

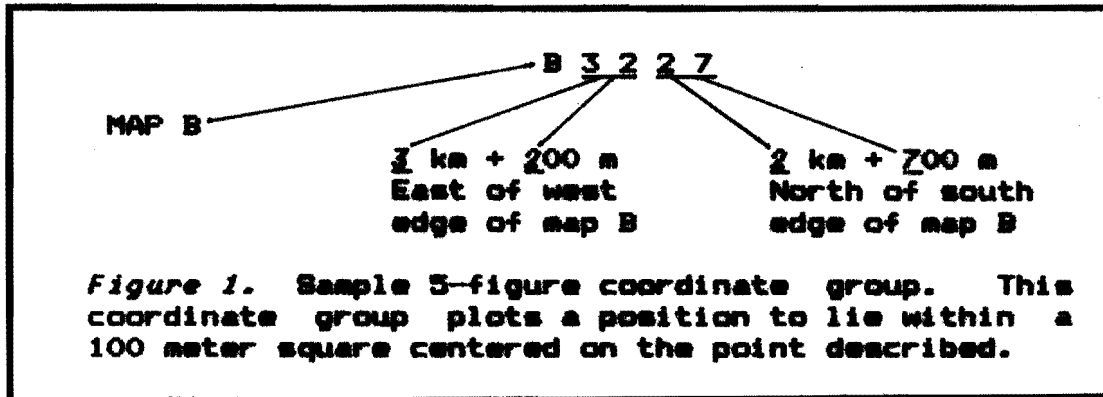
THE ASRC GRID SYSTEM

In order to assure accurate, unambiguous and efficient reporting of positions in the field, the ASRC uses a grid coordinate system similar to that employed by the U.S. Army. Since gridded maps are unavailable in large quantities to the ASRC, gridded photocopies of a single original map are used. An 8-1/2"x11" acetate overlay with a coordinate grid drawn or photographed on it is placed on the original during photocopying so that all the copies carry identical grids. Since the use of photocopy maps is the norm, this step poses little inconvenience to the person procuring maps. Using the grid system, a position report accurate to within 70 meters may unambiguously be made with only five figures, and a position report accurate to seven meters may be made using seven figures. Although the system is designed for use with maps at a scale of 1:24000 (e.g. the USGS 7.5' topographic quadrangles), it may be used effectively with any kind of map.

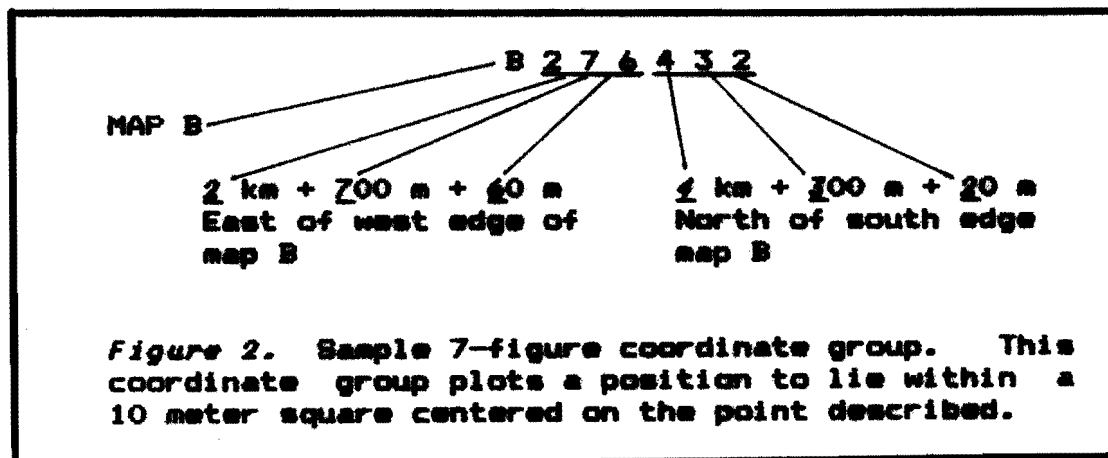
A sample gridded map is attached. The hachures on the borders are spaced 500 meters apart and labeled every kilometer. The hachures on the map itself are spaced one kilometer apart. Note that the origin of the grid is always in the southwest corner of the map. The overlay is reversible to get the long axis of the sheet north-south or east-west, whichever is more appropriate. On the left margin is a box containing the name of the map, which is a letter designating which run of photocopying from which the map was taken. All maps with the same letter designator are thereby assured of having the same grid. The declination is given in the box below the letter designator. When the copies are made, the overlay is best placed so that grid north and true north are identical, but this is not absolutely essential. In any event, the deviation between grid north and magnetic north must be checked for each run of photocopying and noted on each sheet.

