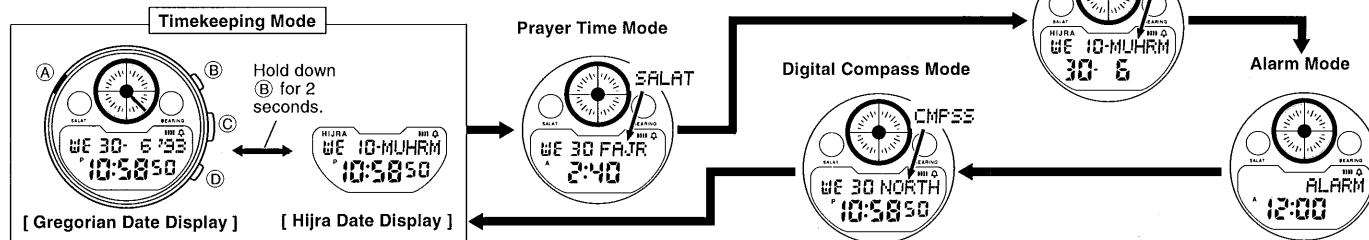


OPERATION CHART: MODULE QW-1034

PART 1 GENERAL GUIDE

- Press (C) to change from mode to mode. Each mode is explained in detail on the following pages.
- After you perform an operation in any mode, pressing (C) returns to the Timekeeping Mode.



PART 2 TIMEKEEPING MODE

This part of the manual tells you how to set city data (to tell the watch where you are), the current time and the current date.

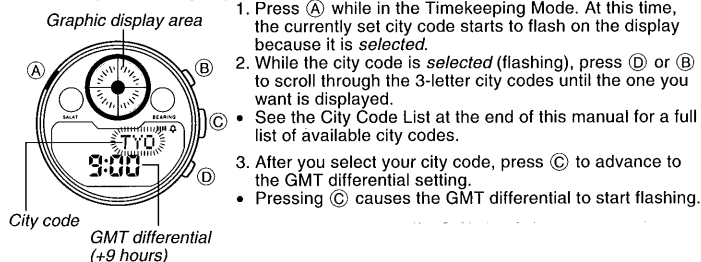
- In the Timekeeping Mode, hold down (B) for 2 seconds.

2-1 About city data...

With the city data, you tell the watch your current location so that it can calculate other data. Be sure to change the city data setting whenever you move from one city to another. City data consist of time differential from Greenwich Mean Time (GMT), latitude, longitude, and directional variation (variation between true north and magnetic north) for the city where you are currently located. You can use either of the two following methods to set city data.

- **Standard Data Input** (see below)
With this method, you simply specify one of 30 pre-programmed city codes, and all other data (based on data for 1990) is input automatically. With this method, however, you must remember to change the time differential from GMT whenever you switch between summer time and standard time. A complete list of the available city codes can be found at the end of this manual.
- **Original Data Input**
With this method, you make each of the settings by yourself, one-by-one.

To set city data using city codes



1. Press (A) while in the Timekeeping Mode. At this time, the currently set city code starts to flash on the display because it is *selected*.
2. While the city code is *selected* (flashing), press (D) or (B) to scroll through the 3-letter city codes until the one you want is displayed.
3. After you select your city code, press (C) to advance to the GMT differential setting.
4. Pressing (C) causes the GMT differential to start flashing.
5. If you want to change the GMT differential setting (to adjust for the 1-hour change for summer time), press (D) to increase the time differential or (B) to decrease it.
6. If you do not want to change the GMT differential setting, skip this step and proceed to step 5.
7. Pressing (D) and (B) changes the time differential in 15-minute increments.
8. The hours setting changes automatically whenever a change in the minutes settings increases or decreases past 00.
9. You can set the GMT differential within the range of -11 hours to +13 hours 45 minutes.
10. After you finish making your setting, press (A) to return to the Timekeeping Mode.
11. After you change the setting in the above procedure, the watch needs a bit of time to calculate certain information. During this calculation, the pattern in the graphic display moves. Wait until this display stops moving before you try to set any further data.
12. If you do not operate any button for a few minutes while a selection is flashing, the flashing stops and the watch automatically goes back to the Timekeeping Mode.

