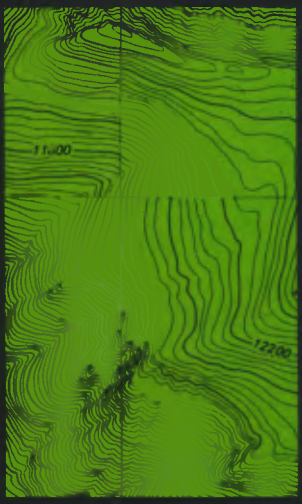

Scout GPS and ScoutMaster GPS User Manual

A global navigation system in the palm of your hand

Trimble

Warranty Registration Card

Check one...

- ☐ *ScoutMaster GPS™*
- ☐ *Scout GPS™*
- ☐ *ScoutMaster TOPO™*
- ☐ *ScoutMaster MasterClock™*

Serial No. _____

Owners Name _____

Address _____

City _____ *State* _____ *Zip* _____

Country _____

Phone _____ *Fax* _____

Purchased from _____

Date of Purchase _____

Are you interested in an Extended Warranty Plan?

Yes ☐ *No* ☐

Please complete, detach and mail or fax to:

Trimble

Service Department
2105 Donley Drive
Austin, TX 78758
Fax: (512) 432-0276

PLACE
STAMP
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Trimble

Service Department
2105 Donley Drive
Austin, TX 78758

Trimble *Scout/ScoutMaster GPS™* Quick INDEX & Options

LOC

Location Aids

◆ *Options*

Coordinate Style
Satellite Data
Set DGPS/GPS-SM
Start Acu–Lock
Mapping Datum
North Reference

NAV

Navigation Aids

Target Track

◆ *Options*

Set Goal
Set Track Scale
Offset From
From A to B
Find Nearest 10
Deactivate Route
Activate Route

LIB

Location Library

◆ *Options*

Edit a Location
Create Location
Erase Library
Delete Location

SETUP

User Preferences

◆ *Options*

Dataport Mode-SM
Two Key Turn On
Auto Shutoff
Screen Contrast
Screenlight On
GPS Update Rate
Reset Battery Hrs.
Elevation Units
Distance Units
Speed Units
Set Clock Style
Time Adjustment
Change Language

Reset Defaults
NMEA chksum ON
NMEA sentences
Char format
Output Baud
Input Baud
Select Output
Select Input
Dataport ON

ROUTE

Route Library

◆ *Options*

Copy Route
Delete Route
Rename Route
Edit Route

ADV

Additional Aids

◆ *Options*

Sun Data
Moon Data
See Julian Date
Over & Up
Convert Over & Up
A to B Over & Up
Time & Date

Trimble *Scout/ScoutMaster GPS™* Quick Reference Card

Key	Symbol	Function
Power	⏻	press for Power ON. Hold 4 secs. for Power OFF
Left or Right	◄ or ►	move Left or Right through INDEX screen or data.
Up or Down	▲ or ▼	scroll Up or Down through Options or data.
Enter	↵	enter a Mode, select an Option or confirm input.
Command	◆	enter Options List or cancel input.
GPS	•	save your current location. (need 3 satellites.)

Example: View current location / Save in Library / Set Local Map Datum

Press	⏻	to turn Scout/ScoutMaster ON.
Press	↵	to view your current location.
Press	•	to save your location in the Library.
Press	◆	to enter the LOC Options list.
Press	▲ or ▼	to scroll up or down to Mapping Datum Options.
Press	◆	to enter the Mapping Datum Options list.
Press	▲ or ▼	to scroll up or down to your local map datum.
Press	↵	to set map datum and view your current location.

Warranty

As an expression of confidence in our products to continue meeting the high standards of reliability and performance that our customers have come to expect, Trimble Navigation products are covered by the following limited warranty:

Limited Warranty

Trimble Navigation warrants its products to be free from defects in material and workmanship for a period of one year from the date of sale by our authorized dealers to an original purchaser or subsequent owner.

This warranty covers repair and/or replacement at our option, of any part or parts found to be defective, provided such defects, in our opinion, are due to faulty material or workmanship and are not caused by unauthorized or improper repair or abuse, or normal wear. Buyer shall be responsible for shipping and insurance of all products returned to TNL for repair under this warranty. Trimble Navigation will pay shipping and insurance for all TNL products returned to buyer provided that the products returned prove defective under this warranty.

Trimble Navigation Limited offers an extended warranty option on all its products for the repair or replacement of parts found to be defective in normal and intended use for a period of one year following the standard warranty period. Prices vary with the product.

This warranty applies only to products in normal use. It does not apply to units or circuit boards defective due to improper installation, physical damage, lightning or other electrical discharge, or units subjected to fresh or salt water immersion or spray.

The foregoing are the only warranties expressed or implied. No other warranties exist.

Trimble Navigation assumes no responsibility for any consequential or incidental losses or damages of any nature with respect to any products or service sold, rendered or delivered.

Manual Improvement

Please help us improve our manuals by sending comments and suggestions to our Scout headquarters in Austin, Texas. (See address on rear cover.) Thank you.

Part Number 25105-00 Revision A

Trimble

THE GPS SOLUTION

Mobile Computing Products
645 North Mary Avenue
PO Box 3642
Sunnyvale, CA 94088-3642

For Technical Service & Support call:
(800)-487-4662
(512) 432-0400

Note: All GPS receivers are subject to degradations of position and velocity accuracies under Department of Defense imposed S/A (Selective Availability). Position accuracy may be degraded up to 328 ft (100 meters) 2D RMS. The impact on velocity is yet to be determined.

The following U.S. patents apply: 4754465, 4970523, 5187450, 5219067, 5239669, 5268064, 5272485, 5311149, 5365192, 5402095, Des. 343383, Des. 344942.

The following patents are pending: Over & Up, USGS TOPO, Trimble Atlas, SMLTU, MasterClock (1PPS), SMPTE SYNC.

Trimble *Scout/ScoutMaster GPS™* Quick INDEX & Options

LOC
Location Aids

◆ *Options*
- *Coordinate Style*
- *Satellite Data*
- *Set DGPS/GPS-SM*
- *Start Acu–Lock*
- *Mapping Datum*
- *North Reference*

NAV
Navigation Aids

Target Track

◆ *Options*
- *Set Goal*
- *Set Track Scale*
- *Offset From*
- *From A to B*
- *Find Nearest 10*
- *Deactivate Route*
- *Activate Route*

LIB
Location Library

◆ *Options*
- *Edit a Location*
- *Create Location*
- *Erase Library*
- *Delete Location*

SETUP
User Preferences

◆ *Options*
- *Dataport Mode-SM*
- *Two Key Turn On*
- *Auto Shutoff*
- *Screen Contrast*
- *Screenlight On*
- *GPS Update Rate*
- *Reset Battery Hrs.*
- *Elevation Units*
- *Distance Units*
- *Speed Units*
- *Set Clock Style*
- *Time Adjustment*
- *Change Language*

ROUTE
Route Library

◆ *Options*
- *Copy Route*
- *Delete Route*
- *Rename Route*
- *Edit Route*

ADV
Additional Aids

◆ *Options*
- *Sun Data*
- *Moon Data*
- *See Julian Date*
- *Over & Up*
- *Convert Over & Up*
- *A to B Over & Up*
- *Time & Date*

Reset Defaults
NMEA chksum ON
NMEA sentences
Char format
Output Baud
Input Baud
Select Output
Select Input
Dataport ON

Trimble *Scout/ScoutMaster GPS™* Quick Reference Card

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Command	◆	enter Options List or cancel input.
GPS	•	save your current location (need 3 satellites)

Example: View current location / Save in Library / Set Local Map Datum

Press	⏻	to turn Scout/ScoutMaster ON.
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Press	◆	to enter the LOC Options list.
Press	▲ or ▼	to scroll up or down to Mapping Datum Options.
Press	◆	to enter the Mapping Datum Options list.
Press	▲ or ▼	to scroll up or down to your local map datum.
Press	↵	to set map datum and view your current location.

About this User's Guide

You're probably anxious to try out your Scout GPS™ or ScoutMaster GPS™, take a moment to familiarize yourself with this user's guide and the different features of the Scout family.

This manual refers to Scout and ScoutMaster as "Scout", unless otherwise noted.

Features available *only* on the ScoutMaster, are identified by the symbol —(SM), for example:

Set Dataport —(SM)

Optional features available for the Scout *and* ScoutMaster are identified by the symbol —[O], for example:

USGS TOPO™ —[O]

MasterClock™ —[O]

This guide is divided into three major sections:

- Introduction (Chapter 1)
- Getting Started (Chapter 2)
- A Reference Section (Chapters 3-8)

Scout is a "menu–driven" device. That means that you, the user, select your next step or make decisions from a sequence of menus—or screen displays. These displays appear as a result of pressing certain keys in order.

Instructions in this guide are presented step by step—and key press by key press—to make sure that you head off in the right direction.

Trimble

Scout/ScoutMaster User's Guide

Introduction

Getting Started

LOCATION—LOC

NAVIGATION—NAV

LIBRARY—LIB

SETUP

ROUTE

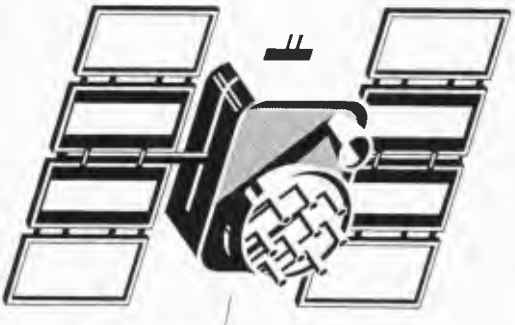
ADVANCED—ADV

Accessories

Appendices

Four measurements give your location

By measuring distance to any four of the 24 satellites in the GPS system, SCOUT can calculate your location—even your speed



Satellites are precise reference points

The satellites are positioned in very high and very stable orbits. In addition, their exact positions in space are monitored constantly by ground stations.

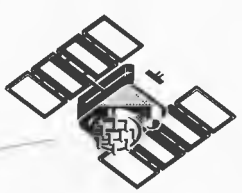
Chapter 1
Introduction

GPS-the technology behind Scout

The Global Positioning System (GPS) is based on a system of satellites developed by the U.S. Department of Defense at a cost of over $13 Billion. Now fully implemented, the system consists of 24 satellites orbiting the earth at an altitude of 11,000 miles.

Scout uses these satellites as precise reference points to triangulate a location. By measuring the travel time of signals transmitted from each satellite, the receiver computes its distance from that satellite. With distance measurements from at least *three* satellites, Scout can calculate your current location and speed. With measurements from at least four satellites, your current elevation is also calculated.

GPS works anywhere on earth, twenty-four hours a day, in any weather, and is rapidly becoming the international standard for navigation.



Speed-of-light travel time gives distance

To measure distance from a satellite, SCOUT measures the time it takes for a radio signal to travel from the satellite back to itself.

Internal antenna
tracks up to 8 satellites
—at the same time

Menu–driven display
Read exactly where you are
—night or day

One–handed operation
Save your location
—with a single keystroke

Introducing the Scout family

Congratulations! You've just purchased the most advanced piece of technology you can hold in the palm of your hand—the Scout GPS or ScoutMaster GPS.

With Trimble's latest handheld Global Positioning System receivers you can:

- Plot any location on any map—using Over & Up™ or USGS TOPO.—O
- Navigate in *real time* from point to point using Target Track™.
- Upload and download locations to a PC or Macintosh™ computer.—SM
- Record locations within 2– 5 meters using real-time differential GPS signals.—SM
- Plot your data to scale using Scout–It–Out™ mapping software.—SM
- Transfer GPS location data in *real time* to external devices using special software.—SM
- Provide atomic clock performance for SMPTE time code generation.—SM

Don't let the size of our Scouts fool you. They are full–function navigational computers that radically simplify the navigational process. If you're involved in search and rescue operations, data collection, cable TV installation, film location scouting, big-game hunting, amateur radio or backpacking, you can use Scout as a powerful and exciting tool.

Chapter 2
Getting Started

Scout is a valuable navigation instrument offering an impressive array of features. This chapter takes you through the basics of getting started and with simple exercises, you will learn how to operate Scout and learn what it can do.

QUICK START or Where on Earth am I?

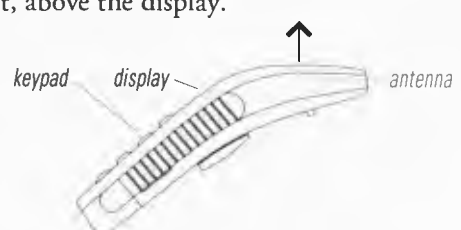
This exercise shows you how to determine your location.

STEP 1

Install the 4 AA batteries supplied. See page 9-2 for details of battery installation.

STEP 2

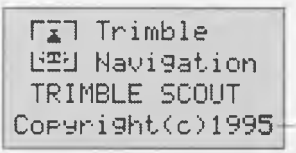
Go outdoors. Hold Scout with its antenna facing toward the sky. The antenna is located inside the unit, above the display.



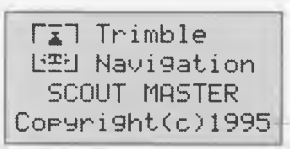
STEP 3

Press the Power key ⏻ once to turn on Scout. This key is located at the bottom of the keypad.

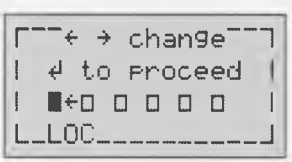
A TITLE screen appears momentarily,



or



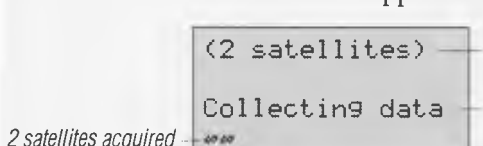
and is followed by the INDEX screen:



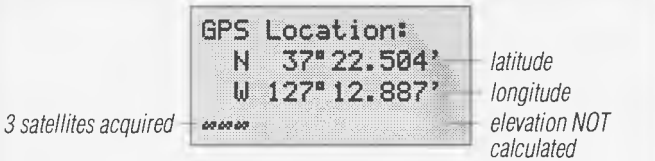
Note: The INDEX screen with LOC highlighted appears every time the Scout is turned on.

STEP 4

Press ↵ and a status screen appears:



When Scout has acquired at least three satellites, a `GPS Location` screen appears:



The symbols in the lower left corner of the screen indicate the number of satellites Scout is currently tracking. Each satellite is represented by a icon.

Your location is expressed in Latitude and Longitude (Degrees/Decimal Minutes)—the default coordinate style for Scout.

An elevation will be displayed if four or more satellites are acquired—assuming good PDOP.

Note: Scout displays stable on-screen information when stationary. A position domain filter (SA filter) is incorporated to reduce the effects of noise measurements and Selective Availability (SA).

STEP 5

Press the GPS key • and the following screen appears:

You have just saved your current location in Scout's memory! You can refer to this location at any time or navigate back to it using Target Track™. See Page 4-1.

Collecting an Almanac

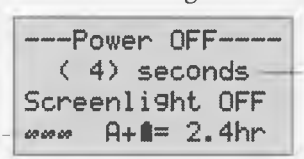
Scout stores and automatically updates the positions of *all* the GPS satellites in an *almanac*. Once an almanac has been collected, Scout will instantaneously display your location anywhere in the world.

STEP 1

Go outdoors. Place Scout with its antenna facing upwards with a clear view of the sky. Turn Scout on. Do not move it for about 12-1/2 minutes.

STEP 2

You can determine if Scout has collected an almanac by holding down the Power key for less than 4 seconds. During that time, the following screen is displayed:



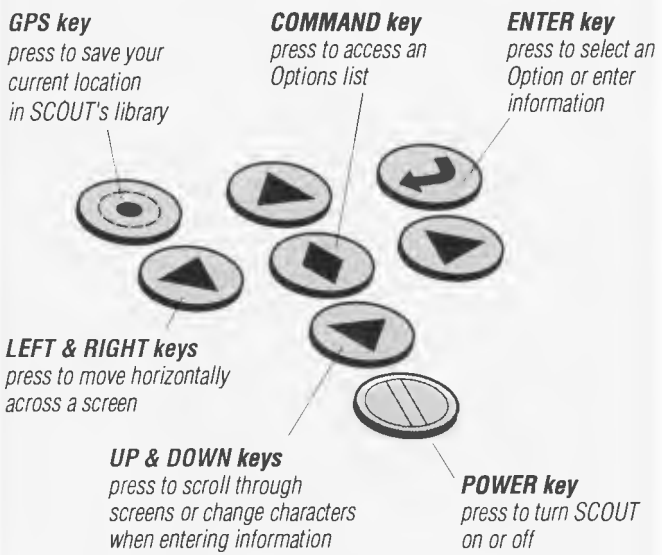
The following indications are displayed:

- a = No almanac
- a+ = No almanac and tracking 3 or more satellites
- A = Full almanac
- A+ = Full almanac and tracking 3 or more satellites

Note: Scout has no almanac when first removed from its box or its memory is lost. If Scout is turned off when an a or a+ is displayed, you must repeat the collection process.

The Keypad

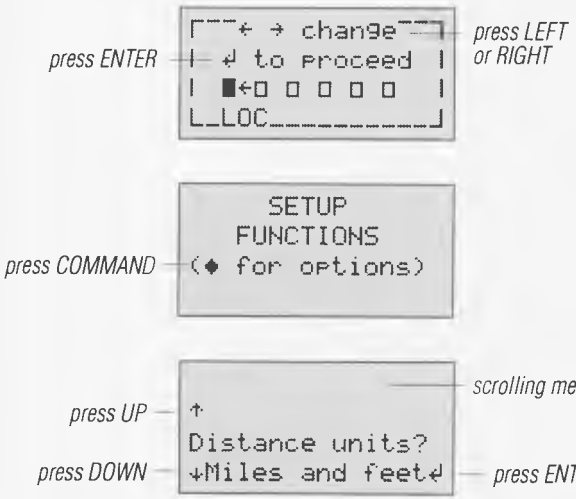
It takes only eight keys to operate Scout—and, it is designed so that you can operate the keypad with one hand. The key functions are illustrated below:



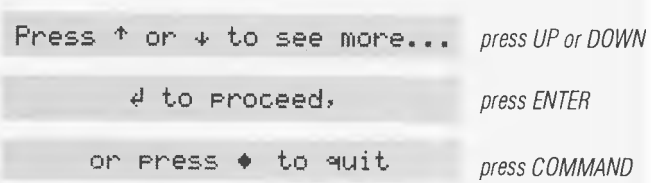
Symbols for these keys are used throughout this user's guide to instruct you step by step. These symbols are:

- ◉ GPS key
- ◀ Left key
- ▶ Right key
- ⏻ Power key
- ◆ Command key
- ▲ Up key
- ▼ Down key
- ↵ Enter key

In addition to the key symbols in this guide, Scout also displays keystroke reminders on screen indicating the next step or choice of action. Examples are shown below:

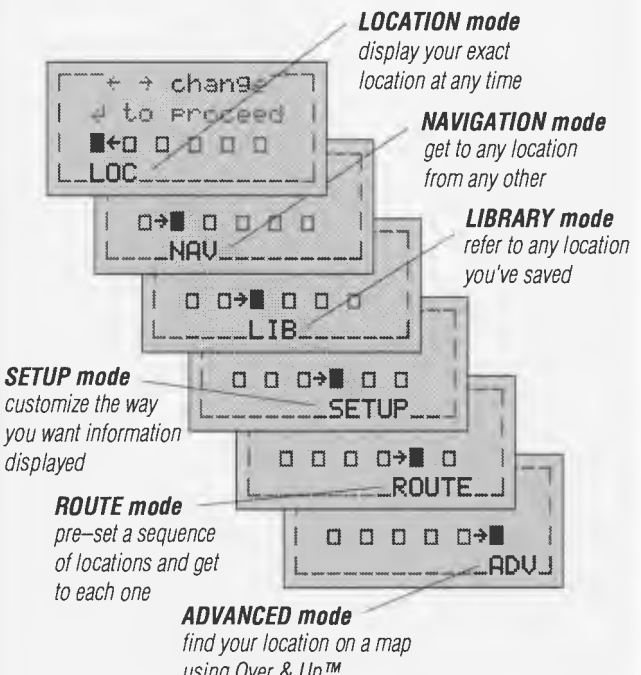


or, in the form of scrolling messages at the top of the screen:



The INDEX

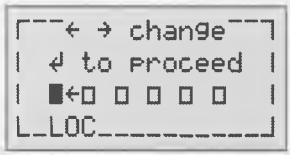
The INDEX consists of six display screens—a screen for each operating *mode*. Each mode contains various *options* that perform specific functions directly related to that mode. These modes and options are described in detail starting with Chapter 3.



The mode currently selected is *highlighted*. The LOC screen appears every time Scout is turned on.

A tour of the INDEX

This exercise assumes that you have just turned on your Scout and the LOC mode is highlighted:



Follow the steps below to familiarize yourself with the keypad operations in each mode.

STEP 1

Press ↵ to enter LOC mode

- `Collecting data` remains on screen until at least three satellites are acquired. Then, your current location is displayed.

STEP 2

Press ▶ and NAV is highlighted. Press ↵.