Above the name block is a conversion table from meters on the ground to millimeters on the map. This table is calculated for a map with a scale of 1:24000. Photocopy machines generally enlarge slightly (usually less than 1%), so the table will not precisely match the photocopy map, but it will be close enough for all practical work. No attempt is made to correct for this enlargement because different machines may enlarge to a different degree, and the correction is negligible over 500 meters anyway. The purpose of the scale is to allow more precise plotting than can be done by eye, although the grid can be interpolated by eye to within 100 meters quite accurately.

A position report has three parts comprising a total of either five or seven figures. A five figure coordinate group plots a position to lie within a 100 meter square and a seven figure group plots the position to lie inside a 10 meter square. Figure 1 illustrates an example plotted on the attached map.



It should be noted that any position within the 100 meter square will be described by the coordinate group B3227. Consequently the maximum error will be 70 meters. To specify the position to within a 10 meter square (which is only 0.42 x 0.42 mm on the map!), the coordinates can be taken to seven figures as shown in figure 2.



To keep the order of the figures correct, remember the mnemonic "read right up"; alternatively, one may view the coordinates as Cartesian X-Y coordinates, where the X coordinate customarily comes first: (X,Y). Five figure coordinates are accurate enough for almost all field work.

A typical radio position report might go like this:

**TEAM CHARLIE, THIS IS BASE.
BASE, THIS IS TEAM CHARLIE. GO AHEAD.
WHAT IS YOUR LOCATION? OVER.
STAND BY. (FTL Charlie consults his map and compass.)
BASE, THIS IS TEAM CHARLIE. OUR LOCATION IS, FIGURES, BRAVO.**

