



Texas School for the Blind and Visually Impaired

Outreach Programs

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Using the Orion TI-84+ Talking Graphing Calculator

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Agenda

- How the Orion TI-84+ Came to Be
- Overview of the Orion TI-84+ Talking Graphing Calculator
- How Students and Teachers Learn to Use the Orion TI-84+
- Experiencing the Calculator- Student and Teacher Perspectives
- Support from Orbit Research

How the Orion TI-84 Plus Talking Graphing Calculator Evolved

- What it was like before the Orion TI-84+ talking graphing calculator – limitations, frustrations, etc.
- Conversations that led to the development of the calculator
- Description of the partnership and Susan's input into the creation of the final product

Orion TI-84+ Talking Graphing Calculator

- What comes in the box?
- What doesn't come in the box?

General Orientation to the TI-84+ Portion

- Bottom 4/5 of the calculator is the standard TI-84+.
- Function Keys
- Basic Keypad
- Turning the Calculator On and Off
- Help Mode
- Leave Help and Work Problems

General Orientation and Working with the Orion Portion

- Dot 1: Repeat Button
- Dots 2 & 5: Decrease & Increase Volume
- Dot 3: Pause/Ctrl Key
- Dot 6: Shift/Mute Key
- Dot 4: Preference Key
- Preference Menu

Other Important Things to Know

- Fully charge the Orion battery
- Replace 4 Triple A batteries in TI-84+
- Check your battery status

How Students and Educators Learn to Use the Calculator

- Direct instruction from TVIs for the Orion portion
- Direct instruction from math teachers for the TI-84+ portion
- Presentations and workshops
- Self-exploration

Experiencing the Calculator- Teacher & Student Perspective

- Texas School for the Blind and Visually Impaired – all students are visually impaired
- Standard public school typically has only one or a few visually impaired students
- Portability is important
- Same calculator as sighted peers
- Students need time to learn the calculator, get oriented
- Help mode is useful
- [Videos](#) Susan made to help learn to use the calculator
- Student stories:
 - Craig finding gold
 - Sarai's memorization
 - Edgar's success story

Support from Orbit Research

- The Orion TI-84 Plus continues to be available from Orbit Research, are in stock, and ship immediately.
- The product can be purchased through our website or our toll-free phone line using a credit card, and we also accept purchase orders.
- The calculator is in full production and there are no plans to discontinue the model. Texas Instruments continues to manufacture and fully support the TI-84 Plus and the TI-30XS calculators and Orbit Research continues to manufacture and support their adapted versions which were developed in partnership with APH. We expect to manufacture and support it for many years.

Sales

Toll-free phone: 888-606-7248 (9am to 5pm Eastern Time, Monday through Friday)

[Purchase](#) from our website.

[Sales inquiries and to send purchase orders.](#)

Technical Support

Toll-free phone: 888-606-7248 (9am to 5pm Eastern Time, Monday through Friday)

[Technical inquiries.](#)

[Technical Resources](#) on our website. This webpage also has other resources including tutorials and videos.

Calculator related support is available from **Texas Instruments** via [TI Cares™](#).

Repairs and Replacement Parts

- For all repairs, please contact Orbit Research directly.
- The following replacement parts or accessories are also available [online](#):
 - Orion TI-84 Plus Spare Battery
 - USB-A to Mini USB-B Cable for Orion TI-84 Plus
 - Charger
 - Orion TI-84 Plus – Talking Graphing Calculator – Back Cover

Summary

- Orbit Research partnered with Texas Instruments and APH to develop specially adapted versions of the TI-84 Plus Graphing Calculator.
- This adapted version of the calculator has been extremely successful in enabling blind students to pursue STEM education in high school and has become a staple for teachers and students alike since it works exactly the same as the standard product.
- The American Foundation for the Blind awarded the prestigious AFB Access Award to Texas Instruments, Orbit Research and APH in 2016 for this work.
- The product is approved for use in standardized tests including the ACT and SAT.

A Quick Introduction to The Orion TI-84+ Talking Graphing Calculator and the Orion TI-30XS Multiview Talking Scientific Calculator and How to Learn More

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The Orion TI-84+ Talking Graphing Calculator and the Orion TI-30XS Multiview Talking Scientific Calculator are fully-accessible and handheld. They are ideal for all students, middle school through college, and beyond. APH partnered with Orbit Research and Texas Instruments to make these powerful calculators accessible.

The Orion TI-84+ Talking Graphing Calculator

What comes in the box?

- Orion TI-84 Plus Talking Graphing Calculator
- Hard slide cover
- Standard A male to Mini-B male USB Cable
- USB Power Adapter
- Earbuds
- Pack of four triple-A batteries
- Quick-Start Guide in braille format
- Quick-Start Guide in print format

What doesn't come in the box?

- TI-Connectivity Cable

General Orientation and working with the TI-84+ portion

- Slide the cover off and place it on the back.
- The bottom 4/5 of the calculator is the standard TI-84+ and the top 1/5 is the Orion – talking portion.
- Right below the screen are the function keys.
- The basic keypad has approximately 9 rows and 5 columns but they are not perfectly aligned, and some rows are shorter.
- The first and 2nd rows only have 3 buttons and the space for a 4th and 5th button are taken up by arrows – similar to your computer keyboard: left, right, up, and down arrows.

- Turn the calculator on by pressing the “on” button located in the first column, bottom row.
- Turn it off by pressing the 2nd key (located in the first column, top row) followed by the “on” key.
- Press the 2nd key 3 times to enter help mode, and it says: “Help on.” Press it an additional 3 times to exit the help menu, and it says: “Help off.”
- Check out the keypad with help on. It announces the name of the key, and also gives a brief explanation of how to use it.
- Leave help and work a few problems.