- Scout immediately displays Target Track. This is a navigational tool that guides you to your destination.

STEP 3

Press ▶ and LIB is highlighted. Press ↵.

- Scout displays the status of the Library—showing how many locations have been saved.

STEP 4

Press ▶ and SETUP is highlighted. Press ↵.

- Press ◆ to see the SETUP Options list.
- Press ▲ or ▼ to scroll through the options.

  Later, you can set the local time, distance units, etc.
- Press ◆ again to exit the SETUP Options list.

STEP 5

Press ▶ and ROUTE is highlighted. Press ↵.

- Scout displays a list of status of the number of used and open routes that are saved.

STEP 6

Press ▶ and ADV is highlighted. Press ↵.

- Press ◆ to see the ADV Options list.
- Press ▲ or ▼ to scroll through the Over & Up mapping features and other options.
- Press ◆ again, then ▶ , to exit the ADV Options list.

Now, you *should* be right back where you started—with LOC mode highlighted.

The keystroke sequences that you have just used are basic to operating your Scout.

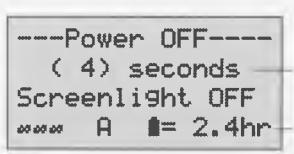
You've learned that:

- ► changes modes—so does ◄.
- ↵ enters a mode.
- ◆ accesses an Options list.
- ▲ or ▼ scrolls through an Options list.

The six modes and their options are discussed in detail in the following chapters, but before getting into detail, let's do the exercise on the next page.

To turn Scout Off

Hold down the Power key ⏻ for 4 seconds. A Power OFF screen is displayed:



Note: The battery in–use timer indicates the number of hours a set of batteries has been *in use*. It *does not* tell you how long they will last. You should reset this timer whenever you install new batteries. See SETUP.

After 4 seconds, the screen will go blank, but all locations saved in memory and almanac data are saved.

Note: To skip the 4 second power count down, Press ⏻ and ▼ simultaneously.

Caring for Scout

With prudent care, Scout will serve you well in all climates and environments. As with most electronic instruments you should treat your Scout with respect. Here are a few helpful hints:

- Keep Scout in its carrying case when not in use.
- Use the lanyard to avoid an accidental drop.
- Do not immerse Scout in water or solvents. Use a damp cloth to clean it. Use a lens brush to clean the window of sand or other materials that could cause scratches.
- Keep batteries installed at all times to maintain the Library and Almanac memories.
- Avoid extended exposure to severe temperature ranges. Below -4° F (-20° C) or above 158° F (+70° C)l.
- Use the Quick Reference Card found in the front of this user guide. Fold it and keep it in the carrying case.
- Fill out and mail the warranty card, found in the front of this user's guide. Your Scout's serial number is located inside the battery compartment.

Chapter 3
LOCATION—LOC

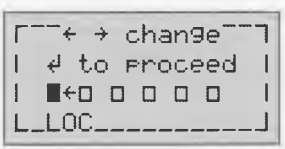
In LOCATION (LOC) mode, Scout displays your current location and, if four or more satellites are used, elevation is also displayed in ten foot increments—assuming good PDOP. GPS location information is updated every 1.5 seconds while Scout is operating.

The LOC Options are:

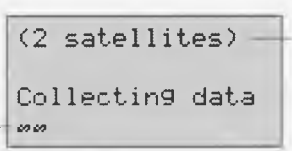
- Coordinate Style
- Start Acu–Lock™
- Satellite data
- Mapping datum
- North Reference
- Set DGPS/GPS — SM

To enter LOC mode

- Press ◄ or ► to highlight LOC on the INDEX screen.



- Press ↵ and the status screen appears until 3 satellites are acquired,



then your current location is displayed.

or

- Press ◆ to directly access the LOC Options list.

Scout uses signals from at least four satellites to calculate a location in three dimensions (3D). If only three satellites are available, the location is two dimensional (2D).

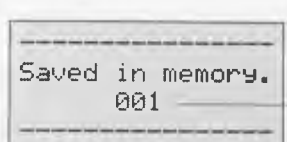
Scrolling messages indicate increasing satellite acquisition as follows:

```
No satellites?  (0 satellites)
Have 1 satellite,
GPS time valid   (1 satellite)
Have 2 satellites (need 3)
(3 satellites)  (4 satellites)
Poor satellite Geometry
```

The message—`Poor satellite Geometry`—may be displayed at times when satellites are in close proximity to each other.

To save your location

- Press • when 3 or more satellites have been acquired.



Note: Locations can be saved in the Library (memory) while operating in *any* mode.

Coordinate Style

This option allows you to select a preferred coordinate style—or system—that coincides with maps or other geographical information you use.

Coordinate systems are used to describe a location on a curved surface—the earth—in a way that can be translated to the flat surface of a map.

Scout offers a choice of ten coordinate styles:

- Lat/Lon Seconds (degrees/minutes/seconds)
- Lat/Lon Minutes (degrees/decimal minutes)
- UTM - meters
- UTM - Kmeters (kilometers)
- OSGB
- USGS TOPO—[0]
- Trimble Atlas™
- Thomas Detail
- Maidenhead
- TNL Grid Locator™

These coordinate systems resolve to less than 100 meters thus, no particular system is more accurate than another.

Note: The default style is Lat/Lon Minutes. Scout will automatically default to this style when first removed from its box or when memory is lost.

To select a coordinate style

- With LOC highlighted on the INDEX, press ◆.
- Press ▲ or ▼ to scroll to `Coordinate style`.
- Press ↵ to access this option.
- Press ▲ or ▼ to scroll to the preferred style.
- Press ↵ to select a style and return to the status or `GPS Location:` screen.

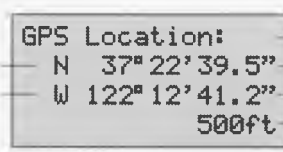
or

- Press ◆ to cancel the change.

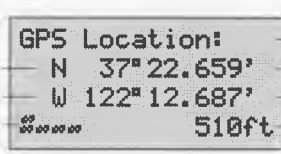
Examples of the nine coordinate styles follow:

1) Lat/Lon Seconds and 2) Lat/Lon Minutes

The latitude/longitude coordinate system is based upon angular distance north or south of the equator (latitude) and east or west of the Prime Meridian at Greenwich, England. This system is usually expressed in Degrees, Minutes and Seconds. Scout displays this system two ways:



Lat/Lon Seconds

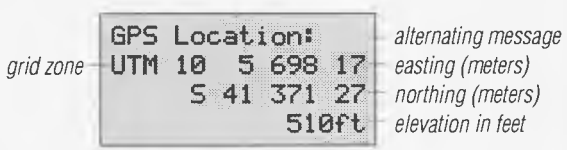


Lat/Lon Minutes (default style)

Note: *Lat/Lon Seconds* should be used to create a reference location for use with the Over & Up features. See ADV.

3) UTM – meters and 4) UTM – Kmeters

The UTM (Universal Transverse Mercator) coordinate system is used typically for U.S. and international topographic maps. It is a worldwide grid consisting of 60–6° N/S zones extending eastward from the International Date Line and 10–8° E/W zones above and below the equator. Locations are indicated by offsets—north of the Equator and in the zones east of the International Date Line. These offsets are known as *northing* and *easting* and are expressed in meters. UTM is not usable in polar regions.

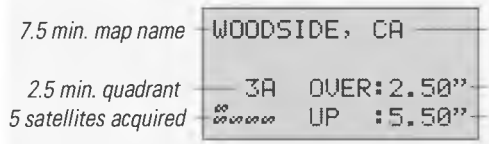


UTM–meters

UTM– Kmeters rounds–off to the nearest *tenth* of a kilometer.

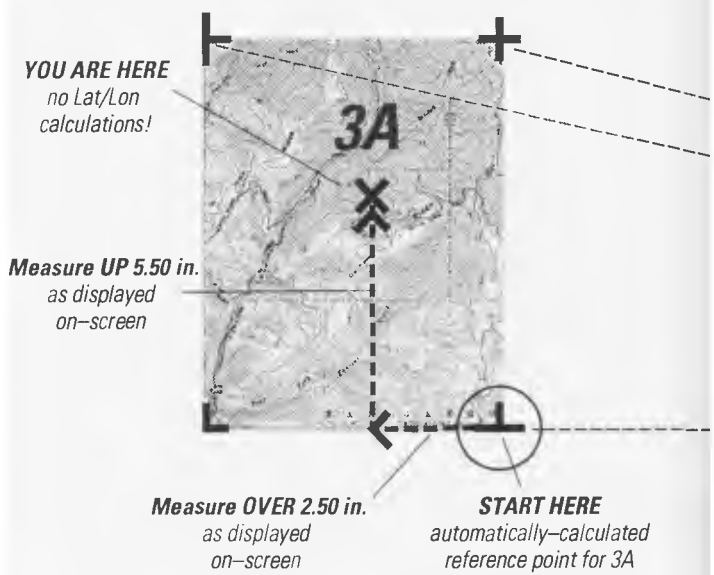
UTM–Kmeters

5) USGS TOPO—[o]



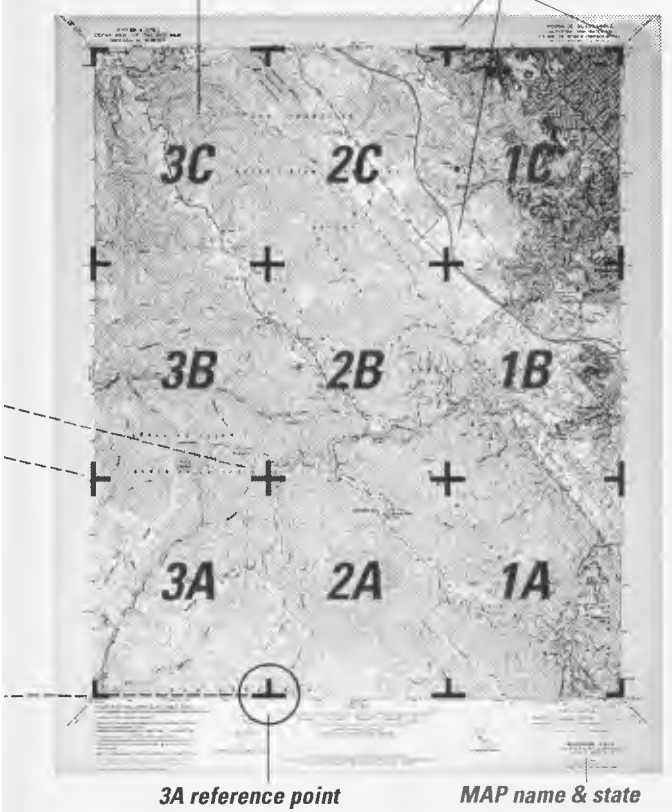
USGS TOPO is an optional coordinate style that references an internal database of 53,689 United States Geological Survey (USGS) 7.5 min. topographic maps.

Over & Up measurements are instantly displayed from the lower right corner of the 2.5 min. sub quadrant within the USGS map named on screen. See example below.



2.5 min Sub Quadrant–Detail of USGS Map

To verify the coordinates of the lower right corner of the sub-quad being used , press and hold down ↵.



7.5 min USGS Map

Note: When USGS TOPO is in use, the mapping datum automatically defaults to the datum of the map selected from the internal database.

The mapping datum option will *not* be available.

The USGS TOPO database includes the following maps:

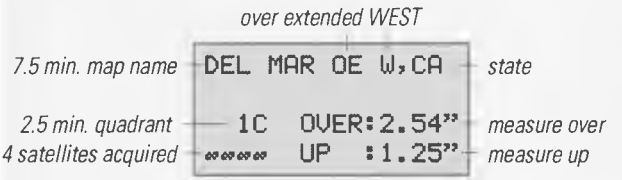
Abbrev.	Area	Scale	Datum
XX	Continental US	1:24,000	NAD27
DC	District of Columbia	1:24,000	NAD27
AK	Alaska (partial coverage)	1:25,000	NAD27
HI	Hawaii	1:24,000	Old Hawaiian Mean

Certain USGS topographical maps are published showing additional areas along coastlines and territorial borders. To avoid producing another map, these *overextended* maps contain more sub-quads than the typical 9 sub-quads of a standard 7.5 min. map.

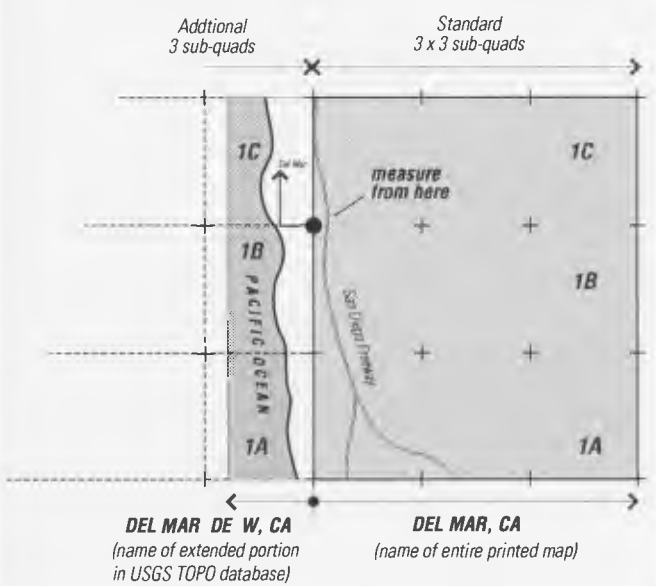
If your location falls outside the 9 sub-quad format, the USGS TOPO database adds the suffix `OE N`, `OE S`, `OE E` or `OE W`—indicating that the location can be found in the overextended portion to the north, south, east or west.

For example, the printed map of Del Mar, CA shown at the right has 12 sub-quads. Three additional sub-quads are added on the west. The USGS TOPO database names the 9 sub-quad portion— `Del Mar,CA` and the overextended portion— `Del Mar OE W,CA`.

The following screen displays a location found in the overextended portion of the Del Mar, CA map as `Del Mar OE W,CA` in sub-quad `1C`.



The Over & Up measurements displayed start from the lower right corner of the *overextended* sub-quad `1C`.



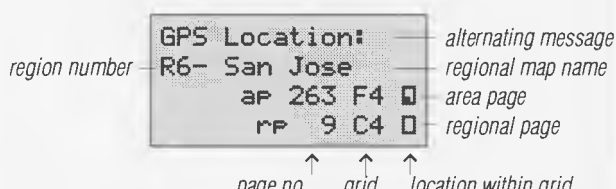
6) OSGB (Ordinance Survey of Great Britain)

Note: When OSGB is the selected coordinate style, the mapping datum automatically defaults to Great Britain 36 (see Appendix A) and the mapping datum option will not be available.

7) Trimble Atlas

The Trimble Atlas is the first road atlas to be tied to a complete mapping system for the continental United States—from Regional and Area pages down to Detail pages of the Thomas Guide®. The mapping datum defaults to North American Datum 1983 (NAD 83).

Nine Regional maps at a scale of 1 in. = 30 mi. are coordinated with Area maps at 1 in.= 5 mi. that display the streets in 35 selected metropolitan areas.



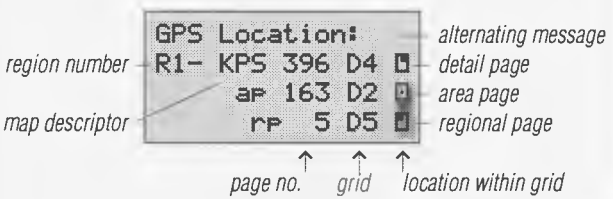
Grid locators on the screen indicate where the location can be found on the map, e.g., ◪= lower left in grid F4 or □= center of grid C4.

See Appendix E for further information.

8) Thomas Detail

Thomas Bros. Maps™ digitally publishes these "intelligent" maps with improved graphics and accuracy for major metropolitan areas of the U.S. The mapping datum defaults to North American Datum 1983 (NAD 83). See Appendix F for a current listing of maps.

Detail pages are at a scale of 1 in. = 2,400 feet using a 1/2 mi x 1/2 mi. reference grid.



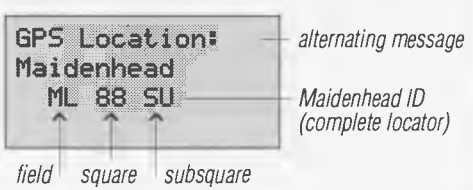
Scout shows locations in a page and grid format.

In the example above, the city of Everett, WA can be found in the KPS (King/Pierce/Snohomish Counties) Directory, detail page 396, in the upper right corner of grid D4.

The added references to area and regional pages correspond with maps found in the Trimble Atlas.

9) Maidenhead

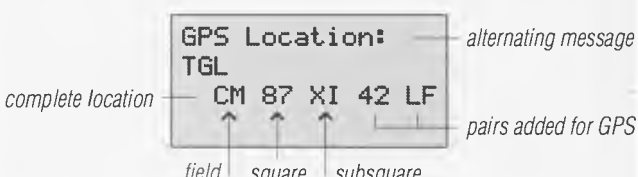
The Maidenhead grid locator system is used worldwide by over 500,000 amateur radio operators in their daily activities to describe their location.



This grid system divides the earth's surface into 324 "fields" of 20° of longitude x 10° of latitude—identified by two letters (AA-RR). Each field is divided into 100 "squares" of 2° of longitude x 1° of latitude—identified by two digits (00-99). Each square is finally divided into 576 "subsquares" of 5 mins. of longitude x 2.5 mins. of latitude—identified by two letters (AA-XX). Thus, the first of a letter pair is longitude, the second is latitude. The numbering direction is always W to E and S to N.

10) TNL Grid Locator

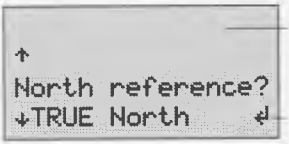
The TNL (*Trimble*) Grid Locator (TGL) is an *extension* of the Maidenhead grid locator system. TGL appends a number pair and a letter pair to the Maidenhead format. These additional pairs provide for the precision obtainable by GPS.



Creating a location in Maidenhead or TGL is easy. For example:

- If you do not want to enter all five pairs of numbers or they are not known, simply enter `CM87` (space)" and Scout will add the remaining pairs.
- If a space is used as the last entry, Scout fills in the remaining characters with the grid "centers".

North Reference



This option allows you choose Magnetic North or True North as your reference.

To set North Reference

- With LOC highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to `North reference?`.
- Press ↵ to access this option.
- Press ▲ or ▼ to scroll to the preferred reference:
  - True North
  - Magnetic North
- Press ↵ to set the North Reference and return to the status or `GPS Location:` screen,

  or
- Press ◆ to cancel the change.

Note: Magnetic declination is corrected for when the Magnetic North option is selected.

Mapping Datums

This option allows you to select a datum that matches the datum of the map you are using. Datum information is usually found in the legend or title block of a map. Scout calculates locations based on the selected datum. Scout offers 123 standard and two user-definable datum selections. See Appendix A.

This option is not available if OSGB or USGS TOPO is the selected coordinate style.

To change the mapping datum

- With LOC highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to `Mapping datum?`
- Press ↵ to access the mapping datum list.
- Press ▲ or ▼ to scroll to the preferred datum.
- Press ↵ to set the datum and return to the status or `GPS Location:` screen,

  or

- Press ◆ to cancel the change.

Note: When NMEA-0183 protocol is selected, *real–time* data is transferred to an external device in the datum selected.—(SM)

Start Acu–Lock

This option processes *multiple* points at the same location to determine a 10-20 meter (typical) solution *without* benefit of real–time differential GPS signals.

Multiple points can be processed all in one session or resumed at a later date. It is also possible to increase—or decrease— the number of points.

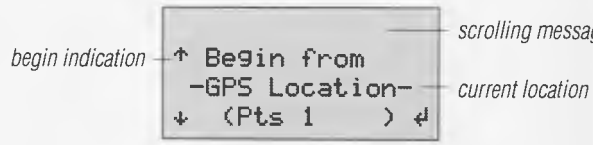
Scout must have *three or more* satellites acquired to perform the calculations and *must* remain stationary during the process. Processing time depends upon the number of points selected. Battery life is extended if the 10 second update rate is used and the Dataport is OFF—(SM). See SETUP.

Approx. time	No. of points	Typical accuracy
Maximum Update Rate (1.5 sec)		
15-45 mins	1000	20 meters
60-90 mins	3000	10 meters
5 Second Update Rate		
15-45 mins	300	20 meters
60-90 mins	900	10 meters
10 Second Update Rate		
15-45 mins	150	20 meters
60-90 mins	450	10 meters

You must be at the location you want to process.

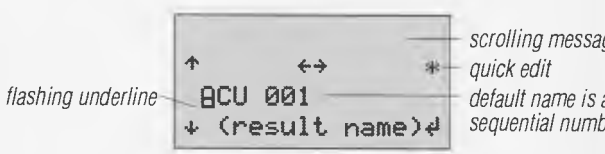
- With LOC highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to `Start Acu-Lock?`

- Press ↵ and the following screen appears.



Note: `Last Location` will be displayed if *no* satellites are being tracked.

- Press ↵ if you want to `Begin from` your current location—indicated as `GPS Location`—and the following screen appears.