To set original city data

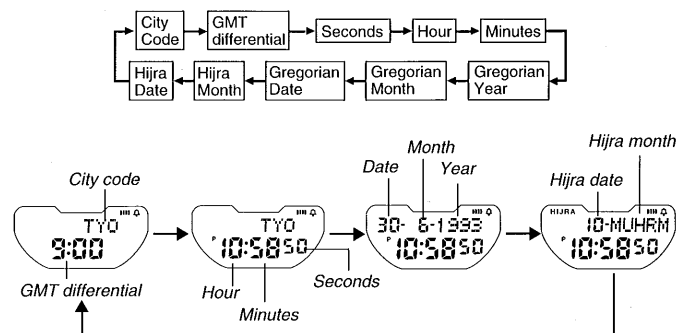
- City code (ready for original city data input)
1. Press (A) while in the Timekeeping Mode. At this time, the currently set city code starts to flash on the display because it is *selected*.
 2. While the city code is *selected* (flashing), press (D) or (B) to scroll through the 3-letter city codes until "—" appears in place of the city code.
 3. After "—" is displayed for the city code, press (C) to advance to the GMT differential setting.
 4. Pressing (C) causes the GMT differential to start flashing.
 5. Press (D) to increase the time differential or (B) to decrease it.
 6. Pressing (D) and (B) changes the time differential in 15-minute increments.
 7. The hours setting changes automatically whenever a change in the minutes settings increases or decreases past 00.
 8. Holding down (D) or (B) changes the time differential at high speed.

- You can set the GMT differential within the range of -11 hours (-11:00) to +13 hours 45 minutes (13:45).

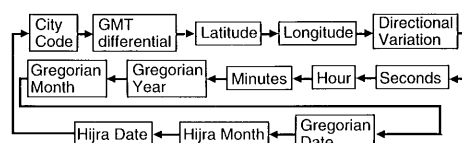
5. After you set the GMT differential, press (C) to advance to the latitude setting.
6. Use (D) and (B) to change the latitude within the range shown in the illustration. Holding down either button changes the setting at high speed.
7. The Latitude and Longitude Table at the end of this manual provides the latitude and longitude information for a number of cities.
8. After you set the latitude, press (C) to advance to the longitude setting.
9. Use (D) and (B) to change the longitude within the range shown in the illustration. Holding down either button changes the setting at high speed.
10. After you set the longitude, press (C) to advance to the directional variation setting.
11. See "Directional Variations Map" (at the end of this manual) that shows directional variations around the globe.
12. The sample display illustrated here shows a directional variation of 7 degrees west.
13. For details on the Qibla value see "3-2 About Qibla values....".
14. Use (D) and (B) to change the directional variation setting the range shown in the illustration. Holding down either button changes the setting at high speed.
15. After finish setting your city data, press (A) to return to the Timekeeping Mode.

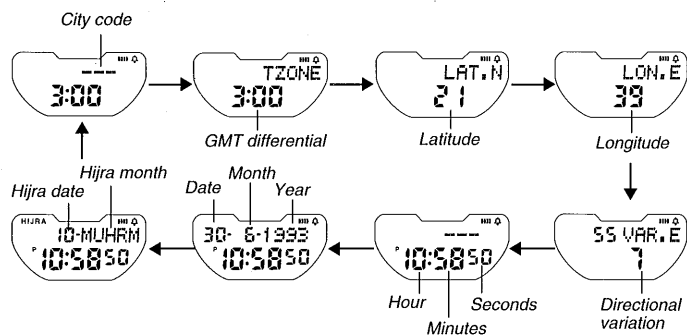
2-2 To set the time and date

1. Press (A) while in the Timekeeping Mode. The city code starts to flash on the display because it is *selected*.
2. Press (C) to change the selection in the following sequence.



- If "—" currently set as the city code (see "To set original city data"), the above sequence changes to the following.





