

CHANGE }
No. 1 }

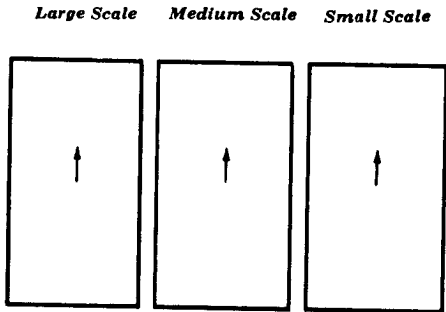
HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 31 December 1968

TOPOGRAPHIC SYMBOLS

FM 21-31, 19 June 1961, is changed as follows:

Page 7. Figure 7.1 is added after figure 7.

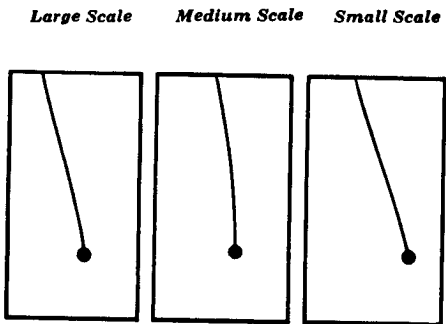
Figure 7.1. Direction of Flow. Shown only when direction of flow of stream or canal is not apparent.



Page 9. Figure 13, the title is changed to read "Dissipating Stream."

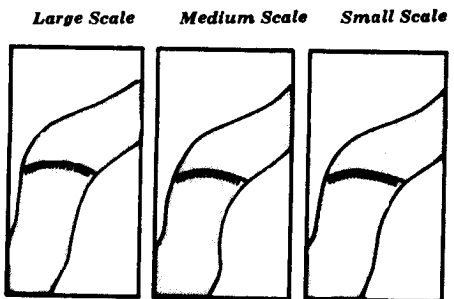
Page 9. Figure 13.1 is added after figure 13.

Figure 13.1. Disappearing Stream.



Page 9. Figure 15 is superseded as follows:

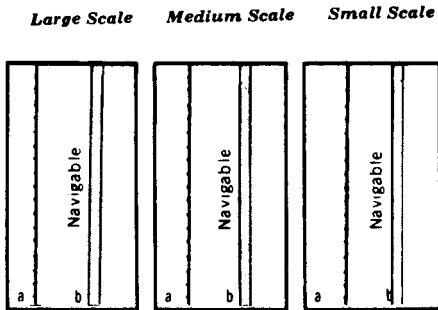
Figure 15. Large Falls.



Page 10. Figure 18 is superseded as follows:

Figure 18. Navigable Canal, In Operation.

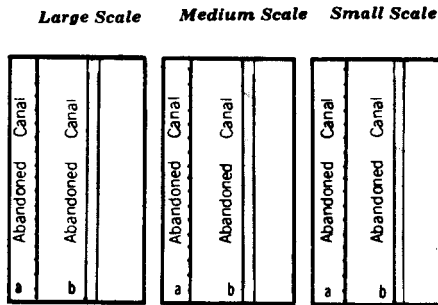
(a) Narrow. (b) Wide.



Page 10. Figure 19 is superseded as follows:

Figure 19. Abandoned Canal, Containing Water.

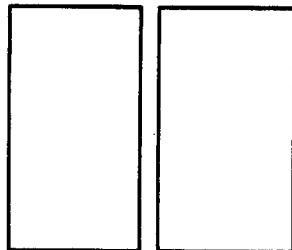
(a) Narrow. (b) Wide.



Page 24. Figure 70.1 is added after figure 70.

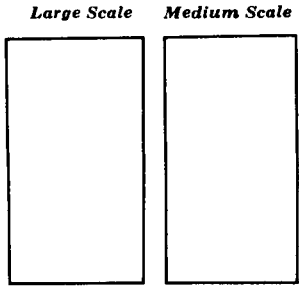
Figure 70.1. Limits of Ice, Sea Ice, Pack Ice.

Medium Scale Small Scale



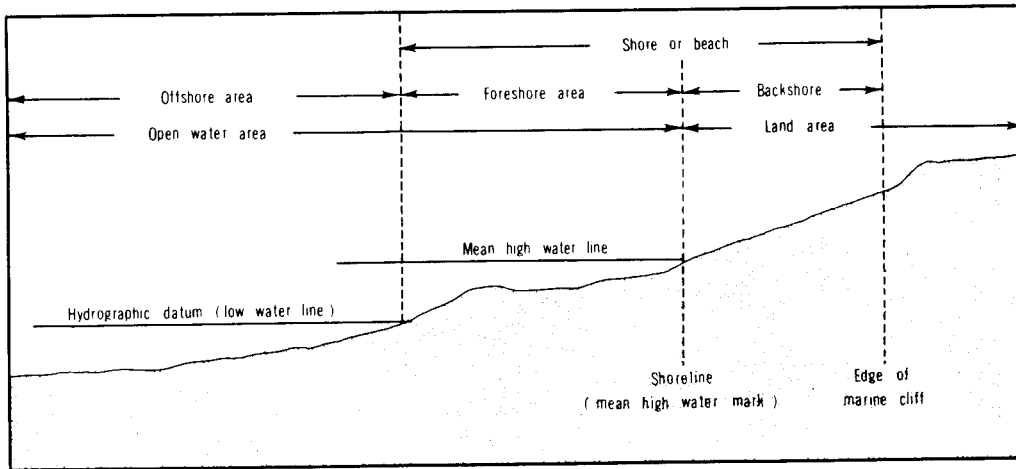
Page 27. Figure 75.1 is added after figure 75.