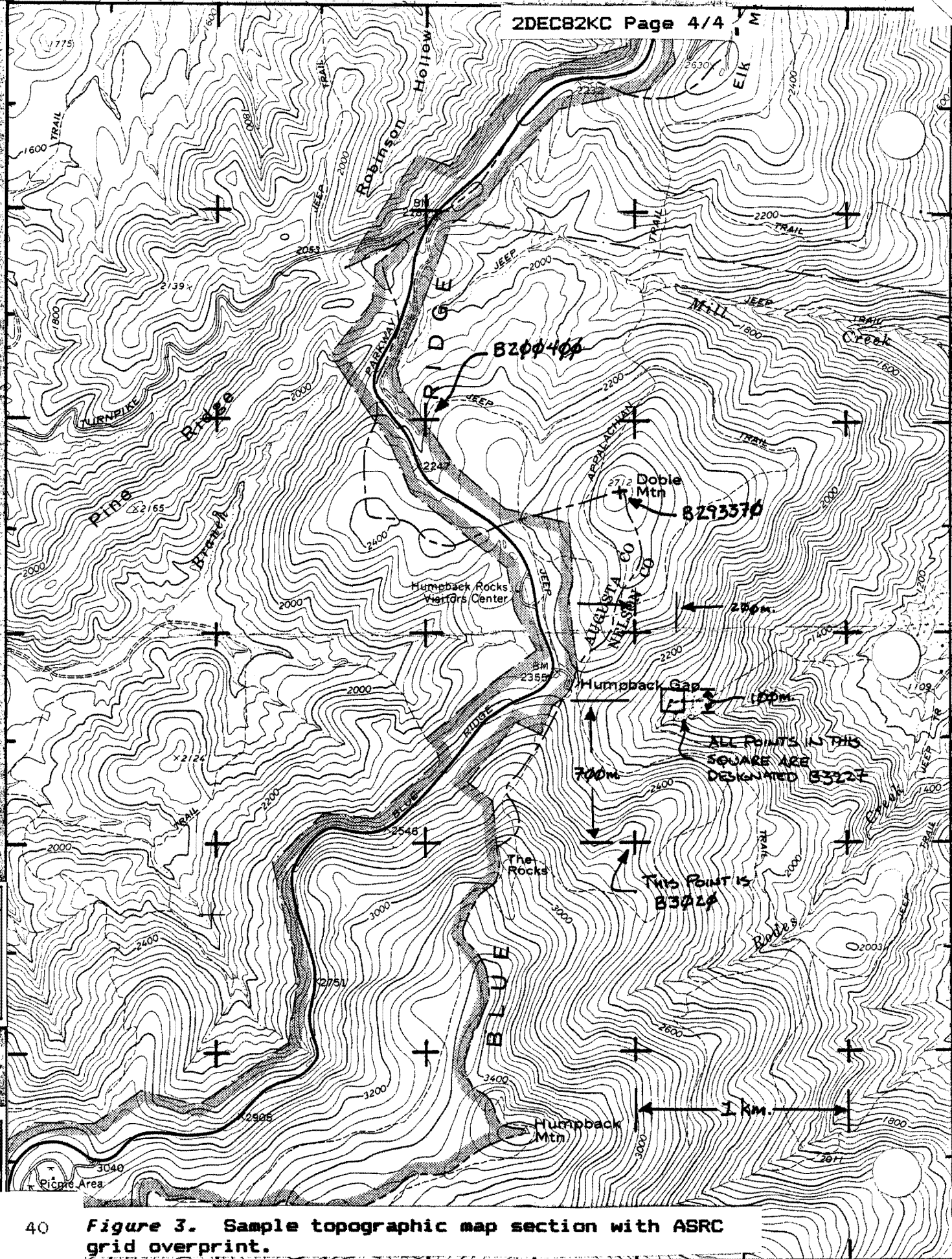
**THREE, TWO, TWO, SEVEN. OVER.
ROGER. BASE CLEAR.
TEAM CHARLIE CLEAR.**

When 7.5' quads are not available, the grid may still be superimposed on any map and used to plot and report positions, but the grid squares will not be one kilometer wide. Some search and rescue agencies, particularly military ones, use the Military Grid Reference System (MGRS), which employs the metric Universal Transverse Mercator (UTM) grid. Most local quads do not have a UTM/MGRS overprint, but their borders do have blue UTM tick marks each kilometer (1000 meters), with the MGRS coordinate: meters north of the equator or east of the MGRS reference. It is possible to align an ASRC grid overlay on a 7.5 minute quad so that the ASRC grid is in register with the UTM grid, using these blue UTM ticks. It is important to note, however, that the UTM/MGRS north coincides neither with the true north of the map edge grid nor with magnetic north. If a map is photocopied with the ASRC grid in register with the UTM grid, the declination specified on the photocopied map should be that from UTM grid north to magnetic north. This is easily calculated (in the ASRC geographic area) by adding the UTM declination and the magnetic declination, since they are of opposite direction. Both UTM and magnetic declination are specified at the bottom of each USGS quadrangle map.