General Orientation and working with the Orion portion

- There are six keys on the left side of the Orion portion that resemble a braille cell, and you might want to think of them as dots (or keys) 1, 2, 3, 4, 5, and 6.
- Dot 1 is the repeat button. Enter a number on the TI-84+ portion and press enter, and the Orion will announce the number. Press Dot 1, and the answer will be repeated.
- Dot 2 decreases the volume and Dot 5 increases the volume.
- Dot 3 will pause your calculator in mid-announcement. Enter a number, have the Orion repeat it, and pause it in the middle by pressing the dot 3. Press it again to continue.
- Dot 3 is also the Ctrl key. Combine it with Dots 2 and 5 to decrease or increase the speech speed.
- Dot 6 is the Shift/Mute key. Enter a number, have the Orion repeat it, and stop it in mid-announcement, and it will not continue. Combining dot 6 with dot 1 gives you a toggle between speech and tone mode.
- Dot 4 is the Pref key, and when combined with Dot 6, it allows for the playback of a graph.
- Dots 3 and 6 held down together can be used for a reset.
- Dot 4 or the preference key allows you to use the navigation keys on the Orion portion. There is a left, right, up, and down arrow with a home key in the middle.
- My favorite things to use in the preference menu:
 - Battery Status
 - Graph Options, Sounds, and Equation Playback Duration

Other Important Things to Know:

- Fully charge the Orion battery the first time you use the calculator. This should take about four hours.
- The four triple-A batteries in the TI-84+ eventually need to be replaced, and if they become low, you will receive a message stating this when they are at about 5% capacity.

- Check your battery status before any major test or assignment and make sure the calculator is fully charged and have a spare set of triple-A batteries on hand.
- The ports at the top of the calculator begin with the TI-84 serial link port on the left, followed by the micro port, the Mini-B port (charger port), and finally the earbud jack on the right.

The Orion TI-30XS Multiview Talking Scientific Calculator

What comes in the box?

- Orion TI-30XS Multiview Talking Scientific Calculator
- Hard slide cover
- Hard snap cover
- Standard A male to Micro-B male USB Cable
- USB wall plug
- Earbuds
- Quick-Start Guide in braille format
- Quick-Start Guide in print format

General Orientation to the TI-30XS Portion

- Gently pull the snap cover off and slide the calculator into the hard slide cover.
- Nearly the entire calculator is the standard TI-30XS but the solar screen area at the top of the calculator has been replaced with the Orion talking portion.
- The 41 TI-30XS keys are located directly below the screen.
- The basic keypad has approximately 9 rows and 5 columns.
- The 1st and 2nd rows only have 3 buttons and the space for a 4th and 5th button are taken up by a four-key directional pad in the top-right corner.
- The four keys of the directional pad are the arrow keys for the TI-30XS.
- Turn the calculator on by pressing the "on" button located in the first column, bottom row. It has a raised outline on the bottom-left corner of the key.
- Turn it off by pressing the 2nd key (located in the first column, top row) followed by the "on" key.

General Orientation and working with the Orion portion

Above the screen on the face of the calculator are three keys in a horizontal region, replacing the solar panel of the original calculator. The keys are labeled A, S/L, and \cup R from left to right, which stand for Access, Silence/Learn, and Repeat. These three keys are the Orion keys. Each of the

Orion keys has multiple functions depending on how they are pressed, tapped, long pressed, or used in combination with the Access key.

Access Key (A)

- Tap the Orion A key followed by an Access Mode key to get the modified functionality for that particular key. For example, Access followed by the “on” key gives you the battery status.
- Holding the A key with a long press enters Orion settings which allows you to change settings such as speed and/or volume using the arrows on the directional pad. Pressing and holding the A key again turns off Orion settings. Pressing a non-Orion settings key also exits the Orion settings.

Silence/Learn Key (S/L)

- Tapping the S/L key silences whatever is currently being spoken.
- Pressing the A key followed by the S/L key turns off access functionality until one of the Orion keys is pressed or the calculator is turned off and on again. This is a good mode to use when an instructor would like to use the calculator without speech.
- Holding the S/L key with a long press switches the calculator to Learn mode. Pressing the same key again with a long press lets you exit Learn mode.

Repeat Key (UR)

- Tapping the UR key repeats the last spoken text.
- Pressing the A key followed by the UR key spells out the last spoken text.
- Press and hold the UR key to read the entire screen.

Working with the Orion TI-30XS

- The Orion TI-30XS is equipped with a Learn mode designed to assist you with locating keys and confirming their functionality. Learn mode can be used at any time. When the unit is in Learn mode, the calculator retains its previous status. For example, if you are in the middle of an operation and enter the Learn mode, the calculator operation is not interrupted and the display remains unchanged.
- To enter Learn mode, press and hold the middle Orion key (S/L) located at the top of the calculator and above the screen.

- To assist you with locating a particular key, during Learn mode each key and its primary function is announced when pressed. When used in combination with the 2nd key, the Orion TI-30XS announces the secondary function for the pressed key.
- To exit Learn mode, press and hold the middle Orion key (S/L). The calculator returns to the speech and operational mode at precisely the same point you were at prior to entering Learn mode, and it restores all the previously set preferences.
- Check out the keypad with help on.
- Leave help and work a few problems.

Other Important Things to Know:

- Fully charge the Orion battery the first time you use the calculator. This should take about four hours.
- Check your battery status before any major test or assignment and make sure the calculator is fully charged.
- The ports at the top of the calculator are the earphone jack on the left and the USB Micro-B port on the right.

Resources: Learning More about these Calculators

To learn more about these calculators including step-by-step distance education videotaped tutorials and helpful user guides visit these links:

[APH Tech](#)

[Orbit Research](#)

[TSBVI Mathematics](#)