Figure 75.1. Scattered Trees.



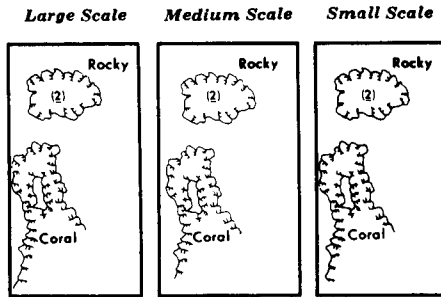
Page 29. Figure 82 is superseded as follows:

Figure 82. Definition of Coastal Terms.



Page 30. Figure 84 is superseded as follows:

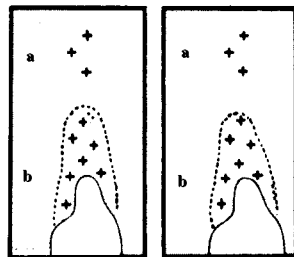
Figure 84. Reef or Ledge. Labeling indicates whether the reef is of rock or coral. The extent of uncovering of reefs at hydrographic datum is shown by labeling.



Page 30. Figure 84.1 is added after figure 84.

Figure 84.1. Submerged Reef or Ledge.

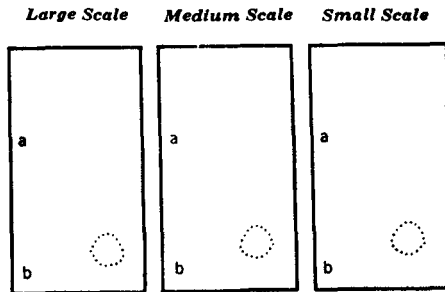
(a) Small area. (b) Large area.



Page 30. Figure 86 is superseded as follows:

Figure 86. Bare Rock, Exposed at Mean High Water.

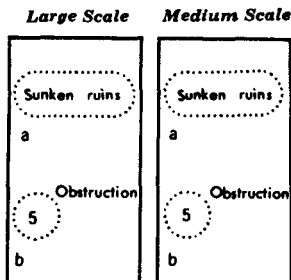
(a) Bare rocks. (b) Bare rocks, dangerous to navigation.



Page 31. Figure 89 is superseded as follows:

Figure 89. Sunken Danger, Other Than a Rock or a Wreck.

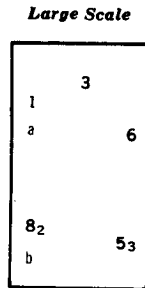
(a) Identified danger, depth unknown. (b) Unidentified danger, depth known.



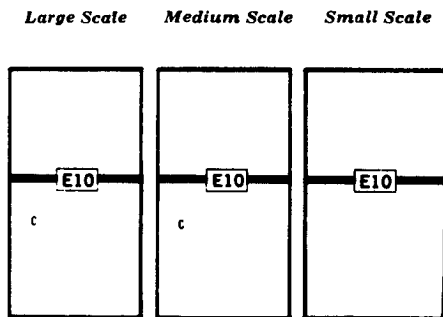
Page 32. Figure 91 is superseded as follows:

Figure 91. Soundings. A sounding is the measured depth of water at the hydrographic datum. The unit of measure may be fathoms, feet, meters, or fathoms and feet in combination, as indicated in the legend.

(a) Soundings. (b) Soundings in fathoms with fractional values in feet.



Page 44. Figure 124, the symbol "(c) International," is added to the legend line and illustration as follows:



Page 86. Paragraphs 23.1 and 23.2 and figures 243 through 332 are added as follows:

23.1. Joint Operations Graphics

a. Purpose and Scope. Joint Operations Graphics are produced in both ground and air versions. The ground version is designated as Series 1501; the air version is designated as Series 1501 AIR. Both versions are designed to provide common base graphics for use in combined operations by the ground and air forces of allied nations. The topographic information is identical on both the ground and air versions.

b. Unit of Vertical Measure. On the ground version, elevation and contour values are shown in meters. These values are converted to foot units on the air version.

c. Aeronautical Information. Both versions contain identical information regarding aerodromes and obstructions to pilotage. The air version contains additional information concerning aids to air navigation.

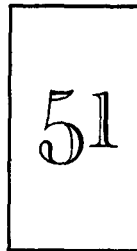
d. Shaded Relief. Both versions contain an identical representation of shading, to provide a rapid recognition of slope and landforms. The shading also serves as a means of correlating contours and elevations, with emphasis on the more significant terrain features.

e. Elevation Tints. Both versions contain a representative system of color tints which depict areas of the same elevation range. A key box on each version indicates the elevation ranges and their corresponding color tints.

j. Symbols. The following approved symbols for Joint Operations Graphics are in addition to, or different from, the standard medium-scale symbols shown in figures 1 through 242:

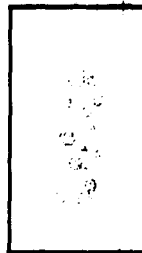
(1) *Elevations*. The following symbol is in addition to the elevation symbols shown in figures 227 through 233:

Figure 243. Highest Known Terrain Elevations. The highest known terrain elevations are shown within each 15-minute square as an aid to air navigation. The larger digit represents thousands of feet; the smaller digit represents hundreds of feet.



