

**Analog/digital watch –
Local reception, 2 digit dot matrix LCD, 2 hands**

Preliminary Specification

Supplier: C-MAX Asia Limited Unit 125, 1/F., Liven House, 61-63 King Yip Street, Kwun Tong, HK SAR

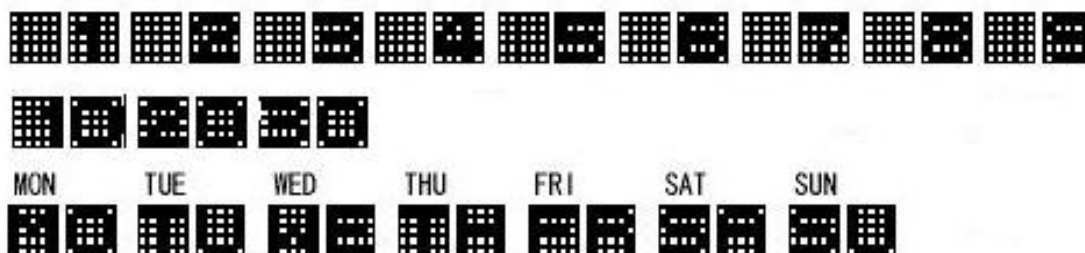
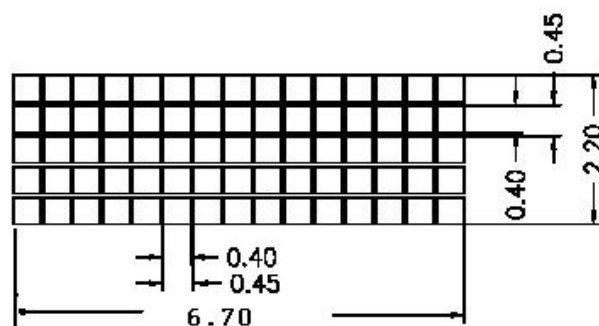
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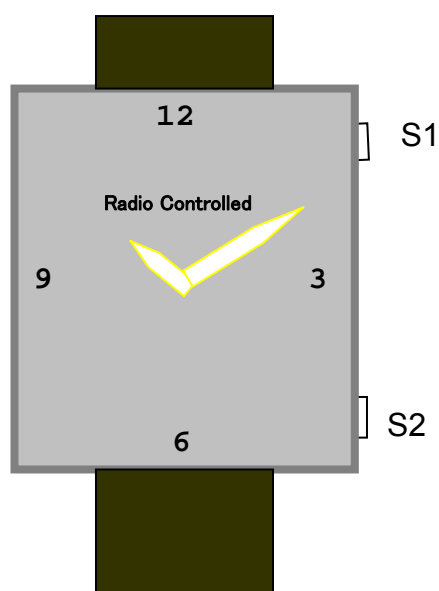
1.0 Functional Overview

Feature	Analog module with 2 digit LCD
Motor	Single minute motor
Local Time display	Hands show minute and hour information.
Date	Can be shown on LCD together with day of the week
Day of the week	Can be shown on LCD together with date
Manual time setting	Via electronic adjust seen on LCD
Hour Offset display	Time offset from default local time can be seen on LCD
Bond Option	Set default time zone and reception signal upon power on;
DST detection	DST detection and update is fully automatic for reception areas. Except for USA M and C zone, user can choose to disable auto DST detection. For no radio control reception areas, DST is turned off by default.
Radio controlled signal reception	Auto reception maximum 3 times daily. Manual reception will only be performed if user manually activates RCC reception by button pressed. Signal can only be received in designated time zone areas: EU and UK for Europe version; P,M,C,E for US version and JP only for Japan version
During reception	Hands will move normally during auto and manual reception Hands will not move during reception after zero calibration
Back light	No back light
Multi-frequency reception	Only available for Japan version JP : JJY40 → JJY60