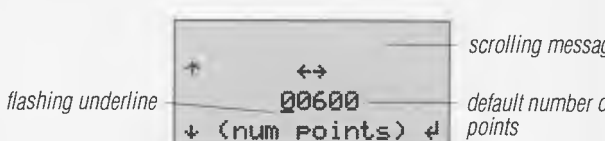


- Press ↵ to use the default name (or rename it- See LIB)

or

- Press ▲ or ▼ to scroll to and `Begin from` a location already saved in memory.
  - Press ↵ to select the location.

Now enter the number of points to be processed, as indicated on the following screen:

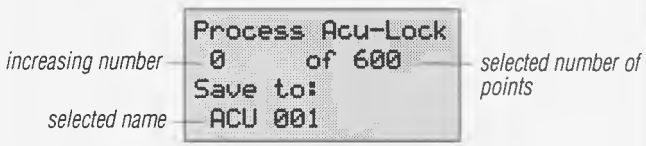


- Use the ◄ or ► to move the underline horizontally.
- Press ▲ or ▼ to scroll through and select characters.

- Press ↵ to set the number of points and start the Acu-Lock process.

Note: The default number is 600 points until modified.

The following screen appears momentarily:



and is followed by the Acu-Lock status screen,

The process continues until the selected number of points is processed.

`Saved in memory` appears when the process is completed. The Acu–Lock location is displayed in the selected coordinate style.

- Press and hold ↵ to verify the number of readings and type of entry:

Note: During the Acu–Lock process it is possible to exit LOC and perform other operations. This may effect your solution.

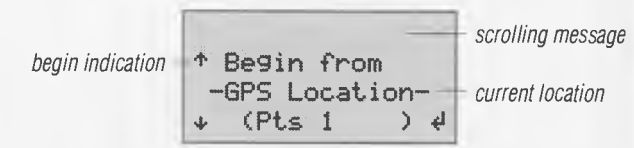
To return to Acu–Lock and view progress:

- With LOC highlighted on the INDEX screen, press ↵ and the Acu-Lock status screen will appear.

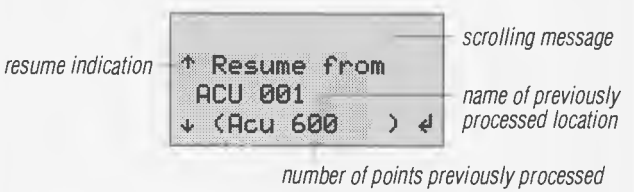
To Resume Acu–Lock

You must physically return to the location where you want to continue processing.

- With LOC highlighted on the INDEX screen, press ♦.
- Press ▲ or ▼ to scroll to `Start Acu-Lock?`
- Press ↵ and the following screen appears.



- Press ▲ or ▼ to scroll to a location identified by the notation: `Resume from?` (This notation *only* appears for previously processed locations.)



- Press ↵ to select the location and the following screen appears,

Enter the number of points to be processed in this session. The number *must* be greater than the reading previously processed.

Note: If you have already collected 600 points in a previous session, and want to add 600 more for the same location, you must set the number of points to 1200.

- Use the ◄ or ► to move the underline horizontally.
- Press ▲ or ▼ to scroll through and select characters.
- Press ↵ to set the number of points and resume the Acu-Lock process.

To Stop Acu–Lock (Available only *during* Acu-lock process)

To stop an Acu–Lock session *before* it is completed.

- With LOC highlighted on the INDEX screen, press ♦.
- Press ▲ or ▼ to scroll to `Stop Acu-Lock?`
- Press ↵ and `Save Result?` appears.
- Press ▲ or ▼ or ◄ or ► to cancel the save,

  or
- Press ↵ to save the partially processed location.

Note: Acu–Lock should be stopped before Scout is turned off. Acu-Lock deactivates the SA position and altitude filters.

To Extend Acu–Lock (Available only *during* Acu-lock process)

To increase—or decrease—the number of points selected during an Acu-Lock session.

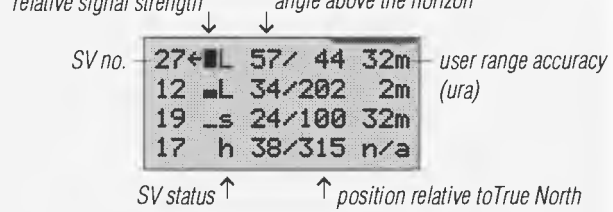
- With LOC highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to `Extend Acu-Lock?`
- Press ↵ and a change is prompted.
- Use the ◀ or ▶ to move the underline horizontally.
- Press ▲ or ▼ to scroll through and select characters.
- Press ↵ to reset the number of points and continue the process.

Satellite Data

Scout can track up to 8 satellites simultaneously. This option displays satellite positions relative to your current location. A clear line of sight to the satellites can be determined

To display Satellite Data

- With LOC highlighted on the INDEX screen, press ♦.
- Press ▲ or ▼ to scroll to `Satellite data?`.
- Press ↵ and the following screen appears:



Information is displayed for up to 4 satellites per screen.

- Press ↵ to see positions of additional satellites.

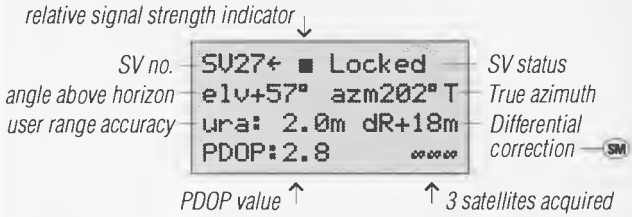
Varying signal strength of each satellite is indicated in *real time.* Low numbers for the user range accuracy (URA) indicate higher satellite range accuracy.

The SV (Space Vehicle or satellite) status letters indicate:

L= locked onto satellite	h= unhealthy satellite
d= collecting data	r= receiving data
s= searching for satellite	←= used in location calculation

To view information about individual satellites,

- Press ↵ again and the following screen appears:



Position Dilution of Precision (PDOP) values determine the uncertainty of a location. Good values are between 2 and 7.

Note: A differential correction is displayed when DGPS is being received. (SM)

- Press ▲ or ▼ to scroll through screens for each satellite,

  or

- Press ◆ to return to the LOC Options list.

Set DGPS/GPS — (SM)

This option allows you to configure ScoutMaster to receive Differential GPS (DGPS) *or* GPS signals.

Auto automatically calculates a DGPS or GPS location. If DGPS data *is* available, a DGPS location is calculated. If DGPS data *is not* available, a GPS location is calculated.

DGPS Only calculates a differential location. If ScoutMaster does *not* receive DGPS data, *no* location is calculated.

GPS Only calculates a location from GPS satellites.

To select Set DGPS/GPS

- With LOC highlighted on the INDEX, press ◆.
- Press ▲ or ▼ to scroll to `Set DGPS/GPS?`
- Press ↵ to access this option.
- Press ▲ or ▼ to scroll to the preferred setting:
  - DGPS only
  - GPS only
  - Auto
- Press ↵ to select a choice and return to the `GPS Location:` screen.

or

- Press ◆ to cancel the change.

Note: `DGPS Location:` will be displayed as an alternating message if a differential location is being calculated.

`GPS Location:` will be displayed as an alternating message if a non-differential location is being calculated.

`Acu-Lock:` will be displayed as an alternating message if Acu-Lock is in process.

Chapter 4
NAVIGATION—NAV

In NAVIGATION (NAV) mode, Target Track displays information for navigating from your current location to a selected destination or from point to point on a route. Your goal, distance and direction to goal, estimated time of arrival, current speed, local time, number of satellites being tracked and steering information are *simultaneously* shown on the Target Track screen.

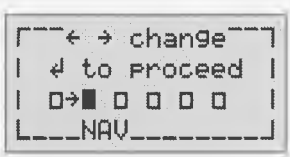
With the NAV Options, you can perform other navigation operations.

The NAV Options are:

- Set Goal
- Activate Route
- Deactivate Route
- Find Nearest 10
- From A to B
- Offset From
- Set Track Scale

To enter NAV mode

- Press ◄ or ► to highlight NAV on the INDEX screen.



- Press ↵ to use Target Track,

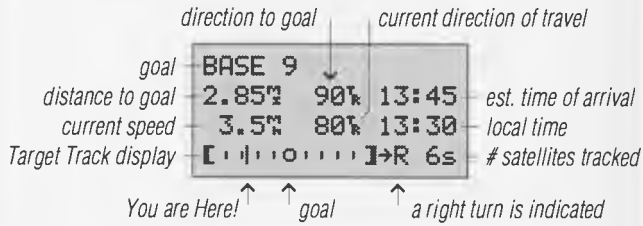
or

- Press ♦ to access the NAV Options list.

Target Track

To use Target Track, you must select a goal and observe the display as you proceed. You must be moving at least 2 mph, tracking 3 or more satellites and have locations stored in the Library.

A typical Target Track screen is shown below:



`Base 9` represents your goal. `90°` and `80°` represent directions relative to True North.

The circle in the Target Track display represents the goal. Your current position is indicated by a vertical line on either side of the goal. The distance between the goal and the vertical line is a scale representation of the distance to the goal. (See pg. 4-11) You are instructed to turn "right, left or turn around" as you move toward `Base 9`.

Distance and Speed can be set to U.S. or metric units. (See SETUP) Estimated Time of Arrival and Local Time are always displayed in a 24 hr. clock style.

Note: In *any* mode, if three or more satellites are being tracked, double click ⊙ to save the current location in memory and display the Target Track screen with that location as your goal.

While viewing the Target Track screen, hold down ↵ to display the name and coordinates of the goal.

Set Goal

This option allows you to set your next destination from the list of locations saved in Scout's library.

To set a goal

- From Target Track or with NAV highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to `Set Goal?`.
- Press ↵ to access a list of locations (goals) saved in the Library.
- Press ▲ or ▼ to a desired goal.
- Press ↵ to set your goal and see the following message before the display returns to Target Track:

- Press ◀ or ▶ to return to the INDEX screen.

Note: A goal *must* be selected for Target Track to function properly.

Activate Route

This option allows you to activate a route previously created in ROUTE mode. Once a route is activated, each point on the route becomes a goal—in sequence, either forward or reverse. This option is *not* available if the Route List is empty.

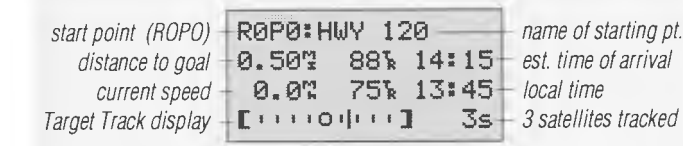
To activate a Route

- From Target Track or with NAV highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to `Activate Route?`.
- Press ↲ to access the Route List.
- Press ▲ or ▼ to scroll to a preferred route. For example:

- Press ↲ to activate Trail 10. (See map on pg 7-1.)

To navigate to the starting point of Trail 10 (R0P0)

After activating Trail 10, the following Target Track screen appears with the *starting* point set as your first goal, i.e., `R0P0`.



To navigate to the next point on Trail 10 (ROP1)

When you arrive at HWY 120 – R0P0,

- Press ▲ to select Camp 1— R0P1 as the next point. The message, Navigating to next Point, will appear momentarily, followed by:

R0P1 is now indicated as the goal in the upper left of the screen.

Continue on to Fish Camp Road—R0P5. The message—Navigating to LAST Point— finally appears.

To navigate in reverse

You can reverse your direction of travel at any point along a route.

- Press ▼. The message, Navigating to PREVIOUS point appears, followed by Target Track.

Note: To navigate an *entire* route in reverse, you must manually advance to the last point and then press ▼ to each point.

Deactivate Route

This option is the opposite of Activate Route and allows you to deactivate the currently active route.

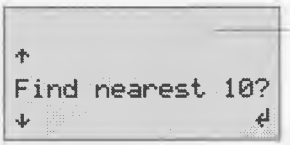
To deactivate a Route

- From Target Track or with NAV highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to `Deactivate rte?`.
- Press ◆ to cancel the deactivation,

  or
- Press ↵ deactivate the active route and return to the Target Track screen. The last location entered is now the goal.

Note: This option is available *only* if a route is active.

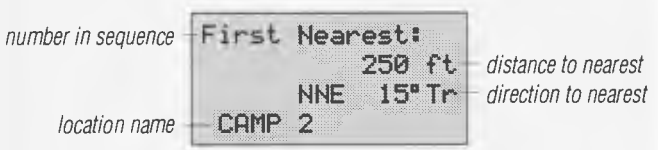
Find Nearest 10



This option calculates the ten nearest locations from your current location or any other location saved in the Library.

To find the Nearest 10

- From Target Track or with NAV highlighted on the INDEX screen, press ♦.
- Press ▲ or ▼ to scroll to `Find nearest 10?`.
- Press ↵ to access this option.
- Press ▲ or ▼ to scroll to a preferred `reference` point.
- Press ↵ to set the reference point and begin processing. Then the screen below appears:



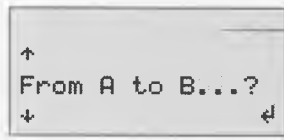
- Press ▲ or ▼ to scroll through the nearest ten.
- Press ♦ to return to the NAV Options list,

  or

- Press ◄ or ► to return to the INDEX screen.

Note: If *less* than ten locations are in the Library, `(No data)` will appear for others.

From A to B



This option calculates the distance and direction between any two locations saved in the library.

To find the distance and direction from A to B

- From Target Track or with NAV highlighted on the INDEX screen, press ♦.
- Press ▲ or ▼ to scroll to From A to B...?.
- Press ↵ to access this option.
- Press ▲ or ▼ to scroll to a beginning point (A).
- Press ↵ to set Point A and the next screen appears.
- Press ▲ or ▼ to scroll to an ending point (B).
- Press ↵ to set Point B and a screen displays the calculated distance and direction from A to B:

- Press ♦ to return to the NAV Options list —press ♦ again to return to Target Track,

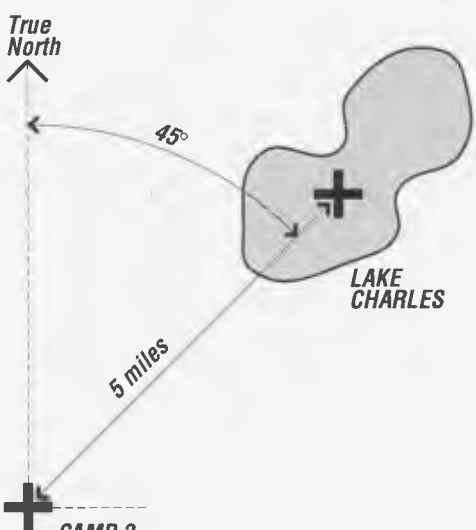
  or

- Press ◄ or ► to return to the INDEX screen.

Offset From

This option calculates the coordinates of an unknown point—if you know how far away and in what direction it is from a saved location. The point is also named and saved.

For example, you are at CAMP 2. You want to go to Lake Charles. The location of the lake is not saved in the Library and you do not know its exact coordinates. However, you do know that the lake is 5 miles away at about 45° relative to True North.



Using the diagram on the previous page, the following is an example of calculating an offset:

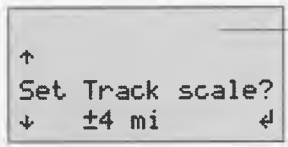
To calculate an Offset from

- From Target Track or with NAV highlighted on the INDEX screen, press ♦.
- Press ▲ or ▼ to scroll to `Offset from...?`.
- Press ↵ to access this option.
- Press ▲ or ▼ to scroll to `CAMP 2`.
- Press ↵ to set `CAMP 2` as the `reference` point.
- Press ◄ or ► and ▲ or ▼ to enter `5.0 mi`.
- Press ↵ to set `distance`.
- Press ◄ or ► and ▲ or ▼ to enter `45° Tr`.
- Press ↵ to set `direction` and the name of Lake Charles appears as `OFF CAMP 2` on the next screen.
- Press ↵ and the following screen confirms the entry.

You can now navigate from your current location to Lake Charles—`OFF CAMP 2`—using Target Track. (See `Set Goal`) or view the actual coordinates of the lake in the Library.

Note: You may want to rename `OFF CAMP 2` as Lake Charles using `Edit a Location`. See LIB.

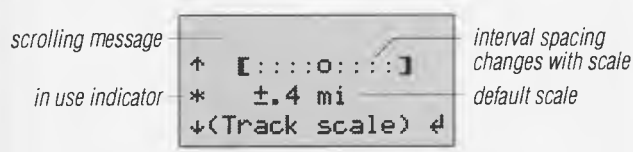
Set Track Scale



This option sets the scale of the Target Track display. Depending upon your situation, the scale can be set to reflect increments of ± .2, .4, .5, 1, 2, 4 or 12 miles or kilometers.

To set the Track Scale

- From Target Track or with NAV highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to `Set Track Scale?`.
- Press ↵ to access this option and the following screen appears:



- Press ▲ or ▼ to scroll between the scale options.

The interval spacing changes accordingly.

- Press ↵ to set the Track Scale and return to the Target Track screen,

  or

- Press ◀ or ▶ to *cancel* the change and return to Target Track.

Chapter 5
LIBRARY —LIB

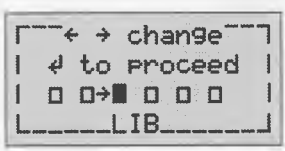
In LIBRARY (LIB) mode, you can save and display up to 250 locations in Scout's Library. These locations may be entered automatically (See LOC) or manually. See Create a Location.

The LIB Options are:

- Create a location
- Edit a location
- Delete a location
- Erase Library

To enter LIB mode

- Press ◄ or ► to highlight LIB on the INDEX screen.



- Press ↵ and the Library status screen appears momentarily,

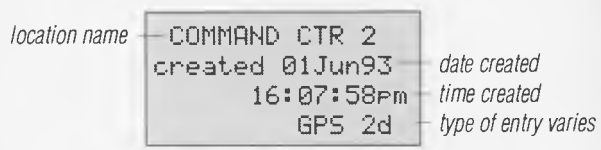
The Library status screen is followed by a display of the last location saved in the Library.

or

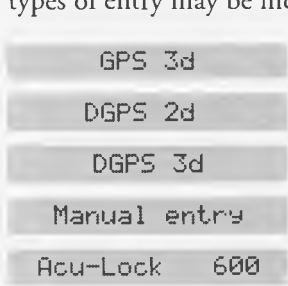
- Press ♦ to directly access the LIB Options list.

Locations are displayed in the coordinate style selected, i.e., Lat/Lon, UTM. Trimble Atlas, Maidenhead, etc.

- Press ▲ or ▼ to scroll through the stored locations, or
- Hold down ↵. A Location TAG (Loc TAG) screen appears indicating the creation date, type of entry for the location,



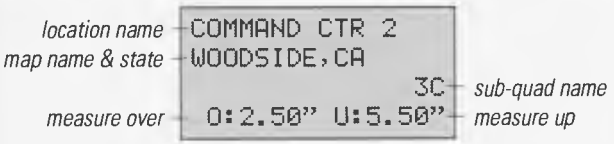
Note: Other types of entry may be indicated:



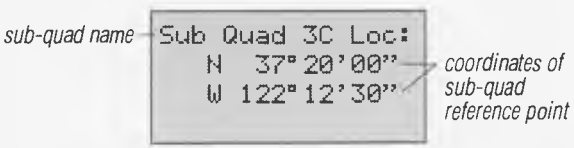
The Acu-Lock entry also indicated the number of points processed.

- Press ◄ or ► to return to the INDEX screen.

If USGS TOPO—[o] is the selected coordinate style, the display is as follows:



- Press ▲ or ▼ to scroll through the stored locations, or
- Hold down ↵. A Quad TAG screen appears with the coordinates of the reference point for the sub-quad indicated.



Create a Location

This option allows you to *manually* create a new location and save it in Scout's Library. Information *must* be entered in terms of the coordinate style currently set, e.g., Lat/Lon or UTM. See LOC. To create locations in Trimble Atlas or Thomas Bros. Map formats, see Appendices E and F.

Note: This option is not available if USGS TOPO is the coordinate style set.

To create a location

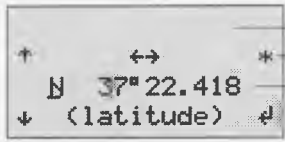
This example uses Latitude/Longitude Minutes.

- With LIB highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to `Create Location?`
- Press ↵ and the following screen appears:

A flashing underline prompts you to enter a character in the first space. Avoid entering duplicate names!

- Press ▲ or ▼ keys to scroll through and select one of the characters.

- Press ◄ or ► to move horizontally to another space.
- Press ↵ when the name is completed. The following screen appears:



A flashing underline prompts you to enter geographical information in terms of the coordinate style set. See LOC.

- Use the ▲ or ▼ and ◄ or ► to enter the *latitude* of the location.
- Press ↵ when completed.
- Use the ▲ or ▼ and ◄ or ► to enter the *longitude.*
- Press ↵ when completed.
- Use the ▲ or ▼ and ◄ or ► to enter the *elevation.*
- Press ↵ and `Saved in memory` appears momentarily followed by a location screen displaying your input.
- Hold down ↵ to see the Loc TAG screen.
- Press ◄ or ► to return to the INDEX screen.

  or

- Press ♦ to return to the LIB Options list.