(2) *Vegetation*. The following symbol is different from the medium-scale symbol shown in figure 74:

Figure 244. Woods-Brushwood; Forest.



(3) *Roads in foreign areas.* The following figures show the approved symbols for roads in foreign areas:

Figure 245. Hard Surface, All-Weather Road, Two or More Lanes Wide. (a) Principal route. (b) Secondary route.

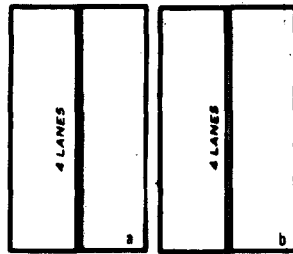


Figure 246. Hard Surface, All-Weather Road, One Lane Wide. (a) Principal route. (b) Secondary route.

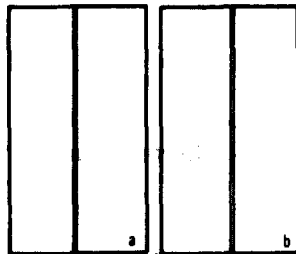


Figure 247. Loose or Light Surface, All-Weather Road, Two or More Lanes Wide. (a) Principal route. (b) Secondary route.

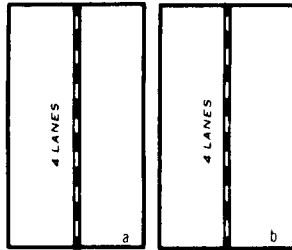


Figure 248. Loose or Light Surface, All-Weather Road, One Lane Wide. (a) Principal route. (b) Secondary route.

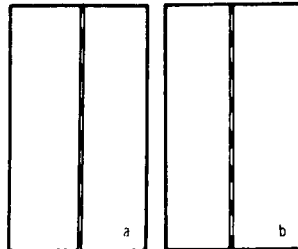


Figure 249. Loose Surface, Fair or Dry Weather Road. (a) Principal route. (b) Secondary route.

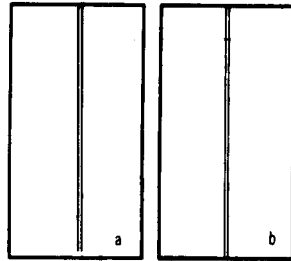


Figure 250. Cart Track. (a) Principal route. (b) Secondary route.

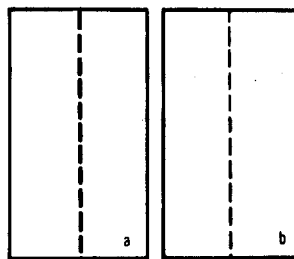


Figure 251. Footpath, Trail. (a) Principal route. (b) Secondary route.

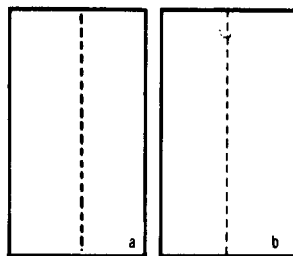


Figure 252. Road Interchange, Access, Cloverleaf.

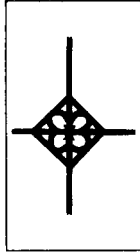


Figure 253. Dual Highway.

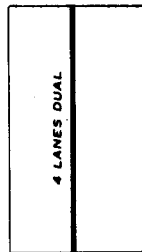
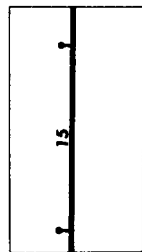


Figure 254. Distance Along Roads. Distances between selected populated places, road intersections, and road and railroad intersections are shown.



(4) *Populated places and landmark features.* The following figures show the approved symbols for populated places and landmark features which are different from, or in addition to, the symbols shown in figures 179 through 222:

Figure 255. Large Developed Areas. The outlined area generally shows that portion of a developed or urban area which comprises a dense concentration of structures. The limits of the outlined area have no relationship to political or administrative boundaries.



Figure 256. Native Settlement (Kampung or Kampong).

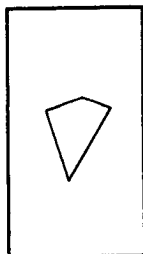


Figure 257. Walled City. The heavy black line represents walls surrounding cities or parts of cities. The word "walled" is shown in parentheses below the place name except when the wall coincides with the outlined limits of the developed area.

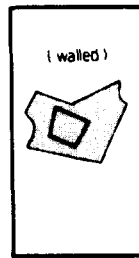


Figure 258. Landmark Features or Objects. Landmarks are those features which, because of their size, height, shape, or location, serve as means of positive orientation. They are readily recognizable from the air or on the ground. All landmark features are identified by explanatory labeling.

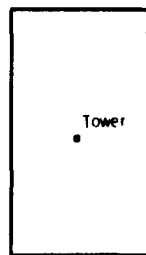


Figure 259. Outlined Landmark Areas. This symbol is used to show areas which are so different in nature or appearance from the surrounding terrain that they serve as outstanding landmarks. The nature of the area is explained by labeling.

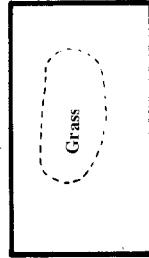
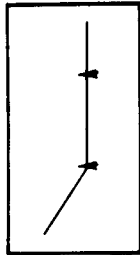


Figure 260. Powerline With Pylons. Pylon symbols are shown at points of directional change, and on straight portions as often as necessary to emphasize the hazard to air navigation.