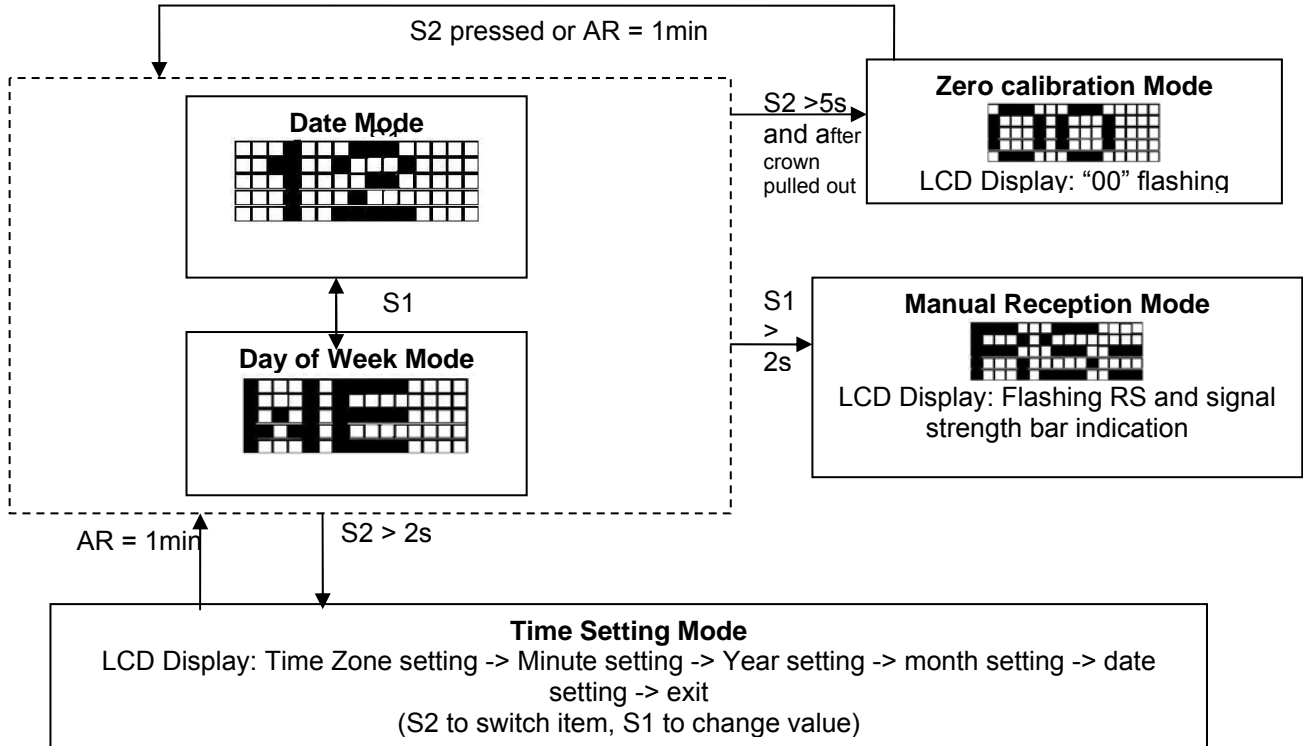
2.0 LCD Display



3.0 Button definition

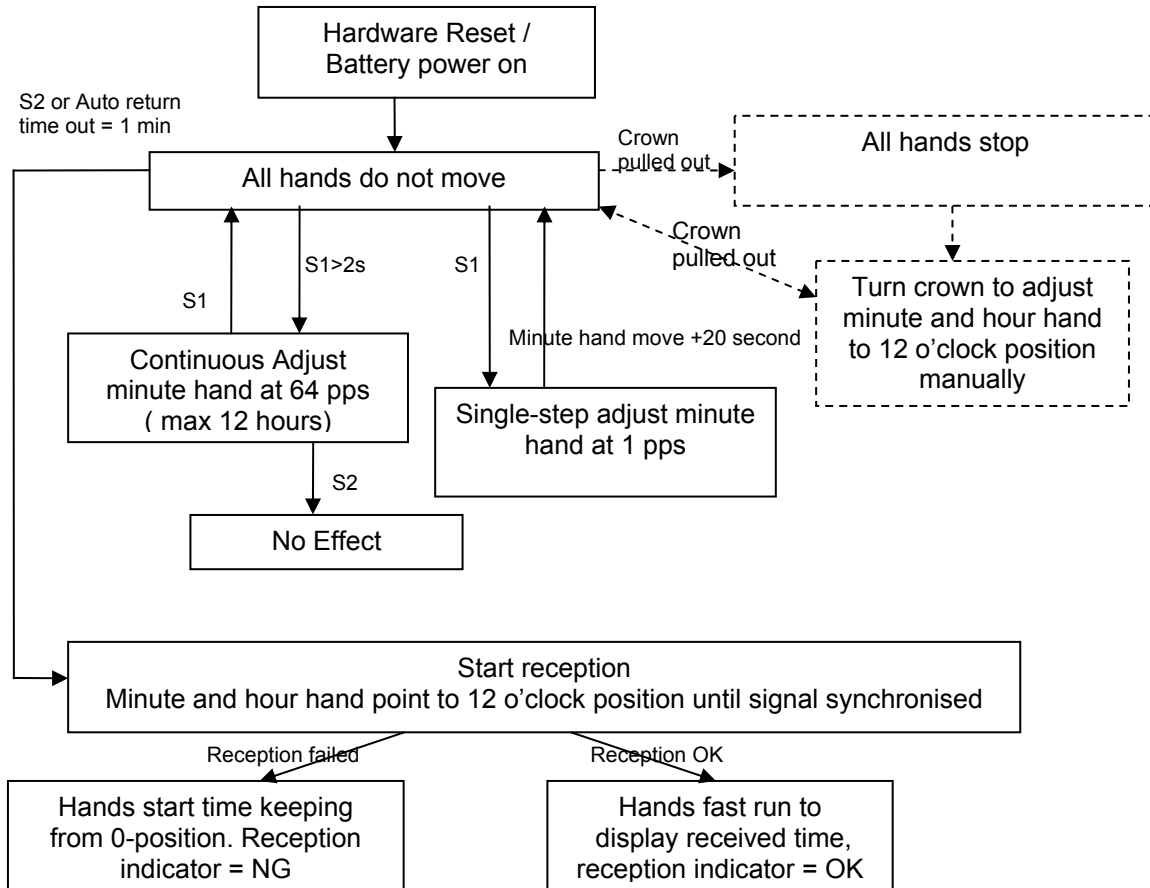


4.0 Modes Overview



4.1 After reset / battery power on

After hardware reset or battery power on, the user must set the hands to 0-position by operation as follows:



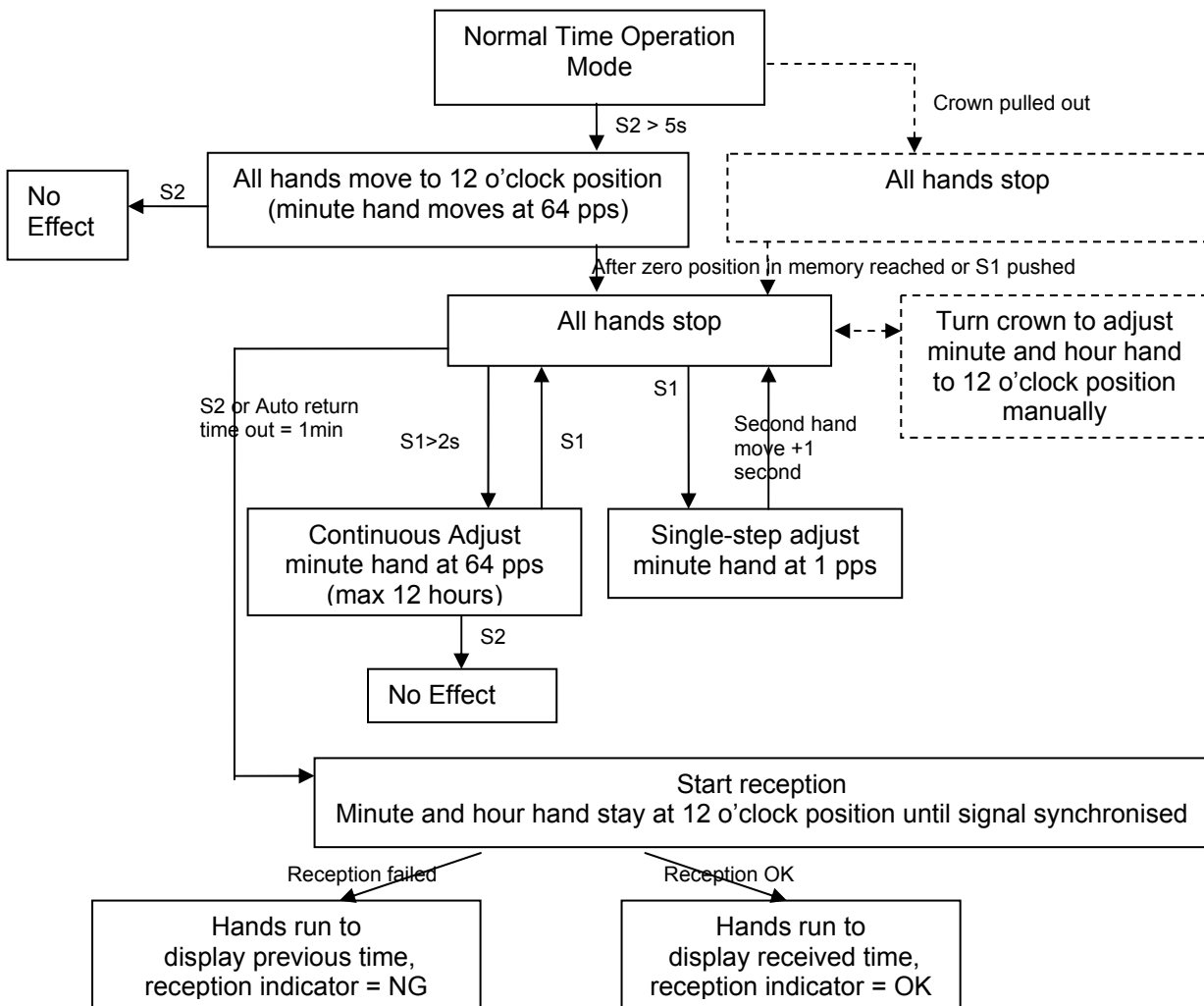
Automatically a receiving mode is started after the calibration mode is quitted after manually by pressing S1 or by auto-return time out (= 1 minute). After zero calibration, reception will syncTZone minutes, seconds, and hours. If no S2 was pressed after continuous fast adjust has started for 12 hours, the needles will stop by itself, and after 1 minute watch will start reception automatically.

Bond Option for default time zone

P10	Default time zone	Reception signal
USA + Japan version		
L	UTC + 9H (Japan)	JJY40 -> JJY60
H	UTC - 8H (USA-P)	WWVB
UK + DCF version		
L	UTC + 0H (UK)	MSF
H	UTC + 1H (EU)	DCF

4.2 0-calibration

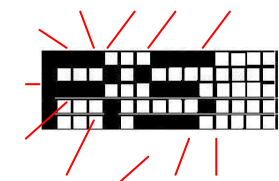

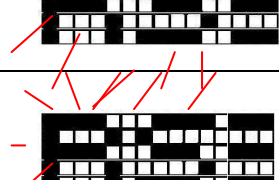
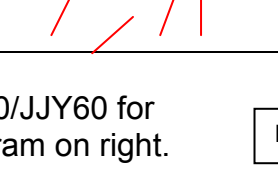
The calibration mode can be started by pressing the S2 button longer than 5 seconds. In 0 calibration, there are two different modes of adjustment: second hand fast adjust at 64 pps and minute adjust. Operation is as follows:



Automatically a receiving mode is started after the calibration mode is quitted by auto-return time out from any stage of the zero-calibration mode if no button is pressed for ≥ 1 minute. After zero calibration, reception will syncTZone minutes, seconds, and hours.