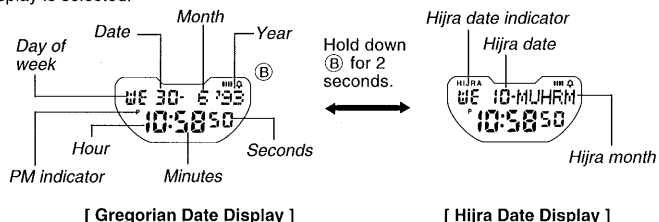
- While the seconds digits are selected (flashing), press (D) to reset them to "00". If you press (D) while the seconds count is in the range of 30 to 59, the seconds are reset to "00" and 1 is added to the minutes. If the seconds count is in the range of 00 to 29, the minutes count is unchanged.
- While any other setting (besides seconds) is selected (flashing), press (D) to increase the setting or (B) to decrease it. Holding down either button changes the setting at high speed.
- The digital time is always displayed in 12-hour format.
- After you set the time and date, press (A) to return to the Timekeeping Mode.
- The day of the week is automatically set in accordance with the Gregorian Date setting.
- The Gregorian Date can be set within the range of January 1, 1990 to December 31, 2029.

Important!

This watch uses a 30-day cycle to calculate the Hijra months. Because of this, the Hijra date shown by this watch may differ from the actual date. When this happens, use time/date setting procedure described above to change the date to its correct setting. Also note that the watch uses midnight as the point for the change of date.

To switch between the Hijra and Gregorian date displays

In the Timekeeping Mode, hold down (B) for approximately two seconds to switch between the Hijra and Gregorian date displays. The date display you select here determines the format for the date that appears in other modes. If you select the Hijra date display, for example, the Hijra date format is used in the Prayer Time Mode as well. Note also that a Hijra Date Indicator appears on the display while the Hijra date display is selected.



[Gregorian Date Display]

[Hijra Date Display]

PART 3 DETERMINING THE DIRECTION TO QIBLA

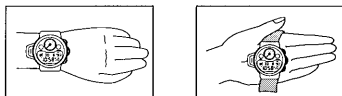
This part of the manual tells you how to determine Qibla. It also contains information about the Qibla value.

Important!

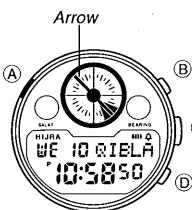
Be sure to keep this watch away from any sources of strong magnetism whenever using the digital compass to determining directions or Qibla. Also note that proper digital compass operation is impossible while inside a motor vehicle. For details, see "7-2 Digital Compass Precautions" of this manual.

3-1 Determining Qibla

- Set your city data.
- Place the watch on a flat surface or (if you wearing the watch), make sure that your wrist horizontal (in relation to the horizon).



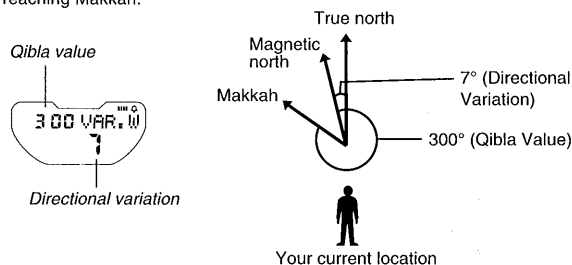
- Digital compass operation while the watch is not horizontal can produce erroneous results.



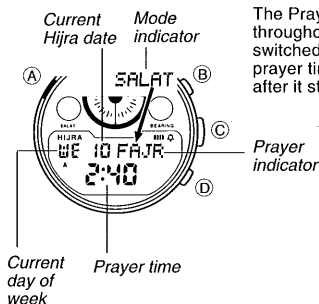
- While in the Timekeeping Mode, press (D) to start the Qibla operation.
- If the watch is not in the Timekeeping Mode, press (C) to enter the Timekeeping Mode before starting the Qibla operation.
- "QIBLA" appears on the display, and soon an arrow pointing in the direction of QIBLA appears in the graphic display area.
- The arrow remains on the display for about two minutes after you perform the above operation.