(5) The following symbols for boundaries differ from those shown in figures 236 through 241:

Figure 261. Primary Administrative Boundary.

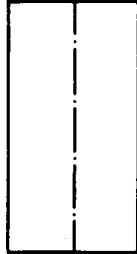


Figure 262. Secondary Administrative Boundary.



Figure 263. Tertiary Administrative Boundary.

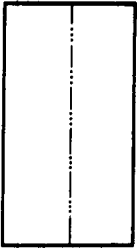
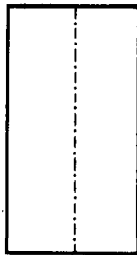


Figure 264. Reservation Boundary.



(6) *Aerodromes*. The following figures show the approved symbols for aerodromes on the 1501 and 1501 AIR Series:

Figure 265. Aerodrome (Military or Civil); Runway Pattern and Field Limits Known. Length of runway and field limits are shown to scale. Absence of the code letter "S" or "U" indicates hard surface runways.

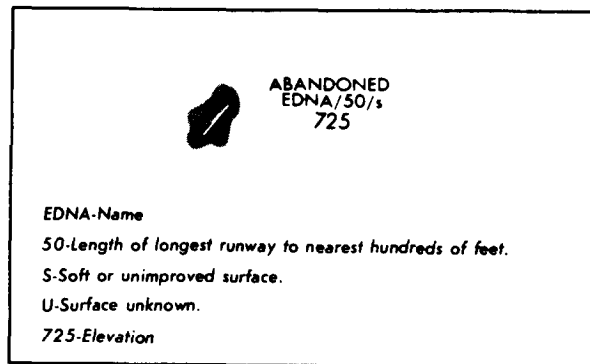


Figure 266. Aerodrome; Runway Pattern Unknown, Field Limits Known.



Figure 267. Aerodrome; Runway Pattern Known, Field Limits Unknown. Length of runways shown to scale.

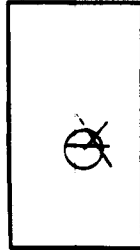


Figure 268. Aerodrome; Runway Pattern and Field Limits Unknown.

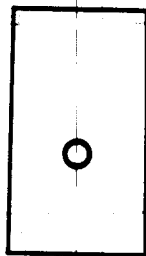



Figure 269. Seaplane Base (Military or Civil).

 *NAS MIAMI/80*
00

NAS MIAMI-Name
80-Length of longest runway to nearest hundreds of feet.
00-Elevation.

Figure 270. Seaplane-Emergency. This symbol is used to show emergency seaplane landing sites which have no facilities or for which complete information is not available.

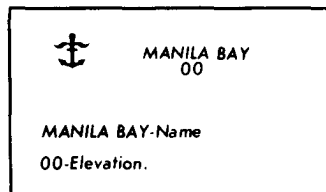
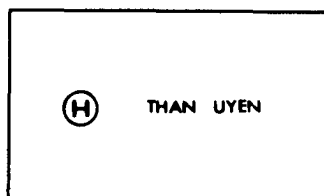


Figure 271. Heliports.



(7) *Radio navigation and communication facilities.* The following figures show the approved symbols for aeronautical, radio navigation and communication facilities:

Figure 272. OMNI Range (Omnidirectional Range). Identified as VOR (very high frequency omnidirectional range), VORTAC (very high frequency omnidirectional range Tactical Air Command), or TACAN (tactical air navigation). The compass rose (magnetic bearing circle) is oriented to magnetic north and centered on the station. Name of the facility is shown in rectangular box.

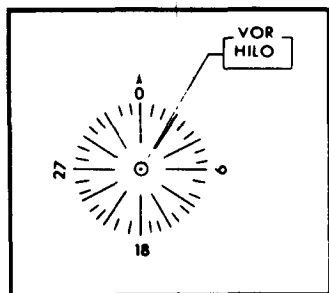


Figure 273. Radio Range (RNG).

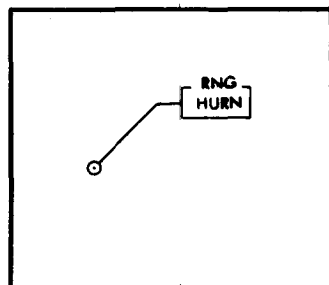


Figure 274. Visual-Aural Range (VAR).

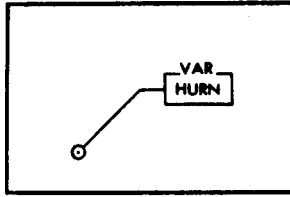


Figure 275. Radio Beacon (R Bn). May also be labeled NDB for nondirectional radio beacons.

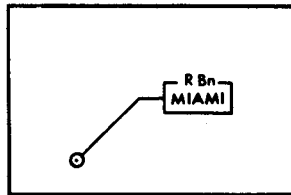


Figure 276. Consol Beacon.

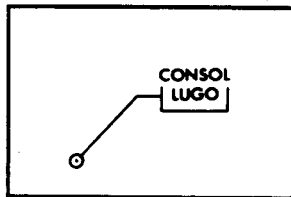


Figure 277. Direction Finders (DF).

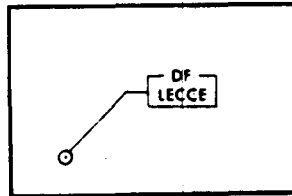


Figure 278. Radar Beacon (RACON-EUREKA).

