Lesson_10_A

- Location identifying and reporting systems:
  - Military Drid Reference System (MGRS)
  - World Geographic Reference System (GEOREF)

Location identifying and reporting systems (1)

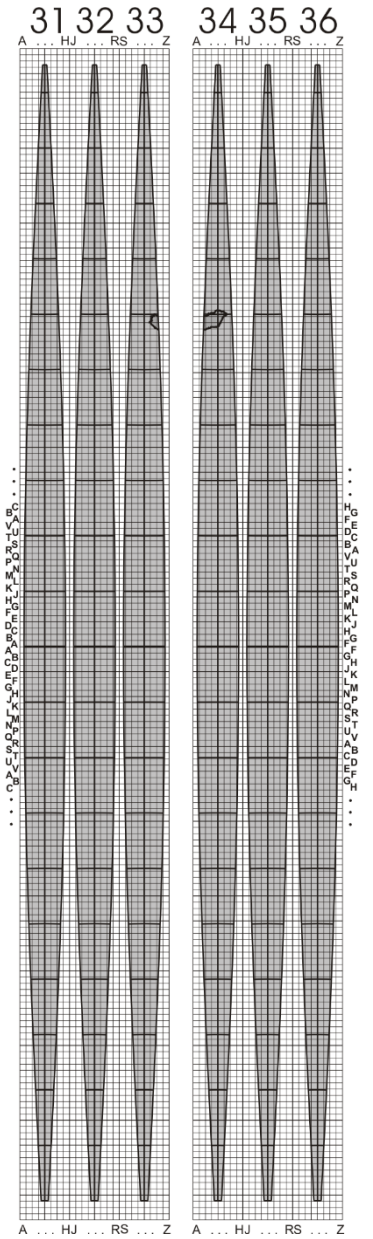
The **MGRS (Military Grid Reference System)** identifying and reporting location system assigns a code („geocode”) to every geographic point and identifies it with an accuracy of 1 meter, for military or navigation purposes. All UTM zones of 6° are covered by an 800 km wide grid and they are grouped in set of three. The 100 km wide columns in this grid are denoted by A–Z (I and O are removed). The 100 km wide rows are denoted in the zones with odd serial number by A–V and even serial number by F–V, A–E (I and O are removed), from the equator to the North Pole 5 times.

The MGRS identifier is composed of three parts:

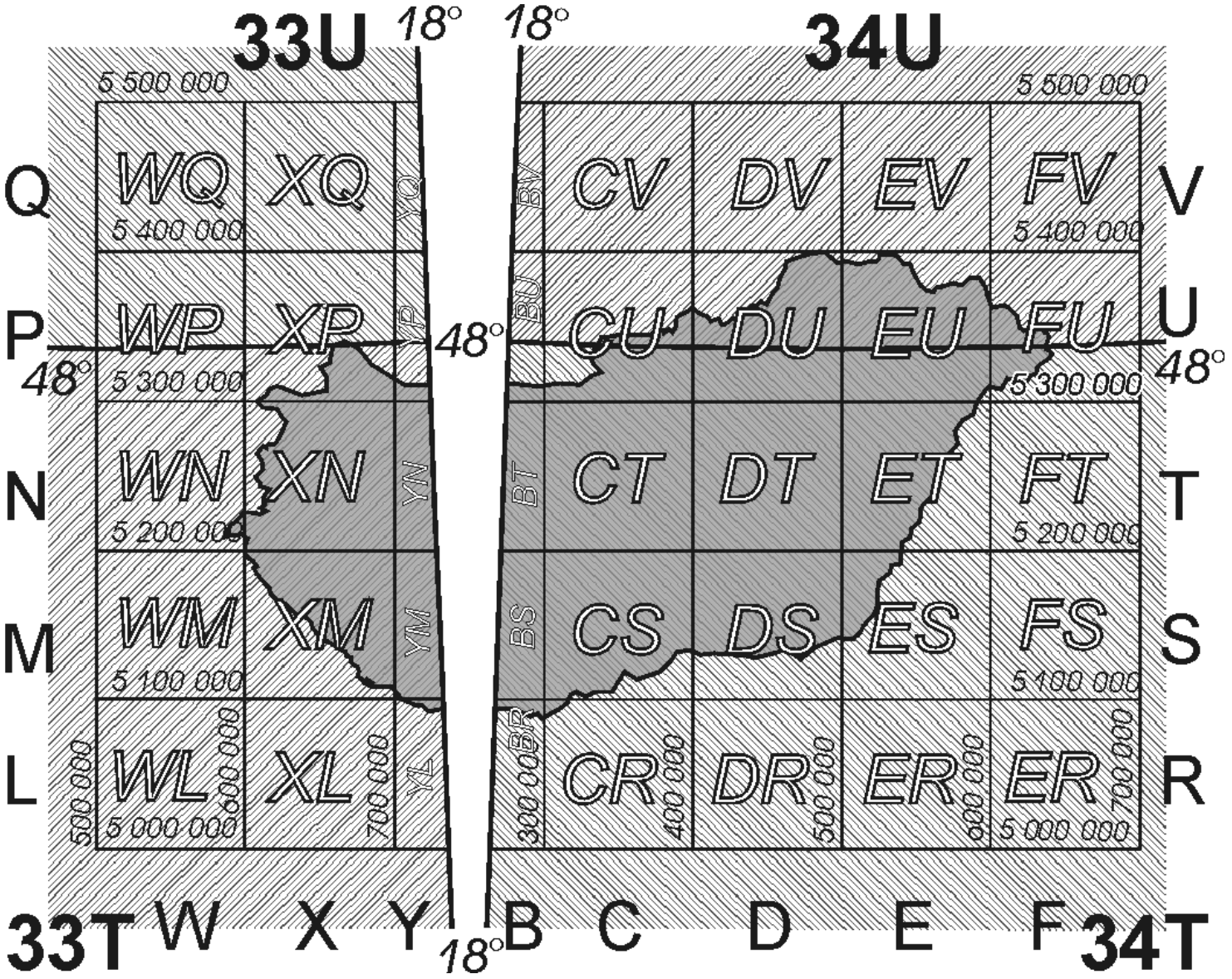
• the identifier of the *geographic quadrangle* of 6°x8° (serial number of the zone + key-letter of the band, e.g. 34T);

• the identifier of the *square* of 100x100 km (key letter of the column + key-letter of the row, e.g. CT)

• the *last five numbers of the UTM coordinates* rounded to meters, inside of the square of 100x100 km (coordinate Y + coordinate X, alltogether 10 digits, e.g. 34T CT 53975 59748).



Location identifying and reporting systems (2)



Location identifying and reporting systems (3)

The **World Geographic Reference system (GEOREF)** location identifying system is based on Earth's coordinates. It is a *search network* partitioning the Earth surface into even smaller *geographic quadrangles* by which a small territory can be appointed and identified.

The Earth is divided up into 24 congruent ellipsoidal lunes (bounded by meridians with longitude differences of 15°) – marked from the Date Line eastwards by the letters from A to Z (omitting I and O).

Every such lune is partitioned into 12 geographic quadrangles with latitude differences of 15° – marked from the South Pole northwards from A to M (omitting I). E.g. Hungary is located in the **15°x15°quadrangle** marked by PK.

The fields of 15°x15° are split up into **subfields of 1°x1°.**

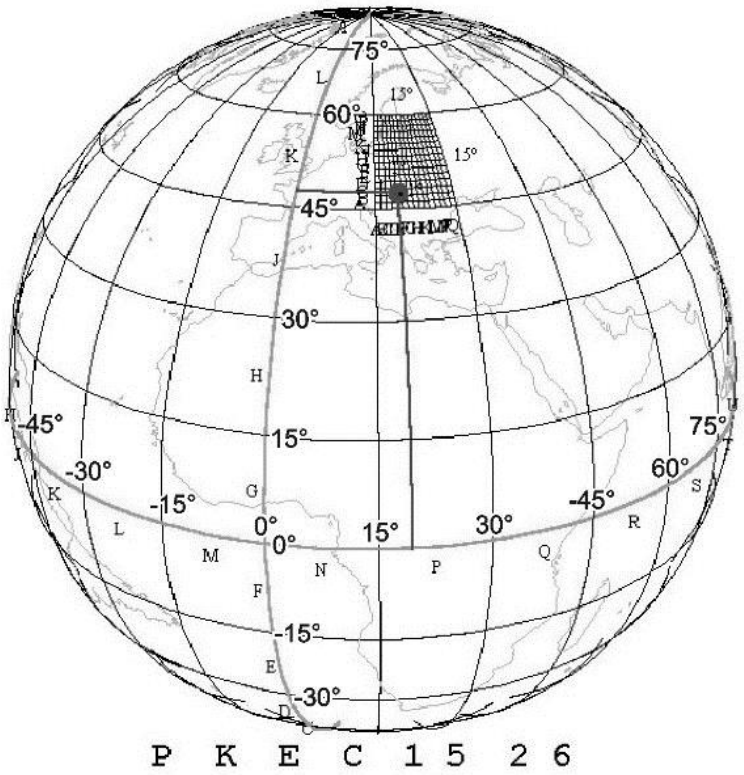
The column of 1° is marked eastwards from A to Q (omitting I and O);