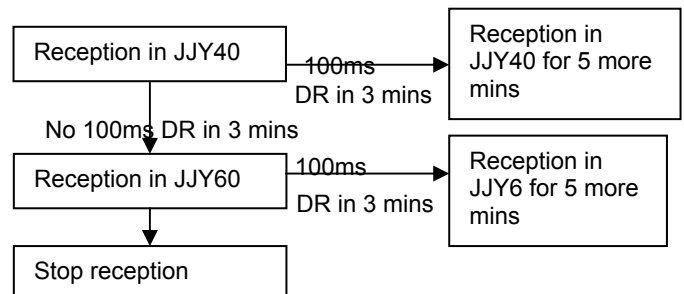
4.3. RC Reception

- During reception (both manual and auto reception), "RS" will flash at 1 Hz and signal quality indicator will appear (when available) on the LCD.
- If a signal is received the watch will be set to the new received time and date.
- If no signal is received after time out, the watch will continue running as old time.
- LCD will revert to normal LCD display once reception is manually terminated.
- Minute, hour and second hand will continue to move during reception.

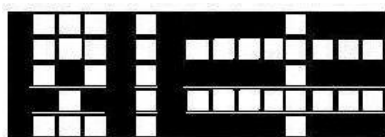
No waves		No signal available
1 wave		Weak signal available
2 waves		Good signal available, some interference
3 waves		Best signal available

Reception sequence for JJY40/JJY60 for First time reception is as diagram on right.

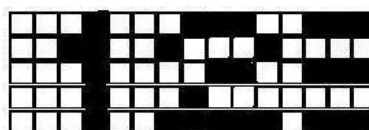
Next dual reception (automatic or manual) Starts from last successfully selected transmitter. If reception failed, next reception sequence will be reversed.



After any successful reception, the LCD display in normal mode will show 3 bars to indicate time syncTzonised.



or



Under the following conditions, the 3 bars will disappear:

- i) After any unsuccessful reception (including manual and auto receptions)
- ii) After a reception is abandoned
- iii) After manual time set (including hour offset set)

4.3.1 Manual Reception

- Manual reception can be started by pushing S1>2s
- Manual can also be cancelled by pushing S1>2s during reception
- Signal to receive during manual reception depends on whether the watch is in local time zone. If the time offset to time away from local time zone, then no manual reception can be started.

4.3.2 Automatic receiving mode

The signal will be checked every night starting at a defined time (see table below) automatically. If the reception was not successful, the signal will be checked again at minute 00 of the next full hour up to 2 more times again. After the 3rd failed reception, the watch will look again for signal in the next reception trial at the coming 3 am. Consecutive auto receptions are cancelled if the reception has succeeded.

AUTO RECEPTION START TIME

Watch version	Auto reception start time at x o'clock A.M. local time
EU and UK (winter time)	3,4,5
EU and UK (summer time)	2,3,4
Japan	2,3,4
USA (summer time)	3,4,5
USA (winter time)	2,3,4

