters for the ID of a bibliographic reference that locates or refers to the site. Codes entered in this field should exist in AGSO's corporate AGSOREFS database (Ryburn & Bond 1995).

AIRPHOTO - An optional free-text field of 36 characters to identify the airphoto on which the site is located and/or was plotted. The field is for the name of the airphoto series, the run number and the photo number, e.g., 'Cloncurry 8/2134'.

Location of site

LOCATION - An optional free-text field of 64 characters for descriptive information relating to the site location, e.g., '5 Km SE of Brown's Bore'.

LOC METHOD - Mandatory field for the method used to obtain the geographic coordinates of the site. For GPS located sites use the code with the correct datum (e.g., WGS84). If a standard series map is indicated it is assumed that the map used was the most up-to-date edition at the time the observation was made (*Pulldown menu*).

Figure 8 - The location of site entry form.

COORDINATES - Mandatory UTM or latitude/longitude position of the site. Nothing need be done if the GPS connection is operating. It is not recommended, but if have to use the Newton independently of the GPS live link, then tap the diamond next to *Coordinates* and modify the position values directly by scrolling the previous numbers up and down to those of the new position.

Outcrops for site

The Outcrops Form covers the OUTCROPS table and is designed for descriptions of the outcrop as a whole and relationships between lithologies and structures in the outcrop. Information on individual lithologies, samples and structures belong in the ROCKS and STRUCTURES tables which have a many-to-one relationship with the OUTCROPS table.

Figure 9 - The Outcrop for a site entry form.

ROCK RELS - Optional free-text field of 128 characters for a description of the rock relations in the outcrop.

SKETCHES - Optional free-text field of 64 characters noting any sketches made at the outcrop.

PHOTOS - Optional free-text field of 64 characters noting any photos taken at the outcrop.

VEG CODE - Optional field for the vegetation type (*Pulldown Menu*).

VEGETATION - Optional 64-character free-text field for a description of the site's vegetation. This is important for remote sensing.

LAND CODE -   Optional field for the landform (*Pulldown Menu*).

LANDFORM -   Optional 64-character free-text field for a description of the landform features of the site.

Sketch for site

A digital sketch may be attached to a site. Simply draw onto the screen and press the tick to save the sketch. You can use all the editing features of the Newton. Consult the Newton manual for tips on deletion etc. The current limit is one sketch per site.

Sketches can include lettering either as raster text (as a graphic using *sketches*) or as text using the Newton's character recognition software (with two fonts - *Text* and *Ink Text*). You can also select a *Shapes* option and the Newton will attempt to draw straight lines and close polygons. Alternatively, select the *Sketches* option and a facsimile of what is on the screen is stored.
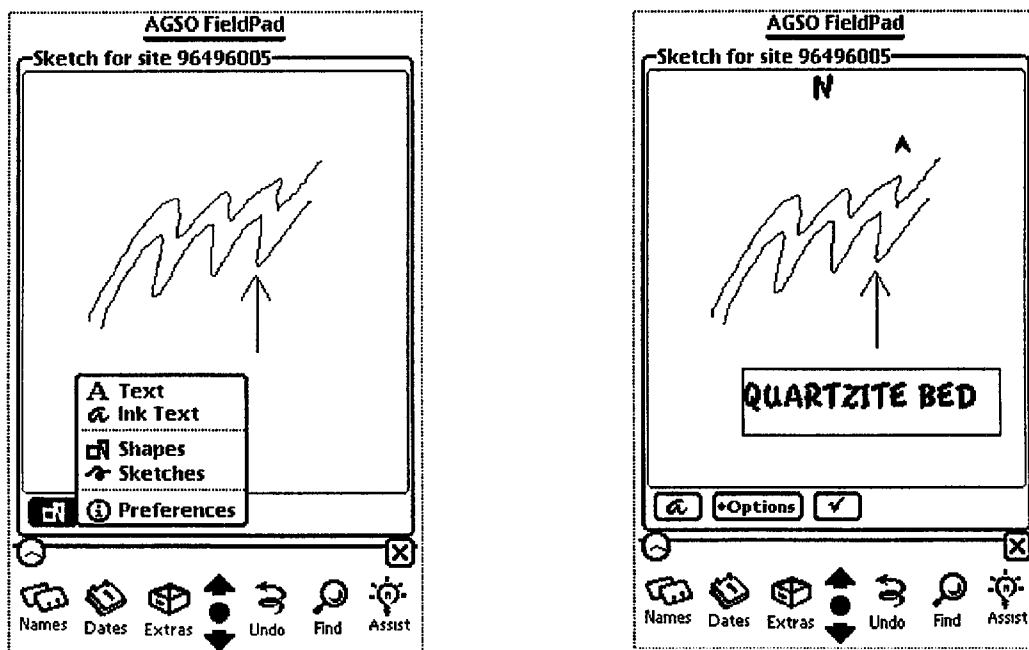
Figure 10 - Example of FieldPad sketching.

