

Group 6 ES Training:

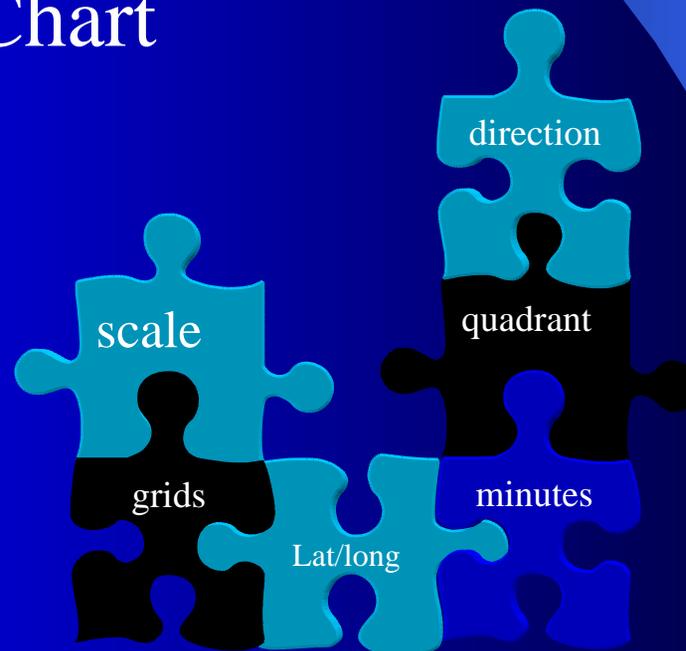
SECTIONAL CHARTS AND GRIDDING

Overview

Getting to know the Grid System

What is “Gridding”

Using a Sectional or Chart



Getting Started

- Sectionals you may use in our area of operation:
 - *Chart Identifier/ North Grid Limit / South Grid Limit / West Grid Limit/ East Grid Limit*
 - Los Angeles **LAX 36-00N 32-00N 121-30W 115-00W**
 - San Francisco **SFO 40-00N 36-00N 125-00W 118-00W**
 - Las Vegas **LAS 40-00N 35-45N 118-00W 111-00W**
 - Phoenix **PHX 35-45N 31-15N 116-00W 109-00W**

Grid System:

The Conventional Grid System remains one of Civil Air Patrol's lasting contributions to Search and Rescue. The CAP (Conventional) Grid system was originally developed in the 1960s (?) by CAP members in Washington State. It was soon adopted nationwide.

The basic premise of the Conventional Grid system is to divide the United States into 15-minute by 15-minute quadrangle grids. In the old conventional grid system, these grids are numerically labeled sequentially on each sectional chart. Where there is overlap, one sectional map is designated the primary. In the new Cell Grid system, a grid is identified by the latitude longitude coordinate of the southeast corner, and then can be divided up into "A" through "D".

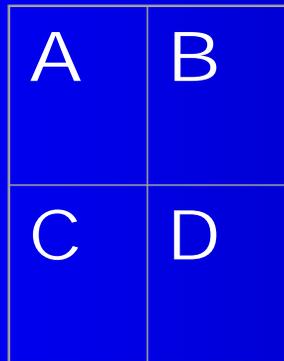
What is a Grid?:

A grid is nothing more than a coordinate system of boxes. Latitude / longitude or UTM (Universal Transverse Mercator) coordinates are grid systems with which many people may be familiar.

The grid system uses latitude and longitude as a basis for establishing an area called a "quad." "Quad" is short for "quadrangle." This basically is just a rectangle shaped area bounded by lines of latitude and longitude. In fact, a grid is just a standard sized quad.

The basic areas that we use in CAP are the 15 minute quad and the 7.5 minute quad. The 15 minute quad extends 15 minutes of latitude and 15 minutes of longitude. The 7.5 quad is similar. You might notice that 7.5 is half of 15. This allows for four 7.5 minute quads to fit within one 15 minute quad. Typically in CAP we call these quads "grids."