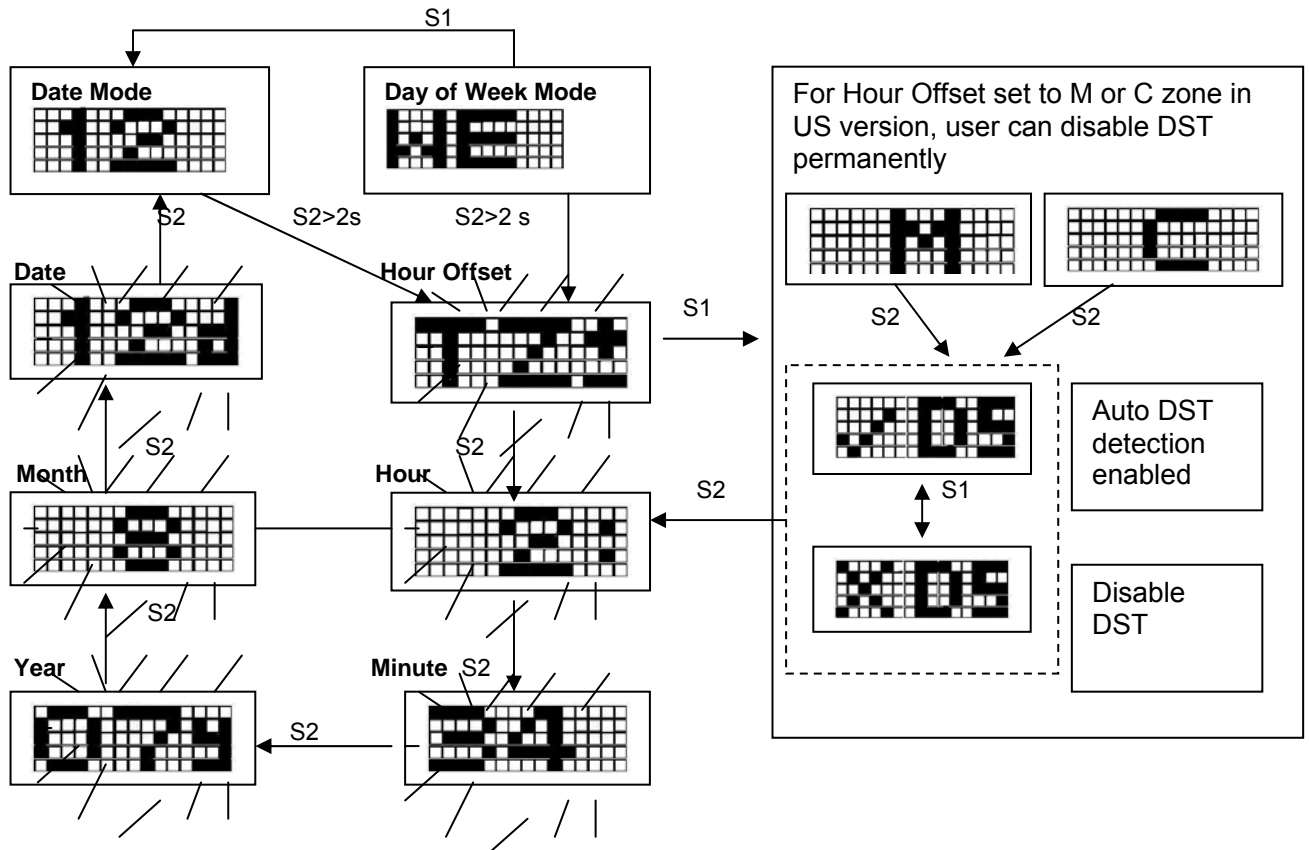
With press of S1 button >2s, auto reception can be cancelled and the watch will display the pre-adjusted time.

4.4. Manual time setting

Items that can be set by the manual time setting mode in sequence includes:

- Hour Offset : Adjustable hour offset depends on the time your watch is displaying. For example, if your watch is on Japanese time, then hour offset is only possible from - 1 hour to - 21 hour and from +1 hour to +2 hour
- Hour : Adjustable between 0 to 23 (after adjustment, second will not be reset to 00)
- Minute : Adjustable between 0 to 59 (after adjustment, second will not be reset to 00)
- Year : Adjustable between 00 to 99
- Month : Adjustable between 1 to 12
- Date : Adjustable between 1 to 31 (28, 29 or 30 for some months)

During time setting mode, the minute hand will stop until exit setting mode or auto return time out after 1 minute of no action in setting mode, then minute hand will fast move to catch up time. Within setting mode, press S1 to make changes or increment, press S2 to switch to next item and confirm present setting.



4.1.1 Hour Offset Setting

When time is at local time zones, LCD will display local time zone abbreviation:

EU: for Europe
 UK: for Great Britain
 JP: for Japan
 P, M, C or E for USA

Outside of local time zones, the LCD will display TZ_±, push of S1 will adjust hour to + or – number of hours from present time. The number of hours that can be adjusted depends on the present time. Outside local time zone, there will be no radio control functions possible.

Time Zone	LCD display at start of hour offset mode				+direction hour adjustable maximum	+ direction hour adjustable minimum	-direction hour adjustable maximum	- direction hour adjustable minimum
	US Version	EU version	UK version	Japan version				
UTC -12	TZ+	TZ+	TZ+	TZ+	23+	1+	0	0
UTC -11	TZ+	TZ+	TZ+	TZ+	22+	1+	1-	1-
UTC -10	TZ+	TZ+	TZ+	TZ+	21+	1+	1-	1-
UTC -9	TZ+	TZ+	TZ+	TZ+	20+	1+	3-	1-
UTC -8	P/(TZ+)	TZ+	TZ+	TZ+	19+	1+	4-	1-
UTC -7	M/(P)	TZ+	TZ+	TZ+	18+	1+	5-	1-
UTC -6	C/(M)	TZ+	TZ+	TZ+	17+	1+	6-	1-
UTC -5	E/(C)	TZ+	TZ+	TZ+	16+	1+	7-	1-
UTC -4	TZ+/(E)	TZ+	TZ+	TZ+	15+	1+	8-	1-
UTC -3	TZ+	TZ+	TZ+	TZ+	14+	1+	9-	1-
UTC -2	TZ+	TZ+	TZ+	TZ+	13+	1+	10-	1-
UTC -1	TZ+	TZ+	TZ+	TZ+	12+	1+	11-	1-
UTC	TZ+	TZ+	UK/TZ±	TZ+	11+	1+	12-	1-
UTC +1	TZ+	EU/(TZ±)	TZ±/UK	TZ+	10+	1+	13-	1-
UTC +2	TZ+	TZ±/(EU)	TZ±	TZ+	9+	1+	14-	1-
UTC +3	TZ+	TZ+	TZ+	TZ+	8+	1+	15-	1-
UTC +4	TZ+	TZ+	TZ+	TZ+	7+	1+	16-	1-
UTC +5	TZ+	TZ+	TZ+	TZ+	6+	1+	17-	1-
UTC +6	TZ+	TZ+	TZ+	TZ+	5+	1+	18-	1-
UTC +7	TZ+	TZ+	TZ+	TZ+	4+	1+	19-	1-
UTC +8	TZ+	TZ+	TZ+	TZ+	3+	1+	20-	1-
UTC +9	TZ+	TZ+	TZ+	JP	2+	1+	21-	1-
UTC +10	TZ+	TZ+	TZ+	TZ+	1+	1+	22-	1-
UTC +11	TZ+	TZ+	TZ+	TZ+	0	0	23-	1-

Note: Abbreviations in () are the displays when local time is in summer time.

4.5 Hands adjustment

There are 4 cases that the 2-hands of the watch will fast move to adjust:

- 1) After reception of signal and time is different to existing time
- 2) After change of time zone
- 3) After change of DST setting
- 4) During zero calibration

During fast adjustment of watch hands, manual reception function will be disabled. Settings adjustment is still possible, once in setting mode, hands will stop until exit setting mode, then it will resume fast run to set time. If auto reception time is reached during hands adjustment, the reception will be postponed until hands finished adjustment and restarted at the next second 00 after adjustment.

The worst case for hands adjustment is when hands have to move 12 hours. Fast movement of minute hand is at 64 Hz. Therefore worst case duration for hands adjustment is around 33 seconds.

4.6 Antenna Tuning Mode

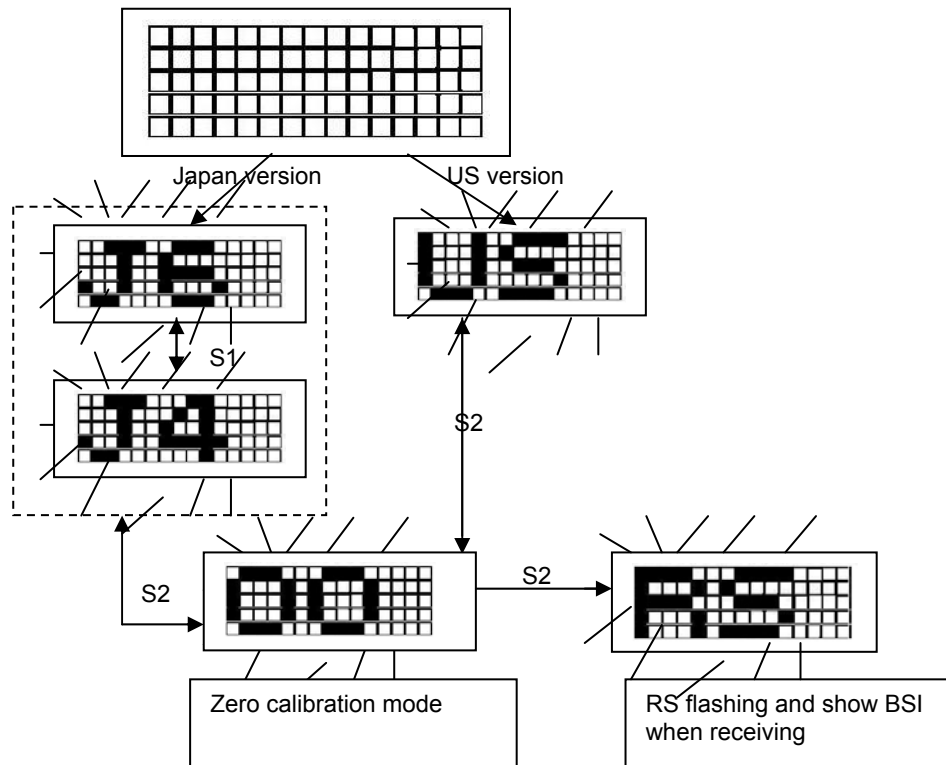
After reset, LCD will show full screen display for 3 seconds:

During full screen display, if S2 is pushed once, watch will enter antenna tuning mode, all hands will not move and user can select between different reception signals to antenna frequency:

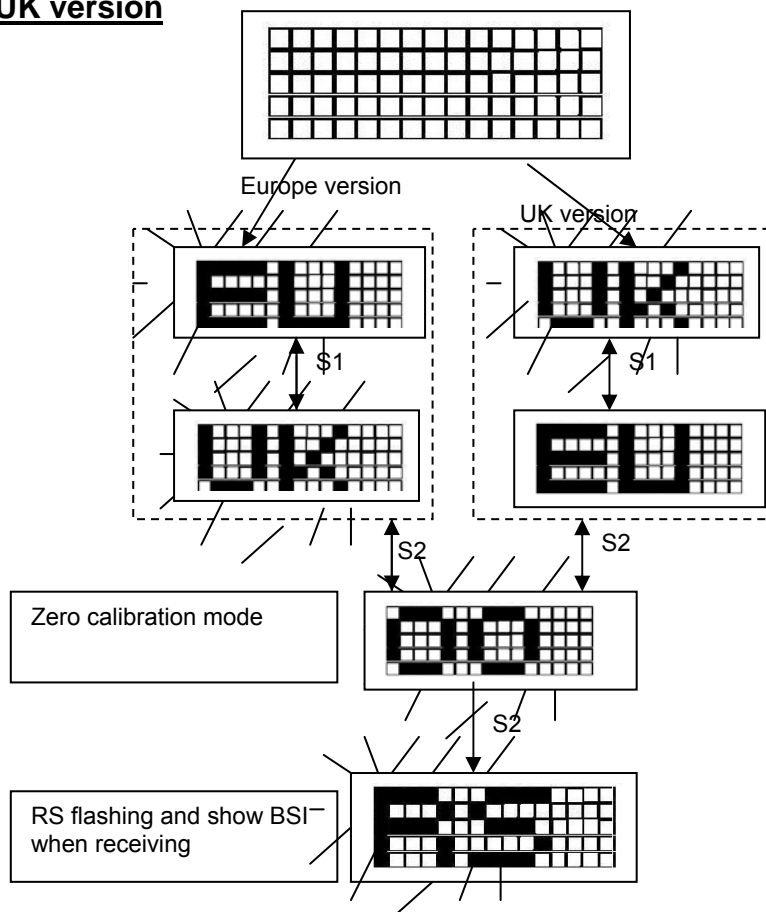
- 1) J4 : JJY40
- 2) J6 : JJY60
- 3) US : WWVB
- 4) UK : MSF
- 5) EU : DCF

The corresponding signal will appear and flash on the LCD during selection, and by pressing S1, signals can be scrolled tTZough. By pressing S2, the flashing signal will be selected. Upon selection, the signal abbreviation will stop flashing and from hereon, the CME8000 will be set to receive the chosen the signal and analog signal output will appear on the TEST pin if 100nF is attached to the pin connected to GND.

Japan + USA version



Europe + UK version



Changes to Specification

Date	Version	Change(s)	Change by	See page	File Reference
11-Oct-06	A1	Original	Michael		CM-07-86-ADW-XX-A1

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