3-2 About Qibla values...

The Qibla value represents the clockwise angle formed between a line starting from your current location extending to magnetic north, and a line starting from your current location reaching Makkah.



PART 4 PRAYER TIME MODE



The Prayer Time Mode lets you recall the prayer times throughout the day. A Prayer Time Alarm (which can be switched on and off) sounds for 10 seconds when each prayer time arrives. Press any button to stop the alarm after it starts to sound.

4-1 About prayer times....

Prayer Indicator	Prayer Time
FAJR (Fajr)	Fajr start time
RISE*	Sunrise time
ZOHR (Zohr)	Zohr start time
ASR (Asr)	Asr start time
MGRB (Mgrib)	Mgrib start time
ISHA (Isha)	Isha start time

Prayer times are calculated automatically in accordance with the time, date, and city code you set in the Timekeeping Mode. This, of course, means that you should always make sure that your Timekeeping Mode data is set correctly.

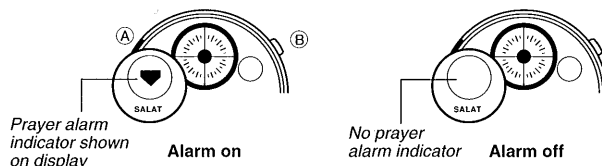
* RISE (sunrise time) does not indicate a prayer time.

To view Prayer Time Mode data

While in the Prayer Time Mode, use (D) and (B) to scroll through the different prayer times. Each prayer time is accompanied by a prayer indicator that tells you what prayer time is displayed.

4-2 To switch the prayer alarm on and off

- Enter the Prayer Time Mode and use (D) and (B) to display the prayer time whose alarm you want to switch on or off.
- While the prayer time you want is displayed, press (A) to switch its prayer alarm on and off.



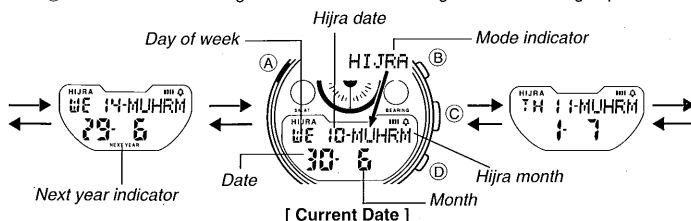
- You can individually switch the alarms on and off.
- If any prayer time indicator is on, the prayer alarm indicator is shown on the display when you change to another mode.

PART 5 HIJRA DATE MODE

In the Hijra Date Mode, you can scroll through dates to display both the Hijra date and the Gregorian date.

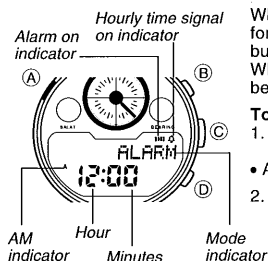
To display a specific date

While in the Hijra Date Mode, use (D) to advance the date (Timekeeping Mode date) and (B) to move back. Holding down either button changes the date at high speed.



- When you enter the Hijra Date Mode from another mode, the display automatically changes to the current Hijra and Gregorian dates, in accordance with the Timekeeping Mode setting.
- This watch uses a 30-day cycle to calculate the Hijra months. Because of this, the Hijra date shown by this watch may differ from the actual date.
- With the above operation, you can advance the date up to one year. If the current Timekeeping Mode Gregorian date is June 30, 1993 for example, you can advance up to June 29, 1994.
- Note that the message "NEXT YEAR" appears on the display when you advance the date into the next year.

PART 6 ALARM MODE

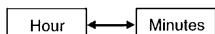


When the Daily Alarm is switched on, the alarm sounds for 20 seconds at the preset time each day. Press any button to stop the alarm after it starts to sound. When the Hourly Time Signal is switched on, the watch beeps every hour on the hour.

To set the alarm time

1. Press (A) while in the Alarm Mode. The hour digits flash on the display because they are selected.
- At this time the Daily Alarm is switched on automatically.