Note: If you press ↵ when the Loc TAG screen is displayed, the location screen reappears. Press ◄ or ► to return to the INDEX screen.

Edit a Location

This option allows you to change information about any location saved in Scout's Library.

If USGS TOPO—[0] is the coordinate style, only the name of a location can be changed.

Note: If you change *only* the name of a location, the original `Loc TAG` with creation date and time is preserved. If you change any other attribute, the location becomes a *manual entry* and you lose the creation date and time information. This may be important to users who need to record and maintain the exact time and date for a given location.

To edit a location

- With LIB highlighted on the INDEX screen, press ↵.

The Library status screen appears momentarily followed by a location screen.

- Press ▲ or ▼ to scroll to the location to be edited.
- Press ♦ to select that location.
- Press ▲ or ▼ to scroll to `Edit a Location?`
- Press ↵ and the following appears:

Change the information on each screen as required, following the same procedure used in Creating a Location. Avoid entering duplicate names!

- Press ◄ or ► to return to the INDEX screen,

  or

- Press ♦ to return to LIB Options list.

Note: You may erase an entire name by moving the underline over and up to the quick edit mark and press ▲,

or

When the flashing underline is under the first character, press ◄ to move under the asterisk. Then press ▲.

Delete a Location

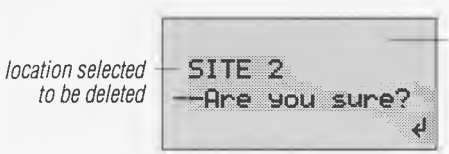
This option allows you to *permanently* remove a location from Scout's Library.

To delete a location

- With LIB highlighted on the INDEX screen, press ↵.

The Library Status screen appears momentarily followed by information about the last location saved.

- Press ▲ or ▼ to scroll to the location you want to delete.
- Press ◆ to select that location for deletion.
- Press ▲ or ▼ to scroll to `Delete Location?`
- Press ↵ and the following question appears:



You are warned as shown above.

- If you are *not* sure, press ◆ to *cancel* the deletion and the Library status screen appears,

  or

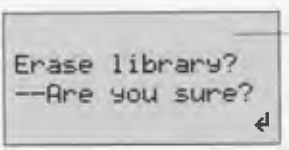
- Press ↵ to *erase* this location from the Library and return to the Library status screen.

Erase Library

This option allows you to *permanently* erase all locations stored in the library of Scout.

To erase the library

- With LIB highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to `Erase Library?`
- Press ↵ and the following screen and question appears:



You are warned as shown above.

- If you are *not* sure, press ◆ to *cancel* the erasure and the Library status screen appears,

  or

- Press ↵ to *erase* the Library and return to the Library status screen.

Chapter 6
SETUP

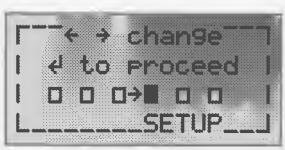
In SETUP mode, you can configure the display of your Scout to best suit your application.

The SETUP Options are:

- Change language
- Time adjustment
- Set clock style
- Speed units
- Distance units
- Elevation units
- Set Dataport℠
- Reset battery hours
- GPS update rate
- Screenlight On/Off
- Screen Contrast
- Auto Shutoff
- Two key turn on

To Enter SETUP mode

- Press ◄ or ► to highlight SETUP on the INDEX screen.

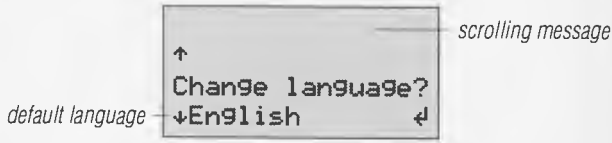


- Press ↵ and the SETUP subscreen appears:

- Press ♦ to access the SETUP Options list.

Note: To access the SETUP Options directly from the INDEX screen, press ♦.

Change Language



This option allows you to choose from seven languages:

- English
- French
- Italian
- German
- Japanese
- Spanish
- Norwegian

To make a change

- With SETUP highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to `Change Language?`
- Press ↵ to access a list of choices.
- Press ▲ or ▼ to scroll to the desired language.
- Press ◆ to *cancel* the change,

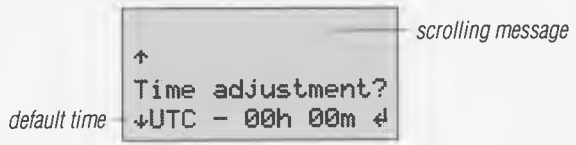
  or

- Press ↵ to select a language and return to SETUP options list.
- Press ◆ and ◄ or ► to return to the INDEX screen.

Note: Should you select a language that you cannot understand, perform the following steps:

- Turn Scout Off. Turn Scout On. *Simultaneously* hold down ◄ and ► while the copyright notice is scrolling across the screen. Scout returns to English.

Time Adjustment



This option allows you to set the local time relative to UTC (Coordinated Universal Time). UTC is approximately the same as GMT (Greenwich Mean Time).

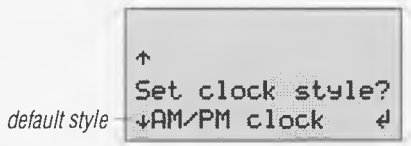
To make a change

- With SETUP highlighted on the INDEX screen, press ♦.
- Press ▲ or ▼ to scroll to `Time adjustment?`
- Press ↵ to access the time adjustment option.
- Press ▲ or ▼ to select either `UTC +` or `UTC -`.
- Press ◄ or ► to move to the hours or minutes you want to change.
- Press ▲ or ▼ to scroll to a new value.
- Press ♦ to *cancel* the change,

  or
- Press ↵ to set the UTC offset and return to SETUP options list.
- Press ♦ and ◄ or ► to return to the INDEX screen.

Note: Refer to Appendix D: UTC Offset Chart.

Set Clock Style



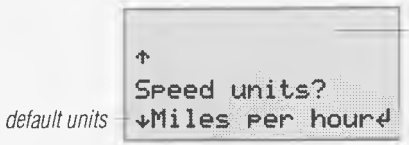
This option allows you to change the expression of time.

To make a change

- With SETUP highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to `Set clock style?`
- Press ↵ to access the clock styles.
- Press ▲ or ▼ to scroll to the preferred style:
  - AM/PM clock
  - 24 hr clock
- Press ◆ to cancel the change,

  or
- Press ↵ to set the clock style and return to SETUP options list.
- Press ◆ and ◄ or ► to return to the INDEX screen.

Speed Units



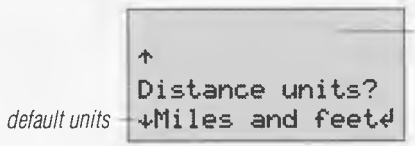
This option allows you to express rates of speed in either U.S., metric or nautical units.

To make a change

- With SETUP highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to `Speed units?`
- Press ↵ to access the Speed units.
- Press ▲ or ▼ to scroll to the preferred units:
  - Miles per hour
  - Kilometers/hr
  - Knots
- Press ◆ to cancel the change,

  or
- Press ↵ to set the speed unit and return to SETUP options list.
- Press ◆ and ◄ or ► to return to the INDEX screen.

Distance Units



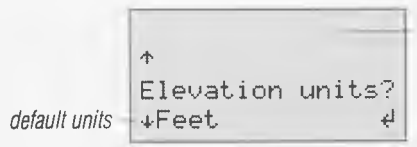
This option allows you to express distances in either U.S., metric or nautical units.

To make a change

- With SETUP highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to `Distance units?`
- Press ↵ to access the Distance units Options.
- Press ▲ or ▼ to scroll to the preferred units:
  - Miles and feet
  - Meters and Km
  - Nautical miles
- Press ◆ to *cancel* the change,

  or
- Press ↵ to set the distance units and return to SETUP options list.
- Press ◆ and ◄ or ► to return to the INDEX screen.

Elevation Units



This option allows you to express elevations in either U.S. or metric units.

To make a change

- With SETUP highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to `Elevation units?`
- Press ↵ to access the Elevation units Options.
- Press ▲ or ▼ to scroll to the preferred units:
  - Feet
  - Meters
- Press ◆ to *cancel* the change,

  or
- Press ↵ to set the Elevation units and return to SETUP options list.
- Press ◆ and ◄ or ► to return to the INDEX screen.

Note: Scout displays elevations in 10 ft. (3m) increments.

If differential signals are being received or AcuLock is in process, elevations are displayed in 1 ft. increments.—(SM)

Reset Battery Hours

This option allows you to reset the battery timer whenever new batteries are installed. This option is *not* available if the Battery Eliminator is in use. (See Optional Accessories)

To make a change

- With SETUP highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to `Reset ▮ hours?`
- Press ↵ to reset battery hours. You are given an opportunity to change your mind:

  `Are you sure?`

- Press ◆ to *cancel* the change,

  or

- Press ↵ to reset battery timer to zero and to return to SETUP options list.
- Press ◆ and ◀ or ▶ to return to the INDEX screen.

Note: The time displayed indicates the length of time the batteries *have been in use.*

Alkaline life expectancy is 6 to 10 hours.
Lithium life expectancy is 12 to 20 hours.

GPS Update Rate

This option allows you to set the GPS update rate to 1, 5 or 10 second update intervals. This option is *not* available if the Battery Eliminator is in use or Dataport is ON—SM.

To make a change

- With SETUP highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to `GPS update rate?`
- Press ↵ to access the Update rate Options.
- Press ▲ or ▼ to scroll to the preferred rate:
  - Maximum rate
  - 5 sec rate
  - 10 sec rate
- Press ◆ to *cancel* the change,

  or
- Press ↵ to choose the update rate and return to the SETUP options list.
- Press ◆ and ◄ or ► to return to the INDEX screen.

Note: If the Dataport is ON or the battery eliminator is in use the update rate defaults to the Maximum rate.

Screen Light On/Off

This option allows you to turn the screen light on or off. When the screenlight is *off*, the screen above is displayed.

To make a change

- With SETUP highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to `Screenlight ON?`
- Press ◆ to *cancel* the change,

  or
- Press ↵ to turn screenlight ON or OFF and return to the SETUP options list.
- Press ◆ and ◄ or ► to return to the INDEX screen.

Note: The screenlight can be turned on immediately after turning the receiver on. As the copyright information runs across the screen, press ◆,

or

During operation, press the ON/OFF key ⏻ and the ◆ key simultaneously to turn the screen light ON or OFF.

Screen Contrast

This option allows you to set screen contrast to one of eight levels—from 0 to 7. The default level is 3.

To make a change

- With SETUP highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to `Screen contrast?`
- Press ↵ to access the Screen contrast Options.
- Press ▲ or ▼ to scroll to a contrast level (0–7).
- Press ◆ to *cancel* the change,

  or
- Press ↵ to choose a setting and return to the SET-UP options list.
- Press ◆ and ◄ or ► to return to the INDEX screen.

Note: While the copyright notice is scrolling across the screen, contrast can be adjusted when the Scout is first turned on by pressing ▲ to *increase* the contrast or ▼ to *decrease* it .

Auto Shutoff

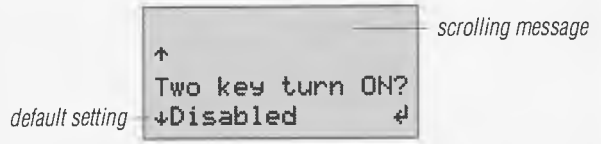
This option allows you to set Scout to turn off automatically if no keys have been pressed within a set period of time. Auto Shutoff Options are: 5, 15, 30, 60, 90 minutes or Never. Select *Never* when using Acu-Lock.

To make a change

- With SETUP highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to `Auto shutoff?`
- Press ↵ to access the Auto shutoff Options.
- Press ▲ or ▼ to scroll to the preferred option.
- Press ↵ to set the option and return to the SETUP options list.
- Press ◆ and ◄ or ► to return to the INDEX screen.

Note: If your Scout turns off unexpectedly, check the Auto Shutoff setting.

Two Key Turn On



This option prevents Scout from being *turned on* accidentally. This may happen inadvertently while carrying it in your pocket or a backpack.

To make a change

- With SETUP highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to `Two key turn ON?`
- Press ↵ to access the Two key turn on Options.
- Press ▲ or ▼ to scroll to `Enabled` or `Disabled`.
- Press ↵ to set the option and return to the SETUP options list.
- Press ◆ and ◄ or ► to return to the INDEX screen.

Note: If Two Key Turn On is enabled and you press the ⏻ only, the following message will appear momentarily below the TRIMBLE logo:

```
TWO KEY TURN ON
    ENABLED
```

To turn Scout on with the Two Key Turn On enabled, you must simultaneously press the ⏻ and hold down the ▲ key for at least 1 second as the copyright message scrolls across the screen.

Set Dataport — (SM)

This option allows you to change operating settings from:

- Reset Defaults?
- Dataport On?
- Select Input?
- Select Output?
- Input Baud?
- Output Baud?
- Character Format
- NMEA sentences?
- NMEA chksum On?

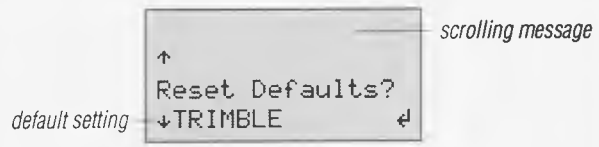
To make a change

- With SETUP highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to `Set Dataport?`
- Press ↵ to access a list of settings.
- Press ▲ or ▼ to scroll to a choice.
- Press ◆ to *cancel* the choice,

  or
- Press ↵ to select a choice and return to SETUP options list.
- Press ◆ and ◄ or ► to return to the INDEX screen.

Detailed information about each of the nine settings follows:

Reset Defaults? — (SM)



This setting allows you to reset all I/O to commonly–used defaults. These settings include I/O protocol, I/O baud rate and character format.

- From **Reset Defaults?** press ↵.
- Press ▲ or ▼ to scroll to the preferred setting:

- Trimble
- Mobile GPS
- Apple Newton™
- Scout–It–Out
- NMEA

- Press ↵ to select the default setting and continue.

Select *Trimble* in order to use the ScoutMaster Library Transfer Utility—SMLTU™ (See Appendix K) or applications requiring TSIP. (Trimble Standard Interface Protocol)

Select *NMEA* in order to use marine electronics equipment or applications requiring NMEA- 0183. (See Appendix H)

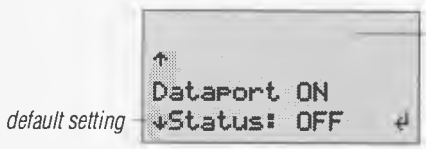
Select *Apple Newton* when using software applications designed for the Apple Newton.

Select *Scout–It–Out* when using Scout–It–Out mapping software.

Select *Mobile GPS* when using ScoutMaster with software that uses the WinMobile™ control panel, such as AutoMap©, City Streets™ or TAXI™.

Note: If Apple Newton or Mobile GPS is selected, Dataport ON (or OFF) is the only option available. The I/O protocol, baud rate and character format are *automatically* set.

Dataport ON? (or OFF?) — SM



This setting enables—or disables—the communication link between the ScoutMaster and an external device, i.e., Apple Newton, DCI pager, portable or desktop computer.

- From `Dataport ON?` or `OFF?` press ↵ to change the current setting and continue.

Note: When the Dataport is ON, the GPS update rate is *automatically* configured to the maximum update rate of 1 second. The GPS Update Rate *cannot* be selected. If a 5 second update rate is required, be sure to turn the Dataport OFF.

Note: At *any* time during operation:

- Press the ON/OFF key and the ↵ key simultaneously to turn the Dataport ON or OFF.
- Press to display the Power OFF Screen. A "D" indicates the Dataport is ON.

Select Input? — SM

Refer to the input device's manual.

- From `Select Input?` press ↵.
- Press ▲ or ▼ to select one of the following:

- NONE
- TRIMBLE
- RTCM -104 (Differential Protocol)
- DCI RTCM (Differential from DCI pager)

- Press ↵ to set the input and continue.

Select *None* to prevent external input.

Select *Trimble* in order to use the Scout Master Library Transfer Utility (SMLTU) or applications requiring TSIP (Trimble Standard Interface Protocol)

Select *RTCM-104* in order to receive standard differential corrections from a radio link.

Select *DCI RTCM* in order to receive differential corrections from a DCI pager or radio link.

Select Output? —(SM)

Refer to the output device's manual.

- From `Select Output?` press ↵.
- Press ▲ or ▼ to select one of the following:
  - NONE
  - TRIMBLE
  - NMEA
  - SMPTE SYNC™
- Press ↵ to set the output and continue

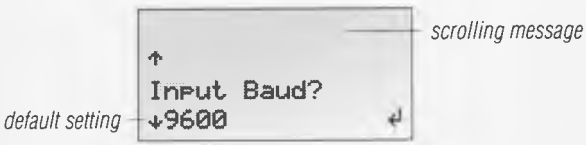
Select *None* to prevent external input.

Select *Trimble* in order to use the ScoutMaster Library Transfer Utility—SMLTU (See Appendix K) or applications requiring TSIP. (Trimble Standard Interface Protocol)

Select *NMEA* in order to use marine electronics equipment or applications requiring NMEA 0183. See Appendix H.

Select *SMPTE SYNC* in order to use ScoutMaster to synchronize a SMPTE Time Code Generator (See Appendix I) or timing applications using MasterClock. See Appendix J.

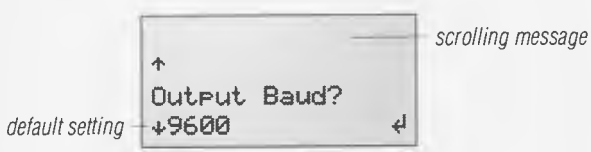
Input baud? — SM



Refer to the input device's manual to determine the baud rate.

- From Input baud? press ↵.
- Press ▲ or ▼ to select the level of baud input:
  - 300
  - 600
  - 1200
  - 2400
  - 4800
  - 9600
  - 19200
- Press ↵ to set the input baud rate and continue.

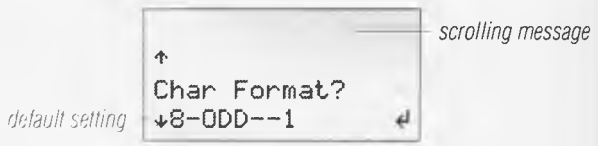
6) Output baud? — SM



Refer to the output device's manual to determine the baud rate.

- From Output baud? press ↵.
- Press ▲ or ▼ to select the level of baud output:
  - 300
  - 600
  - 1200
  - 2400
  - 4800
  - 9600
  - 19200
- Press ↵ to set the output baud rate and continue.

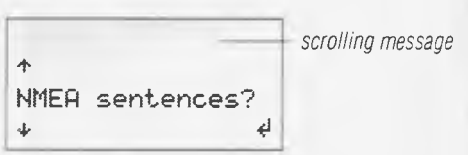
Char Format? (SM)



Refer to the output device's manual to determine the character format.

- From `Char format?` press ↵.
- Press ▲ or ▼ to select a character format.
  - 8-None-1
  - 8-None-2
  - 8-Even-1
  - 8-Even-2
  - 8-Odd-1
  - 8-Odd-2
  - 7-None-1
  - 7-None-2
  - 7-Even-1
  - 7-Even-2
  - 7-Odd-1
  - 7-Odd-2
- Press ↵ to set the character format and continue.

NMEA sentences? (SM)



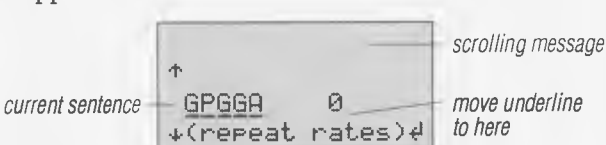
NMEA (National Marine Electronics Association) is an interface standard that allows electronic equipment to exchange navigation data in ASCII protocol NMEA-0183. Refer to your software or external device manual for the appropriate NMEA sentences. See Appendix H for a detailed list of the available sentences.

The following sentences can be activated:

Sentence	Description
GPAPA	Autopilot Message A
GPAPB	Autopilot Message B
GPBWC	Range and Bearing to Waypoint
GPGGA	GPS Fix Data (GPS altitude)
GPGLL	Longitude and Latitude
GPGSA	GPS DOP and Active Satellites
GPGSV	GPS Satellites in View
GPRMB	Recommended Navigation Information
GPRMC	Recommended Specific GPS Data
GPVTG	Actual Track and Ground Speed
GPWCV	Waypoint Closure Velocity
GPXTE	Cross-Track Error
GPZTG	UTC and Time to Destination

If more than one sentence is to be activated, repeat the steps described below for each one.

- From `NMEA sentence?` press ↵.
- Press ▲ or ▼ to select the NMEA sentence.
- When on the desired sentence, the following screen appears:



- Press ▶ to move the underline cursor to the right.
- Press ▲ or ▼ to select the repeat rate.
- Press ↵ to activate the sentence and repeat rate and continue.

Repeat rate refers to how often a sentence will be updated per a set number of position fixes, i.e., 1-99. The most common setting of 1 updates the sentence at each position fix. If the repeat rate is 2, the sentence is updated every 2 position fixes.

Refer to the output device manual to determine the messages that it accepts and the recommended repeat (update) interval for each.