APPALACHIAN SEARCH AND RESCUE
CONFERENCE GRID OVERLAY

m	mm
100	4.2
200	8.3
300	12.5
400	16.7
500	20.8

MAP
BRAVO
DECL
5°W

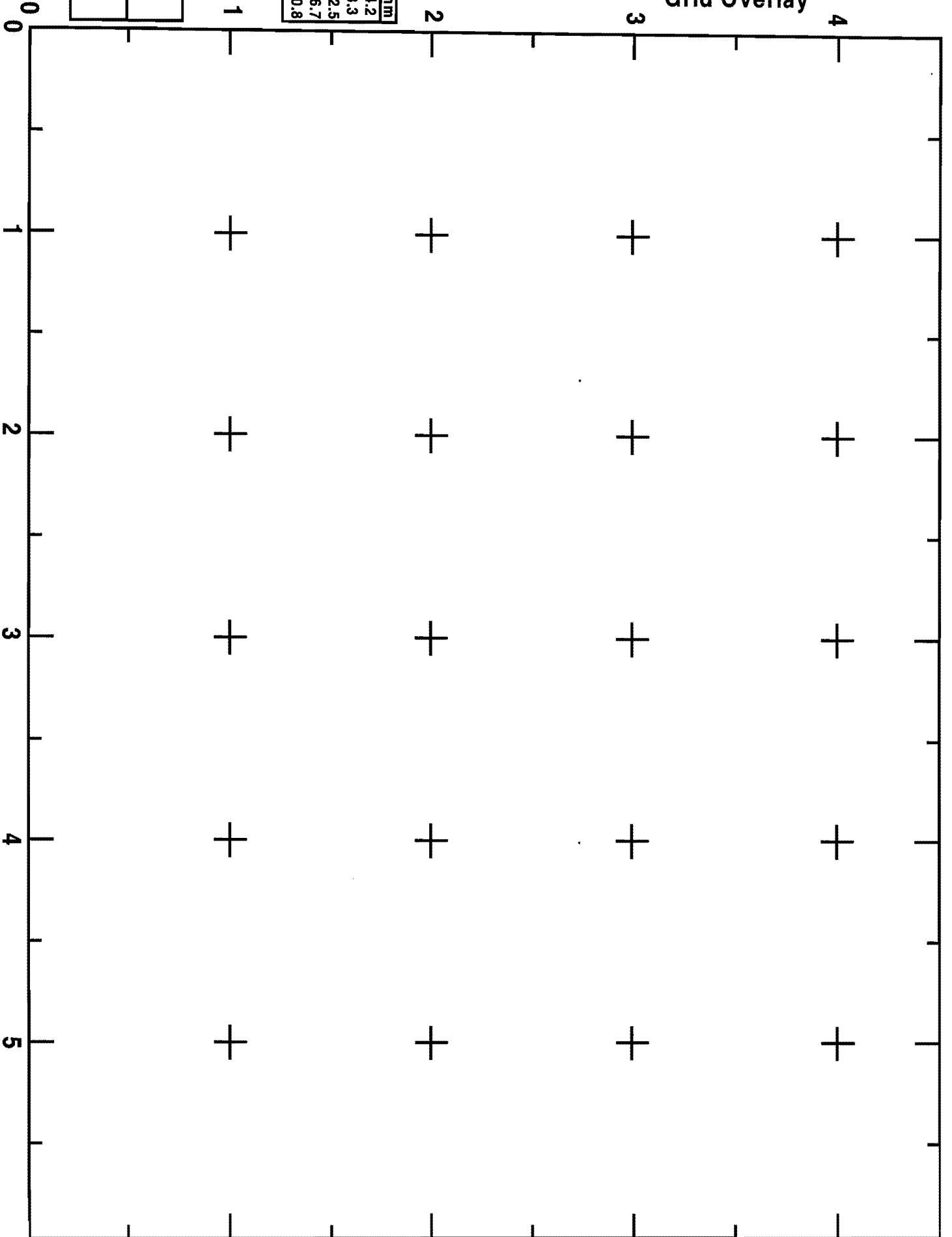


40 Figure 3. Sample topographic map section with ASRC grid overprint.

Appalachian Search and Rescue Conference Grid Overlay

m	mm
100	4.2
200	8.3
300	12.5
400	16.7
500	20.8

Map
Decl.