2. Press (C) to change the selection in the following sequence.

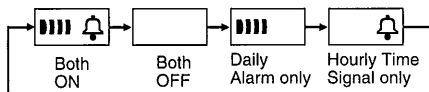


3. Press (D) to increase the selected digits and (B) to decrease them. Holding down either button changes the selection at high speed.
- The digital time is always displayed in 12-hour format. Take care to set the alarm time correctly as morning (A) or afternoon (P).
4. After you set the alarm time, press (A) to return to the Alarm Mode.

To switch the Daily Alarm and Hourly Time Signal on and off

Press (B) while in the Alarm Mode to change the status of the Daily Alarm and Hourly Time Signal in the following sequence.

[Alarm ON Indicator/Hourly Time Signal ON indicator]



To test the alarm

Hold down (D) while in the Alarm Mode to sound the alarm.

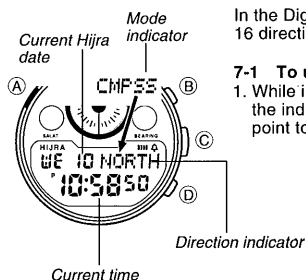
About the alarm sounds

This watch has three types of alarms: Prayer Time Alarm, Daily Alarm, and Hourly Time Signal. Each alarm has a different type of sound so you can tell them apart. Note that the alarms have the following priority sequence whenever they are set to sound at the same time.

1. Prayer Time Alarm
2. Daily Alarm
3. Hourly Time Signal

- This means that if the Daily Alarm and Prayer Time Alarm are set to sound at the same time, only the Prayer Time Alarm sounds.

PART 7 DIGITAL COMPASS MODE



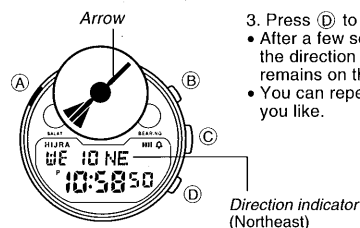
In the Digital Compass Mode, the watch points to one of 16 directions selected by you.

7-1 To use the digital compass

1. While in the Digital Compass Mode, use (B) to display the indicator that specifies the direction you want to point to.

Indicator	Direction	Indicator	Direction	Indicator	Direction	Indicator	Direction
NORTH	North	NNE	North-northeast	NE	Northeast	ENE	East-northeast
EAST	East	ESE	East-southeast	SE	Southeast	SSE	South-southeast
SOUTH	South	SSW	South-southwest	SW	Southwest	WSW	West-southwest
WEST	West	WNW	West-northwest	NW	Northwest	NNW	North-northwest

2. Place the watch on a flat surface or (if you wearing the watch), make sure that your wrist horizontal (in relation to the horizon).
- Note that taking a measurement while the watch is not horizontal (in relation to the horizon) can result in large measurement error.



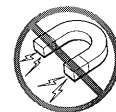
3. Press (D) to start the compass operation.
- After a few seconds the arrow on the display points in the direction you selected in step 1. This arrow remains on the display for about two minutes.
- You can repeat steps 1 through 3 as many times as you like.

7-2 Digital Compass Precautions

The following describes precautions you should observe when performing a digital compass operation. Note that the term digital compass operation in this manual refers to Digital Compass Mode operations and to the Qibla operation.

This watch features a built-in magnetic bearing sensor that detects terrestrial magnetism. This means that the northern direction indicated by this watch is magnetic north, which is somewhat different from true polar north. The magnetic north pole is located in northern Canada, while the magnetic south pole is in southern Australia. The difference between true north and magnetic north is expressed in degrees, and it is called the *directional variance*. The map that is included separately with this watch shows the directional variance for points around the globe. Note that the directional variance as measured with magnetic compasses tends to be greater as one gets closer to either of the magnetic poles. You should also remember that some maps indicate true north (instead of magnetic north), and so you should make allowance when using such maps with this watch.