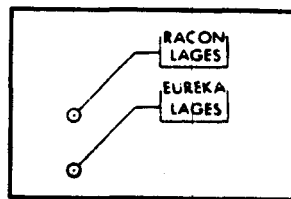


Figure 279. Broadcast Station (BS). Name of facility is shown in rectangular box.

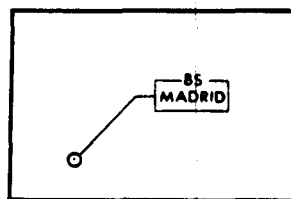


Figure 280. Ocean Station Vessel.

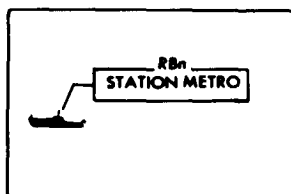
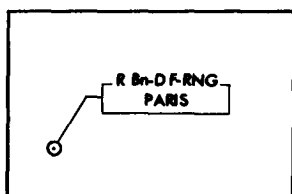


Figure 281. Multiple Radio Facilities. This symbol is used when two or more facilities are located in close proximity. The types of facilities are identified by the appropriate abbreviations.



(8) *Controlled airspace.* The following figures show the approved symbols for controlled airspace identification:

Figure 282. Air Defense Identification Zone (ADIZ).

- (a) Portion of graphic covered by ADIZ.
- (b) Entire graphic covered by ADIZ.

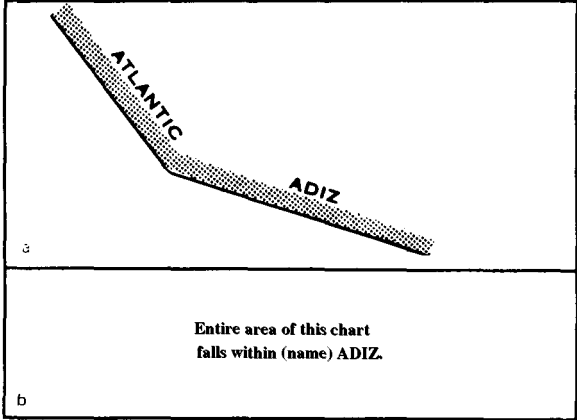


Figure 283. Buffer Zone. Name of zone is indicated by labeling.

- (a) Portion of graphic covered by Buffer Zone.
- (b) Entire graphic covered by Buffer Zone.

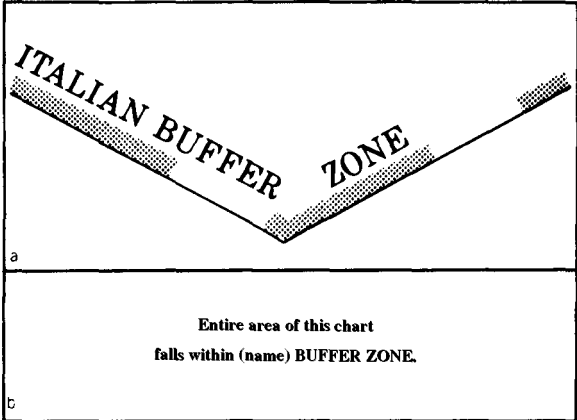
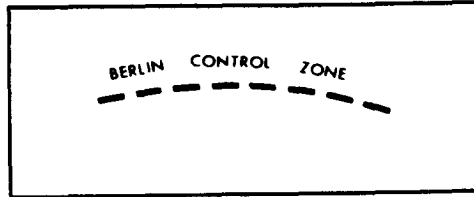
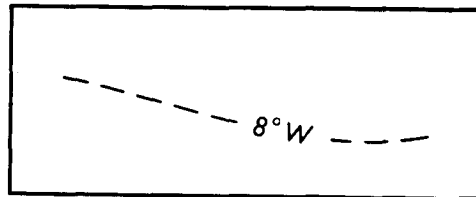


Figure 284. Berlin Control Zone. This symbol is used to show the 20 statute mile radius Berlin Control Zone and associated air corridors. The label BERLIN CONTROL ZONE is positioned immediately *outside* the dashed symbol.



(9) *Magnetic variation data.* The following figure shows the approved symbol for magnetic variation data:

Figure 285. Isogonic Line.



(10) *Visual aids and obstructions.* The following figures show the approved symbols for visual aids and obstructions to aerial navigation:

Figure 236. Aeronautical Rotating or Oscillating Light. Symbol is shown as: (a) If located on aerodrome; (b) If in isolated location.

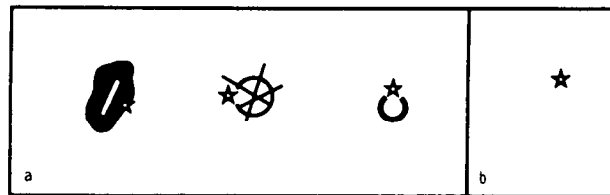


Figure 287. Aeronautical Rotating Light With Flashing Code Identification Light. Symbol is shown as: (a) If located on aerodrome; (b) If in isolated location.

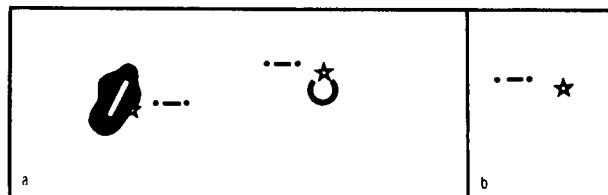


Figure 288. Aeronautical Rotating Light With Course Light and Site Number. Symbol is shown as: (a) If located on aerodrome; (b) If in isolated location.