Rocks for site

The Rocks Form records data on lithologies and rock samples at a site. The ROCKS table has a many-to-one relationship with the SITES table and also with the OUTCROPS table if an outcrop record exists for a site. This is a natural relationship as a number of different lithologies and samples commonly occur at the one site. The primary key for the Newton is the Site ID (links the various tables), it is system-generated Site Number in OZROX.

A Sample ID uniquely identifies each sample or lithology description. By default the Site ID is the basis of the Sample ID. If there is more than one description at a site the Site ID is typically modified by adding letters (e.g., 96834000A, 96834000B, 96834000C etc). This is the recommended system, as it ensures the connection between samples and sites is clear. For each new lithology or sample description press the right hand Index scroll

buttons at the top of the screen and the Sample ID will 'increment' from A to B and so on. It is recommended that all attributes and structural recordings to a lithology be entered together and that the user return to this screen for subsequent lithologies and their associated attributes and structures. This is because scrolling down to LITHDATA and STRUCTURES (see later) will ensure that the link between this data and rocks is maintained.

SAMPLE ID -   The default Sample ID uses the Site ID as a prefix, followed by a series of letters for different lithologies at the same site. This can be overwritten if required.

ROCK TYPE -   An optional field for a first-pass field classification of rock types (*Pulldown Menu*).

Figure 11 - The Rock for site entry form.

PROVINCE -   Optional field for the geological province, subprovince or domain (*Pulldown Menu*).

STRATIGRAPHY -   Optional field for the stratigraphic unit (*Pulldown Menu*).

LITH QUAL 1,2,3 -   Optional fields for the qualifying term of a lithology e.g., 'foliated', 'porphyritic'. Fill the qualifiers in such a way that you would expect to read them with the following lithology, so if you have only one qualifying term use the qualifier 1 field; if two use the qualifier 1 and 2 fields, and so on (*Pulldown Menu*).

LITH NAME -   Optional field for the lithology (*Pulldown Menu*).

AGE -   Optional code for the age of the lithology (*Pulldown Menu*).

MAP SYMBOL - Optional field for the map symbol of a lithological unit. This field should only be entered if there is no formal lithostratigraphic unit. It is designed for the type of informal units traditionally used for geological mapping in the Yilgarn Craton and Arunta Province (*Pulldown Menu*).

MODE OF OCC- Optional field for the mode of occurrence of a lithology or sample - for example 'xenolith' (*Pulldown Menu*).

DESC - Optional 64 character free-text field for a description of the lithology.

OTHER - A 64 character optional free-text field that may be used for any data not covered by the above fields that the user feels are relevant, such as general remarks.

Lithology for sample

This form allows any number of attributes to be added to the description of the sample (lithology). Attributes should be added only to the lithology they describe and that is why you must fill in attributes for each lithology separately (it saves jumping between screens and ensures internal relationships between the data are maintained).

Five attributes are displayed on a single screen, more can be added by using the scroll buttons at the bottom. Attributes or data types (e.g., colour, igneous texture, grain size) have values or subtypes (e.g., green). These are all optional fields. Records can be deleted by pressing the record number on the left hand side of the record to be deleted.

Figure 12 - The lithology for sample entry form.

TYPE -   Types are any attribute included in the pulldown menu, such as colour, alteration, thickness, texture (*Pulldown Menu*).

SUBTYPE -   Subtypes are mandatory attribute values unique to each Type (*Pulldown Menu*).

DESC -   This is an optional free-text field of 64 characters for any additional descriptive information relating to the Type/Subtype record. For example, one may wish to comment on the mode of occurrence of a mineral in a sample. You can over run onto lines below, but only 64 characters can be stored on a single line. To get around this, just repeat the Subtype and carry on writing. Tap the diamond to open up a clear page for data entry.