Location



- Using a digital compass operation when you are near a source of strong magnetism can cause large errors in readings. Because of this you should avoid using a digital compass operation while in the vicinity of the following types of objects: permanent magnets (magnetic necklaces, etc.), concentrations of metal (metal doors, lockers, etc.), high tension wires, aerial wires, household appliances (TVs, personal computers, washing machines, freezers, etc.).
- Accurate direction measurements are impossible while in a train, boat, air plane, etc.
- Accurate measurements are also impossible indoors, especially inside ferroconcrete structures. This is because the metal framework of such structures picks up magnetism from appliances, etc.

Storage

- The precision of the digital compass may deteriorate if the watch becomes magnetized. Because of this, you should be sure to store the watch away from magnets or any other sources of strong magnetism, including: permanent magnets (magnetic necklaces, etc.) and household appliances (TVs, personal computers, washing machines, freezers, etc.).
- Whenever you suspect that the watch may have become magnetized, perform one of the calibration procedures (See "7-4 Calibrating the magnetic sensor").

7-3 Warning Indicators

Warning indicators (message) appear whenever any of the conditions described below occurs.

Abnormal Magnetic Field Indicator



This indicator appears on the display whenever the digital compass has a problem obtaining a correct reading. This condition could indicate that the watch is within a very high magnetic field, and so you should try moving to another location. Also see "7-2 Digital Compass Precautions" for further information on conditions that cause errors.

Low Battery Indicator



This message indicates battery power is too low to perform a digital compass operation. It appears whenever battery power drops below a certain level, or when you try to perform a digital compass operation under cold conditions.

If the BATT message appears because of use under cold conditions, it should clear (and normal operation should return) after the watch is brought back to normal temperature.

If battery power is low (indicated when BATT appears under normal temperatures), you should have the battery replaced as soon as possible (see "7-4 Calibrating the magnetic sensor").

7-4 Calibrating the magnetic sensor

Whenever you suspect that the readings produced by a digital compass operation are wrong, you should calibrate it. You can use either one of two calibration procedures: *bidirectional calibration* or *northerly calibration*. You should use bidirectional calibration when you want to calibrate the digital compass to operate within an area exposed to magnetic force. This type of calibration should be employed if the watch becomes magnetized for any reason.

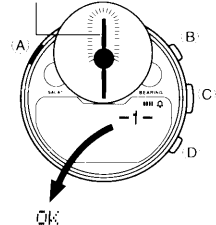
With northerly calibration, you "teach" the watch which way is magnetic north (which you have to determine with another compass or some other means).

Important!

- If you want to perform both bidirectional and northerly calibration, be sure to perform bidirectional calibration first, and then perform northerly calibration. This is necessary because bidirectional calibration cancels any previously set northerly calibration setting.
- If you do not perform any button operation for two or three minutes while either calibration procedure is in progress (while the calibration direction indicator is flashing at the 12 or 6 o'clock position), the watch automatically returns to the Digital Compass Mode.
- The more correctly you perform bidirectional calibration, the better the accuracy of your digital compass readouts. You should perform bidirectional calibration whenever you change environments where you perform digital compass operations and whenever you feel that digital compass operations are producing incorrect readings.

To perform bidirectional calibration

Calibration direction indicator



- While in the Digital Compass Mode, press **A** to start the bidirectional calibration procedure.
- At this time, the display changes to show "1" and the calibration direction indicator flashes at the 12 o'clock position to indicate that the watch is ready to calibrate the first direction.
- Place the watch on a level surface, and press **D** to calibrate the first direction.
- When the calibration procedure is complete, the message "OK" appears in the display. This shortly changes to "2" and the calibration direction indicator flashes at the 6 o'clock position to indicate that the watch is ready for the second direction.
- Rotate the watch 180 degrees.

- Press **D** again to calibrate the second direction.

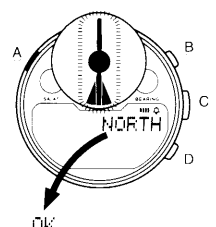
When the calibration procedure is complete, the message "OK" appears in the display. After a short while, the watch automatically returns to the Digital Compass Mode.

