Introduction

Your Pulsar® is the world's first commercially available LED wrist calculator, a personal information center which combines six-digit display, 12 digit capacity calculating capability, along with time, month and date.

The timekeeping circuitry of Pulsar is accurate to within 60 seconds a year. This accuracy is achieved through a quartz crystal oscillating 32,768 times per second, and the Computer™ which translates these oscillations into precise usable increments. The digital readout is an array of solid-state lamps called light-emitting diodes (LED), which emit light without generating heat.

Pulsar timing and calculating performance are warranted for three years. Be sure to read your warranty and fill out and return enclosed Record of Warranty within 30 days from date of purchase.

To learn in detail about how your Pulsar works and how simple it is to operate, please read this booklet carefully. Note the index on the inside back cover of this manual for quick reference to operating instructions. For everyday convenience, a handy wallet size card containing a summary of instruction is also included.

If, after reading these instructions you have any questions, call our toll-free "hotline"—800-233-0262 (Pennsylvania residents call collect—717-299-0840).

Features

- Overflow/Negative Number Indicator
- Subtract from Memory (calculate mode)
- Set Time and Date (time mode)
- Data Keys
- Subtract
- Zero Key (also used to enter calculate mode)
- Command Button (time, month, and date)
- Data Screen
- Floating Decimal
- Add to Memory
- Divide
- Total
- Memory Read/Clear
- Clear Entry
- Multiply
- Percent
- Clear
- Add

Retractable Command Pen

Pulsar facts

Computer Module. Custom designed and patented by Pulsar, the Computer module utilizes large scale integrated circuits containing the equivalent of over 4,500 transistors.

Calculator Display Readout. Although the calculator has a six-digit display, it is possible to calculate answers up to 12 digits. When your total exceeds six digits, an overflow dot lights up to the left of the first digit displayed. The floating decimal then indicates the answer in millions, and the first six significant digits of the total will be displayed (i.e., 90,560 × 1,364 = 123,523,840 will be displayed as •123.523).

Memory and Percent. Contains memory add, memory subtract, memory read/clear as well as percentage keys.

Floating Decimal. When a decimal is entered, it will be displayed in correct position for all entries and calculations. All entries and answers fully float in the display.

Power Source. Four miniature silver oxide power cells #RW 42. Under normal use of 25 calculations and 25 time readouts per day, the cells should last about one year. A certificate for an additional free set of four cells is attached to your warranty card. Retain it until you need fresh cells. Your authorized Pulsar jeweler can replace them for you in a matter of minutes. *Always replace all four cells at the same time.* Use only genuine Pulsar replacement cells.

Pulsar facts (continued)

Light-Emitting Diodes. The light-emitting diodes are superior for reliability and long life span. These solid-state lamps, if kept lighted continuously, would retain over 80% of their original brightness after 100 years of continuous use.

Smart Calendar. Pulsar knows the difference among 28, 30 and 31 day months and changes automatically. Adjustment is required only in a leap year.

Data Screen. The data screen is made of synthetic sapphire, guaranteed scratchproof and unbreakable for the life of the product.

Command Pen. A fine quality pen with two retractable tips is included with your Pulsar—one tip for writing, the other a spring-loaded plastic tip for calculating. When using the calculating tip, a *gentle* pressure will activate the keys. There is no need to exert heavy pressure on the keyboard.

Shock Resistance. Designed for maximum resistance to damage from shock in normal usage. Since Pulsar has no moving parts, there are no balance wheels, springs, hands, gears or motors which can be damaged by shock.

Anti-Magnetic. Your Pulsar cannot be damaged by exposure to high magnetic fields.

Routine Maintenance. None. Pulsar has no moving parts to wear out, or require cleaning or oiling.

Note: The Pulsar Time Computer Calculator is *not* intended for underwater use, but incorporates a special urethane shield which protects the Computer from water, dust, and dirt as long as case and data screen remain intact.