Note: For optimum performance, enable the minimum number of sentences required to drive your external device, i.e., a " moving map", and the highest acceptable repeat rate.

NMEA chksum ON? — (SM)

The Checksum is a unique hexadecimal value based on the contents of each sentence and is used for error detection. Set to OFF unless specifically required in the output device's instruction manual.

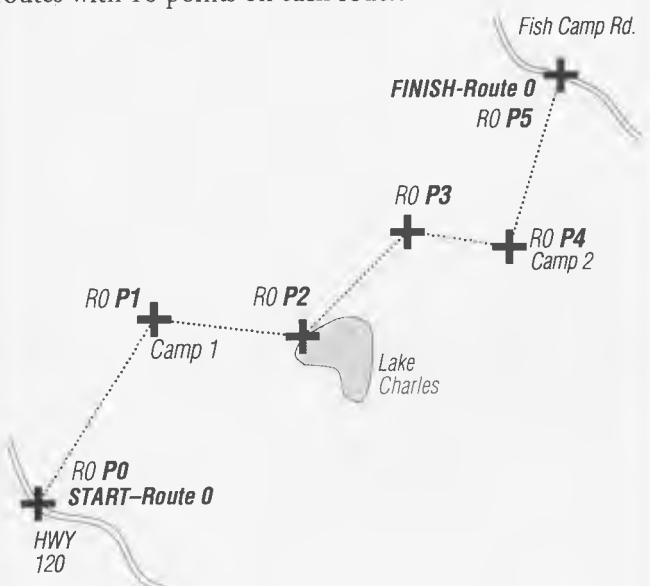
- From NMEA chksum? press ↵.
- Press ↵ to change the current setting and continue,

or

- Press ◆ to proceed without changing the setting.

Chapter 7
ROUTE

In ROUTE mode, you can enter a sequence of locations—*route points*—that you want to pass through on your way to a final destination. These points are selected from locations saved in Scout's Library. You can preset up to 10 routes with 10 points on each route.



Trail 10

The map above shows Trail 10, a route with 6 points. Note that the starting point is Route 0–Point 0. Scout automatically numbers routes and route points in sequence starting with 0.Routes can be renamed for easy identification.

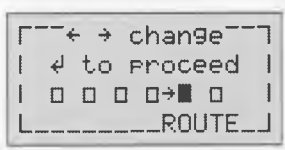
The ROUTE Options are:

- Edit route?
- Copy route?
- Rename route?
- Delete route?

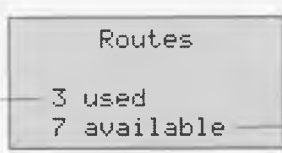
Rename route, Delete route and Copy route are not available until a route is created.

To enter ROUTE mode

- Press ◄ or ► the highlight ROUTE on the INDEX.



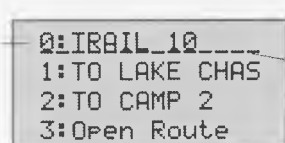
- Press ↵. A Route Status screen momentarily appears. For example:



none used if no routes are entered

10 max. available

and is followed by a Route List screen:



route selected is underlined

underline bar scrolls up & down the list

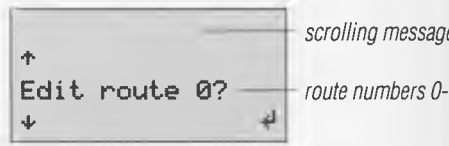
Route List

- Press ▲ or ▼ to scroll a preferred route.
- Press ♦ or ↵ to access the ROUTE Options List.

See the following pages for detailed explanations of Route Options.

Route information is saved and used by Target Track in the NAV mode. See `Activate route?` An active route will be identified on the Route List as shown below:

Edit Route?

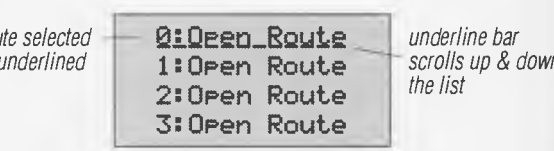


This option is used to place points in a route and to change the points later. This option is *unavailable* if the location library is empty.

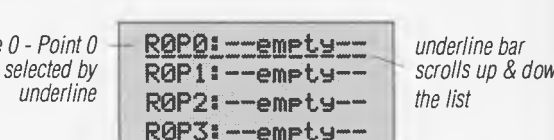
To edit a route

- With ROUTE highlighted in the INDEX screen, press ↵.

The Route Status screen appears followed by the Route List screen:

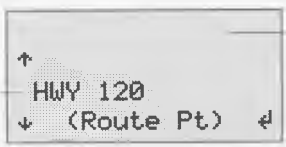


- Press ▲ or ▼ to scroll flashing underline and select a route. All routes are `Open`, if this is the first route to be entered.
- Press ↵. Press ▲ or ▼ to scroll to `Edit route 0?`
- Press ↵ again and the Route Point list appears:



A flashing underline prompts you for the first point—or starting point—of this route.

- Press ▲ or ▼ to scroll flashing underline and select a point. For now, R0P0:--empty-- should be selected.
- Press ◆ and the message `Change point?` appears.
- Press ↵ to access a list of locations (points) saved in the Library,

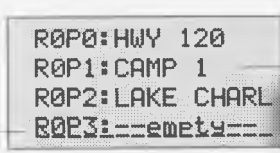


- Press ▲ or ▼ to scroll to the preferred point. In this example, `HWY 120` is the start point (Pt 0).
- Press ◆ to *cancel* the editing procedure,

  or

- Press ↵ to set that point and the Route Point list reappears with your first point entered.

Repeat these steps to enter additional points on this route, as in the example below:

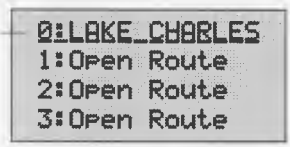


The previous example shows a route with three points defined. Points 3 through 9 `--empty--` are all displayed as the underline is scrolled.

Due to space limitations, a route point's name is displayed using the first 10 characters. For example, `R0P2` (Route 0, Point 2) would be listed in the Library as `LAKE CHARLES`, however, it would appear as `LAKE CHARL` on the Route Point list. The letters `E` and `S` were dropped.

- Press ↵ again. Following the example from the map on pg 7-1, a Route List screen appears:

route name is last point entered



Scout has named Route 0, `LAKE CHARLES`—the name of the *last* point added. You may want to change this name to `TRAIL 10`. See `Rename Route?`

Once a route point has been entered, two additional editing options become available:

- Insert point?
- Delete point?

To insert a point

- With ROUTE highlighted in the INDEX screen, press ↵.
- Press ▲ or ▼ to scroll to the preferred route.
- Press ↵ to select the route.
- Press ▲ or ▼ to scroll to `Edit route 0?` (The number of the route varies with your selection)

- Press ↵ and the Route Point list appears.
- Press ▲ or ▼ to scroll to the point of insertion.
- Press ◆ and scroll ▲ or ▼ to `Insert point?`
- Press ↵ to access points (locations) in the Library.
- Press ▲ or ▼ to scroll to the new point to be inserted.
- Press ◆ to cancel the insertion,

  or

- Press ↵ and the Route Point list reappears with the new point inserted. (Each point is advanced)

To delete a point

- With ROUTE highlighted in the INDEX screen, press ↵.
- Press ▲ or ▼ to scroll to the preferred route.
- Press ↵ to select the route.
- Press ▲ or ▼ to scroll to `Edit route 0?` (The number of the route varies with your selection.)
- Press ↵ and the Route Point list appears.
- Press ▲ or ▼ to scroll to the point to be deleted.
- Press ◆ and scroll ▲ or ▼ to `Delete point?`
- Press ◆ to cancel the deletion,

  or

- Press ↵ and the point is deleted from the route.

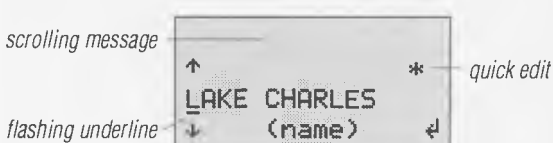
Rename Route?

This option is used to rename a route. As indicated in `Edit Route?`, the last point (location) entered automatically becomes the route name.

A name, such as `LAKE CHARLES` can be changed to something more applicable, say, `TRAIL 10`.

To rename a route

- With ROUTE highlighted in the INDEX screen, press ↵ to access the route list.
- Press ▲ or ▼ to scroll to the route to renamed.
- Press ◆ to enter Route Options list.
- Press ▲ or ▼ to scroll to `Rename route?`
- Press ↵. A screen similar to the following appears:



The flashing underline prompts you for a change. Proceed as in `Edit Location` (See LIB)

Note: This option is *unavailable* if the Route List is empty.

Copy Route?

This option is used to copy a route. Copying a route saves the time required to create an entire new route if you only want to change a couple of points.

To copy a route

- With ROUTE highlighted in the INDEX screen, press ↵ to access the route list.
- Press ▲ or ▼ to scroll to the route to copied.
- Press ◆ to enter Route Options list.
- Press ▲ or ▼ to scroll to `Copy route?`.
- Press ◆ to cancel the copy procedure,

  or
- Press ↵ and a `Route copied` message appears momentarily, followed by the Route Status screen.

The Route List reappears with a duplicate of the original route displayed. Rename this duplicate route and edit it as necessary.

Note: This option is *unavailable* if the Route List is empty.

Delete Route?

This option is used to delete an entire route.

To delete a route

- With ROUTE highlighted in the INDEX screen, press ↵ to access the route list.
- Press ▲ or ▼ to scroll to the route to be deleted.
- Press ◆ to enter Route Options list.
- Press ▲ or ▼ to scroll to `Delete route?`.
- Press ↵ and a `Are you sure?` warning appears.
- Press ◆ to *cancel* the deletion,

  or

- Press ↵ again. A `Route deleted` message appears momentarily followed by the Route Status screen.

The Route List reappears with an additional `Open Route` displayed.

Note: This option is *unavailable* if the Route List is empty.

Chapter 8
ADVANCED —ADV

In ADVANCED (ADV) mode, you can use Over & Up, Convert Over & Up™ or A to B Over & Up™ — Trimble's unique map reading systems—to determine locations on any map.

Using other ADV Options, Scout will calculate astronomical data for the sun and moon and display local date and time.

The ADV Options are:

- Sun Data?
- Moon Data?
- See Julian Date?
- Over & Up
- Convert Over & Up
- A to B Over & Up
- Time & Date?

To Enter ADV mode

- Press ◄ or ► to highlight ADV on the INDEX screen.

- Press ↵ and the ADV subscreen appears:

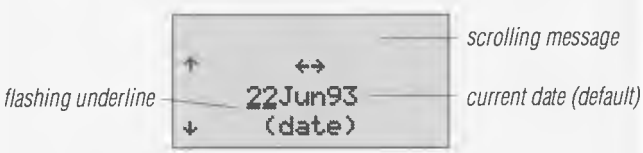
- Press ◆ to access the ADV Options directly from the INDEX screen.

Sun Data

This option calculates the position of the sun at *any time*, on *any day* for *any location*—your current location or a location saved in the Library. In order to calculate sun data for a time zone other than your own, the local time must be set for that geographical area. Set local time using UTC Offset chart. See Appendix D.

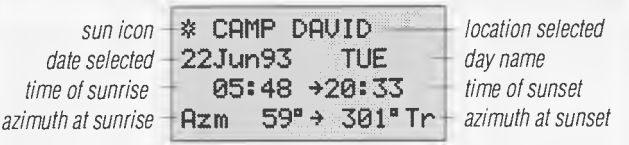
To see sun data

- With ADV highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to Sun data?
- Press ↵ and the last location saved appears.
- Press ▲ or ▼ to scroll to a preferred location.
- Press ↵ to select the location the following appears:



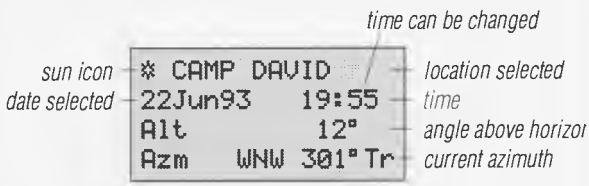
The current date is displayed.

- Press ◄ or ► and ▲ or ▼ to change the date above the flashing underline.
- Press ↵ to select the date and a sun screen appears:



Times for sunrise and sunset as well as azimuths indicating the sun's position at sunrise and sunset are displayed.

- Press ↵ and a second sun screen appears:



The sun's position is displayed for date selected and time of day.

You can change the current time in 15 minute increments by pressing ▲ or ▼. The sun's angle above the horizon and azimuth are recalculated for that new time.

- Press ↵ to repeat the sun screens,

  or

- Press ◆ to return to the ADV options list,

  or

- Press ◀ or ▶ to return to the INDEX screen.

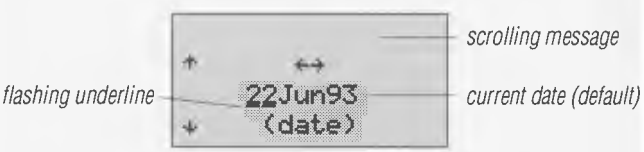
Note: The angle of the sun is shown as *negative* (below the horizon) before sunrise and after sunset. The angle is shown as 0° exactly at sunrise and sunset.

Moon Data

This option calculates the position of the moon at *any time*, on *any day*, or at *any location*—your current location or a location saved in the Library.

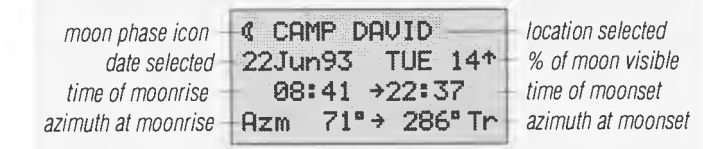
To see moon data

- With ADV highlighted on the INDEX screen, press ♦.
- Press ▲ or ▼ to scroll to `Moon data?`
- Press ↵ and the last location saved appears.
- Press ▲ or ▼ to scroll to a preferred location.
- Press ↵ to select the location and the following appears:



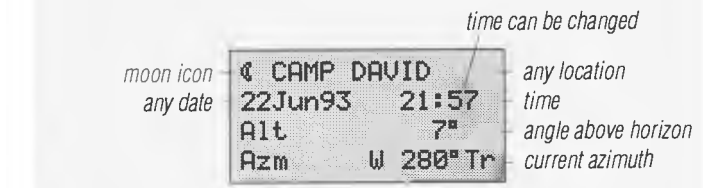
The current date is displayed.

- Press ◄ or ► and ▲ or ▼ to change the date above the flashing underline.
- Press ↵ to select the date and a moon screen appears:



Times and azimuths are shown for both moonrise and moonset. The moon icon changes to indicate phases. The small blinking ↑ indicates that the moon is "waxing", while the ∂ indicates the moon is "waning".

- Press ↵ and a second moon screen appears:



The moon's position on the date selected and current time of day is displayed.

You can change the current time in 15 minute increments by pressing ▲ or ▼. The moon's angle above the horizon and azimuth are recalculated for that new time.

- Press ↵ to see the first moon screen again,

  or

- Press ◆ to return to the ADV options list,

  or

- Press ◀ or ▶ to return to the INDEX screen.

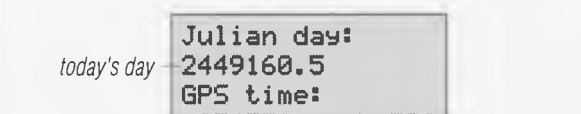
Note: The angle of elevation of the moon is shown as *negative* (below the horizon) before moonrise and after moonset. The angle is shown as 0° exactly at moonrise and moonset.

See Julian Date

This option expresses dates in days, rather than years. Astronomers use this method to place long intervals of time within the Julian period. The Julian day is the number of consecutive days starting at noon, on Jan. 1, 4713 B.C. Scout replaces conversion tables using GPS.

To see Julian Date

- With ADV highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to `See Julian date?`
- Press ↵ and the following screen appears:



- Press ◆ to return to the ADV options list,

  or

- Press ◀ or ▶ to return to the INDEX screen.

Note: The week counter started on Friday, Jan. 6, 1980. It advances by 1 each Saturday at 11:59:59 PM (GMT). The seconds counter restarts every Saturday at 11:59:59 PM (GMT).

Introduction to the Over & Up series

- Over & Up
- Convert Over & Up
- A to B Over & Up

These options are tools designed to simplify map reading. They can be used in conjunction with any map, without having to interpolate latitudes or longitudes, UTM, etc.

Scout *must* be provided with the following information:

- a southeast reference point (stored in the Library)
- the scale of your map

A southeast (lower right) reference point must be chosen from the Library because you will be measuring *over* (left) and *up* from that point to find a location on a map. A reference point must be created using `Create Location?` See LIB.

Over & Up measurements can be displayed in U.S.—decimal inches/miles or metric units—cms/kms. See SETUP and decimal inch equivalents table below.

.0625 = 1/16"	.375 = 3/8"	.6875 = 11/16"
.125 = 1/8"	.4375 = 7/16"	.75 = 3/4"
.1875 = 3/16"	,5 = 1/2"	.8125 = 13/16"
.25 = 1/4"	.5625 = 9/16"	.875 = 7/8"
.3125 = 5/16"	.625 = 5/8"	.9375 = 15/16"

Selectable scale factors are incorporated into Scout to work with maps of the following scales:

1:10,000	1:12,000	1:20,000
1:24,000	1:25,000	1:50,000
1:62,500	1:63,360	1:100,000
1:126,720	1:150,000	1:500,000

plus one custom scale (1:123,456)

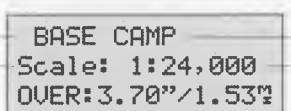
Note: Mapping datum should match the datum of your map. See LOC.

Over & Up

This option is used to calculate two measurements—a distance *over* and a distance *up* from a southeast reference point on a map—in ~~*real time.*~~

To use Over & Up

- With ADV highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to Over & Up?
- Press ↵ and the Over & Up screen appears:



To set South East reference point

- From the Over & Up screen, Press ◆.
- Press ▲ or ▼ to scroll to South-East Ref?
- Press ↵ to access locations stored in the Library.
- Press ▲ or ▼ to scroll to the location you want to use.
- Press ↵ to select that point and the Over & Up screen appears with the new reference point.

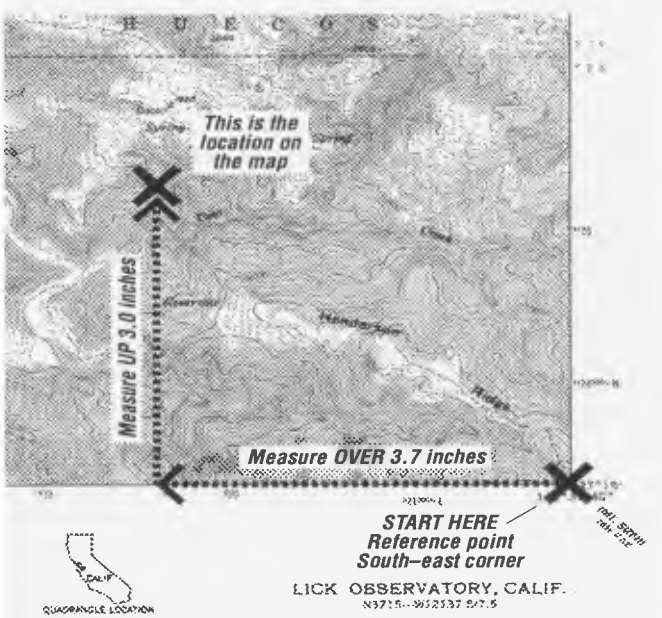
To set map scale

- From the Over & Up screen, Press ◆.

- Press ▲ or ▼ to scroll to `Topo Map Scale?`
- Press ↵ to access the list of available scales.
- Press ▲ or ▼ to scroll to the scale of your map.
- Press ↵ to select that scale and the Over & Up screen appears again with the new scale and measurements to your current location:

S. E. reference pt. — `BASE CAMP` — *user defined*
scale of map — `Scale: 1:24,000` — *user defined*
`OVER:3.70"/1.53"`
`UP: 3.00"/1.00"`

- Measure with the Over & Up ruler as below:



- Press ↵ to return to the ADV options list,

  or

- Press ◄ or ► to return to the INDEX screen.

If you press ♦ from the Over & UP screen, you return to the SE Reference or topo map scale options.

- Press ♦ again followed by ◄ or ► to return to the INDEX screen.

Note: *Flashing* values indicates NO GPS position. Scout has not acquired 3 satellites. The information displayed is from the *last* GPS location.

Dashed values indicate the selected reference point is out of range, i.e., it is *not* southeast of your current location.

If the scale of your map is *not* one of the selectable scale factors in Scout, you can create a custom scale factor.

To create a custom scale factor

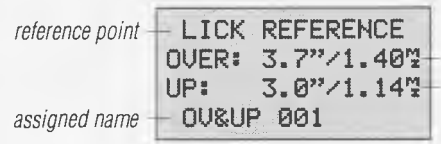
- From the Over & Up screen, Press ♦.
- Press ▲ or ▼ to scroll to `Topo Map Scale?`
- Press ↵ to access the list of available scales.
- Press ▲ or ▼ to scroll to `1:123,456 (custom.)`
- Press ↵ to access custom scale.
- Press ▲ or ▼ and ◄ or ► to edit the scale.
- Press ↵ set your custom scale and return to the Over & Up screen.

Convert Over & Up

This option is the opposite of Over & Up. Use it to calculate the coordinates of any location on a map by measuring —with the Over & Up ruler—over and up distances from a reference point.

To use Convert Over & UP

- With ADV highlighted on the INDEX screen, press ♦.
- Press ▲ or ▼ to scroll to `Convert Over & UP`.
- Press ↵ to access locations stored in the Library.
- Press ▲ or ▼ to scroll to the location you want to use as the reference point.
- Press ↵ to set the reference point and access the list of available scales.
- Press ▲ or ▼ to scroll to the scale of your map.
- Press ↵ to set the map scale. An `(Over)` screen appears.
- Press ▲ or ▼ and ◄ or ► to enter an Over value.
- Press ↵ to set an Over value. An `(Up)` screen appears.
- Press ▲ or ▼ and ◄ or ► to enter an Up value.
- Press ↵ to set an Up value. A `(result name)` screen appears.
- Finally, press ↵ and the following screen appears:



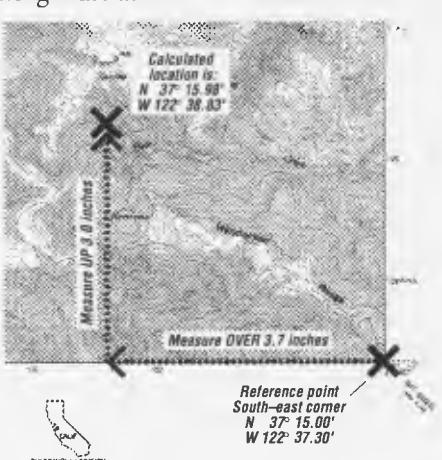
Scout assigns a name to the location—`OV&UP 001`—and saves it. Names start in a sequence with 001.

- Press ◄ or ► to highlight LIB on the INDEX screen.
- Press ↵ to access LIB.

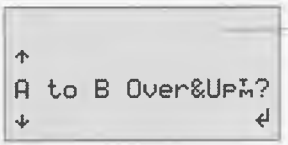
Your location—`OV&UP 001`—is displayed in the selected coordinate style.

Note: If you press ♦ from the Over & Up screen, you return to the ADV Options list. Press ♦ again, followed by ◄ or ► to return to the INDEX screen.

The following illustrates the use of Convert Over & Up



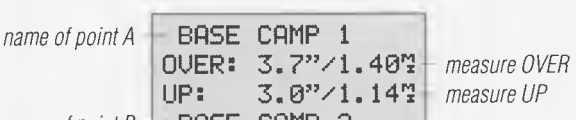
A to B Over & Up



This option calculates *over* and *up* measurements from Point A to Point B. Point A *must* be southeast of point B and both points *must* be stored in the Library.

To use A to B Over & UP

- With ADV highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to A to B Over & UP.
- Press ↵ to access this option.
- Press ▲ or ▼ to scroll to a beginning point (A).
- Press ↵ to set Point A and the next screen appears.
- Press ▲ or ▼ to scroll to an ending point (B).
- Press ↵ set Point B and a list of available scales appears.
- Press ▲ or ▼ to scroll to your map scale.
- Press ↵ and the following screen appears:

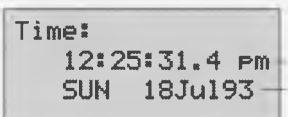


Time & Date

This option displays the current GPS time and date. Time is expressed in local time and in the selected clock style. See SETUP.

To see Time & Date

- With ADV highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to TIME & DATE?.
- Press ↵ and the time/date screen appears:



- Press ◆ to return to the ADV options list,

  or
- Press ◀ or ▶ to return to the INDEX screen.

Chapter 9
ACCESSORIES

Your Scout is equipped with the standard accessories:

- User's Guide
- 4 - AA alkaline batteries
- The Trimble Atlas
- Over & Up ruler
- International Orange cordura carrying case
- Lanyard
- Waterproof bag

Optional accessory kits, designed to provide additional flexibility in special operating situations, are also available.

Standard Accessories

Alkaline Batteries

Four AA batteries power the Scout. Alkaline batteries may provide up to 10 hours of continuous use.

Replace batteries before storage or when the Warning screen below appears:

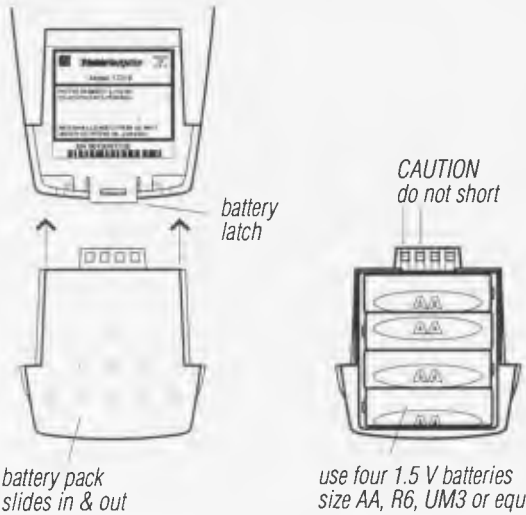
Store Scout with fresh batteries. Scout will maintain all memory while batteries are being changed. If batteries are

removed for more than 30 minutes, memory may be lost.

If batteries go dead and new batteries are not readily available, do not panic. Dead batteries supply enough power to maintain Scout's memory up to a year.

To install the batteries

- Turn the Scout over.
- Press the battery pack latch down while sliding out the battery pack.
- Install new batteries by following the diagram inside the battery pack. (If batteries are installed incorrectly, the Scout may malfunction or be permanently damaged.)
- Slide the battery pack in until the latch is engaged.
- Reset the Battery timer. See SETUP.



Trimble Atlas

For use with your Scout when set to Trimble Atlas coordinate style. See LOC and Appendix E.

Lanyard

The lanyard allows you to carry the Scout around your neck or tie it to another object.

To install the lanyard, first remove the battery pack; then feed the lanyard through the openings on either side of the battery pack latch and thread the lanyard through the cord lock provided. Tie the loose ends together. Slide the battery pack in until the latch is engaged.

Thread the lanyard through the ring on the cordura case.

Carrying Case & Waterproof Bag

The cordura carrying case protects the Scout. The case is padded and water–resistant, but not waterproof. Use the waterproof bag if necessary.

Trimble Scout Accessory Kit (Optional)

The Scout Accessory Kits (Part Nos. 19638-03 and 19638-04) contain items that provide additional flexibility for your Scout's operation, e.g., in an enclosed environment such as a vehicle.

19638-03:

- Magnetic external antenna with cable, suction cup and pole–top mounts.

19638-04:

- Nonmagnetic external antenna with cable, suction cup and pole–top mounts.

19638-03 and 19638-04:

- Battery Eliminator

  Permits operation on 9V to 32V DC power.

- Cigarette Lighter Adaptor

  Connection to a DC power source.

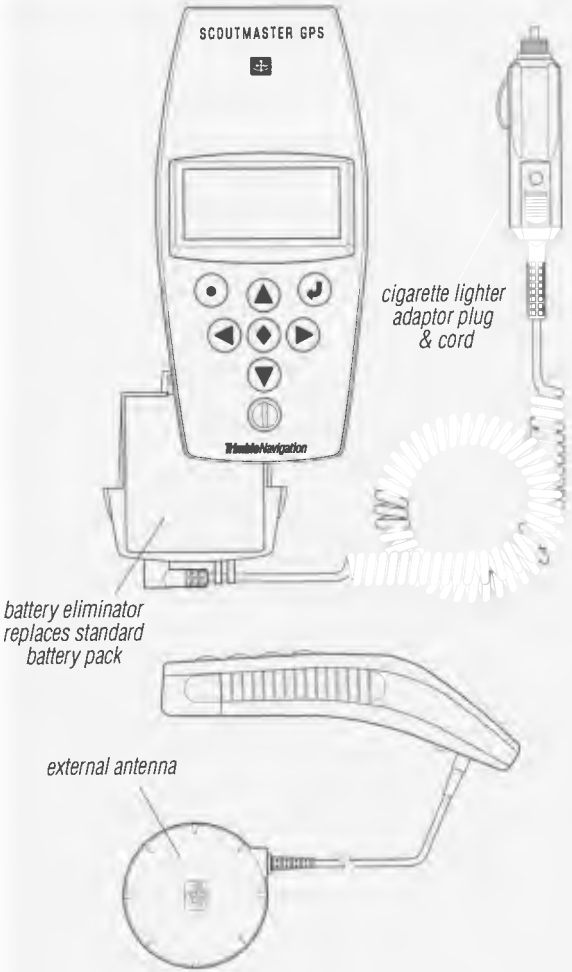
- AC Adaptor

  Connection to a 110V AC power source.

Note: The external antenna can be operated with either 4 - AA batteries or external power.

The diagram on pg 9-5 illustrates the relationship of the kit components. Instructions for connection and installation are included. (AC adaptor not shown)

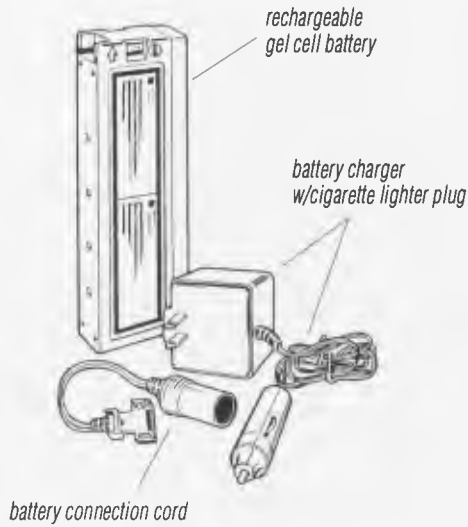
To order, call Trimble Navigation at 1-800-959-9567.



Optional Accessory Kits (AC adaptor not shown)
Part Nos. 19638-03 or 19638-04

Leatex Battery Kit (Optional)

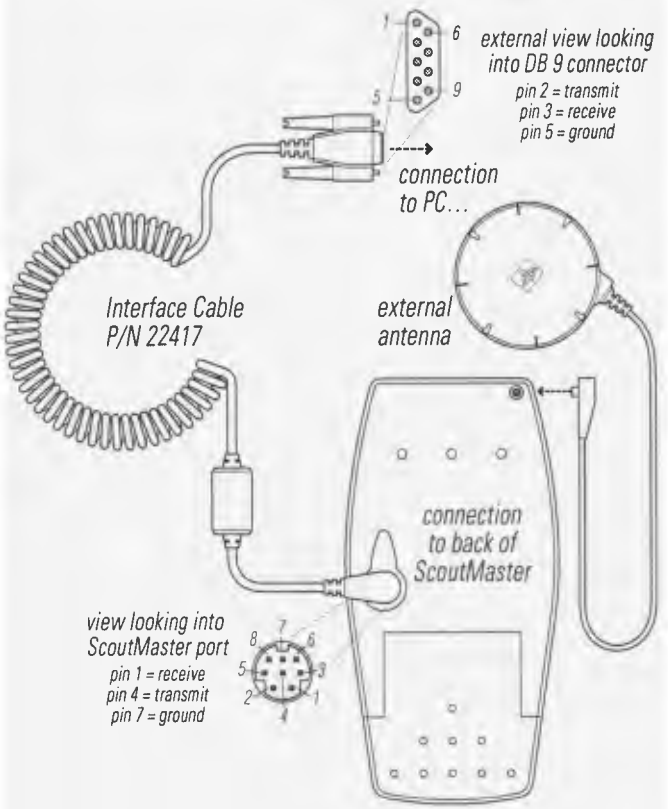
The 12V Gel Cell battery kit is available *only* from Leatex, Inc. and permits up to 15 hours of continuous use.



The kit includes a battery charger, a cigarette light socket and a 12V Gel Cell battery. The kit must be used with the Scout battery eliminator and cigarette lighter adaptor installed. The price is $49.00 plus $6.50 for shipping (in USA).

Call Leatex direct at (800) 875-7638, (619) 686-4999 or Fax (619) 681-4988 or send check or money order to Leatex, Inc., 1165 Cushman Ave., San Diego, CA 92110.

The PC–based I/O cable (P/N 22417)—SM

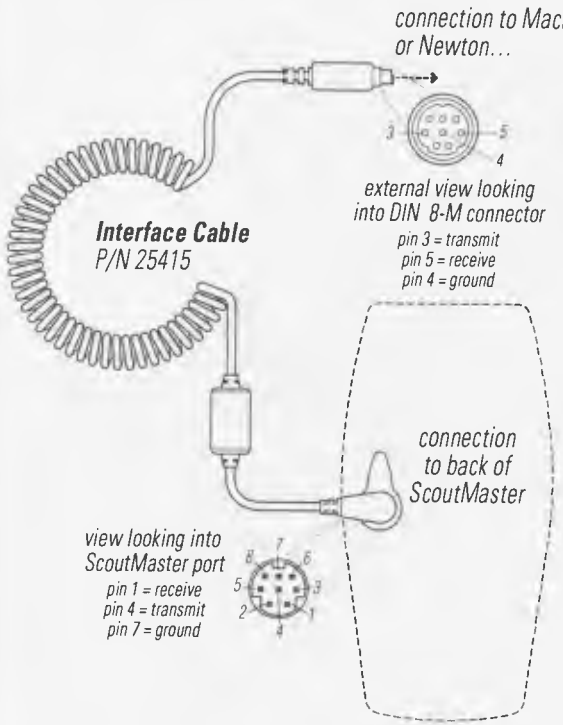


Dataport Connection Diagram

Call (800) 959-9567 or (512) 343-8970

List price: $25.00

The Macintosh/Newton I/O cable (P/N 25415) SM

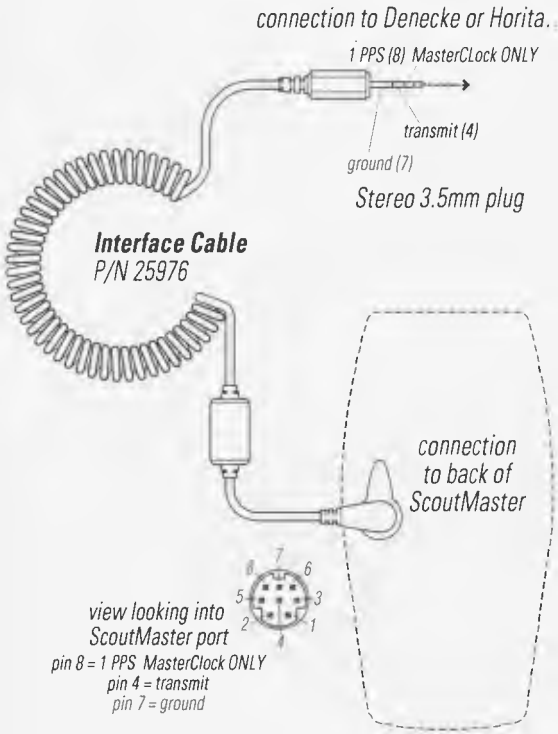


Dataport Connection Diagram

Call (800) 959-9567 or (512) 343-8970

List Price: $25.00

The SMPTE I/O cable (P/N 25976) — SM



Dataport Connection Diagram

Call (800) 959-9567 or (512) 343-8970

List Price: $25.00

APPENDIX A —**Mapping Datums**

If your application requires a datum not listed below, you can configure the datum using a user–defined or custom datum. See Appendix B.

The list of datum options available in the Scout are:

Adindan N. Africa
AFG (Somalia)
Ain El Abd 1970
Alaska <NAS-D>
Alaska/Can. NAD-27
Anna 1 Astro 65
ARC-1950 mean v
ARC 1960 mean v
Ascension Isl. 58
Astro Beacon E
AstroB4 Sor. Atol
Astro Pos 71/4
Astro Station 52
Australian Geo66
Australian Geo84
Bahamas (NAD-27)
Bellevue (IGN)
Bermuda 1957
Bogota Observatory
Bukit Rimpah
Camp Area Astro
Campo Inchauspe
Canada mv (NAS-E)
Canal Zone (NAD-27)
Canton Island 66
Cape (S. Africa)
Cape Canaveral mv
Caribbean (NAD-27)
Carthage, Tunisia
Central Am. NAD-27
Chatham 1971
ChuaAstro (Para.)
Corrego Alegre
Corrego Allegre COA
Cuba (NAD-27)
Cyprus
DatumXXX, custom
DatumYYY, custom
Djakarta, Batavia
DOS 1968, Gizo I

Easter Island 67
Egypt <EUR-F>
European 1950
European 1950 mv
European 1979 mv
Finnish Nautical
Gandajika Base
Geodetic Datum 49
Ghana, Africa
Great Britain 36
Greenland (NAD-27)
Guam Island 1963
G. Segara Borneo
G. Serindung 1962
GUX1 Astro Guad.
Herat N., Afghan.
Hjorsey 55 Iceland
Hong Kong 1963
HuTzuShan, Taiwan
Indian <IND-M>
Iran <EUR-H>
Ireland 1965
ISTS 073 Astro 69
Johnston Island 61
Kandawala S. Lan
Kerguelen Island
Kertau 48 Malayan
L.C.5 Cayman Brac
La Reunion, Masc.
Liberia 1964
Luzon, Philippines
Mahe 71 Seychelles
Marco Astro
Masirah Island
Massawa, Eritrea
Merchich, Morocco
Mexico (NAD-27)
Midway Astro 61
Mindanao (Luzon)
Minna, Nigeria
Montjong, Celebes
Nahrwan Saudi A.
Namibia, Africa
Naparima BWI (T+T)
N-Am. 1927 CONUS mv
N-Am. 1983 (NAD-83)
Observatorio 1966
Old Egyptian
Old Hawaiian, mean
Old Hawaiian, Maui
Old Hawaiian, Kuai
Old Hawaiian, Oahu
Oman <FAH>
PicoDeLasNieves

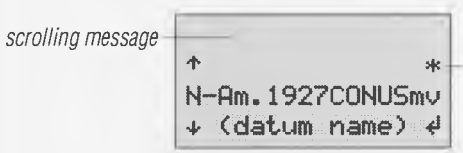
Pitcairn Astro 67
Puerto Rico
QornoqKal.Nunaat
Quatar National
Rome 40 Sardinia
SAD 69, BrazilIBGE
SantaBraz Azores
SantoDOS, Vanuatu
Sapper Hill 1943
Sicily <EUR-J>
Sierra Leone 60
S-American 56 mv
S-American 69 mv
S. Asia Singapore
S. Chilean 1963
S.E. Asia (Indian)
Southeast Base
Southwest Base
Tananarive Ob. 25
Thai/Viet <IND-A>
Timbalai 1948
Tokyo, mean value
Tristan Astro 68
U. Arab Emirates
VitiLevu 16, Fiji
Voirol (Alg+Tun)
Wake-Eniwetok 60
WGS-72 (World)
WGS-84 (World)
Yacare, Uruguay
Zandrij, Suriname

*APPENDIX B —**Custom Datums***

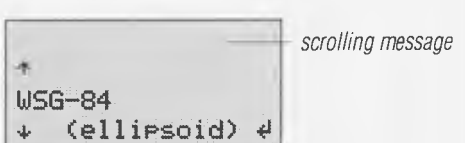
`Datum XXX, custom` and `Datum YYY, custom` are found after `Cyprus` in the Scout's list of available mapping datums. XXX & YYY can be used to establish special purpose, user–entered datums. This feature is recommended for use by professional, experienced geodesists.

To enter a custom datum

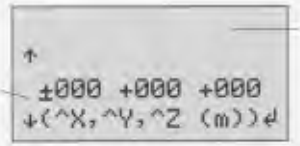
- From LOC mode, press ◆.
- Press ▲ or ▼ to scroll to `mapping datum?`
- Press ↵ and the following screen will appear:



- Press ▲ or ▼ to scroll to `DatumXXX, custom` or `DatumYYY, custom`.
- Press ↵ and the following screen will appear:



- Press ▲ or ▼ to scroll to the ellipsoid of your choice. (See list on next page.)
- Press ↵ and the following screen will appear:



- Press ◄ or ► to move to the X, Y and Z values you want to change

  and

- Press ▲ or ▼ to change the value. All values are to be entered in *meters.*
- Press ↵ to set the datum and return to the LOC mode.

List of ellipsoids

WGS-84 (default)
Airy
Australian National
Bessel 1841
Clarke 1866
Clarke 1880
Everest
Fischer 60 Merc
Fischer 1968
GRS–80
Helmert 1906
Hough
International
Krassovsky
Modified Airy
Mod. Everest
Mod. Fischer 60
Nambian Bessel
SAD–69
Custom 1
Custom 2
War Office
WGS–60
WGS–66
WGS–72

*APPENDIX C —**Glossary***

2D, 3D Two-dimensional and three-dimensional positions. A 2D position fix provides coordinates in two dimensions, such as latitude and longitude. Elevation is assumed to be fixed. Only three satellites are required to provide a 2D position with a user-supplied elevation. A 3D position provides the elevation in addition to LAT/LON and may require four or five satellites.