Precautions about bidirectional calibration

- You can use any two opposing directions for bidirectional calibration. You must, however, make sure that they are 180 degrees opposite each other. Remember that if you perform the procedure incorrectly, you will get wrong readings from digital compass operations.
- Do not move the watch during one to two seconds (from the point you press **D** up to the point that "OK" appears on the display) that the calibration of each direction is in progress. If you do, the Abnormal Magnetic Field Indicator "ERROR" appears on the display. When this happens, restart the bidirectional calibration procedure from the beginning.
- The appearance of "ERROR" during bidirectional calibration can also be caused by local interference. Move to another location and try the bidirectional calibration procedure again.
- You should perform bidirectional calibration in an environment that is the same as that where you plan to be performing digital compass operations. If you plan to use it in an open field, for example, calibrate in an open field.

To perform northerly calibration

- While in the Digital Compass Mode, press **A** to start the bidirectional calibration procedure.
- Press **C** to start the northerly calibration procedure.
- At this time, the indicator "NORTH" appears on the display.



- Place the watch on a level surface, and position it so that its 12 o'clock position points magnetic north (as measured with another compass).
- Press **D** to start the calibration operation.
- When the calibration procedure is complete, the message "OK" appears on the display. After a short while, the watch automatically returns to the Digital Compass Mode.

CITY CODE LIST

*1 City Code *2 City *3 No city code *4 Latitude *5 Longitude

City Code *1	City *2	City Code *1	City *2	City Code *1	City *2
HNL	Honolulu	MAD	Madrid	DEL	Delhi
LAX	Los Angeles	PAR	Paris	DAC	Dhaka
DEN	Denver	ROM	Rome	BKK	Bangkok
CHI	Chicago	ATH	Athens	JKT	Jakarta
NYC	New York	CAI	Cairo	HKG	Hong Kong
CCS	Caracas	IST	Istanbul	KUL	Kuala Lumpur
RIO	Rio de Janeiro	JED	Jeddah	TYO	Tokyo
---	No city code *3	KWI	Kuwait	SYD	Sydney
CAS	Casablanca	THR	Tehran	WLG	Wellington
LON	London	DXB	Dubai		
BER	Berlin	ISB	Islamabad		

LATITUDE AND LONGITUDE TABLE

<Africa and Middle East>

City	LAT *4	LON *5	City	LAT *4	LON *5	City	LAT *4	LON *5
ABHA	18N	43E	BEIRUT	34N	46E	JOHANNESBURG	26S	28E
ABIDJAN	5N	4W	BISSAU	12N	16W			
ABU DHABI	24N	54E	CAPE TOWN	34S	18E	KARACHI	25N	67E
ACCRA	6N	0E	DAKAR	15N	17W	KHARTOUM	16N	33E
ADEN	13N	45E	DAMASCUS	34N	36E	KINSHASA	4S	15E
ADDIS ABABA	9N	39E	DAMMAM	26N	50E	MEDINA	25N	40E
ALGIERS	37N	3E	DJIBOUTI	12N	43E	MOGADISHU	2N	45E
AL MANAMAH	26N	51E	DOHA	25N	52E	MUSCAT	24N	59E
AMMAN	32N	36E	FREETOWN	9N	13W	NAIROBI	1S	37E
BAGHDAD	33N	44E	JAWF	30N	40E	NIAMEY	14N	2E
BAMAKO	13N	8W	JERUSALEM	32N	35E	NICOSIA	35N	33E

City	LAT *4	LON *5	City	LAT *4	LON *5	City	LAT *4	LON *5
NOUAKHOOT	18N	16W	RIYADH	25N	47E	TRIPOLI	33N	13E
PRAIA	15N	23W	TABUK	28N	37E	TUNIS	37N	10E

<North America>

City	LAT *4	LON *5	City	LAT *4	LON *5	City	LAT *4	LON *5
BOSTON	42N	71W	MEXICO CITY	19N	99W	SAN FRANCISCO	38N	122W
DALLAS	33N	97W						
DETROIT	42N	83W	MIAMI	26N	80W	SEATTLE	48N	122W
EDMONTON	54N	113W	MONTREAL	46N	74W	VANCOUVER	49N	123W
EL PASO	32N	107W	NEW ORLEANS	30N	90W	WASHINGTON	39N	77W
HOUSTON	30N	95W	PAGO PAGO	14N	171W	WINNIPEG	50N	97W
LOS ANGELES	34N	118W						

