

# Package: mgrs (via r-universe)

February 13, 2025

**Type** Package

**Title** Convert 'MGRS' ('Military Grid Reference System') Coordinates  
From/To Other Coordinate Systems

**Version** 0.2.4

**Date** 2023-12-16

**Maintainer** Bob Rudis <bob@rud.is>

**Description** The 'Military Grid Reference System' ('MGRS') is the geocoordinate standard used by 'NATO' militaries for locating points on the earth. The 'MGRS' is derived from the 'Universal Transverse Mercator' ('UTM') grid system and the universal polar stereographic ('UPS') grid system, but uses a different labeling convention. The 'MGRS' is used for the entire earth. Methods are provided to convert 'MGRS' coordinates to and from other coordinate systems.

**URL** <https://gitlab.com/hrbrmstr/mgrs>

**BugReports** <https://gitlab.com/hrbrmstr/mgrs/issues>

**Encoding** UTF-8

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**Suggests** tinytest

**Depends** R (>= 4.0.0)

**Imports** Rcpp

**LinkingTo** Rcpp

**RoxygenNote** 7.2.3

**Repository** <https://b-cubed-eu.r-universe.dev>

**RemoteUrl** <https://github.com/hrbrmstr/mgrs>

**RemoteRef** HEAD

**RemoteSha** 6ad14411cdac5195547f579f10b793a7f7f75ef1

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latlng_to_mgrs	<i>Convert latitude/longitude to MGRS string</i>
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### Description

Convert latitude/longitude to MGRS string

### Usage

```
latlng_to_mgrs(latitude, longitude, degrees = TRUE, precision = 5L)
```

### Arguments

latitude, longitude	coordinates
degrees	are latitude/longitude in degrees? Default: TRUE
precision	0:5; level of precision for the conversion. Default 5

### Examples

```
latlng_to_mgrs(42, -93)
```

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mgrs

*Convert 'MGRS' ('Military Grid Reference System') Coordinates  
From/To Other Coordinate Systems*

---

## **Description**

The 'Military Grid Reference System' ('MGRS') is the geocoordinate standard used by 'NATO' militaries for locating points on the earth. The 'MGRS' is derived from the 'Universal Transverse Mercator' ('UTM') grid system and the universal polar stereographic ('UPS') grid system, but uses a different labeling convention. The 'MGRS' is used for the entire earth. Methods are provided to convert 'MGRS' coordinates to and from other coordinate systems.

## **Details**

The origin of the MGRS grid, in the Pacific. Honolulu is in 4QFJ.