Almanac A reduced-precision subset of the ephemeris parameters. Used by Scout to compute the elevation and azimuth angles of the satellites. Each satellite broadcasts the almanac for all the satellites.

Azimuth Angle The angle of the line-of-sight vector, projected on the horizontal plane, measured clockwise from north.

Channel Receiver hardware that is required to lock to a satellite, make the range measurements, and collect data from the satellites.

Datum or Mapping Datum A mathematical model of the earth. Many local datums model the earth for a small region, for example: Tokyo datum, Alaska, NAD-27 (North American). Others, WGS-84, for example, model the whole earth.

Differential GPS (DGPS) is the most accurate form of GPS navigation. It overcomes the effects of Selective Availability (SA) and various atmospheric and GPS system errors. DGPS allows for very accurate position and velocity measurements.

DGPS relies on error corrections calculated by a GPS

reference station placed at a precisely known location. The reference station calculates a correction for each GPS satellite signal by comparing its GPS determined position to its known geodetic position.

DGPS requires a communication link to deliver these corrections to compatible GPS receivers in neighboring areas.

Elevation Mask The angle below which a satellite is considered unusable. Scout elevation mask is 5°. The mask prevents Scout from searching for satellites which are obscured by buildings or mountains.

Ephemeris A set of parameters that describes a satellite's orbit very accurately. It is used by the receiver to compute the position of the satellite. This information is broadcast by the satellites.

GDOP, PDOP, TDOP Geometric Dilution of Precision, Position Dilution of Precision, and Time Dilution of Precision. GDOP describes how much an uncertainty in range affects the uncertainty in position. The GDOP depends on where the satellites are, relative to the user. A large GDOP means that a small error in range will translate into a larger error in the position.

GDOP has two components (TDOP and PDOP). TDOP determines the uncertainty in the clock bias; PDOP determines the uncertainty of the position. PDOP is composed of HDOP and VDOP and typically has good values between 2 and 7. See HDOP.

Geoid A three-dimensional surface of constant gravitational potential that closely approximates mean sea level. The geoid is the level of reference for common-

ly used elevations—know as othometric elevations. The shape of the geoid is affected by variations in the earth's gravitational field.

GPS The Global Positioning System, consisting of 24 NAVSTAR satellites in six different orbits, GPS ground-control stations, and the user community.

GPS Time The length of the second is fixed and is determined by primary atomic frequency standards. Leap-seconds are not used as they are in UTC. Therefore, GPS time and UTC differ by a variable whole number of seconds.

HDOP, VDOP The horizontal and vertical components of PDOP. They describe how an uncertainty in range affects the horizontal position (latitude and longitude) and the vertical position (elevation). For 2D position, HDOP is the only important component.

Latitude, Longitude A topocentric, spherical coordinate system, whose coordinates are latitude, longitude, and elevation. Latitude and longitude can be expressed as degrees, minutes, seconds (DMS), or as degrees, decimal minutes (DM).

L1 The primary L-band signal radiated by each NAVSTAR satellite at 1575.42 MHz. The L1 beacon is modulated with the C/A and P codes and with the NAV message. L2 is centered at 1227.60 MHz.

Magnetic North Northerly direction in the earth's magnetic field indicated by the northern seeking pole of the horizontal magnetic needle in a compass.

Monitor Station One of five worldwide stations maintained by the U.S. Dept. of Defense and used in the

GPS control segment to monitor and control satellite clock and orbital parameters. Corrections are calculated and uploaded to each satellite at least once per day.

NAV Data The 1500-bit navigation message broadcast by each satellite at 50 bps on both L1 and L2 beacons. This message contains system time, clock correction parameters, ionospheric delay model parameters, and the space vehicle's ephemeris and health. This information is used to process GPS signals to obtain user position and velocity.

NAD–27 North American Datum of 1927. Technically, only a horizontal datum employing the Clarke 1866 ellipsoid. Height values of this era are expressed in NAVD (National Geodetic Vertical Datum) of 1929.

PDOP See GDOP, PDOP, TDOP.

PPS Precise Positioning Service. The GPS as available to the authorized user with cryptographic hardware and keys.

PRN Pseudo-Random Noise. Each GPS satellite generates its own distinctive PRN code, which is modulated onto each carrier. The PRN code serves as identification of the satellite, as a timing signal, and as a subcarrier for the navigation data.

Pseudorange A measure of the range from the receiver's antenna to the satellite. Pseudorange is obtained by multiplying the speed of light by the apparent transit time of the signal from the satellite. Pseudorange differs from actual range because the satellite and user clocks are offset from GPS time and because of propagation delays and other errors.

RTCM SC-104 is the standard protocol for GPS correction data. It is a binary protocol which can be delivered with different baud rates and data formats.

Radio Data System (RDS) is a European developed standard for transmitting data over Broadcast FM subcarrier. It also provides a medium for the transmission of Differential GPS. A compatible variant of the standard RBDS, has been approved for the United States. At present, there are 200 stations broadcasting RBDS in the United States.

Relative Positioning The process of determining the vector distance between two points and the coordinate of one spot relative to another. This technique yields GPS positions with greater precision than single-point positioning mode.

Rise/Set Time The period during which a satellite is visible, that is, has an elevation angle above the elevation mask. A satellite is said to *rise* when its elevation angle exceeds the mask and *set* when the elevation drops below the mask.

SA Selective Availability. The name of the U.S. Dept. of Defense's policy and the implementation scheme by which unauthorized users of GPS will have their accuracy limited to 100 meters 2DRMS horizontal and 156 meters 2DRMS vertical.

SMPTE (Society of Motion Picture and Television Engineers) time code provides a machine readable address for each picture frame and has a length of 80 bits per frame. Each frame is identified as to hour, minute, second, frame and stores up to 8 digits of user information.

There are currently 6 time codes in use throughout the world. The 25 FPS (Frames per Second) EBU standard is used in Europe and most of Asia, India, Africa and Central and South America, wherever 50 Hz power is standard. The U.S., Canada, Mexico and Japan use the SMPTE standards.

Additional information about time code generation products is available from:

Denecke, Inc., North Hollywood, CA,
Tel (800) 866-3525 or (818) 766-3525.

SPS Standard Positioning Service. The GPS as available to any user with a C/A code receiver.

SV Space Vehicle. GPS satellite.

TDOP See GDOP.

True North Northerly direction with respect to the earth's axis, not to magnetic north.

URA Satellite User Range Accuracy. The URA is sent by the satellite and is computed by the GPS operators. It is a statistical indicator of the contribution of the apparent clock and ephemeris prediction accuracies to the ranging accuracies obtainable with a specific satellite, based on historical data.

USGS The United States Geological Survey, has published over 53,000 of the 7.5 min. quadrangle series maps. These maps cover 50 states at a scale of 1:24,000 and can be purchased by mail or directly from a local USGS office. These 1:24,000 maps indicate detailed information about natural and man-made features and are used extensively by hikers and outdoorsmen as well as architects and engineers.

UTC Coordinated Universal Time, the time standard maintained by the U.S. Naval Observatory. The length of the second is fixed and is determined by primary atomic frequency standards. Since the rate of Earth's rotation (hence the length of the mean solar day) varies, and since it is desirable to maintain UTC approximately the same as Greenwich mean solar time, leap-seconds are inserted in, or deleted from UTC as required.

UTM Universal Transverse Mercator Map Projection The UTM Grid consists of 60 –6° wide N/S zones commencing at the International Date Line and 10–8° wide W/E zones above and below the Equator. Locations are expressed in meters or kilometers of northing or easting. UTM only applicable between 80°S and 84°N.

VDOP See HDOP.

WGS-72 World Geodetic System (1972). A mathematical reference ellipsoid used by the GPS, having a semimajor axis of 6,378.135 km and a flattening of 1/298.26.

WGS-84 World Geodetic System (1984). A mathematical reference ellipsoid used by the GPS, having a semimajor axis of 6,378.137 km and a flattening of 1/298.257223563.

APPENDIX D —**Time Zone Chart**

This time zone chart is used to determine your local time offset. Remember to make adjustments for daylight savings time. Certain areas on the chart may have local offsets not shown here

*APPENDIX E —***Trimble Atlas**

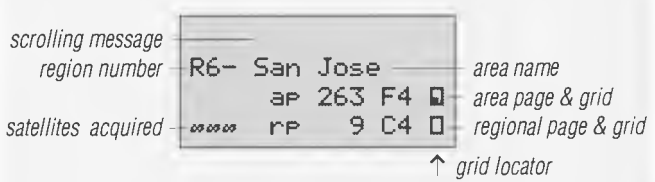
To use the Trimble Atlas

To display your current location

- With LOC highlighted on the INDEX press ◆.
- Press ▲ or ▼ to scroll to `Coordinate style`.
- Press ↵ to access this option.
- Press ▲ or ▼ to scroll to `Trimble atlas`.
- Press ↵ to set this coordinate style.

To display your location

As an example, if you were in Portola Valley, California, Scout would display your location—in *real time*—as follows:



Region 6 corresponds to the region shown on the overall map on page 5 of the Trimble Atlas. A region page number is also shown on each page of the Atlas. The area name refers to the nearest large city. The area page and grid `263 F4` refers to the page number in Region 6. The regional page and grid `9 C4` refers to the page number in Region 6 at a larger scale.

To create a location

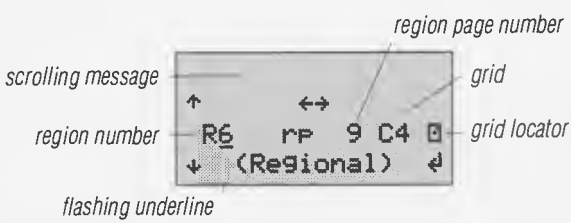
With the coordinate style set to `Trimble Atlas`.

Using the same procedure as `Create Location` in LIB, enter a name,

- Press ↵ to save the name and the following screen appears:

Example No. 1 – Regional page format

- Press ↵ to create the location in region page format. For the example, the following screen appears:



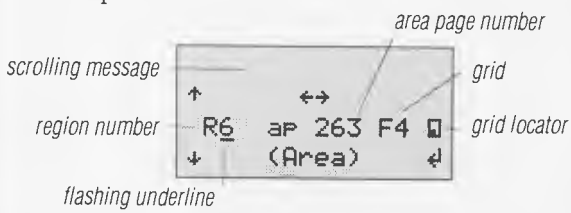
Portola Valley is found on *regional* page 9 of region 6 in the Trimble Atlas, thus,

- Press ▲ or ▼ to scroll to the appropriate region– `6`.
- Press ► and ▲ or ▼ to enter the page number– `9`.
- Press ► and ▲ or ▼ to enter the grid number– `C4`.
- Press ► and then use ▲ to position the grid locator.
- Press ↵ to save this location.

Example No. 2– Area page format

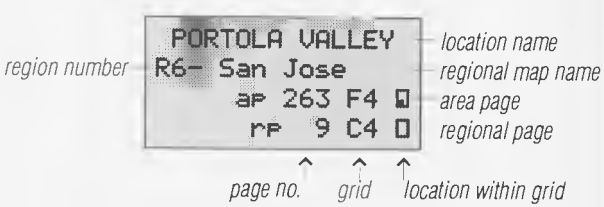
When the page type screen appears

- Press ▲ or ▼ to change page type to `--Area page` and press ↵.



Portola Valley is found on *area* page 263 of region 6 in the Trimble Atlas, thus,

- Press ▲ or ▼ to scroll to the appropriate region– `6`.
- Press ▶ and ▲ or ▼ to enter the page number– `263`.
- Press ▶ and ▲ or ▼ to enter the grid number– `F4`.
- Press ▶ and then use ▲ to position the grid locator.
- Press ↵ to save this location and the following screen appears:



Note: If you create a location in either regional *or* area page format using the Trimble Atlas coordinate style the results are the same. Both regional *and* area locations are calculated and displayed on the same screen.

To use the grid locator

Both the Trimble Atlas and Thomas Bros. Guides are published in a page and grid format. Scout displays a *grid locator icon* that indicates location in a 3 x 3 sub grid. These icons have the following forms:

upper left	upper–center	upper right
left center	center–center	right center
lower left	lower center	lower right

The icons can be adjusted when the flashing underline is under the grid locator icon. Press ▲ to change the locator to the appropriate position.

*APPENDIX F —***Thomas Detail**

Introduction

Thomas Bros. Maps (TBM) has developed a series of "intelligent" maps—The Thomas Guides—using computer technology to improve graphics, accuracy and functionality. This detail mapping system covers the major metropolitan areas of the US and is extended to cover the entire continental USA—at a scale of 1" = 2400 ft.

"Metro" pages are street maps of the major metropolitan areas. These pages are numbered 100 through 1999.

"Universal Detail" pages are arterial maps covering areas outside the metropolitan areas. These pages are numbered 2000 through 9999.

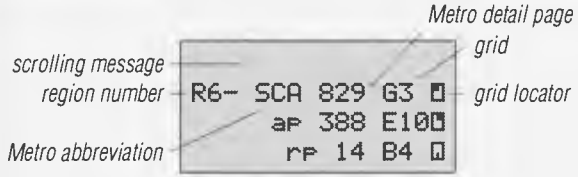
To use the Thomas Guides

To display your current location

- With LOC highlighted on the INDEX press ◆.
- Press ▲ or ▼ to scroll to `Coordinate style`.
- Press ↵ to access this option.
- Press ▲ or ▼ to scroll to `Thomas Detail`.
- Press ↵ to set this coordinate style.

Example No. 1: Metro page format

If you were at the Thomas Bros offices in Southern California, Scout would display your location—in *real time*—in *Metro page* format as follows:



Region 6 corresponds to the region shown on page 5 of the Trimble Atlas. The metro abbreviation SCA refers to the major metropolitan area. The Metro detail page 829 (<2000) refers to the page number in the Los Angeles/ Orange Counties Guide.

Example No. 2: Universal Detail format

If you were at Lake Hughes in Southern California, outside the major metropolitan area, Scout would display your location—in *real time*— in *Universal Detail* page format as follows:

Region 6 corresponds to the region shown on page 5 of the Trimble Atlas. Sub region 4 refers to a further subdivision of California. See pg. A-22. The Universal Detail page 4101 (> 2000) refers to the page number in the Los Angeles/Orange Counties Guide.

Note: No matter where you are in the U.S., Scout displays your location in both Metro and Universal Detail formats even though a Thomas Guide *may not exist* for your area.

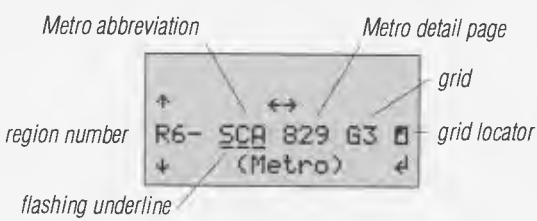
To create a location

With the coordinate style set to `Thomas Detail`, use the same procedure as `Create Location` in LIB, to enter a name.

- Press ↵ to save the name and the following screen appears:

Example No. 1—Metro detail (for a page number < 2000)

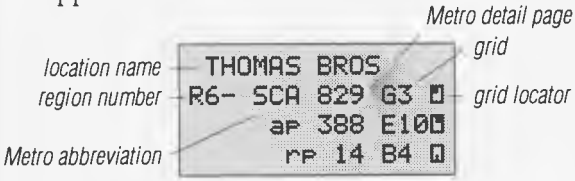
- Press ↵ to create the location of Thomas Bros. offices in *Metro* page format. For the example, the following screen appears:



The Thomas Bros. offices are found in the Los Angeles/ Orange Counties Guide, thus,

- Press ▲ or ▼ to scroll to the Metro abbreviation for the Guide. (See list on pg. A-23.) The corresponding region number changes automatically.
- Press ► and ▲ or ▼ to enter the page number.
- Press ► and ▲ or ▼ to enter the grid number.

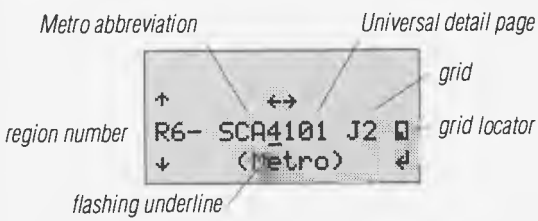
- Press ▶ and then use ▲ to position the grid locator.
- Press ↵ to save this location and the following screen appears:



Note: If a page number > 2000 is entered, the location will be saved in Universal detail format. See Example 2.

Example No. 2—Metro detail (for a page number > 2000)

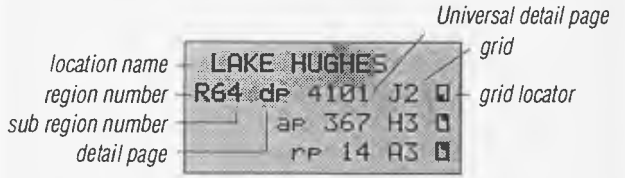
- Press ↵ to create a location of Lake Hughes in Metro page format.. As an example, the following screen appears:



Lake Hughes is found in the Los Angeles/Orange Counties Guide, on page 4101 (> than 2000) thus,

- Press ▲ or ▼ to scroll to the Metro abbreviation for the Guide. (The corresponding region number changes automatically.)
- Press ▶ and ▲ or ▼ to enter the page number.
- Press ▶ and ▲ or ▼ to enter the grid number.

- Press ► and then use ▲ to position the grid locator.
- Press ↵ to save this location. The following appears:

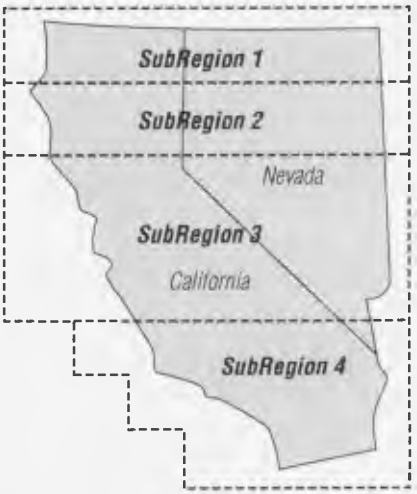


Scout has saved your entry in Universal Detail format because the page number was > 2000 and there is no map in metro detail page that shows Lake Hughes.

Note: As metropolitan areas expand, Thomas Bros. may add Metro detail pages. Scout will not require upgrades to accommodate these additions.

The Thomas Bros. mapping system divides regions into smaller *sub regions*. For example, current Guides for the Western U.S. as designated as follows:

Region 1–PNW–Pacific Northwest



Region 6–PSW—Pacific Southwest

Note: Scout contains the specifications for all planned sub regions of the U.S.

Contact Thomas Bros. Maps for updates.

List of Available Guides

Thomas Guides are available at their retail outlets:

11731 Cowan, Irvine, CA 92714
(714) 863-1984
603 West 7th St., Los Angeles, CA 90017
(213) 627-4018
550 Jackson St., San Francisco, CA 94133
(415) 981-7520
or Call 1-800-899-MAPS.

The Thomas Guides *currently* available are listed below:

Guide	Metro Abbrev.
Washington	
King/Pierce/Snohomish Counties	KPS
Oregon	
Portland	POR
California	
Sacramento	SAC
Solano	NCA
San Luis Obispo	CCA
Santa Barbara	CCA
Ventura	SCA
Los Angeles	SCA
Orange	SCA
San Diego	SCA

APPENDIX G —**USGS Topo Maps**

United States Department of the Interior Geological Survey

Offices for Counter Sales of Topographic Maps

Room 1028
Gen. Services Admin. Bldg.
19th & F Street NW
Washington, DC

1400 Independence Road
Rolla, MO

345 Middlefield Road
Menlo Park, CA

Room 1012—Federal Building
1961 Stout Street
Denver, CO

Room 1C45—Federal Building
1100 Commerce Street
Dallas, TX

Room 504—Custom House
555 Battery Street
San Francisco, CA

Room 8105—Federal Building
125 South State Street
Salt Lake City, UT

Room 1C402—National Center
12201 Sunrise Valley Drive
Reston, VA

Room 678—U.S. Court House
West 920 Riverside Avenue
Spokane, WA

Room 108—Skyline Building
508 Second Avenue
Anchorage, Alaska

Federal Building
101 Twelfth Avenue
Fairbanks, Alaska

Building 41
Federal Center
Denver, CO

1200 South Eads Street
Arlington, VA

Mail Orders for Topographic Maps

For maps east of the Mississippi River, including Minnesota, Puerto Rico, the Virgin Islands of the U.S. and Antarctica:

Branch of Distribution
U.S. Geological Survey
1200 South Eads Street
Arlington, VA 22202

For maps west of the Mississippi River, including Alaska, Hawaii, Louisiana, American Samoa and Guam:

Branch of Distribution
U.S. Geological Survey
Box 25286
Federal Center
Denver, CO 80225

*APPENDIX H—***NMEA-0183** *(v.2.0)*℠

Detail Sentence List

Autopilot Format A

APA,A,A,xte,L,N,V,V,xxx,M,wpt

Field	Description
1, 2	Status Fields A=Valid V=invalid
3, 4, 5	Cross-Track Error; Steer: L=left, R=right; N=nautical miles
6, 7	Arrival Indicator Fields: A=arrival, V=no arrival
8, 9	Bearing from origin to waypoint: M=magnetic
10	Destination waypoint number
11, 12	Bearing from position to waypoint T=true, M=magnetic
13, 14	Heading to Steer T=True, M=magnetic

Autopilot Format B

APB,A,A,xte,L,N,V,V,xxx,T,wpt,xxx,T,xxx,T

Field	Description
1, 2	Status Fields: A=valid, V=invalid
3, 4, 5	Cross-Track Error—Steer: L=left, R=right; N=naut. miles
6, 7	Arrival Indicator Fields: A=arrival, V=no arrival
8, 9	Bearing from Origin to Waypoint; T=true, M=magnetic
10	Destination Waypoint Number
11, 12	Bearing from position to waypoint T=true, M=magnetic
13, 14	Heading to Steer T=true M=magnetic.