Each 15 minute grid is approximately 225 square (statute) miles of area. Because the difficulty of searching an area this large depends greatly upon the terrain and techniques involved, each 15 minute grid is often subdivided into four manageable sections, 7.5 minutes on each side. These sections are labeled, from left to right and top to bottom: A, B, C, D



Coincidentally, a 7.5 minute quad is the exact same size as a 1:24,000 scale USGS map. While it is certainly not the only kind, this type of map is often referred to as a "topographic" map which we have previously discussed. The 7.5 minute quadrangle is generally the highest scale and shows the most detail for most areas of the country. As such, the 1:24k 7.5' quad is usually the best available for ground teams. If you wish to have this level of detail in mapping, you will need to do significant research ahead of an incident to determine what USGS 7.5' quadrangles cover your areas of interest. There are several mapping programs (such as the National Geographic "TOPO!" program)

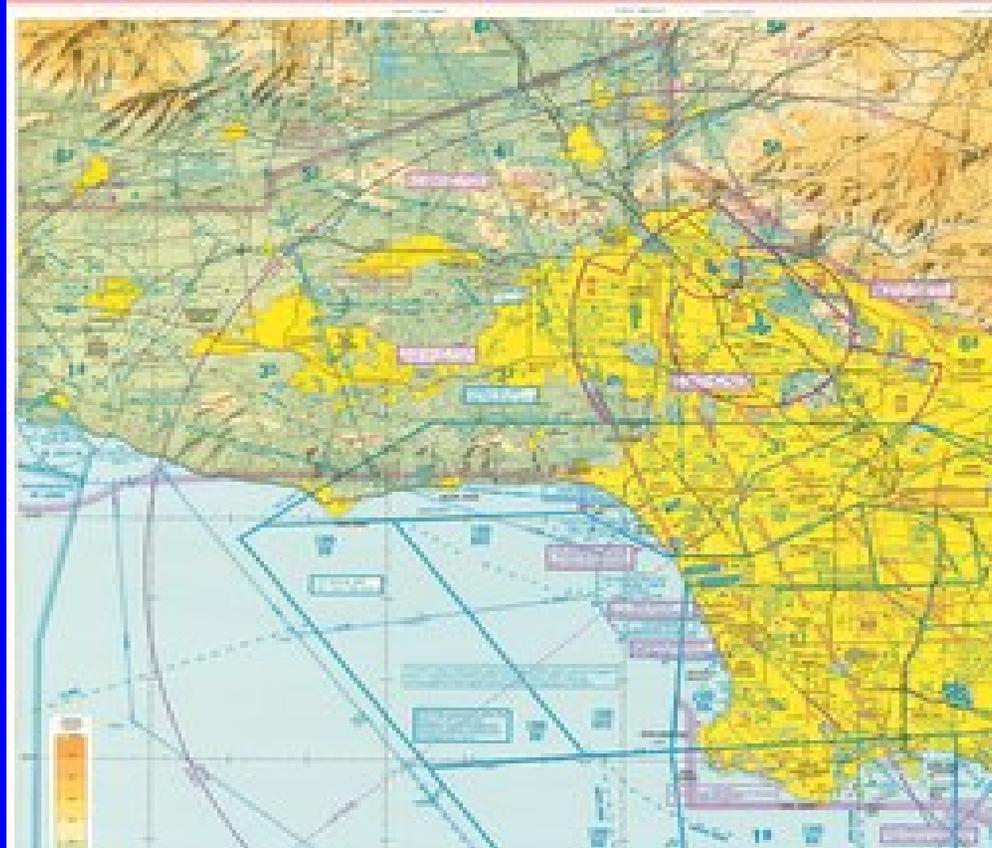
Sectional Charts are like aviation maps. Pilots use these maps in flight planning

A sectional chart provides detailed information on topographical features that are important to aviators, such as terrain elevations, ground features easily identifiable from altitude (rivers, dams, bridges, large buildings, etc.), and ground features useful to pilots (airports, beacons, distinctive landmarks, etc.). The chart also provides information on airspace classes ground-based navigation aids, radio frequencies, longitude and latitude, navigation waypoints, navigation routes. Sectional Charts are in 1:500,000 scale. The Federal Aviation Administration in the United States provides a series of over 50 charts covering the continental United States, Alaska and Hawaii. A number of commercial enterprises, notably Jeppesen, produce compatible, certified Sectionals.

U.S. Terminal Areas



Smaller section of LAX Sectional



How do I grid a sectional chart?