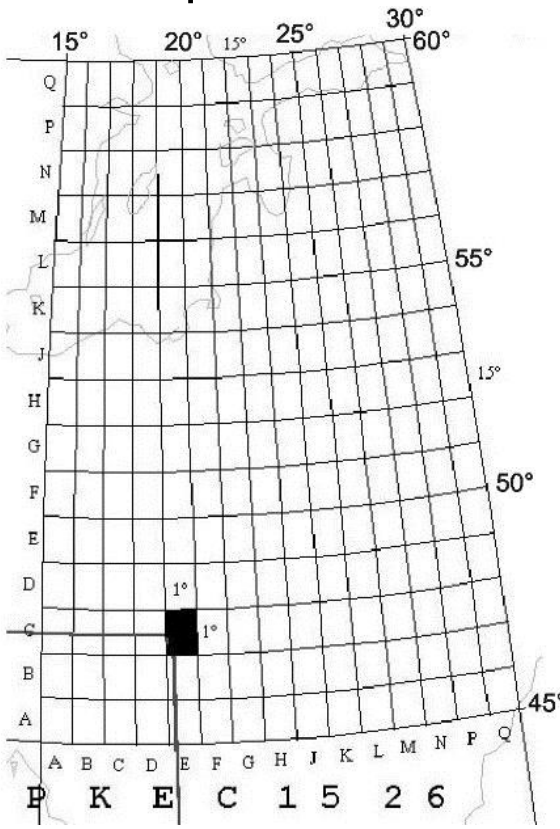
The row of 1° is marked northwards from A to Q (omitting I and O), too. E.g. the 1°x1° subfield of Budapest (~47.5°N,~19°E) is marked by EC in PK.

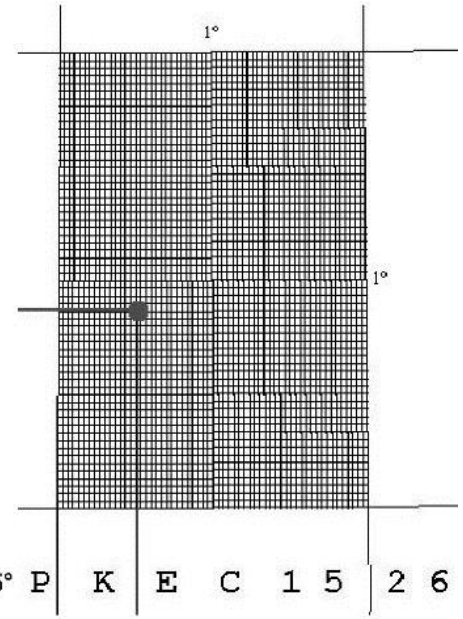
The subfields of 1°x1° are partitioned into **sub-subfields of 1'x1'** which are identified by the geographic coordinates of their southwestern corner of the sub-subfield rounded to minutes. E.g. the sub-subfield of Liszt Ferenc Airport 2 (φ=47°26'22"N, λ=19°15'43"E) is: PK EC 15 26 (or using the first or second decimal of the minutes: PK EC 1572 2637).

Location identifying and reporting systems (4)

The GEOREF is used by the international aeronavigation for location of airports and reporting the position of aeroplanes.







Example:

Istanbul Atatürk Airport Φ=40° 58' 57.1980'; Λ=28° 49' 14.9844' (WGS84)

UTM Easting=653178.53m; UTM Northing= 4538417.06m

Asked: the MGRS and the GEOREF identifiers.