<Central and South America>

City	LAT *4	LON *5	City	LAT *4	LON *5	City	LAT *4	LON *5
BOGOTA	5N	74W	LIMA	12S	77W	PORT OF SPAIN	11N	61W
BRASILIA	16S	48W	MONTEVIDEO	35S	56W			
BUENOS AIRES	35S	59W	PANAMA CITY	9N	80W	SANTIAGO	34S	71W
LA PAZ	17S	68W				SAO PAULO	24S	47W

<Asia and Pacific>

City	LAT *4	LON *5	City	LAT *4	LON *5	City	LAT *4	LON *5
BEIJING	40N	116E	NOUMA	22S	166E	SINGAPORE	1N	104E
CHRAIST-CHURCH	44S	173E	PAPEETE	18S	150W	SUVA	18S	178E
GUAM	13N	145E	PERTH	32S	116E	TAIPEI	25N	122E
HANOI	21N	106E	PHNOM-PENH	12N	105E	ULAN BATOR	48N	107E
MANILA	15N	121E	PORT VILA	18S	168E	VIENTIANE	18N	103E
MELBOURNE	38S	145E	PYONGYANG	39N	126E			
NAURU ISLAND	1S	166E	SANANA	2S	126E			
			SEOUL	38N	127E			

<Europe>

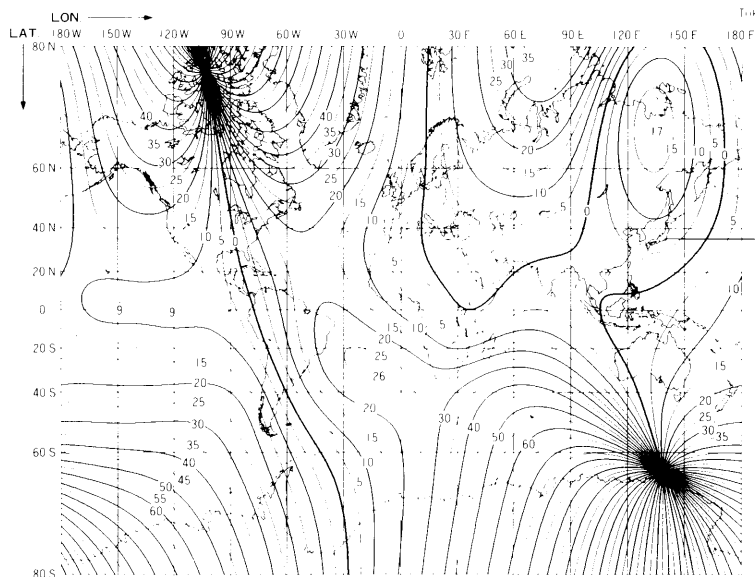
City	LAT *4	LON *5	City	LAT *4	LON *5	City	LAT *4	LON *5
AMSTERDAM	52N	5E	FRANKFURT	50N	9E	MOSCOW	56N	38E
AZORES	39N	28W	GENEVE	46N	6E	MUNCHEN	48N	12E
BRUSSEL	51N	4E	HANBURG	54N	10E	STOCKHOLM	59N	18E
COPENHAGEN	56N	13E	HELSINKI	60N	25E	VIENNA	48N	16E
HAGEN			LISBON	39N	9W	ZURICH	47N	9E
DUBLIN	53N	6W	MILAN	45N	9E			

Directional Variations

The map below shows you directional variations for various points around the world. The values preceded by "W" are westerly values (W), and the other values (those without "W") are easterly values (E). The directional variation for Tokyo, which falls between the lines marked -10 and -5 would be 7W.

Important!

The information contained in the map is current as of 1990. Note that directional variations are subject to change in accordance with movements of the earth's axis.



Source: World Data Center C2 for Geomagnetism Kyoto