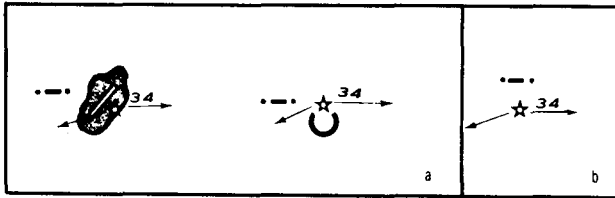


Figure 289. Aeronautical Flashing Light. Symbol is shown as: (a) Located on aerodrome; (b) In isolated location.

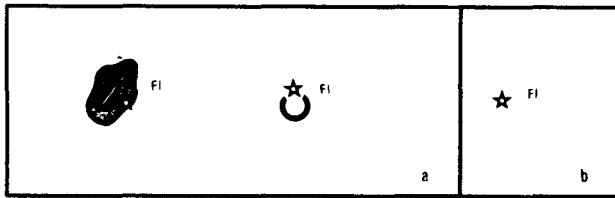


Figure 290. Aeronautical Light With Flashing Code Identification. Symbol is shown as: (a) Located on aerodrome; (b) In isolated location.

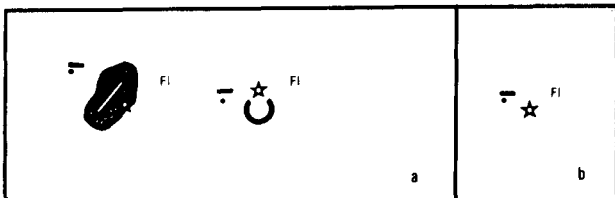


Figure 291. Marine Light With Characteristics of Light. The abbreviations used to show the characteristics are: F (Fixed), Fl (Flashing), QK (Quick Flashing), I QK Fl (Interrupted Quick Flashing), Occ (Occulating), Alt (Alternating), Gp (Group), R (Red), W (White), G (Green), B (Blue), U (Unwatched), SEC (Sector), and Sec (Second). Marine lights are white and alternating lights are red and white unless otherwise labeled. Symbol is shown as: (a) Land light; (b) Lightship.

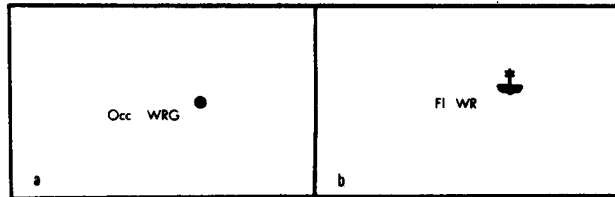


Figure 292. Visual Ground Signs (Shore and Landmarks). Symbol is shown as: (a) Arrow pointing to location of sign; (b) Actual location of ground sign.

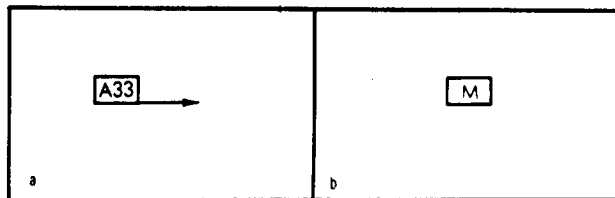


Figure 293. Obstruction. This symbol is used to show structures which extend 200 feet or more above the surrounding terrain. The height of the structure above ground is shown immediately below the symbol in parentheses, and the elevation of the top of the obstruction above sea level is shown immediately above the symbol. The nature of the obstruction, i.e., building, smokestack, etc., is shown by labeling. Symbol is shown as: (a) Obstruction; (b) Radio facility obstruction.

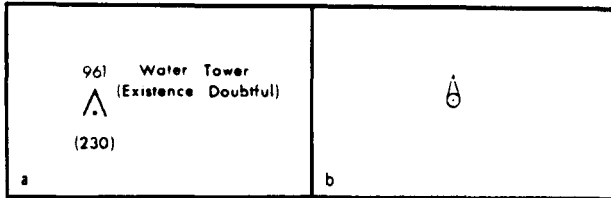
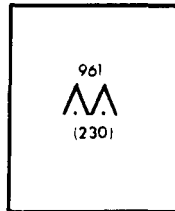


Figure 294. Group Obstruction. Two or more obstructions in close proximity are shown by this symbol. The elevation and height of the highest feature in the group is shown.



23.2. Pictomaps

a. A pictomap is a map on which photographic imagery of a standard photomosaic has been converted into interpretable colors and symbols.

b. The components of the pictomap consist of three basic color tones photographically extracted from a photomosaic, masked and drafted symbols, and names data. At the large scales used for city maps (1:5,000 to 1:12,500), the light tones and shadows on the photographic image serve to delineate many of the map features. At scales of 1:25,000 and 1:50,000, however, most planimetric features are shown by drafted symbols, printed in specified colors.

c. *Tones.* The three basic color tones used for area features are as follows:

(1) Landtone, a buff-like color tone which represents uncovered earth.

(2) Vegetone, green tones which represent densities of vegetation.

(3) Shadowtone, a black-green tone which represents shades and shadows.

d. *Symbols.* The following pictomap symbols are different from the standard large-scale symbols shown in figures 1 through 242:

Figure 295. Main Roads and Through Streets On City Maps.