Quadrangle Name:

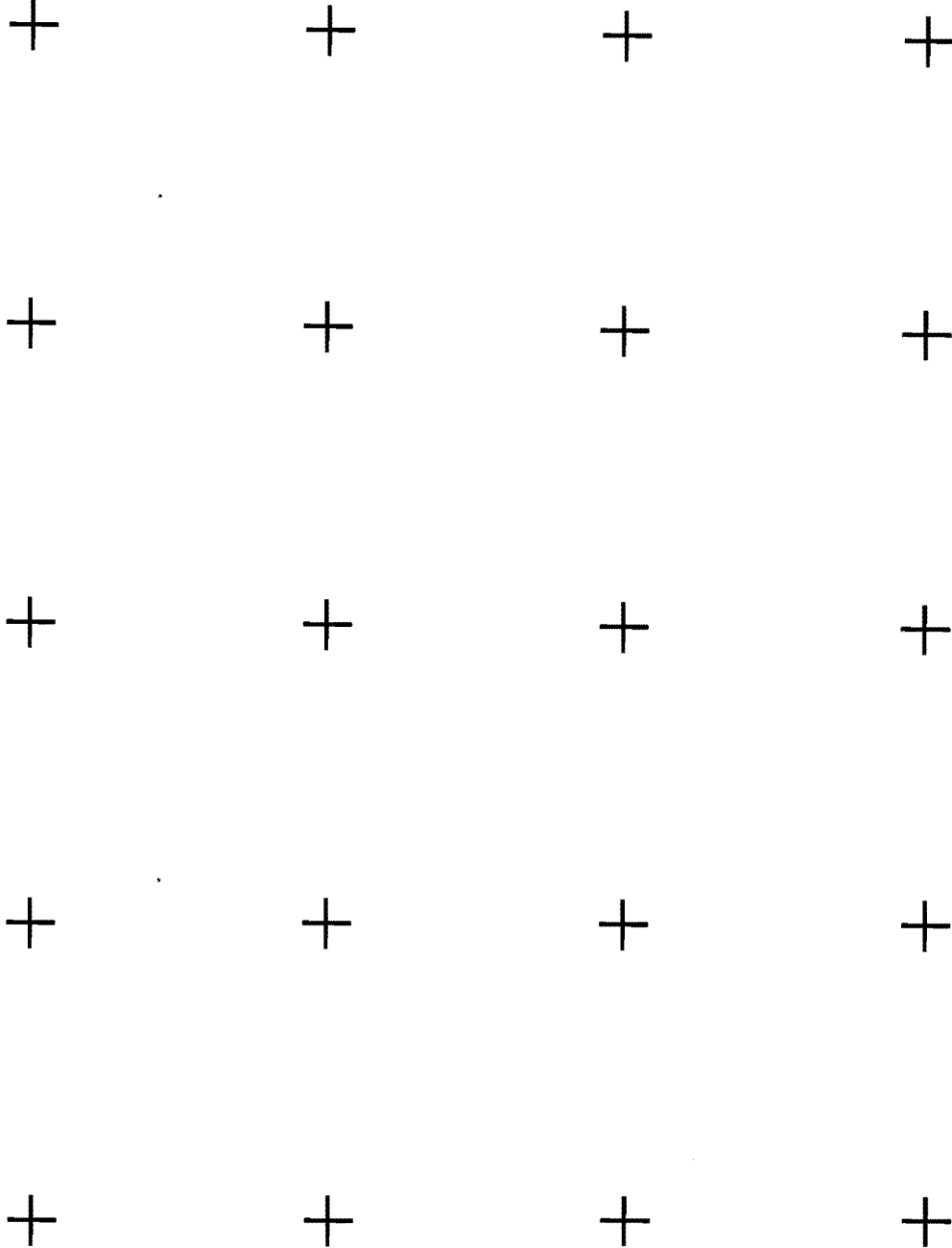
0,0 = UTM:

Appalachian Search and Rescue Conference
Grid Overlay

m	mm
100	4.2
200	8.3
300	12.5
400	16.7
500	20.8

Map
Decl.

5
4
3
2
1
0



Quadrangle Name: 0,0 = UTM: