

SERVICE MANUAL & PARTS LIST

REF. NO. S/M-506
OCTOBER 1995

MODULE NO.

QW-1403

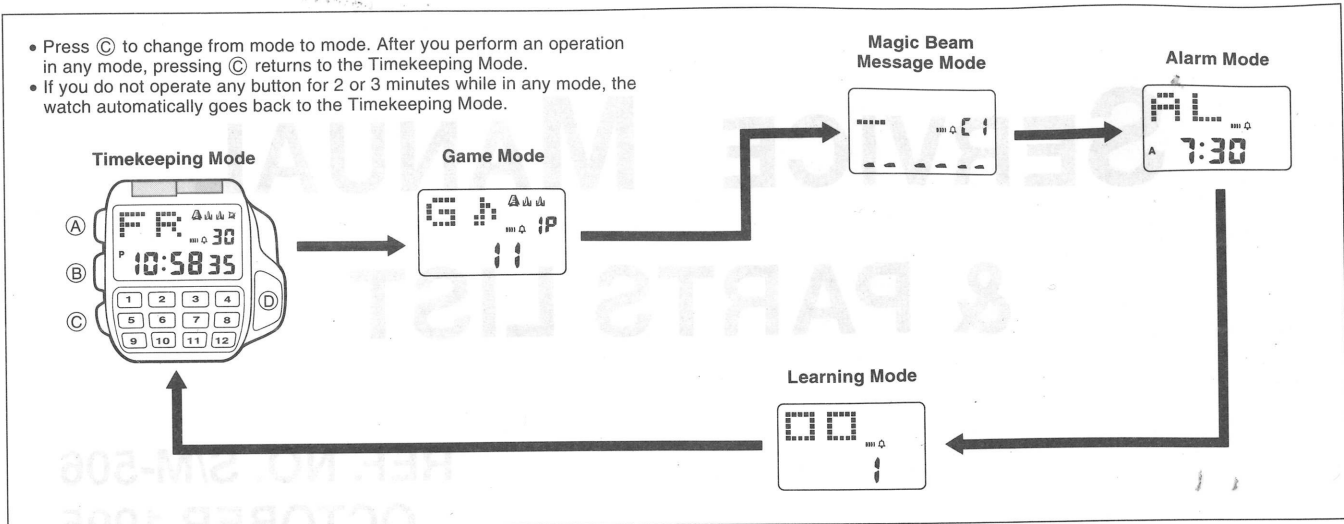


JG-10

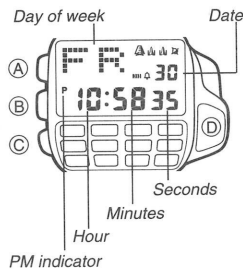
CASIO® (WITHOUT PRICE)

GENERAL GUIDE

- Press (C) to change from mode to mode. After you perform an operation in any mode, pressing (C) returns to the Timekeeping Mode.
- If you do not operate any button for 2 or 3 minutes while in any mode, the watch automatically goes back to the Timekeeping Mode.



TIMEKEEPING MODE



Use the Timekeeping Mode to view the current time and to set the current time and date.

- The game icons (A B C) appear on and disappear from the watch's display as the seconds pass in the Timekeeping Mode.
- You can also perform remote control operations while in the Timekeeping Mode. See "Learning Mode" for details.

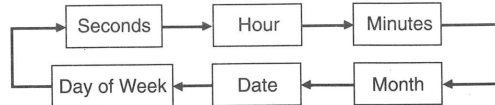
■ About the 12-hour/24-hour formats...

The 12-hour format divides each day into two 12-hour halves, called "a.m." (midnight to noon) and "p.m." (noon to midnight). The 24-hour format, on the other hand, counts each hour of the day from 00:00 (midnight) to 23:59 (11:59 p.m.). Three o'clock in the afternoon, for example, could be called 3:00 p.m. using the 12-hour format, or 15:00 using the 24-hour format. This watch can tell time using either the 12-hour or the 24-hour format. With the 12-hour format, the letter A on the display means a.m. while the letter P means p.m. To switch between the two timekeeping formats, press (B) while you are in the Timekeeping Mode.

■ To set the time and date



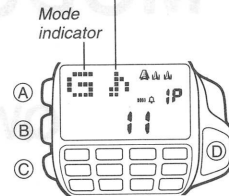
1. Hold down (A) while in the Timekeeping Mode until the seconds digits start to flash on the display.
 - The seconds digits flash because they are selected.
2. Press (C) to change the selection in the following sequence.



3. While the seconds digits are selected (flashing), press (B) to reset the seconds to 00.
 - If you press (B) 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 do not change when the seconds are reset to 00.
4. While any other digits (besides the seconds) are selected (flashing), press (B) to increase the number. While the day of the week is selected, pressing (B) advances to the next day.
 - Holding down (B) changes the current selection at high speed.
5. After you set the time and date, press (A) to return to the Timekeeping Mode.
 - If you do not operate any button for a few minutes while a selection is flashing, the flashing stops and the watch goes back to the Timekeeping Mode automatically.
 - The watch does not make any allowance for leap years. Be sure to manually set February 29 when one occurs.

GAME MODE

Sound on indicator (Sound off indicated by "....")



In the Game Mode, you can play the exciting galactic defense game against the built-in computer (1-player) or any friend (2-player) who also has a JG-10 watch.

■ To switch the game sound effects on and off

While in the Game Mode, press (D) to switch the game sound effects on and off.

- The watch beeps when you press (D) to switch sound effects on. No sound is produced when you press (D) to switch sound effects off.
- Game sound effects include a confirmation tone that sounds when you press a button and sound effects that sound during the games.
- Note that the daily alarm and hourly time signal still sound even if you switch the game sound effects off.

■ About the exciting galactic defense game

The exciting galactic defense game is an exciting challenge of intergalactic warfare. The object of the game is to destroy an opposing space fleet and save the galaxy.

Basic Rules

- Both your fleet and the fleet of your opponent consist of two attack ships and one mother ship. The ships of each fleet are located inside their own galaxies.
- Opposing forces must locate enemy ships using radar, and shoot them down with missiles.
- A game has five rounds, which means that each side gets five chances to shoot their missiles.
- The side that destroys all opposing ships or that has the most fighting force remaining at the end of a game wins.

Missiles

- You get one missile shot per ship in your fleet.
- A single missile hit destroys an attack ship (B), but it takes three missile hits to destroy a mother ship (A).

Game Over

- The game ends after five rounds (each side shoots five times) or when all of the ships of one side are destroyed.

Winners and Losers

- The side that destroys all opposing ships or that has the most fighting force remaining at the end of a game wins.
- A mother ship has the fighting force of three attack ships. Because of this, a side with only the mother ship (fighting force 3) remaining at the end of the game will be declared the winner over a side that has only two attack ships (fighting force 2) remaining.
- A draw is declared when both sides have the same fighting force remaining at the end of the game.

Scoring

- Points are added to the total of the winning side and deducted from the total of the losing side.
- One point is added to the score of the winner of a game and one point is deducted from the score of the loser.
- If all of the ships of one side are destroyed during a game, five points are added to the score of the winner and five points are deducted from the score of the loser.
- No points are added or deducted in the case of a draw.
- Scores are accumulated within the range of -999 to 999.

Space Mines

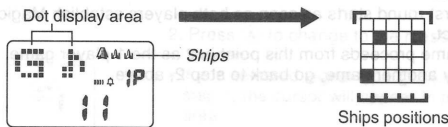
- Whenever your point total at the beginning of a game is 20 or greater, you can also use a space mine (M). See "To play the 1-player game" for details on how to position a space mine inside your galaxy.
- Whenever a missile hits a space mine, the mother ship of the side that fired the missile suffers a hit. If the side that fired the missile does not have a mother ship, one of attack ships suffers a hit. Note that you can use only one space mine per game.

Penalties

- Whenever you start a game with -20 points or less, you lose one attack ship. This means that you start the game with a mother ship and one attack ship.

Positioning Your Ships and Aiming Your Missiles

- The dot display area acts as a radar screen in the Game Mode for positioning your ships and aiming your missiles. Ship positions and aiming points appear on the radar screen as black dots (■) as shown below.



- When you are changing the position of a ship or aiming a missile in the 1-player game, each press of the (B) button moves the dot as shown nearby.

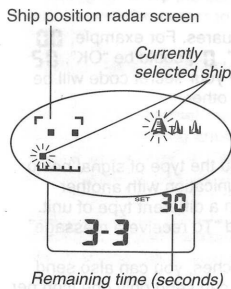
Important!

The dot display area is a 5 × 5 dot matrix as shown in the above illustrations. Note, however, that the lines in the illustrations do not actually appear on the display of the watch.

To play the 1-player game

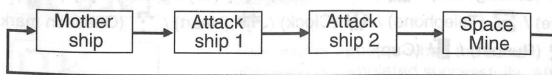


1. In the Game Mode, use (B) to display the 1P (one-player) game screen.
 - The 1-player screen appears to show the ships that make up your fleet and your current point total.



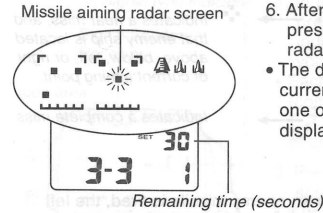
2. Press (A) to change to the ship position radar screen.
 - The mother ship icon is flashing on the display because it is selected. The current position of the mother ship also flashes on the radar screen.
 - Note that you have only 30 seconds to position your ships. When the remaining time countdown reaches zero, the watch automatically changes to the missile aiming radar screen in step 6, below.

3. Press (C) to change the selected ship in the following sequence.



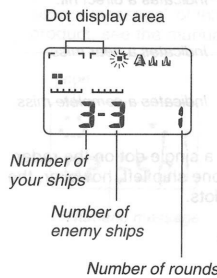
- The icon of the currently selected ship and its position in the radar screen flash on the display.
- Note that the space mine (M) appears only when your point total is 20 or greater at the beginning of the game.

4. Use (B) to move the position of the currently selected item.
 - See "Positioning Your Ships and Aiming Your Missiles" on this page for details on how the position of an item moves when you press (B).
 - Holding down (B) moves an item at high speed.
 - Two items cannot be located in the same position.
5. Repeat steps 3 and 4 to position all your ships (and the space mine if it is available).



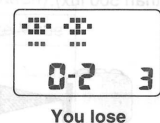
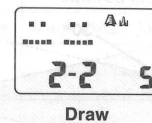
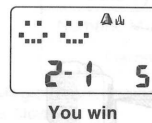
6. After you finish positioning your ships, press (A) to change to the missile aiming radar screen.
 - The dots in the radar screen show the current aiming of each missile. The dot of one of the missiles is flashing on the display because it is selected.

- Note that you have only 30 seconds to aim your missiles. When the remaining time countdown reaches zero, the battle automatically begins, with the missile aiming as it is when the countdown reaches zero.
7. Press (C) to select another missile.
 8. Use (B) to move the aiming of the currently selected missile.
 - See "Positioning Your Ships and Aiming Your Missiles" on this page for details on how the aiming of a missile moves when you press (B).
 - Holding down (B) moves the aiming at high speed.
 9. Repeat steps 7 and 8 to aim all your missiles.
 - You can aim more than one missile at the same point by moving two or more dots to the same location on the missile aiming radar screen.



10. After you finish aiming your missiles, press (A) to start the battle.
 - The watch automatically selects either you or your opponent as the first to shoot. Missiles are fired one-by-one, with one side firing all its missiles and then the other side firing all its missiles.
 - The number of ships values on the display change whenever a ship is destroyed by a missile.

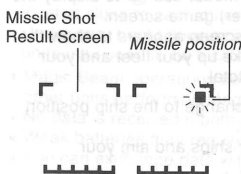
- The result of a missile shot is indicated on the left side of the dot display area. By watching this area, you can get important information you can use when re-aiming your missiles in the steps below. See "Missile Shot Results" for details.
 - After both sides are finished firing their missiles, the missile aiming radar screen re-appears so you can re-aim your missiles.
11. Return to step 8 to re-aim your missiles for the next round.
 - You keep repeating steps 8 through 11 until all of the ships on one side are destroyed or until you complete five rounds.
 - To stop a game part way through, press (A) to return to the initial 1-player game screen.
 - When the end of a game is reached, one of the following three types of screens appears for about two seconds. Then the display changes to the initial 1-player game screen.



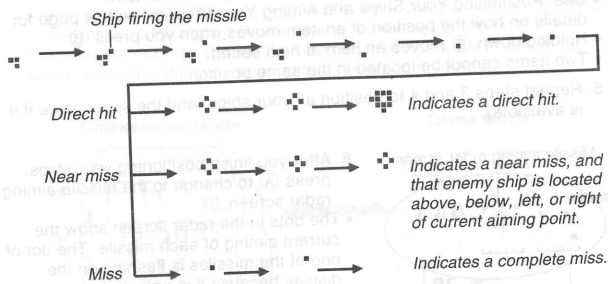
- Points are added to or subtracted from your total according to the rules outlined under "Scoring".
- To play another game, go back to step 2, above.

Missile Shot Results

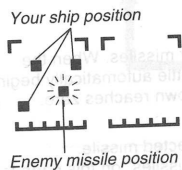
Your missile shots



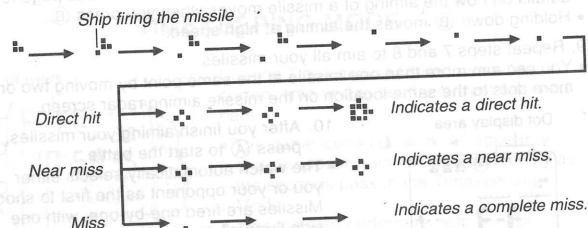
When one of your missiles is fired, the right side of the dot display area shows the point where the missile is aimed. The left side of the dot display area shows you the result of the missile shot, as shown below.



Enemy missile shots



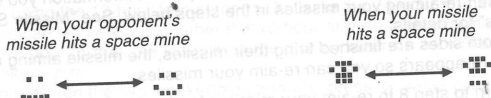
When an enemy missile is fired, the left side of the dot display area shows the position of your ships. The right side of the dot display area shows you the result of the missile shot, as shown below.



- Normally the aiming point of missiles cover only a single dot on the radar screen. Whenever you or your enemy has only one ship left, however, the aiming point of that ship expands to cover four dots.
 - Normal aiming point
 - Aiming point when only one ship remains

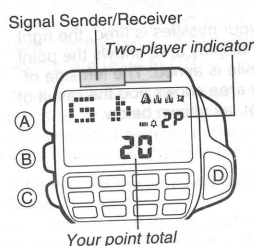
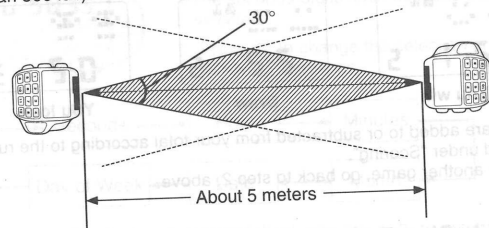
Space Mines

The following shows what appears as the missile shot result when a missile hits a space mine.

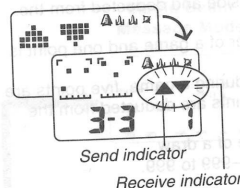


To play the 2-player game Important!

When you are playing a game against a friend, you must establish Magic Beam contact between the two watches. The two watches exchanging game data must be positioned as shown below (indoor fluorescent lighting less than 500 lux).



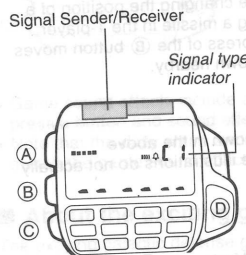
- In the Game Mode, use (B) to display the 2P (two-player) game screen.
 - The 2-player screen appears to show the ships that make up your fleet and your current point total.
- Press (A) to change to the ship position radar screen.
- Position your ships and aim your missiles.
- Perform steps 3 to 9 of the procedure under "To play the 1-player game".



- Press (A) to change to the Magic Beam contact screen.
 - When the Magic Beam contact screen appears, the send and receive indicators (▲▼) flash on the display.
- Decide between you and your friend who will go first (first player) and who will go second (second player).

- Note that "first player" and "second player" indicates only who goes first and second to establish Magic Beam contact. It does not determine who goes first when you actually play the game. Who goes first when you actually play the game is randomly decided by the watch's built-in computer.
- After correctly aligning the Signal Sender/Receivers of the two watches, the first player should press (D) to establish Magic Beam contact.
 - The send indicator of the first player's watch appears on the display while data is being sent. The send indicator disappears and the receiver indicator starts to flash when the data send operation is complete.
 - The message [] appears in the dot display area for about one second if a problem occurs while data is being exchanged. Then the Magic Beam contact screen reappears. When this happens, press (D) and try again.
 - If you continue to have problems, refer to "Magic Beam Trouble Sources".
 - To stop a Magic Beam operation part way through, press (A) to return to the initial 2-player game screen.
 - After the send indicator on the display of the second player's watch starts to flash, the second player presses (D) to establish Magic Beam contact.
 - The first round starts as soon as both players establish Magic Beam contact.
 - The game proceeds from this point just as the 1-player game.
 - To play another game, go back to step 2, above.

MAGIC BEAM MESSAGE MODE



The Magic Beam Message Mode lets you use infrared light to exchange numeric messages with another watch or with a CASIO Digital Diary.

About Magic Beam messages

This watch lets you exchange six-digit numbers with another CASIO JG-10 wristwatch, or with another CASIO product that is equipped with Magic Beam capabilities. You and your friends can create your own secret code to send messages back and forth. One way you could do this is with a "matrix" like the one shown below.

	0	1	2	3
0				
1				
2				
3				

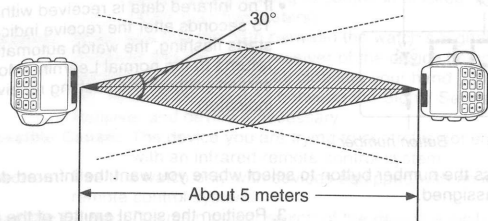
You can fill in any messages you want in the squares. For example, 00 could be "Let's walk home from school together", 0 1 could be "OK", 02 could be "No, I can't", etc. Only those who know your secret code will be able to understand what you are saying to each other.

Important!

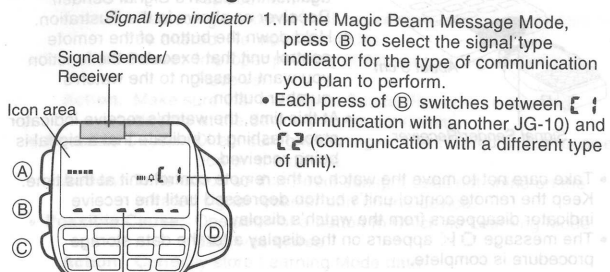
- A "signal type indicator" on the display tells you the type of signal being used for communication. [] indicates communication with another JG-10, while [] indicates communication with a different type of unit. See the notes under "To send a message" and "To receive a message" for details on the signal type indicator.
- When communicating between two JG-10 watches, you can also send and receive the following icons. Note that you can send only one icon per message.

- (Smiling face) / (Normal face) / (Crying face) / (Angry face) / (Telephone) / (Clock) / (Heart) / (Question mark) / (Runner) / (Cup)

- To exchange messages, the two units must be positioned as shown below (indoor fluorescent lighting less than 500 lux).

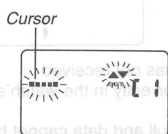


To send a message



- In the Magic Beam Message Mode, press **(B)** to select the signal type indicator for the type of communication you plan to perform.
 - Each press of **(B)** switches between **[1]** (communication with another JG-10) and **[2]** (communication with a different type of unit).

Numeric area

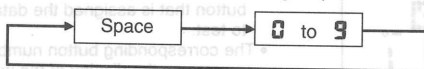


- Press **(A)** to change to the message input screen.
 - If you selected signal type **[1]** (JG-10) in step 1, the cursor will appear in the icon area.
 - If you selected signal type **[2]** (other type) in step 1, the cursor will appear at the first digit of the numeric area.

- The watch automatically switches from the message input screen to the Magic Beam Message Mode display after about 90 seconds pass.
- Use **(B)** to input the icon or numbers you want.
 - Each time you press **(B)** while the cursor is in the icon area, the displayed icon changes in the following sequence. See "About Magic Beam messages" for the meaning of each icon.



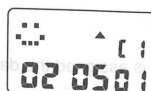
- While the cursor is in the numeric area, each press of **(B)** changes the number at the cursor location in the following sequence.



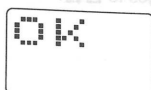
- After you input the icon or number you want, press **(C)** to move the cursor to the right.
 - To input a space, press **(C)** while there is nothing displayed at the cursor.
 - Pressing **(C)** while the cursor is located at the sixth digit of the numeric area causes the cursor to jump back to the first position it was at in step 2, above.
- Repeat steps 3 and 4 to input the rest of your message.

Note that your partner must also set up the receiving unit to receive. If your partner is using another JG-10 watch, use the procedure under "To receive a message" of this manual. If your partner is using another CASIO product, see the manual that comes with that product for details.

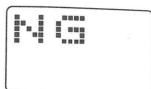
- After setting up this watch to send data and the receiving unit to receive, point their Signal Sender/Receivers at each other and press **(D)** to start the message send operation.



The display nearby appears while the send operation is in progress. The send operation takes up to 10 seconds to complete.



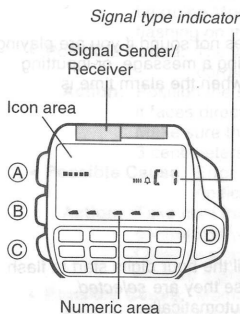
This display appears when the send operation is completed successfully. After a short while, the watch returns to the message input screen.



This display appears when an error occurs. After a short while, the watch shows the message you tried to send. Press **(D)** to try sending again.

- Press **(A)** to return to the Magic Beam Message Mode display.
- The message you input is not saved in memory. It is deleted when you return to the Magic Beam Message Mode display.
- See "Magic Beam Trouble Sources" for details on what to do when you have Magic Beam problems.

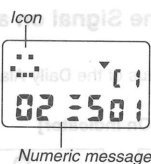
To receive a message



- In the Magic Beam Message Mode, press **(B)** to select the signal type indicator for the type of communication you plan to perform.
 - Each press of **(B)** switches between **[1]** (communication with another JG-10) and **[2]** (communication with a different type of unit).
- Press **(A)** to change to the message input screen.
 - If you selected signal type **[1]** (JG-10) in step 1, the cursor will appear in the icon area.

- If you selected signal type **[2]** (other type) in step 1, the cursor will appear at the first digit of the numeric area.
- The watch automatically switches from the message input screen to the Magic Beam Message Mode display after about 90 seconds pass.
- The watch is now ready to receive a message.

Note that your partner must also set up the sending unit to send. If your partner is using another JG-10 watch, use the procedure under "To send a message" of this manual. If your partner is using another CASIO product, see the manual that comes with that product for details.



- This display shown nearby appears when the receive operation is completed successfully.
- All characters that cannot be received by this watch (any character besides the watch's icons or numbers from **0** to **9**) are replaced by **-**.
- A received message remains on the display for about 90 seconds. Then the watch automatically returns to the message input screen.

- Press **(D)** to return to the message input screen.
 - At this point you could start from step 3 under "To send a message" to send your reply.
 - To exit the communication procedure, press **(A)** to return to the Magic Beam Message Mode display.

Magic Beam Trouble Sources

The following describes things that can cause problems when using Magic Beam.

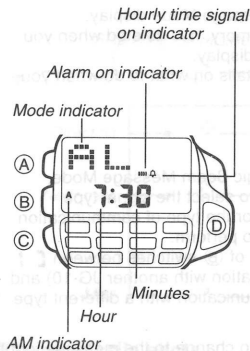
- Note that the two units must be in the correct mode to exchange data. The following table shows the required mode for this watch. See the manual that comes with the unit you are exchanging data with for details on its required mode.

Data Type	Required Mode (watch)
Numeric Message	Magic Beam Message Mode
Game	Game Mode

- Magic Beam operations are impossible if the path between the two units is blocked.
- When the angle between the communicating units is greater than 30 degrees, the two units must be brought very close together.
- When communicating with a Digital Diary, make sure that the distance between the two units and the angle between them are as described in this manual (not in the manual of the Digital Diary).
- Communication may be impossible if the two units are too close to each other.
- Outdoors, near a window, or anywhere else lighting is very bright, communication may be impossible or may require that the two units be located close to each other.
- Under very bright fluorescent or incandescent indoor lighting, the two units may need to be located close to each other.
- Magic Beam operations between two units may be impossible if there are other units performing Magic Beam operations nearby.
- No data is received if both units are both sending data.
- Weak batteries may require that unit be located closer together.
- You can exchange data with the following CASIO watch and Digital Diary models (as of October 1995).

Watch: JG-10, JG-100C, JG-100D
 Digital Diary: JD-5500, JD-6000, JD-7000, JD-7000R

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.

Important!

The alarm does not sound if you are playing a game, sending a message, or inputting infrared data when the alarm time is reached.

To set the alarm time

- Hold down (A) while in the Alarm Mode until the hour digits start to flash on the display. The hour digits flash because they are selected.
- Press (C) to change the selection in the following sequence.

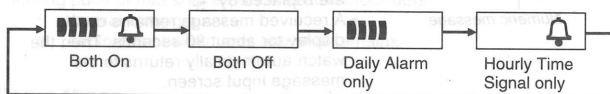


- Press (B) to increase the selected digits. Holding down (B) changes the selection at high speed.
- The format (12-hour and 24-hour) of the alarm time matches the format you select for normal timekeeping.
- When setting the alarm time using the 12-hour format, take care to set the time correctly as morning A or afternoon P.
- After you set the alarm time, press (A) to return to the Alarm Mode.

To switch the 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.

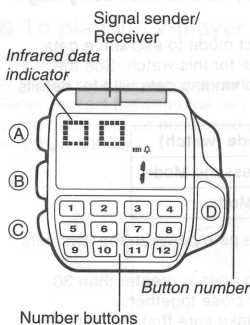
[Alarm On Indicator/Hourly Time Signal On Indicator]



To test the alarm

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

LEARNING MODE



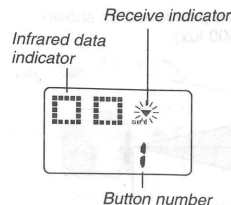
The Learning Mode lets you set up the watch to control a TV, video tape deck, or any other device equipped with an infrared remote control unit. You can store infrared data for up to 12 functions for instant recall when you need them.

- The button number on the display shows the number of the button you pressed.
- The infrared data indicator shows whether or not infrared data is assigned to the number button whose number is currently on the display. □ □ means there is no data assigned, while ■ ■ indicates that there is data assigned.

Important!

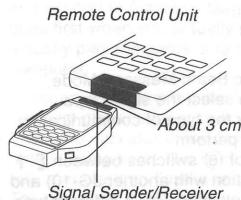
- Some of the number buttons are marked with labels. Button (1), for example, is marked "POWER". Note that even number buttons with labels do not have any infrared remote control function until you store data using the procedure under "To store Learning Mode data," below. You can assign any infrared function to any number button, even if the function you assign does not match the button's label.
- Due to differences in infrared signal forms, this watch may not work properly with certain types of equipment.
- Learning Mode functions may not work properly if watch battery power is too low.
- Replacing the battery will cause the Learning Mode data settings to be cleared. If you want to assign functions to the same buttons after the battery is replaced, be sure that you make a record of your data before you have the battery replaced.
- Learning Mode data for some functions take up more memory than data for other functions. Because of this, memory may become full after you store fewer than 12 functions.

To store Learning Mode data



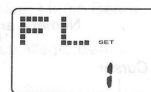
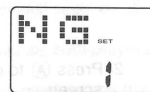
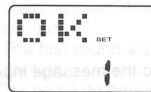
- While in the Learning Mode, hold down (A) until the receive indicator starts to flash on the display.
- If no infrared data is received within about 15 seconds after the receive indicator starts flashing, the watch automatically returns to the normal Learning Mode screen (without the flashing receive indicator).

- Press the number button to select where you want the infrared data to be assigned.



- Position the signal emitter of the remote control unit whose infrared data you want to assign to the watch's number button against the watch's Signal Sender/Receiver as shown in the illustration.
- Hold down the button of the remote control unit that executes the function you want to assign to the watch's number button.
- At this time, the watch's receive indicator stops flashing to indicate that a signal is being received.

- Take care not to move the watch or the remote control unit at this time. Keep the remote control unit's button depressed until the receive indicator disappears from the watch's display.
- The message ■ ■ appears on the display after the data storage procedure is complete.

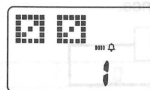


- The message ■ ■ (no good) indicates that data was not received correctly or that the infrared data was not stored correctly in the watch's memory. Repeat the procedure from step 3.
- The message ■ ■ (full) indicates that memory is full and data cannot be stored.
- If you want to store more data, continue from step 2, above. To exit this procedure, press (A).

Important!

- Whenever you assign infrared data to a number button, any data that was previously assigned to the button is replaced.
- If an ■ ■ or ■ ■ error occurs while you are replacing existing data with new data, the previous data remains unchanged in memory.
- Sometimes, the watch will indicate that data was successfully stored, but you may have problems when later using the function. When this happens, repeat the above procedure and try storing the Learning Mode data again.

To test Learning Mode data



- In the Learning Mode, press the number button that is assigned the data you want to test.
- The corresponding button number appears on the display of the watch.
- The infrared data indicator should also appear as ■ ■.
- To test whether the function works properly, point the Signal Sender/Receiver at the device you want to control and press (D).
- If the function does not work as it should, see the "Troubleshooting Guide".

To use Learning Mode data

- Press (C) to enter the Timekeeping Mode.
- Point the Signal Sender/Receiver at the device you want to control and press the button to which the function is assigned.

To clear Learning Mode data

- In the Learning Mode, press the number button that is assigned the data you want to clear.
- Hold down (B) until the infrared data indicator changes to □ □.

■ Troubleshooting Guide

Problem: Learning Mode functions do not work.

- **Possible Cause:** The path between the Signal Sender/Receiver and device you are trying to control is blocked or too long (more than five meters).
Action: Make sure that the path between the watch's Signal Sender/Receiver and the signal receiver of the device being controlled is not blocked by clothing, your hand, furniture, etc. Reduce the distance between the Signal Sender/Receiver and device if necessary.
- **Possible Cause:** The device you are trying to control is not equipped with an infrared remote control system.
Action: Use this watch only with devices equipped with an infrared remote control system.
- **Possible Cause:** The main power switch of the device is switched off.
Action: Use the main power switch to switch power on.
- **Possible Cause:** Learning Mode data were altered by battery replacement.
Action: Replacing the battery will cause the Learning Mode data to be altered. Re-input the codes.
- **Possible Cause:** Improper pointing of the watch's Signal Sender/Receiver.
Action: Make sure that the Signal Sender/Receiver is pointing directly at the device you are controlling.
- **Possible Cause:** Direct sunlight shining on the infrared signal receiver port on the device.
Action: Take action so that direct sunlight does not shine on the infrared signal receiver port on the device.
- **Possible Cause:** Operation of a button to which no Learning Mode data was stored.
Action: Correctly store Learning Mode data.

Problem: Cannot store Learning Mode data.

- **Possible Cause:** The remote control unit whose signals you are trying to store is not an infrared type remote control unit.
Action: Use this watch only with devices equipped with infrared remote control systems.
- **Possible Cause:** The watch is not set up correctly to store data.
Action: This watch can store data in the Learning Mode only as long as "▼" mark is flashing on the display. Perform the Learning Mode operation correctly so that "▼" mark is flashing on the display.
- **Possible Cause:** The watch and remote control unit are not facing correctly or they are too far from each other.
Action: Position the signal emitter of the remote control unit so that it faces directly at the Signal Sender/Receiver of the watch. Make sure that the remote control unit and watch are about 3 centimeters apart.
- **Possible Cause:** Error during storage of Learning Mode data (indicated by H message).
Action: Take care that you do not move the watch or the remote control unit you are using while storing Learning Mode data. Otherwise, you may be using a remote control unit whose infrared signals are incompatible with this watch's memory.
- **Possible Cause:** Memory full (indicated by F L message).
Action: Delete data that you no longer need to make room for new data.