Bearing and Distance to Waypoint (Great Circle)

BWC,utc,latitude,N,longitude,W,xxx,T,xxx,M,range,N,wpt

Field	Description
1	Universal Time Coordinated
2, 3	Destination Waypoint Latitude; N=north, S=south
4, 5	Destination Waypoint Longitude; W=west, E=east
6, 7	True Bearing to Destination Waypoint
8, 9	Magnetic Bearing to Destination Waypoint
10, 11	Nautical Miles to Destination Waypoint
12	Destination Waypoint Number

GPS Fix Data (Altitude Output)

GGA,utc,latitude,N,longitude,W,x,x,hdop,xxx,M,xxx,M,xxx,xxx

Field	Description
1	Universal Time Coordinated
2, 3	Latitude; N=north, S=south
4, 5	Longitude; W=west, E=east
6	GPS Quality: 0=no GPS, 1=GPS, 2=diff. GPS
7	Number of Satellites Used
8	Horizontal Dilution of Position (HDOP)
9,10	Antenna Height in Meters
11,12	Geoidal Height in Meters
13	Age of Differential GPS Data
14	Differential Reference Station ID

Latitude and Longitude

GLL,Latitude,N,Longitude,W,utc,A

Field	Description
1, 2	Latitude; N=north, S=south
3, 4	Longitude; W=west, E=east
5	Universal Time Coordinated
6	Status: A=valid, V=invalid

GPS DOP and Active Satellites

GSA,A,3,pm1,pm2,pm3,pm4,pm5,pm6,pm7,pm8,pdop,hdop,vdop

Field	Description
1, 2	Operating Mode: A=automatic, M=manual
3, 4	Positioning Mode: 1=not available,2=2D, 3=3D
5-12	PRN Numbers of Satellites Used in Solution
13	Position Dilution of Precision
14	Horizontal Dilution of Precision
15	Vertical Dilution of Precision

GPS Satellites in View

GSV,x,x,x,pm1,elv1,azm1,snr1.....,pm4,elv4,azm4,snr4

Field	Description
1	Total Number of Messages
2	Message Number
3	Total Number of Satellites in View
4, 5, 6, 7	First Satellite:PRN Number, Elevation; Azimuth; SNR
8, 9,10,11	Second Satellite:PRN Number, Elevation; Azimuth; SNR
12,13,14,15	Third Satellite: PRN Number; Elevation; Azimuth; SNR
16,17,18,19	Forth Satellite: PRN Number; Elevation; Azimuth; SNR

Recommended Navigation Information

RMB,A,xte,L,wpt,wpt,Latitude,N,Longitude,W,xxx,xxx,xxx,A

Field	Description
1	Status: A=valid, V=invalid
2, 3	Cross-Track Error in Nautical Miles; Steer: L=left, R=right
4	Origin Waypoint Number
5	Destination Waypoint Number
6, 7	Destination Latitude; N=north,S=south

Recommended Specific GPS Data

RMC,utc,A,Latitude,N,Longitude,W,xxx,xxx,date,xxx,E

Field	Description
1	Universal Time Coordinated
2	Status: A=valid, V=invalid
3, 4	Latitude; N=north, S=south
5, 6	Longitude; W=west, E=east
7	Speed Over Ground in Knots
8	True Course Over Ground
9	Date
10, 11	Magnetic Variation; E=east,W=west

Actual Track and Ground Speed

VTG,xxx,T,xxx,M,xxx,N,xxx,K

Field	Description
1, 2	True Course Over Ground
3, 4	Magnetic Course Over Ground
5, 6	Speed Over Ground in Knots
7, 8	Speed Over Ground in Kms per hr.

Waypoint Closure Velocity

WCV,xxx,N,wpt

Field	Description
1, 2	Velocity Component in Knots
3	Destination Waypoint Number

Cross-Track Error

XTE,A,A,xte,L,N

Field	Description
1, 2	Status Fields: A=valid, V=invalid
3, 4, 5	Cross-Track Error; Steer: L=left, R=right, N=nautical miles
16, 17, 18, 19	Fourth Satellite:PRN Number; Elevation; Azimuth; SNR

UTC and Time to Destination Waypoint

ZTC,ute,ttg,wpt

Field	Description
1	Universal Time Coordinated
2	Time to Go (hhmmss.ss)
3	Destination Waypoint Number

APPENDIX I—**SMPTE SYNC**℠

ScoutMaster is compatible with time code products designed to function specifically with Society of Motion Picture Television Engineers (SMPTE) and European Broadcast Union (EBU) time code for both film and video production.

ScoutMaster provides Universal Time Coordinate (UTC) time and date outputs once per second to "jam sync" a time code generator.

ScoutMaster features a unique ASCII (RS-232) output timing sentence—SMPTE SYNC. The sentence is configured at 1200 baud, 8-None-1. The sentence is synchronized to UTC within 1-2 milliseconds (typical).

```
UTC    10:35:19    03/16/95
UTC    10:35:20    03/16/95
UTC    10:35:21    03/16/95
UTC    10:35:22    03/16/95
UTC    10:35:23    03/16/95
UTC    10:35:24    03/16/95
UTC    10:35:25    03/16/95
```

SMPTE SYNC output

After acquiring an initial position, ScoutMaster is ready for synchronization applications—outdoors or indoors.

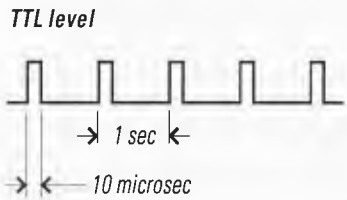
Before attaching Scoutmaster to any equipment indoors, you must first acquire a position outdoors and leave ScoutMaster ON as you move inside.

Note: Local time output can be set by Time Adjustment setting. See SETUP–Time Adjustment.

*APPENDIX J—***MasterClock™**

MasterClock features a timing pulse (TTL level)—once every second—within 1 microsecond per second.

In order to recognize the time associated with the pulse, set ScoutMaster MasterClock to output SMPTE SYNC (See SETUP–Select Output). The SMPTE SYNC sentence will follow the pulse.



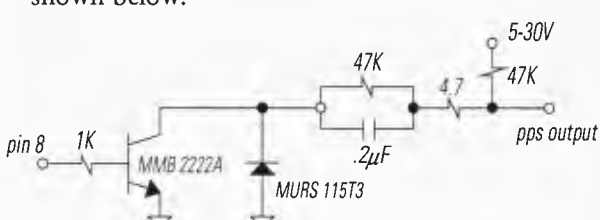
UTC	10:35:19	03/16/95
UTC	10:35:20	03/16/95
UTC	10:35:21	03/16/95
UTC	10:35:22	03/16/95
UTC	10:35:23	03/16/95
UTC	10:35:24	03/16/95
UTC	10:35:25	03/16/95

SMPTE SYNC output

Note: Local time output can be set by Time Adjustment setting. (See SETUP—Time Adjustment).

Specifications:

- *One pps interface:* TTL on Pin 8
- *Timing pulse:* Ten microsecond wide pulse with the leading edge synchronized to UTC ±1 microsecond. Care should be taken when interfacing with external circuitry. A recommended buffer/inverter circuit is shown below:



APPENDIX K—SMLTU℠
ScoutMaster Library Transfer Utility

(See Software License Agreement at the end of this Appendix.)

ScoutMaster and ScoutMaster Library Utility (SMLTU) provide the ability to upload location data from a computer to ScoutMaster or download data collected in the field from ScoutMaster to a computer.

- SMLTU is available for DOS or Macintosh (MAC) operating systems. SMLTU for DOS is included in ScoutMaster, P/N 17737-05. SMLTU for MAC is included in ScoutMaster, P/N 17737-08.
- Data I/O cables for DOS (P/N 22417) or MAC (P/N 25415) computers are provided separately.

  These items can be ordered from your authorized Trimble dealer or directly from Trimble for $25.00 (800-959-9567).

SMLTU will download library locations in a comma-delimited format in the datum selected. Files are easily exported to spreadsheets programs such as Lotus 123 or Microsoft Excel.

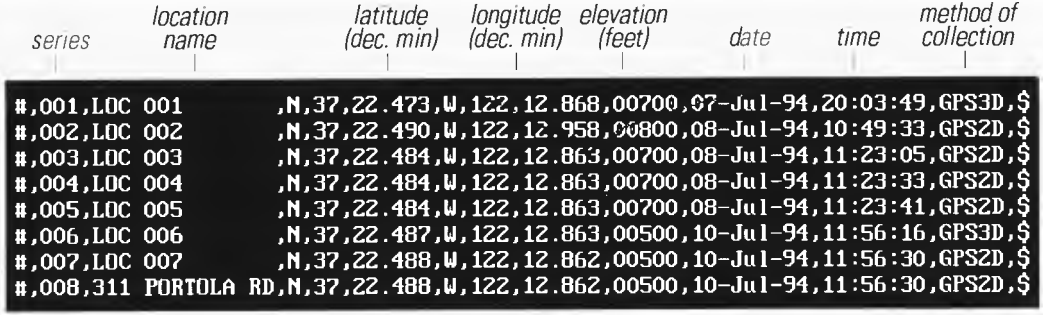
- SMLTU downloads the following fields for each location:

  prefix character (#), location number (001), 14 character location name, latitude/longitude (deg. & decimal min.) or UTM coordinates, elevation (feet), date and time (local UTC, 24 hour clock) and method of collection (MANUAL, GPS2D, GPS3D, DGPS2D, DGPS3D or Acu-Lock), suffix character ($)

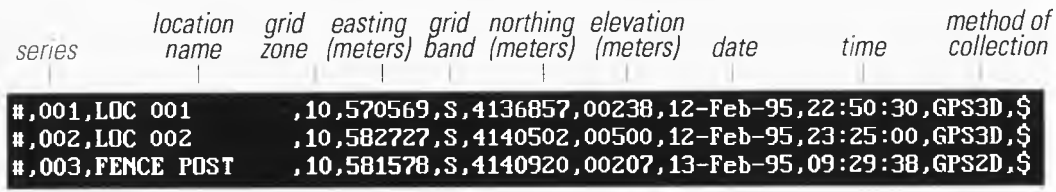
See sample file formats on page A-35.

Note the following features:

- SMLTU supports all 123 ScoutMaster datums.
- When UTM coordinates are selected, elevations are downloaded in meters. To upload a UTM file, the elevation field *must* be in meters.
- Duplicate location names are not checked. Before uploading, it is recommended to *erase* ScoutMaster's library. If your locations are important, download the library first.
- A maximum of 250 locations can be uploaded.
- Special characters can be used: **> . ; & @ / -**
- SMLTU downloads the Library in alphanumeric order.
- ScoutMaster Format (SMF) must be followed in order to upload location file. See example of SMF file format on the next page.
- Long location names will be truncated to the first 14 characters when uploaded.
- Locations uploaded to ScoutMaster are labeled MANUAL as the method of collection.
- *Both* Latitude/Longitude or UTM coordinates can be download to a single file. Uploaded files *must* contain only *one* coordinate style i.e., a file containing Latitude/Longitude and UTM coordinates *cannot* be uploaded to ScoutMaster.
- Multiple libraries may be downloaded to a single file. Newly downloaded locations will append the original file. The numbering sequence will begin



Example of ScoutMaster (SMF) File –Latitude/Longitude format



Example of ScoutMaster (SMF) File –UTM format

again with 001.

SMLTU Operation

The steps below assume the SMLTU application has been loaded and placed in a new directory or folder called "SMASTER"—and, field data is to be *downloaded* from ScoutMaster to a computer file named "TEST" using Latitude/Longitude coordinates in North American Datum 1927 (NAD27).

STEP 1 Configure ScoutMaster's Dataport to Download or Upload with SMLTU.

- With SETUP highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to `Set Dataport?`
- Press ↵ to access the Dataport Options.
- Press ▲ or ▼ to scroll to `Reset Defaults?`
- Press ↵ to access the Default options.
- Press ▲ or ▼ to scroll to `Trimble?`
- Press ◆ to cancel the change,

  or
- Press ↵ to configure the Dataport for SMLTU.

Step 2) Turn ScoutMaster's Dataport ON:

- With SETUP highlighted on the INDEX screen, press ◆.
- Press ▲ or ▼ to scroll to `Set Dataport?`
- Press ↵ to access the Dataport Options.
- Press ▲ or ▼ to scroll to `Dataport ON?`
- Press ◆ to cancel the change,

or

- Press ↵ to turn Dataport ON or OFF.

Note: To quickly turn Dataport ON or OFF, press and hold the Power key followed by ↵.

STEP 3 Connect data I/O cable from ScoutMaster to the Computer's serial communication port.

*STEP 4 From C:\> Type "**SMLTU**" and view the following:*

```
Scout Master Library Transfer Utility
Trimble Navigation Ltd. <Rev 1.03 03/21/95 tb>
  (No command line parameters)
--Upload to or Download [default] from Scout Master (U,D or Q to quit)?
```

*STEP 5 Type "**D**" to Download a complete Library from ScoutMaster to a computer.*

- Type "U" to Upload an complete file from a computer to ScoutMaster.
- Type "Q" to Quit Scout Master Library Transfer Utility
- Hit the ENTER key to select the default option (DOWNLOAD) and view the following:

```
--Position lib filename?
```

STEP 6 Type in the complete file name.

- Enter the name of a new or existing file to download to or an existing file to upload from to ScoutMaster.
- Name the file "**TEST**" and view the following:

```
--Use COM1 [default] or COM2 (1,2 or Q to quit)?
```

STEP 7 Select the appropriate serial communication port.

- Type "1" for COMM1 and "2" for COMM2.
- Hit the ENTER key to select the default option, COM1, and view the following:

```
--Enter datum number [default = 0, NAD27] (0 - 123, ? to list or Q to quit)? _
```

STEP 8 Type the appropriate datum number.

- Refer to the list below for each Datum and it's corresponding number. To view the complete list, type "?". (See Datum list at the end of this section.)
- Hit the ENTER key to select the default option, North American 1927, and view the following:

```
--Use Lat/lon [default] or UTM format (L,U or Q to quit)? _
```

*STEP 9 Type either "**L**" (Lat/Lon) or "**U**" (UTM) coordinates*

- Hit the ENTER key to select Lat/Lon—the default option—and view the following:

```
--Datum in use: North American 1927 mean value (CONUS)
--Opening file... _
```

ScoutMaster will download its complete library to a file named "TEST" in the "SMASTER" directory.

STEP 10 To view the downloaded information, use the DOS command "Type".

- From C:\> Type "**TYPE TEST**" and view your file displayed in the format described on page 31.

Note: Five additional library databases in comma-delimited format are enclosed with SMLTU.

USA_CITY	Selected United States Cities
USA_CAP	United States Capitals Cities
AIRPORTS	Selected United States Airports
W_CAP	World Capital Cities
W_CITY	Selected World Cities

List of Datums

0: North American 1927 mean value (CONUS)
1: WGS-84 (World)
2: Adindan (N.Africa)
3: AFG (Somalia)
4: Ain El Abd 1970
5: Alaska <NAS-D>
6: Alaska/Canada NAD27
7: Anna 1 Astro 1965
8: ARC-1950 mean value
9: ARC-1960 mean value
10: Ascension Island 1958
11: Astro Beacon E
12: Astro B4 Sor.Atoll
13: Astro Pos 71/4
14: Astronomic Station 1952
15: Australian Geodetic 1966
16: Australian Geodetic 1984
17: Bahamas (NAD-27)
18: Bellevue (IGN)
19: Bermuda 1957
20: Bogota Observatory
21: Bukit Rimpah
22: Camp Area Astro
23: Campo Inchauspe
24: Canada Mean Value (NAD27) <NAS-E>
25: Canal Zone (NAD27)
26: Canton Island 1966
27: Cape (S.Africa)
28: Cape Canaveral mean value
29: Caribbean (NAD27)
30: Carthage (Tunisia)
31: Central America (NAD27)
32: Chatham 1971
33: Chua Astro (Paraguay)
34: Corrego Alegre
35: Corrego Alegre (Provisional)
36: Cuba (NAD27)
37: Cyprus
38: Djakarta (Batavia)
39: DOS 1968 (Gizo Island)
40: Easter Island 1967
41: Egypt <EUR-F>
42: European 1950 mean value
43: European 1950
44: European 1979 mean value
45: Finnish Nautical Chart
46: Gandajika Base
47: Geodetic Datum 1949
48: Ghana (Africa)
49: Ordnance Survey Of Great Britain '36
50: Greenland (NAD27)
51: Guam 1963
52: Gunung Segara (S.E.Borneo)
53: Gunung Serindung 1962
54: GUX 1 Astro (Guadalcanal Is.)
55: Herat North
56: Hjorsey 1955
57: Hong Kong 1963
58: Hu-Tzu-Shan (Taiwan)
59: Indian <IND-M>
60: Iran <EUR-H>
61: Ireland 1965
62: ISTS O73 Astro 1969
63: Johnston Island 1961
64: Kandawala
65: Kerguelen Island
66: Kertau'48 (Malayan Rev'd Triangulation)
67: La Reunion (Mascarene Island)
68: L.C. 5 Astro (Cayman Brac Is.)
69: Liberia 1964
70: Luzon (Philippines)
71: Mahe 1971 (Seychelles)
72: Marco Astro
73: Masirah Island (NAHRWAN)
74: Massawa (Eritrea)
75: Merchich (Morocco)
76: Mexico (NAD27)
77: Midway Astro 1961
78: Mindanao (Luzon)
79: Minna (Nigeria)

80: Montjong Lowe (Celebes Is.)
81: Nahrwan (Saudi Arabia)
82: Namibia (Africa)
83: Naparima, BWI
84: North American 83 (NAD83)
85: Observatorio 1966
86: Old Egyptian
87: Old Hawaiian, mean value
88: Old Hawaiian, Maui
89: Old Hawaiian, Oahu
90: Old Hawaiian, Kauai
91: Oman <FAH>
92: Pico De Las Nieves
93: Pitcairn Astro 1967
94: Puerto Rico
95: Quatar National
96: Qornoq (South Kalaallit Nunaat)
97: Rome 1940
98: SAD-69,Brazil (IBGE)
99: Santa Braz (Azores)
100: Santo (DOS) (New Hebrides)
101: Sapper Hill 1943
102: Schwarzeck (Nambia)
103: Sicily <EUR-J>
104: Sierra Leone 1960
105: Provisional South American 1956 mean value
106: South America 1969 mean value
107: South Asia (Singapore)
108: Provisional South Chilean 1963
109: S.E.Asia (Indian)
110: Southeast Base
111: Southwest Base
112: Tananarive Observatory 1925
113: Thai/Viet <IND-A> (Indian)
114: Timbalai 1948
115: Tokyo, mean value
116: Tristan Astro 1968
117: United Arab Emirates (Nahrwan)
118: Viti Levu 1916 (Fiji)
119: Voirol (Algeria and Tunisia)
120: Wake-Eniwetok 1960
121: WGS-72 (World
122: Yacare (Uruguay
123: Zanderij (Suriname)

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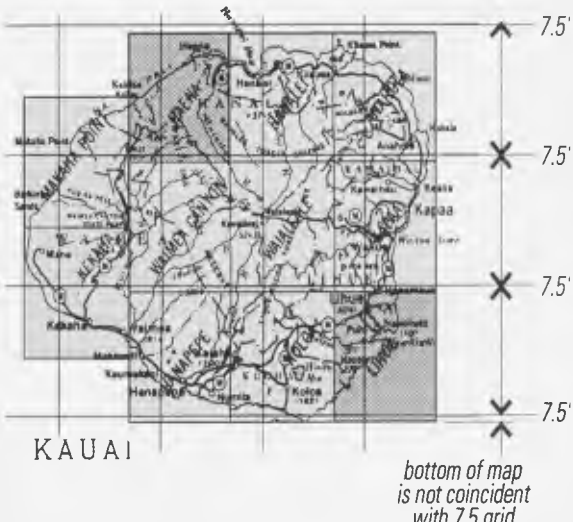
APPENDIX L—**USGS TOPO Format**

ScoutMaster's USGS TOPO map database is based upon the standard 7.5 min. quad format and grid divisions of 2.5 mins.

The coordinates of these grids are automatically used as "southeast reference" points when the USGS TOPO feature is in use.

Certain USGS maps *are not* compatible with the USGS TOPO data base because they do not coincide with 2.5m grids. An example of this irregularity is shown on the map of the island of Kauai below.



In such cases, use the Over & Up method to determine your location rather than using the USGS TOPO feature. See Over & Up–pg. 8-8.

BYTESYZE STUDIO

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