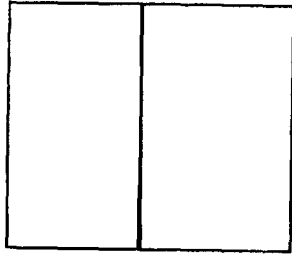


Figure 296. Roads and Streets On City Maps. (Those not shown by symbol in fig. 295.)

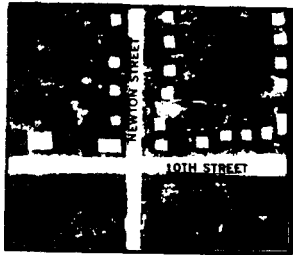


Figure 297. Hard Surface, All-Weather Road, One or More Lanes Wide (1:25,000 and 1:50,000 Scales). Number of lanes is indicated by labeling.

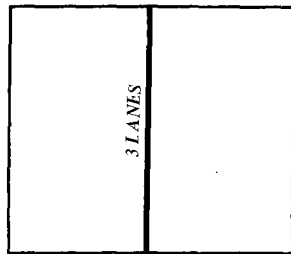


Figure 298. Loose or Light Surface, All-Weather Road, One or More Lanes Wide (1:25,000 and 1:50,000 Scales). Number of lanes is indicated by labeling.

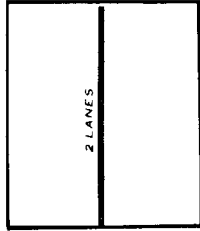


Figure 299. Point of Change in Number of Lanes (1:25,000 and 1:50,000 Scales).

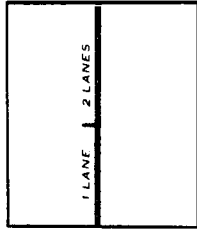


Figure 300. Loose Surface, Fair or Dry Weather Road (1:25,000 and 1:50,000 Scales).



Figure 301. Street (1:25,000 and 1:50,000 Scales). Streets are shown by a solid white line .02'' wide, or if wider, drawn to scale.



Figure 302. Track (1:25:000 and 1:50,000 Scales).



Figure 303. Trails (1:25,000 and 1:50,000 Scales).



Figure 304. Route Marker. (a) National or Federal. (b) Secondary or State. (c) Provincial, Communal or other.

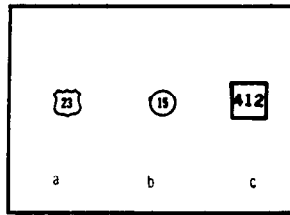


Figure 305. Railroad. All railroads are shown by this symbol with number of tracks indicated by labeling: (a) Railroad; (b) Railroad spur.

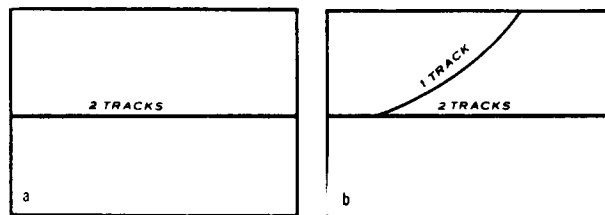


Figure 306. Railroad Station. (a) Position unknown. (b) Position known.

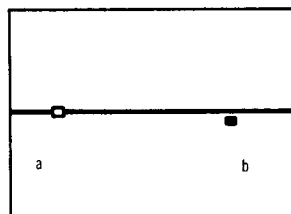


Figure 307. Tunnel, Road and Railroad. (a) Road tunnel. (b) Railroad tunnel.

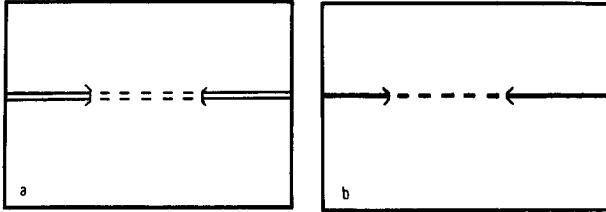


Figure 308. Railroad Overpass, Underpass. (a) Railroad overpassing road. (b) Railroad underpassing road.

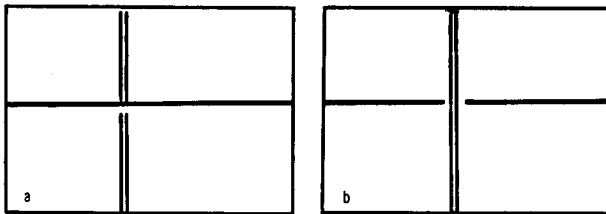


Figure 309. Fills. Fills are symbolized when they are landmark in nature and an impediment to cross-country movement.

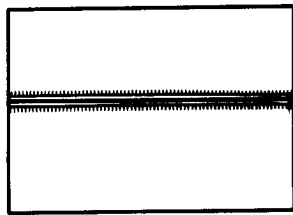


Figure 310. Cut. Cuts are symbolized when they are landmark in nature and an impediment to cross-country movement.

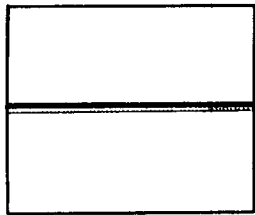


Figure 311. Small Levee. Small levees are symbolized when they are landmark in nature and an impediment to cross-country movement.

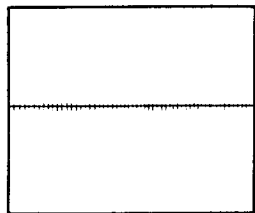


Figure 312. Large Levee and Large Earth Dams. These features are symbolized when they are landmark in nature and an impediment to cross-country movement.