Structure for sample

The Structures Form, corresponding to the STRUCTURES table, allows observations of mesoscopic to macroscopic geological structures to be related to the lithologies and stratigraphic units in which they are found. The structural readings are linked by a many-to-one relationship with ROCKS. This means that structures should be entered with the lithology in mind. Five attributes are displayed on a single screen, more can be added by using the scroll buttons at the bottom.

Figure 13 - The Structures for sample entry form.

TYPE & SUBTYPE - Structural features are stored as a mandatory *type* and a *subtype* (e.g., bedding that dips is type 1 subtype 1). We use this system rather than traditional structural systems as it makes map making easier. For example, S_2 is the second generation fabric but it may be a cleavage, crenulation cleavage, mylonitic fabric and so on. The Type and Subtype system allows the geologist to distinguish the different fabric elements (*Pulldown Menu*).

AZ - *Azimuth* is the direction of dip, between $0°$ and $359°$ oriented $90°$ to a strike. This is important as the plotting routines will rotate (place) the symbols in an incorrect orientation if one uses strike.

INCL - *Inclination* is the amount of dip between $0°$ and $90°$. ·The value provided will be placed along side the relevant symbol in the GIS plotting routines.

DEFNO - Optional field to store the *deformation number* or generation of a structure (e.g., bedding would be 0 and the first cleavage would be 1). It is particularly useful when the generation of a foliation or lineation is known (or inferred), for example F_3 would have a 3 in the *defno* field.

DEFSU - The *deformed surface number* is the generation of the surface that is deformed by a subsequent generation of structure (it is used in conjunction with *defno*). For example, a third generation fold of an second generation surface ($F_3{}^2$) would be type 3, defno 3, defsu 2.

PRANK A positive integer of up to 3 digits indicating the order of importance in plotting the structure on a map. Where a number of structures have been measured at the one locality, *plot rank* determines which structures will be plotted first. On maps plotted by computer, only one structure can generally be plotted at any one point on a map.

Site search

The Site Search Form allows users to search for, delete or create new sites. To search for a particular site enter the Site ID in the *Search for* field then press [**Search**]. To edit a site select the Site ID and then press the *edit Site ID* button which is displayed on selection. Deleting a site is done the same way except by pushing the *delete* button.

Figure 14 - The Site Search form.

Utilities

The Utilities Form manages the transfer of site records (Book Entries) to a PC or laptop and the clearing or indexing of the AGSO FieldPad pulldown lookup tables (these are sometimes called soups in Newton terminology). On the utilities page there is a scrolling list of lookup tables. Lookup tables can be cleared individually or all together. To clear them individually scroll to the required soup and highlight its name, then press the *clear soup name* button which pops up below the scrolling list. To clear all lookup tables press the ◆ Options button and then choose *Erase All Lookup Tables* from the pop-up menu. Large lookup tables can take some time to clear particularly if available memory is low. With any new lookup table indexing is required. To index the lookup tables press the ◆ Options button and choose *Index All Lookup Tables*. Site descriptions can be stored on flash card or within internal memory. It is recommended to use flash card as they are much safer for storing data than internal memory (tick box).

Below the lookup table list is a control panel for *Upload[ing] Book Entries*. For information on how to transfer site descriptions to a PC see the section on Uploading field sites to a PC below.

Figure 15 - The Utilities form.

TRANSFERRING DATA TO AND FROM THE NEWTON

Apple Newton Backup Utility

Install the Apple Newton Backup Utility on your PC or laptop and plug in the Apple Newton serial cable to both the Newton and the PC or laptop.

Checking memory

Start the Newton. Before installing a package on the Newton check that there is enough memory available, either internally or on the flash card. Memory information is available by pressing the ⓘ icon. It may be necessary to remove some packages if there is not enough memory available. To remove a package hold the scribe on the screen until a large dot appears and the Newton squeaks, then drag the scribe across the icon to highlight it. Next select the *envelope* icon at the bottom right of the screen and choose delete from the pop-up.

To store a package on the flash card open the icon called *card*. There is a check box in this window which allows you to choose where you want to store new packages either on the card or in internal memory.