It is a fairly easy but time consuming task. Due to the conical projection (the world is not flat) of a sectional chart, the lines of longitude are straight but latitude lines are slightly curved. It is possible to take a flexible yardstick and use a long piece of tape to match the latitude curve, thus facilitating easy drawing of lines. Every degree of latitude and longitude will yield 16 grids, or four lines per 1 degree by 1 degree square (technically, "quadrangle"). The 30 minute lines are already drawn, so the only additional lines necessary are those at the 15 minute marks. These are the difficult ones to draw and may require the yardstick technique listed above. Use of a highlighter is recommended.

THE FOLLOWING IS INFORMATION EXTRACTED FROM JOINT PUBLICATION 3-50.1, NATIONAL SEARCH AND RESCUE MANUAL (VOLUME II)

A. The standard sectional aeronautical chart and the following grid identifications system is used by CAP when coordinating missions with the AFRCC and other agencies. CAP does not preclude the use of local procedures where they are deemed necessary or more practicable. Many missions are "local" in nature, and local procedures may be highly efficient and effective in the management of SAR resources within a defined geographical boundary.

B. Standardized Sectional Aeronautical Chart Grid and Identification System

1. The Sectional Aeronautical Chart (scale: 1-500,000) is divided into 30 minute intervals. Consider both the north and south sides of a sectional chart as one unit. Identify the northern and southern most latitude limits, and the western and eastern most longitude limits from the grid table. The rectangular area thus formed is the area to be gridded. Line off each 15 minutes of latitude and longitude within this area. Start with the first full 15 minute quadrangle in the northwest corner of the chart as number one (1) and number in sequence from west to east. Continue in this manner until reaching the southeast corner of the gridded area which serves as the last full 15 minute quadrangle.

2. The basic 15 minute quadrangle (grid) is further broken down into quarter sections. The northwest quarter is labeled "A"; the northeast "B"; the southwest "C"; and the southeast "D". This breakdown is used when concentrated search is required and as a means of identifying 7 1/2 minute quadrangles, they need not be annotated on the charts but should be understood to exist and used in mission assignment and reporting.

3. Where charts overlap (the same grid is located on two or more charts) the grids on all charts will be assigned the number and identifier of the primary chart (the most westerly chart will be designated as the primary chart). Consider the Kansas City and St. Louis charts as an example. The Kansas City chart will be numbered in accordance with paragraph B.1. above; that portion of the St. Louis that is overlapped by the Kansas City chart will be labeled with the number identical to the same grid on the Kansas City chart preceded by the letters "MKC" to identify the origin of the grid numbers. The normal sequential numbers on the overlap area that are displaced by the primary chart will simply be omitted for use.

- a. The Los Angeles chart has a 15 minute latitude overlap on the Las Vegas chart within the area defined by 36-00N to 35-45N, and 118-00W. (Total of 12 grids)
- b. The Los Angeles chart has one (1) degree longitude overlap on the Phoenix chart within the area defined by 35-45N to 32-00N, and 116-00W to 115-00W. (Total of 60 grids)
- c. The Denver chart has a 15 minute latitude overlap on the Albuquerque chart within the area defined by 36-00N to 35-45N, and 109-00W to 104-00W. (Total of 12 grids)
- d. The Kansas City chart has one (1) degree longitude overlap on the St. Louis chart within the area defined by 40-00N to 36-00N, and 91-00W. (Total of 64 grids)
- e. The St. Louis chart has one (1) degree longitude overlap on the Cincinnati chart within the area defined by 40-00N to 36-00N, and 85-00W to 84-00W (Total of 64 grids)
- f. The Cincinnati chart has one (1) degree longitude overlap on the Washington chart within the area defined by 40-00N to 36-00N, and 79-00W to 78-00W. (Total of 64 grids)

On charts with inserts over oceanic areas, number consecutively through the insert just as would be accomplished were the insert not published.

Using this system allows CAP personnel to easily designate areas for search. For example, an operations director could say, "I would like Los Angeles (Sectional designator LAX) Grid #### searched." The IC may further request the search method he or she desires in that grid, and may further restrict the search to a smaller area (e.g., LAX ####A). A tasking such as this positively identifies the region to be searched to anyone using the CAP grid system.

More than one aircrew could be designated to search in the designated area of operation, this helps to eliminate flight safety hazards and close coordination of search assets. Time entry and departure of the grid is calculated and coordinated with Air Ops and Ground Team personnel.

Where to find charts

- Local airport FBO's or flight instructors.
- Online information <http://skyvector.com/>
- Charts expire every 6 months, check for throw aways, only if you use for ground ops. Air ops do need current charts for navigation purposes.