YQ	BK	CK	DK	EK	FK	GK	KQ	LQ	MQ	NQ	PQ	QQ	TK	UK	VK	WK	XK	YK	BQ	CQ	DQ	EQ	FQ
YP	BJ	CJ	DJ	EJ	FJ	GJ	KP	LP	MP	NP	PP	QP	TJ	UJ	VJ	WJ	XJ	YJ	BP	CP	DP	EP	FP
YN	BH	CH	DH	EH	FH	GH	KN	LN	MN	NN	PN	QN	TH	UH	VH	WH	XH	YH	BN	CN	DN	EN	FN
N24	BO	CO	DO	EO	FO	GO	KM	LM	MM	NM	PM	QM	TO	UO	VO	WO	XO	YO	BM	CM	DM	EM	FM
YL	BF	CF	DF	EF	FF	GF	KL	LL	ML	NL	PL	QL	TL	UL	VL	WL	XL	YL	BL	CL	DL	EL	FL
YK	BE	CE	DE	EE	FE	GE	KK	LK	MK	NK	PK	QK	TK	UK	VK	WK	XK	YK	BK	CK	DK	EK	FK
YJ	BD	CD	DD	ED	FD	GD	KJ	LJ	MJ	NJ	PJ	QJ	TJ	UJ	VJ	WJ	XJ	YJ	BJ	CJ	DJ	EJ	FJ
YH	BC	CC	DC	EC	FC	GC	KH	LH	MH	NH	PH	QH	TH	UH	VH	WH	XH	YH	BH	CH	DH	EH	FH
YG	BB	CB	DB	EB	FB	GB	KG	LG	MG	NG	PG	QG	TB	UB	VB	WB	XB	YB	BG	CG	DG	EG	FG
YF	BA	CA	DA	EA	FA	GA	KF	LF	MF	NF	PF	QF	TF	UF	VF	WF	XA	YA	BF	CF	DF	EF	FF
YE	BV	CV	DV	EV	FV	GV	KE	LE	ME	NE	PE	QE	TV	UV	VV	WV	XV	YV	BE	CE	DE	EE	FE
YD	BU	CU	DU	EU	FU	GU	KD	LD	MD	ND	PD	QD	TU	UU	VU	WU	XU	YU	BD	CD	DD	ED	FD
N16	BT	CT	DT	ET	FT	GT	KC	LC	MC	NC	PC	QC	TC	UC	VC	WC	XC	YC	BC	CC	DC	EC	FC
YB	BS	CS	DS	ES	FS	GS	KB	LB	MB	NB	PB	QB	TB	UB	VB	WB	XB	YB	BB	CB	DB	EB	FB
YA	BR	CR	DR	ER	FR	GR	KA	LA	MA	NA	PA	QA	TR	UR	VR	WR	XR	YR	BA	CA	DA	EA	FA
YV	BQ	CQ	DQ	EQ	FQ	GQ	KV	LV	MV	NV	PV	QV	TQ	UQ	VQ	WQ	XQ	YQ	BV	CV	DV	EV	FV
YU	BP	CP	DP	EP	FP	GP	KU	LU	MU	NU	PU	QU	TP	UP	VP	WP	XP	YP	BU	CU	DU	EU	FU
YT	BN	CN	DN	EN	FN	GN	KT	LT	MT	NT	PT	QT	TN	UN	VN	WN	XN	YN	BT	CT	DT	ET	FT
YS	BM	CM	DM	EM	FM	GM	KS	LS	MS	NS	PS	QS	TM	UM	VM	WM	XM	YM	BS	CS	DS	ES	FS
YR	BL	CL	DL	EL	FL	GL	KR	LR	MR	NR	PR	QR	TL	UL	VL	WL	XL	YL	BR	CR	DR	ER	FR
YQ	BK	CK	DK	EK	FK	GK	KQ	LQ	MQ	NQ	PQ	QQ	TK	UK	VK	WK	XK	YK	BQ	CQ	DQ	EQ	FQ
N8	YP	CJ	DJ	EJ	FJ	GJ	KP	LP	MP	NP	PP	QP	TJ	UJ	VJ	WJ	XJ	YJ	BP	CP	DP	EP	FP
YN	BH	CH	DH	EH	FH	GH	KN	LN	MN	NN	PN	QN	TH	UH	VH	WH	XH	YH	BN	CN	DN	EN	FN
YM	BG	CG	DG	EG	FG	GG	KM	LM	MM	NM	PM	QM	TG	UG	VG	WG	XG	YG	BM	CM	DM	EM	FM
YL	BF	CF	DF	EF	FF	GF	KL	LL	ML	NL	PL	QL	TL	UL	VL	WL	XL	YL	BL	CL	DL	EL	FL
YK	BE	CE	DE	EE	FE	GE	KK	LK	MK	NK	PK	QK	TK	UK	VK	WK	XK	YK	BK	CK	DK	EK	FK
YJ	BD	CD	DD	ED	FD	GD	KJ	LJ	MJ	NJ	PJ	QJ	TJ	UJ	VJ	WJ	XJ	YJ	BJ	CJ	DJ	EJ	FJ
YH	BC	CC	DC	EC	FC	GC	KH	LH	MH	NH	PH	QH	TH	UH	VH	WH	XH	YH	BH	CH	DH	EH	FH
YG	BB	CB	DB	EB	FB	GB	KG	LG	MG	NG	PG	QG	TB	UB	VB	WB	XB	YB	BG	CG	DG	EG	FG
YF	BA	CA	DA	EA	FA	GA	KF	LF	MF	NF	PF	QF	TF	UF	VF	WF	XA	YA	BF	CF	DF	EF	FF
N0	BV	CV	DV	EV	FV	GV	KE	LE	ME	NE	PE	QE	TV	UV	VV	WV	XV	YV	BE	CE	DE	EE	FE

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### Author(s)

boB Rudis (bob@rud.is)

### See Also

Useful links:

- <https://gitlab.com/hrbrmstr/mgrs>
- Report bugs at <https://gitlab.com/hrbrmstr/mgrs/issues>

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mgrs\_precision

*Return MGRS grid reference precision (in meters)*

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### Description

MGRS coordinates represent a "square" with a certain level of precision. See Details for more info.

### Usage

mgrs\_precision(x)

### Arguments

x                      character vector of MGRS grid references

### Details

An MGRS grid reference is a point reference system. When the term 'grid square' is used, it can refer to a square with a side length of 10 km (6 mi), 1 km, 100 m (328 ft), 10 m or 1 m, depending on the precision of the coordinates provided. (In some cases, squares adjacent to a Grid Zone Junction (GZJ) are clipped, so polygon is a better descriptor of these areas.) The number of digits in the numerical location must be even: 0, 2, 4, 6, 8 or 10, depending on the desired precision. When changing precision levels, it is important to truncate rather than round the easting and northing values to ensure the more precise polygon will remain within the boundaries of the less precise polygon. Related to this is the primacy of the southwest corner of the polygon being the labeling point for an entire polygon. In instances where the polygon is not a square and has been clipped by a grid zone junction, the polygon keeps the label of the southwest corner as if it had not been clipped.