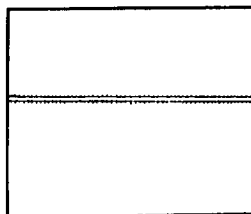


Figure 313. Small Dam. This symbol is used to show small dams of either earthen or masonry construction.

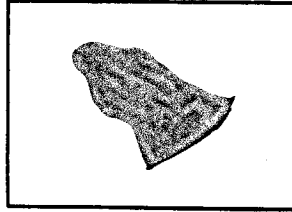


Figure 314. Escarpment. The continuous line represents the point of abrupt change in slope. Tick marks point downslope.

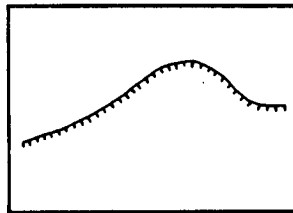


Figure 315. Buildings (1:25,000 and 1:50,000 Scales). Buildings outside the built-up areas which are not shown by the pictotone process are shown as: (a) Small buildings; (b) Larger buildings shown to scale.

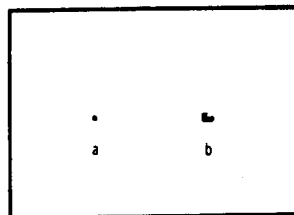


Figure 316. Church.

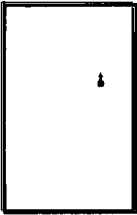


Figure 317. Mosque.

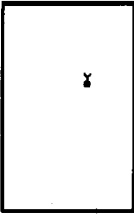


Figure 318. Shrine. (a) Christian. (b) Moslem.

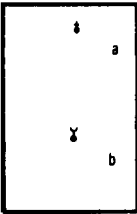


Figure 319. School.

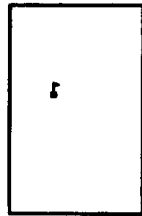


Figure 320. Windmill.

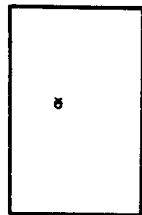


Figure 321. Located or Landmark Object. Object identified by labeling.

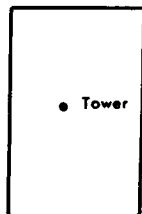


Figure 322. Telephone or Telegraph Line.

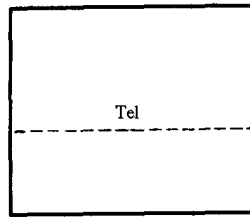


Figure 323. Ski Lift.

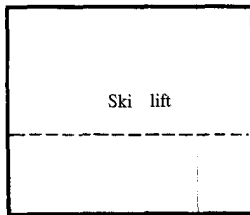


Figure 324. Powerline.

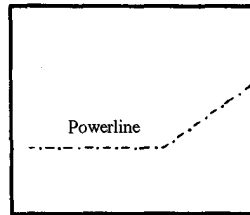


Figure 325. Tank. All types of small tanks which are not shown by the pictotone process are shown by this symbol and labeled as to contents.

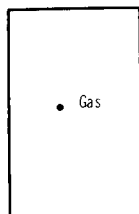


Figure 326. Triangulation Station. The symbol represents a described horizontal control point which is marked on the ground and which was established by triangulation or traverse of third or higher order accuracy.

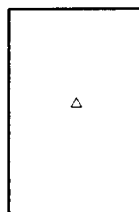


Figure 327. Bench Mark. The symbol represents a described vertical control point established by survey methods of third or higher order accuracy.

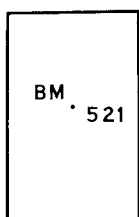


Figure 328. Spot Elevation (a) Checked elevation established by closed lines, including spirit level, stadia, and vertical angle methods. (b) Unchecked elevation determined by unchecked field surveys.

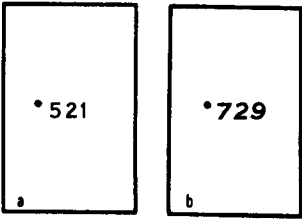


Figure 329. Highest Elevation on Pictomap. The highest elevation on the pictomap is shown as: (a) Checked; (b) Unchecked.

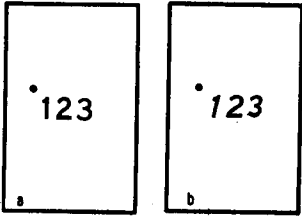


Figure 330. Contours. (a) Index. (b) Intermediate. (c) Supplementary.

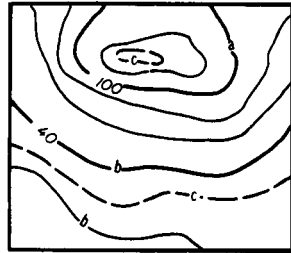


Figure 331. Lake or Pond. (a) Small. (b) Large.

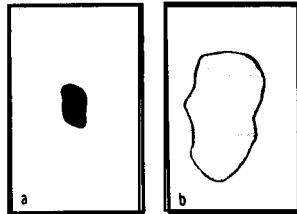
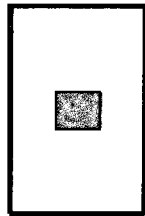


Figure 332. Small Reservoir. Larger Reservoirs shown as "b" of figure 331.



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