Installing a package

Open the Newton *connection* icon in Windows. The first time that you use the Connection utility you may need to set the communications information. Under the Newton menu option on the menu bar select the settings option. The baud rate should be 9600 and the communications port will be either comm1 or comm2.

If the communications information is right, then press the *connection* icon on the Newton, then press the *connect* icon. When a connection has been established the buttons in the Newton Backup Utility on the PC will no longer be greyed out. Install a package by pressing the *install package* button.

At times connection can be difficult to establish particularly for non-Pentium computers. If you have trouble, check the baud rate which should be 9600, and also check which port you are using. It should be the same one that the serial cable is plugged into. If you still cannot establish a connection try restarting the Newton and also Windows.

Uploading field sites to the PC

Field sites are uploaded to a PC using the Windows Terminal programme. The Terminal programme is usually found in the Accessories Group. To communicate with the Newton Terminal requires a parameter file. Open the parameter file by choosing **open file** from the File menu. If a parameter file does not exist create one by choosing **new** from the File menu. Then from the **setting** menu choose **communications**. In the communications dialog box select the communications **port** that you are using and then the **baud rate** which should be 9600. Next select **save as** from the file menu and give the parameter file a name that you will remember like

Newton. To upload field sites choose **receive text file** from the **transfers** pulldown menu. Next select the directory and file name to which you want to save the uploaded data and press **OK**. The PC is now ready to receive uploaded site records. On the utilities page in FieldPad press the

| Upload Book Entries | button to commence the data transfer process.

Installing lookup tables

Provided with each Newton is a disk containing lookup tables copied from the ORACLE database. The lookup tables are stored as tab-delimited files in a directory called data. These files can be edited, if required, in any text editor to obtain a subset of values.

A tab-delimited text file for loading into FieldPad has the following format.

1. A header with the soup name, and name and format of the data columns.
2. Tab-delimited columns of data, either two columns or three.
3. Each file is terminated by the string BYE!.

If you have more than one table to load they can be appended together into a single file. The Newton will know when one soup has finished loading when it reads the terminating string BYE!. It will then interpret the next line as a new table. A batch file has been set up to output the files containing the lookup tables in the correct format. The following describes the steps in creating and loading lookup tables.

1. Export tables in tab-delimited format, without any quotes around fields from the Oracle database. For two-column files the format is code, then description. There are two three column files, the subtypes for lithdata and subtypes for structures files. These files have the format: subtype code, datatype code, description.

2. The table files should be stored in the DATA directory with the file extension TAB

3. Run the MERGEALL batch command from a DOS prompt. The MERGEALL batch file is in the directory called TABLE. Also in this directory are the headers for all the lookup table files and a file containing the BYE! string.

4. MERGEALL merges each lookup table file with its header and the terminating string BYE!. The tables ready to download are created in the DOWNLOAD directory. There is a .TXT file for each table. A merged .TXT file is also created which contains all the tables, allowing downloading of all tables in one operation.

5. Ensure the table(s) you are about to download have been removed from the Newton, otherwise the new table data will be appended to the existing tables.

6. Removing tables from the Newton can be done via the **Utilities** form in FieldPad, or via the Newton OS. Removing tables via the Utilities form is probably the easiest method and has been described above.

7. To make the Newton ready to receive text files start Slurpee. When Slurpee is open the Newton is ready to receive text files. In Terminal under the Transfers pulldown menu choose *send text file*. Select the file that you wish to send and click OK. The file will be transmitted

and you will be able to see each line displayed by Slurpee as it is loaded. When a table has finished loading the Newton will make a "werp" sound. Soup loading is a relatively slow process and will take some time for large soups. Loading rates seem to be about 2 lines per second.

8. After loading tables INDEX all the soups via the Utilities form as described.

Trouble shooting

Error message when a pop-up list is chosen.

Soup is empty or not indexed.
Try indexing the soups. If this doesn't work go to the utilities page and try deleting the soup. A pop up window will ask if you want to proceed, it will also tell you how many records are in the soup. If there are no records in the soup, load a new soup and then index it.

Unable to establish a connection with the Newton.

Check the serial cable is connected to both the Newton and the PC.

Creating MapPad Maps

This programme converts .dxf maps into MapPad packages for loading into the Newton. Dxf files can be created from arc coverages by using the arcdxf command. Maps can be any polygon, line or point coverage. You may wish to load the topography, culture, geology, geophysical interpretation, sample localities, and/or key sites or traverses. Note that the size of the image file being created (not the dxf input file) should not be greater than 880Kb as the Newton operating system is currently unable to create images of a larger size. By way of example, a sample of Melbourne roads started as a 4.5Mb dxf file and resulted in a 1:26000 scale MapPad image with a size of 880Kb. RIA has frequently converted 15Mb .dxf files into 800Kb MapPad package files with a scale of 1:15000.

When loading a dxf file, MapPad looks for a corresponding Projection file (.prj) and Layer control file (.lyr). If no corresponding files are found, DEFAULT.PRJ and DEFAULT.LYR are searched for in the same directory as the dxf file. If these are not found then default values are used.

.PRJ Files
A .prj describes the map projection of the .dxf file, and contains the default description information. An example of the file Melbour.prj (UTM projection) is set out below:

```
[Information]
MapTitle=Melbourne CBD*
Description=MapInfo Melbourne CBD*
PackageName=Melbour*
UniqueName= Melbour*
SymbolName= Melbour*

[Projection]
Description=AMG Zone 55*
Projection=UTM
DatumName=AGD66*
Units=m
OriginLongitude=147*
OriginLatitude=0
StandardParallel1=0
StandardParallel2=0
Azimuth=0
ScaleFactor=0.9996
FalseEasting=500000
FalseNorthing=10000000
Zone=-55*
```

The only lines that need changing to your specific map sheet are ones with the * symbol.

.LYR Files

The lyr files control the visibility and style attributes for layers in a dxf file. Note, it is not necessary to have a .lyr file to create a map.

#Name	Include	Style	Width	TxtFG	TxtBG
*	0	0	0	0	1
1COAST	1	0	2	0	1
1DRD	1	0	0	0	1
1DRDUS	1	1	0	0	1
1FWY	1	0	5	0	1
1FWYUC	1	1	5	0	1
1HWY	1	0	4	0	1
1HWYUS	1	1	4	0	1

Comment lines begin with #, and are ignored.

The file must contain six columns of information for each layer.

The first column contains the layer name, if the layer name is * then this sets the default value for all unspecified layers.

The second column determines the specified layer's visibility 0 = Off, 1 = Visible. The example turns off all layers except those specified.

The third and fourth columns specify line style and width. Styles available are :

> 0 Solid
> 1 Dash
> 2 Dot
> 3 Dash Dot
> 4 Dash Dot Dot

The fifth and sixth columns specify text foreground and background colour.

> 0 1   is Black text on a clear background
> 1 0   is White text on a solid black background

Creating the MapPad Package

This programme (Tsmappad.exe) only works on a Windows 95 PC.

Go to **File** and **Open** your dxf file and select a **custom scale** then select **custom.** Wait while the map is created. A useful scale is **1024** (equates to a square 1024x1024 pixel map) or for larger scale try **2048**. More than one scale of map can be created and loaded into the Newton.

Once an image of satisfactory size and scale has been created select **Create.**
Open **File** and select from the MapPad subdirectory a template package file (*.pkg) of similar size (e.g., s1024.pkg for the 1024 scale option) for pasting the map you have just created. Select **Create** then **Save As** with a new name for the map sheet you have created. Select the sub-directory for the image.pkg you are about to create and **SAVE.**

Once the package (*.pkg) file(s) have been created they can be loaded into the Newton for use. See the section on communicating with your Newton above.

Tricks and Tips

To help with hand writing recognition:
- build up a comprehensive dictionary, the Newton operates by trying to match words;
- add extensions (aliases) to common words;
- go through the Newton exercises and read the manual carefully.

To help with entry and editing:
- if the handwriting recognition is working poorly use the keyboard feature (double tap the screen);
- try making up pro-forma sites and give them names that can be easily distinguished so they can be retrieved and customised to each unique outcrop. Be careful doing this.

Acknowledgements

References

Blewett, R.S., 1993. The AGSO field geological notebooks - a user's guide. Australian Geological Survey Organisation, Record, 1993/46.

Ryburn, R.J., Blewett, R.S., Stuart-Smith, P.G., & Williams, P.R., 1993. Users' guide to the NGMA Field Database. Australian Geological Survey Organisation, Record, 1993/47.

