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Model ATX

AirTime Wireless Wall Clock Transceiver



Installation & User's Guide



LATHEM

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Other AirTime Products

ATX6 6 Watt Transceiver capable of transmitting exact time in larger facilities/areas



AT12RPS Solar Powered 12” Analog Wireless Wall Clock



AT-ANTOD Outdoor Antenna for maximum coverage with the ATX6 or the AT20WT



AT-MSX AirTime receiver that accepts the AirTime signals from an ATX, ATX6 or AT20WT and corrects Lathem RS485 devices or Intercom systems via a 12:00AM dry contact closure



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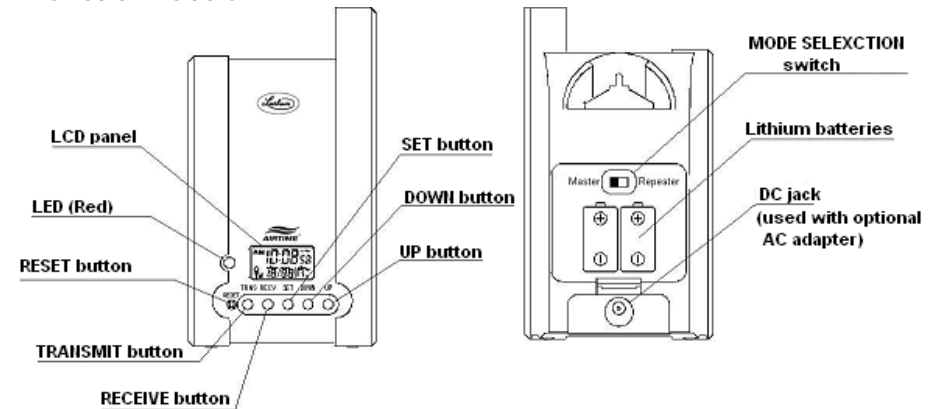
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Introduction

The ATX (AirTime Transceiver) is a user-installable, battery-operated radio-frequency unit that provides the wireless signal to keep AirTime wall clocks within its range synchronized to the second. The ATX can receive the WWVB signal from a radio station used by millions of people throughout North America and transmit the accurate time to 12" and 15" analog and 4" and 6" digital model AirTime wall clocks. The ATX can be operated using 2 - CR123A batteries rated with a five (5) year life or powered by an optional AC adapter. AirTime is an affordable time keeping solution for institutions such as schools, hospitals, offices or any environment that requires precise and consistent time from room-to-room. Should any problems arise with your ATX please contact Lathem Time at 800-241-4990.

Function Labels



LCD Display - Time, Date, Time Zone and Indicators



Indicators on LCD Display

Transmitting "TRNS"

When flashing, indicates the ATX is transmitting an AirTime signal

Receiving "RECV"

When flashing, indicates the ATX is in receiving mode listening for an AirTime signal. (used in Repeater mode)

Daylight Savings Time

When illuminated, indicates that the ATX is in Daylight Savings Time.

Reception strength

In Master mode indicates the strength of the WWVB signal when receiving.

In Repeater mode displays for 5 seconds indicating the strength of the signal from the Master when a signal is received.

Low battery

Indicates the batteries should be replaced.

Link "LINK"

Indicates data reception from another AirTime transmitter was successful within the last 24 hours. (Used in Repeater mode)

WWVB receiving

When steady, indicates successful reception of the WWVB signal.

When scrolling, the ATX is listening for a WWVB signal.

Other Indicator - Flashing Red LED

This indicates that a Repeater ATX failed to receive the signal from a Master ATX Transceiver. Press the Reset button or move the ATX to a location that is closer to the Master ATX.

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WARNING: Changes or modifications to this product not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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Disclaimer

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THIS EQUIPMENT COMPLIES WITH FCC CLASS-B REQUIREMENTS PURSUANT SUBPART J OF PART-15

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

WARNING: Changes or modifications to this product not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:


- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio TV technician for help.

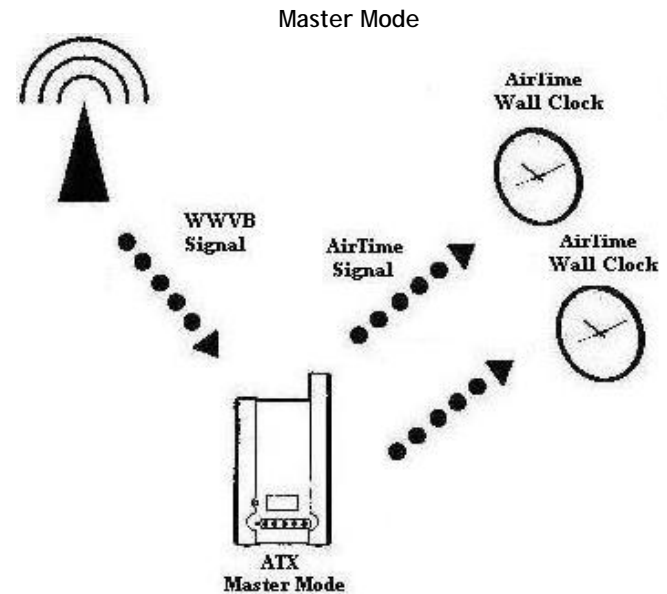
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body. This Transceiver must not be co-located or operating in conjunction with any other antenna or Transceiver.

Performance

Accuracy	Average monthly rate +/- 20 seconds
Battery Life	Approximately 5 years
WWVB receiving sensitivity	Less than 45dBuV/m
Carrier frequency	452.3125 MHz
RF reception Sensitivity	Less than 35dBμV/m/
Channel filter band width	19.2kHz
Intensity of electric wave emitted	Less than 3nW
Usage temperature range	(14~+122°)
LCD readable range	(0 ~1.3')

Mode Selection

The ATX can operate in either of two modes, Master or Repeater. The most common mode is "Master". In Master mode, the ATX receives and synchronizes with the WWVB signal. It then transmits the signal to AirTime wall clocks and ATX Repeaters. The WWVB signal strength indicator  indicates the strength of the WWVB signal being received. The ATX ideally should be placed near a window facing Boulder, Colorado or under a skylight with a clear view of the sky for best signal reception. In Master mode, the ATX can also be set manually if no WWVB signal is available. The accuracy of the ATX without the WWVB signal is +/- 5 minutes per year. Note: If the ATX (in Master Mode) does not receive the WWVB signal, the clocks will not function properly.



When using more than one AT Transceiver, you can set the ATX to operate in "Repeater" mode. See page 9 for setting the ATX as a Repeater.

☞ Start Here

Master Mode

!! IMPORTANT !!

This AirTime System is designed to provide highly accurate and reliable time reference in your building. You must follow these instructions or your clocks will fail to operate properly. You must allow the transmitter to sit overnight and receive the WWVB signal before installing your wall clocks.

FOLLOW THESE INSTRUCTIONS BEFORE INSTALLING THE WALL CLOCKS

1. Remove the back cover of ATX and slide the Mode Selection switch to the Master position.
2. Insert two (2) CR123A lithium batteries (provided) and replace the back cover or connect the optional 6VDC adapter. *Note: You can not use both the batteries and the AC adapter at the same time.* (If the ATX loses power, replace the batteries or check the optional AC adapter and reset the clock starting at step 1 above)



- Q. When does the ATX listen for the WWVB radio signal?
- A. The ATX listens for the WWVB radio signal 2 minutes and 40 seconds after every hour. The strength of the last signal reception can be determined by the signal strength indicator (📶) on the display.
- Q. How do I synchronize my AirTime wall clocks?
- A. Press the TRANS button on the ATX. You will see T - TR - TRN - TRNS flash on the display. At the wall clock, press the Reset button. If the wall clock does not correct within several minutes, then it may be out of the 150 foot range of the ATX. Relocate the wall clock closer to the ATX.
- Q. Can I use more than one ATX?
- A. Yes. Secondary ATX units can be set to Repeater mode to increase coverage. All repeater ATX's within the 150 foot range from the first ATX will re-broadcast the signal. As long as ATX Repeaters are within 150 foot range of each other there is virtually no limit to how many ATX's you can install.
- Q. If I manually set the Daylight Savings settings will the WWVB signal affect the ATX?
- A. No, the manual Daylight Savings settings override the automatic WWVB signal for Daylight Savings.
- Q. Why is the ATX changing for Daylight Savings in the wrong month or week?
- A. If you have manually set the Daylight Savings month and week they may be incorrect. Verify your settings by following the instructions on page 6.

- Q. What do I do if the time does not correct on the ATX after WWVB reception indicator scrolls?
- A. Make sure you selected "Master" mode, then move the ATX closer to a window facing Boulder, Colorado or under a skylight with an unobstructed view of the sky. Allow 24 hours for reception. Reception is best at night when there are fewer radio interferences. Install the ATX in the same place where it finally received WWVB.

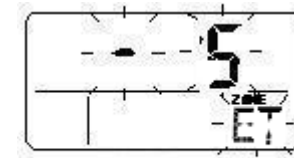
- Q. Can I set the time on the ATX manually?
- A. If you manually set the time on the ATX, Daylight Savings changes will not occur unless you also set the Manual Spring and Fall Month and Week describes on pages 5-7. It is recommended that you install the ATX in a location that can receive the WWVB signal.

- Q. If I manually set the Daylight Savings settings will the WWVB signal affect the ATX?
- A. No, the manual Daylight Savings settings override the automatic WWVB signal for Daylight Savings.

- Q. What do I do if my ATX does not update for Daylight Savings Time?
- A. Make sure the ATX has a clear view of the sky or faces toward Boulder, Colorado to insure it receives the WWVB signal.

- Q. When does the ATX transmit the time to the secondary wall clocks?
- A. The ATX transmits once per hour during the 58th minute between the 50th and 59th second. When the TRANS button is pressed, the ATX transmits every 10 seconds for one hour.

3. Set Time Zone: Press and release the Set button for less than 1 second. The Time Zone will flash on the display. Use the Up or Down buttons to select the proper Time Zone (see list of zones below) and press Set.

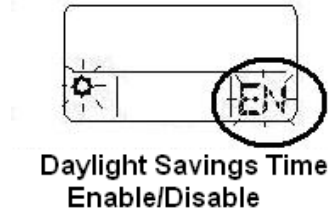


Time Zone

Available Time Zones

Time Zone	Offset	Display
Atlantic Time	-4Hrs	AT
Eastern Time	-5Hrs	ET
Central Time	-6Hrs	CT
Mountain Time	-7Hrs	MT
Pacific Time	-8Hrs	PT
Alaska	-9Hrs	AL
Hawaii	-10Hrs	HI

- Use the Up or Down buttons to Enable (EN) or Disable (DI) the Daylight Savings Time function. If enabled, the time on the ATX will automatically change when daylight saving time changes. This setting affects both the automatic WWVB and manual Daylight Savings options. Press Set when done.



- It is recommended to allow WWVB signals to control Daylight Savings changes by leaving the Spring month selection set to 00. If for some reason the ATX cannot receive WWVB signals, then you should manually set the month and week for Daylight Savings changes to occur.
- To manually set the Daylight Savings dates, use the Up or Down buttons to select the Spring Month. Press Set when done. If set to 00, pressing Set will skip steps 6-8 and return to normal display.



- (ONLY USED FOR MANUAL DAYLIGHT SAVINGS DATES) Use the Up or Down buttons to select what Spring Week Daylight Savings will occur and press Set.

Power Requirements

Cylindrical lithium battery (2 batteries) or Optional AC adapter
 Specifications of optional AC adapter (Lathem part #VIE1800).

- Output voltage : 6V DC
- Rated current : 200mA
- Ripple voltage : max 500mVrms (200mA load)
- Plug type : EIAJ-2RA
- Polarity : Center plus(+) terminal

Troubleshooting

- What happens if batteries die before I replace them?
 - The ATX will stop working. When the batteries are replaced, press and release the RESET button on the ATX. It will automatically reset time when it receives the WWVB signal. (This may take 24 hours). The battery life is approximately 5 years. When the batteries become low the display will show a low battery indicator "⚡".
- Do I need batteries if I use an AC adaptor?
 - No, batteries are bypassed when an AC adapter is used.
- What do I do if TRNS does not flash after I press TRNS button?
 - Verify the ATX is not listening for the WWVB signal. The ATX will not transmit until the listening period ends.
- How many Wall Clocks can an ATX correct?
 - As long as all Wall Clocks are in the range of the ATX, there is virtually no limit of the number of clocks it can correct.

Additional Definitions




Automatic Interference Prevention Function

Use this function to automatically change Transmit Channel to prevent interference if multiple Transceivers use the same Transmit Channel within reception area. (This automatic function requires no settings)




Backup Function

Time Zone and Daylight Savings Time are memorized in the ATX and will not be cleared after power failures or resets.

WWVB Reception Off/On Function

In Master mode, continuously pressing the RECEIVE button for 7 seconds or longer will turn OFF WWVB reception and the “” indicator is removed from the display. Continuously pressing the RECEIVE button for 7 seconds or longer with the “” indicator not displayed re-enables WWVB reception, and the “” indicator will appear.

Battery Life Indicator

When the battery capacity is low, the “” symbol starts to flash as warning that it is time to replace the battery. After 10 days, the “” symbol starts to flash and all segments except the “” symbol extinguishes and functions cease.

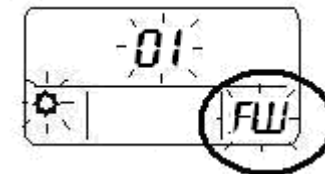
Remove the back cover and replace the 2 CR123A batteries. Repeat the setup procedures for either Master or Repeater mode as described earlier.




8. (ONLY USED FOR MANUAL DAYLIGHT SAVINGS DATES) Use the Up or Down buttons to select what Fall Month Daylight Savings will occur and press Set.



9. (ONLY USED FOR MANUAL DAYLIGHT SAVINGS DATES) Use the Up or Down buttons to select what Fall Week Daylight Savings will occur and press Set. The display will return to normal.



- Decide where to locate the ATX. Ideally it should be mounted in the center of area to be covered. The ATX can either be wall mounted or sat on a shelf. If the ATX does not receive the WWVB signal in the next step, then consider installing it near a window facing Boulder Colorado or under a skylight with a clear view of the sky to receive the best signal from the WWVB.
- Press and release the Reset button. The Display will blink once and the red LED will flash. The WWVB reception indicator  will scroll left to right indicating it is waiting for a signal.



During WWVB reception, the indicator will flash



The signal strength indicator shows the signal strength during reception

BE PATIENT!!!

Because of other interfering radio transmissions, reception often takes 24 hours to occur

If the ATX fails to receive the WWVB after 24 hours, press the RECV button for 4 seconds to begin WWVB reception again and move the ATX to another location with a clear line of site toward the sky. Once the ATX receives the WWVB signal do not change its location.

Because it must continue receiving WWVB signals, the ATX must be installed in the same area where WWVB signals are first received.

Once the WWVB signal is received, the indicator  will stop scrolling. (To verify the WWVB signal has been received in the past 24 hours press the RECV button for 2 seconds and release. The  indicator will flash 4 times indicating the signal has been received or 5 times if no reception has occurred).

How to access Setup Modes

- Select the setup mode to enter by pressing the SET button for the period of time defined in the table below.
- When the mode changes to the selected setup mode, the functions of the selected mode will flash.
- Change the values of the functions by pressing UP / DOWN button.
- Press the SET button to enter selection. When the setup process is complete, it returns to a normal display.

Normal operation resumes if no buttons are pressed for 5 minutes.

SET button	Set mode	Set item	
		Master	Repeater
2 seconds or shorter	Time zone set mode	Time zone, D.S.T Enabled/Disabled, Manual D.S.T.	Invalid
2 - 7 seconds	Manual time set mode. (Do not use this feature).	Year, Month / Day, Hour / Minute	Year, Month / Day, Hour / Minute
7 seconds or longer	Link set mode*	Channel Status, TX Channel	Channel Status, TX channel, RX Channel, Layer
		Only display: WWVB Elapsed Time	Only display: Linkage Elapsed Time, WWVB Elapsed Time

*This is an advanced setting that will rarely be required. If you have multiple transceivers and are experiencing synchronization problems please review the document ID #888 - "Some clocks are not correcting to time signals" located on our Knowledge Base at

<http://www.lathem.com/support/knowledge-base.aspx>.

Search under Airtime Wireless | ATX Mini Transceiver.

Glossary of Definitions:

Selection of Mode

Select the MASTER mode or REPEATER mode by using the MODE switch.

Operation of Master Mode


WWVB is received once per hour. The time data begins automatically transmitting if the receiving is successful.

Operation of Repeater Mode

Time data is automatically received and transmitted once per hour.

Operation of Reset in Master Mode

Press and release the reset button to start receiving the WWVB. If the receiving is successful, time data is automatically transmitted.

The  symbol changes during the WWVB reception to show that it is receiving. The "TRNS" indicator flashes during the data transmission to show that it is transmitting.

While transmitting, you will see T - TR - TRN - TRNS flashing in the display.

12. Press and release the TRNS button on your Master ATX to begin transmitting to AirTime Wall clocks and other ATX devices. The TRNS flashing in the display confirms the transmissions.



The ATX will transmit for one hour, allowing you to setup and install your AirTime wall clocks and Repeaters.

13. Insert the batteries into your wall clocks and Repeater ATXs (if applicable). Press and release the reset button on the back of the AirTime wall clocks or the front of the Repeater ATXs to start receiving the signal from the Master ATX.
14. Install the Master ATX: Install the ATX in the same location where the WWVB signal was received.

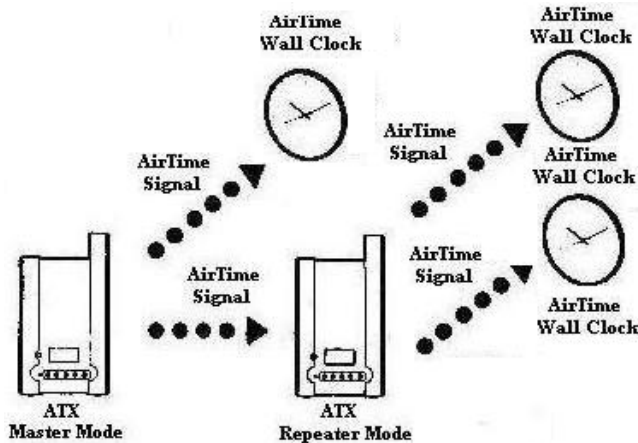
Mount the ATX

- Drill a 5/16" hole.
- Insert a wall anchor and tap flush to wall with a hammer.
- Insert a screw into the anchor leaving 1/8" exposed.
- Align the keyhole on case back and slide onto the screw.

CONGRATULATIONS!!! Setup in Master mode is now complete

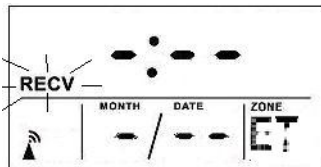
Repeater Mode (Used in Multiple ATX Installations)

In Repeater mode, the ATX receives time signals from another ATX transceiver, and rebroadcasts the signal to other ATX Repeaters or AirTime wall clocks.



Setup (Repeater Mode)

1. Remove the back cover and slide the Mode Selection switch to the Repeater position.
2. Insert two (2) CR123A lithium batteries and replace the back cover or connect the optional 6VDC adapter if it will be used.
3. Press the Reset button. The display will appear with dashes and the RECV indicator will flash.



4. Press the TRNS button on the ATX that is set to "Master" mode.

5. Install the Repeater ATX at the desired location (within approximately 150 feet of the ATX Transceiver).
6. When the signal is received from the "Master", the term "LINK" will display and the time and date will update to the Masters time.
7. The TRNS indicator will flash while the ATX Repeater transmits to AirTime wall clocks or other ATX Repeaters. The ATX will transmit for one hour, allowing you to setup and install your AirTime wall clocks and other ATX Repeaters.



If the Repeater ATX fails to receive the signal from the Master ATX Transceiver (indicated by a LED flashing red or the display toggling between time and date and "E"), then press the Reset button or move the ATX to a location that is closer to the Master ATX.

MAKE CERTAIN THAT THE REPEATER ATX DISPLAYS "LINK". Unless your Repeater ATX continuously receives signals from the Master ATX, then your clock system will not operate properly.

The setup of the ATX in Repeater Mode is now complete. You can now synchronize and install your AirTime Wall Clocks using the instructions furnished with them.