For example (spaces used for clarity):

**4Q** precision level 6x8 degrees (in most cases) - function returns NA for this

**4QFJ** precision level 100 km

**4QFJ 1 6** precision level 10 km

**4QFJ 12 67** precision level 1 km

4QFJ 123 678 precision level 100 m  
 4QFJ 1234 6789 precision level 10 m  
 4QFJ 12345 67890 precision level 1 m

**Value**

data frame with grid\_ref and precision columns. precision is in meters.

**References**

[https://en.wikipedia.org/wiki/Military\\_Grid\\_Reference\\_System#Grid\\_zone\\_designation](https://en.wikipedia.org/wiki/Military_Grid_Reference_System#Grid_zone_designation)

**Examples**

```
grefs <- c("4Q", "4QFJ", "4QFJ16", "4QFJ1267", "4QFJ123678",
           "4QFJ12346789", "4QFJ1234567890")
mgrs_precision(grefs)
```

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mgrs_to_latlng	<i>Convert an MGRS string to latitude/longitude</i>
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**Description**

Convert an MGRS string to latitude/longitude

**Usage**

```
mgrs_to_latlng(MGRS, degrees = TRUE, include_mgrs_ref = TRUE)
```

**Arguments**

MGRS	an MGRS string
degrees	convert to degrees? Default: TRUE
include_mgrs_ref	if TRUE the data frame returned will include the MGRS reference in a column named mgrs. Default: TRUE.

**Value**

data.frame

**Note**

vectorized

**Examples**

```
mgrs_to_latlng("15TWG0000049776")
```

---

mgrs_to_ups	<i>Convert MGRS to UPS</i>
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---

**Description**

Convert MGRS to UPS

**Usage**

```
mgrs_to_ups(mgrs_string, include_mgrs_ref = TRUE)
```

**Arguments**

`mgrs_string` a character vector of MGRS strings  
`include_mgrs_ref`  
if TRUE the data frame returned will include the MGRS reference in a column named `mgrs`. Default: TRUE.

**Value**

data.frame

**Note**

vectorized

**Examples**

```
mgrs_to_ups("ZGC2677330125")
```

---

mgrs_to_utm	<i>Convert MGRS to UTM</i>
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---

**Description**

Convert MGRS to UTM

**Usage**

```
mgrs_to_utm(mgrs_string, include_mgrs_ref = TRUE)
```

**Arguments**

`mgrs_string` a character vector of MGRS strings  
`include_mgrs_ref`  
if TRUE the data frame returned will include the MGRS reference in a column named `mgrs`. Default: TRUE.

**Value**

data.frame

**Note**

vectorized

**Examples**

```
mgrs_to_utm("48PUV7729883034")
```

---

ups_to_latlng	<i>Convert UPS to Latitude/Longitude</i>
---------------	--

---

**Description**

Convert UPS to Latitude/Longitude

**Usage**

```
ups_to_latlng(hemisphere, easting, northing, degrees = TRUE)
```

**Arguments**

hemisphere	South (S) or North (N)
easting, northing	easting (X) / northing (Y) (meters)
degrees	convert to degrees? Default: TRUE

**Examples**

```
ups_to_latlng("N", 2426773, 1530125)
```

---

ups_to_mgrs	<i>Convert UPS to MGRS</i>
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---

**Description**

Convert UPS to MGRS

**Usage**

```
ups_to_mgrs(hemisphere, easting, northing, precision = 5L)
```



**Arguments**

hemisphere      South (S) or North (N)  
easting, northing      easting (X) / northing (Y) (meters)  
precision      0:5; level of precision for the conversion. Default 5

**Examples**

```
ups_to_mgrs("N", 2426773, 1530125)
```

---

utm\_to\_latlng      *Convert UTM to Latitude/Longitude*

---

**Description**

Convert UTM to Latitude/Longitude

**Usage**

```
utm_to_latlng(zone, hemisphere, easting, northing, degrees = TRUE)
```

**Arguments**

zone      1:60  
hemisphere      South (S) or North (N)  
easting, northing      easting (X) / northing (Y) (meters)  
degrees      convert to degrees? Default: TRUE

**Examples**

```
utm_to_latlng(48, "N", 377299, 1483035)
```

---

`utm_to_mgrs`*Convert UTM to MGRS*

---

**Description**

Convert UTM to MGRS

**Usage**`utm_to_mgrs(zone, hemisphere, easting, northing, precision = 5L)`**Arguments**

<code>zone</code>	1:60
<code>hemisphere</code>	South (S) or North (N)
<code>easting, northing</code>	easting (X) / northing (Y) (meters)
<code>precision</code>	0:5; level of precision for the conversion. Default 5

**Examples**`utm_to_mgrs(48, "N", 377299, 1483035)`

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