Ryburn, R.J., Bond, L.D. & Hazell, M.S. 1995. Guide to OZROX. AGSO's Field Geology Database. Australian Geological Survey Organisation, Record, 1995/79.

Ryburn, R.J. & Bond, L.D., 1995. Guide to AGSOREFS: AGSO's shared bibliographic reference database. Australian Geological Survey Organisation, Record, 1995/6.

Appendix 1 - Technical Specifications for Newton 130[3]

Newton Intelligence Newton Recognition Architecture

- Recognises handwriting--printed, cursive, or a mixture of the two--with the assistance of a 93,000-word, built-in word list
- Lets you add up to 1,000 words
- Includes four pop-up keyboards: typewriter, numeric, phone, and time/date
- Recognises graphics and symmetrical objects

Newton Information Architecture

- Object-oriented database stores, finds, and links information and provides a flexible view of this data
- Newton Toolkit lets you easily create custom applications using its flexible graphical toolbox
- Architecture lets you easily share data across applications

Newton Communications Architecture

- Provides built-in support for serial communications, PC card modems, sending and receiving faxes, and electronic mail
- Provides a single interface for modular, object-oriented communications services
- Provides improved performance with Internet communications applications and multitasking support
- Supports new communications capabilities through its modular design
- Supports Class II Fax

Intelligent Assistance Architecture

- Helps users complete repetitive tasks in multiple categories, including communications, scheduling, finding, and reminding functions
- Contains smart defaults to reduce complexity
- Works in and between applications
- Supports third-party extensions

MessagePad Hardware Architecture

- ARM 610 RISC processor at 20 MHz
- Apple custom system ASIC
- Low-power, transflective LCD display with EL backlight (320 by 240 pixels) 9.6 cm by 7.2 cm.
- Nonglare writing surface
- Telescoping pen
- 8MB of ROM; 2.5MB RAM (1,199K of system RAM; 1,361K of nonvolatile user RAM)
- One PC Card Type II slot with 325 mA capacity
- LocalTalk and RS-232-compatible serial port
- Low-power, half-duplex, infrared transceiver that works at up to 38.4 Kbits/sec within 1 m.
- Protective, removable lid

Communications capabilities

- Prints using a variety of serial, parallel, and network printers
- Receives and stores wireless messages using optional messaging cards

---

[3]Specifications from Apple (http://newton.info.apple.com/newton/solutions/messagepad130ds.html)

- Communicates via e-mail or taps into on-line services and the Internet with optional wired or wireless modem cards and software
- Provides faxing with optional fax modem (automatic cover-page generation, post-formatting)
- Beams notes, name cards, appointments, and packages at up to 38.4 Kbits/sec within 1 m using high-speed infrared
- technology
- Automatically dials phone calls with assistance from intelligent auto-dialing (DTMF or modem dialing)
- Connects to cellular or GSM phones for wireless data and fax communications

Size and weight

- Length: 20.32 cm
- Width: 10.16 cm
- Height: 2.9 cm
- Weight: 0.48 kg without batteries

Operating environment

- Temperature: 0-40°C
- Storage temperature: -20-47°C
- Transit temperature: -20-65°C for up to 72 hours
- Relative humidity: 20% to 90% noncondensing

Power requirements

- Power adapter
- Universal, 100 to 240 V AC, 50/60 Hz
- Four plug configurations: Australia, U.K., Europe, and U.S.A.
- Battery type: AA (LR6) alkaline or NiCd Battery Pack
- Lithium cell: DL2032 (3 V nominal)
- Built-in fast charger for optional NiCd Battery Pack
- Power source: four AA alkaline batteries (included), optional power adapter, and optional NiCd Rechargeable Battery Pack

Computer connectivity requirements

- Works with PC-compatible computers with 80386DX or later processors running Windows version 3.0 or later
- Works with Mac OS-based computers with 68030 or later processors and system software version 7.1 or later

Printer support

- Offers built-in printer support for Apple LaserWriter Plus (and other PostScript-equipped LaserWriter printers), Personal LaserWriter
- LS, and Personal LaserWriter 300, as well as StyleWriter I and II printers
- Works with most popular PC printers, including the Hewlett-Packard LaserJet II DeskJet 500, Canon BubbleJet 10e, and Epson LQ and
- FX, using the optional Newton Print Pack