To operate your Pulsar

1. Press the command button once. Pulsar displays hour and minute.

2. Press the command button two times. Pulsar displays month and date.
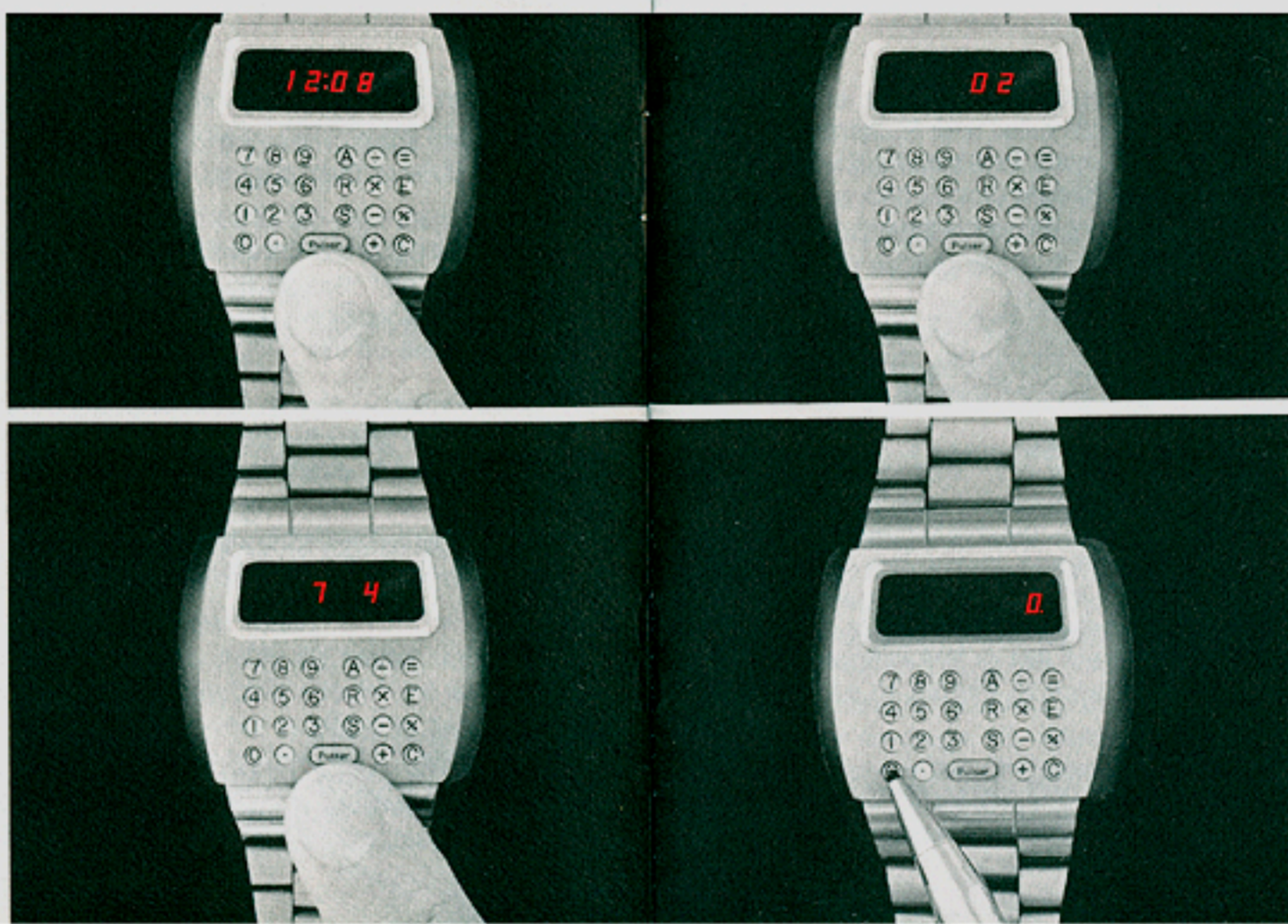
3. Press the command button three times. Pulsar displays seconds as long as the button is pushed.

4. To enter calculate mode, gently plastic tip of the command pen on (0) key. *After completing calculations, press command button once to return to time/date readings.* (Do not leave in calculate mode, as this will cause excessive power cell drain.)

Setting your Pulsar

Your authorized Pulsar jeweler will set your Pulsar to an accurate time source at the time of purchase and each time he changes power cells. Your Pulsar has a setting feature which permits hours, minutes, month and date to be set easily and independently. This allows you to reset hours to different time zones, or shift from standard to daylight saving time, without disrupting the accuracy of minute and seconds calculations.

Pulsar setting is accomplished by using the ⑤ key on the calculator keyboard in conjunction with the command button in time keeping mode. By pressing the ⑤ key repeatedly, setting information is displayed in the following order:

1st press = month set	**3rd press** = hour set	**5th press** = normal
2nd press = date set	**4th press** = minutes set	operation

Resetting Hours Only. With Pulsar in timekeeping mode, press the ⑤ key with the command pen's plastic tip *three* times. Hour will light up along with A (to indicate AM) or P (to indicate PM). Now press the command button to cycle the hours to the time desired, making certain the correct AM or PM indicator is lighted. Release the button. Then press the ⑤ key twice to restore to normal operation. The hour is now reset.

When it becomes necessary to completely reset your Pulsar (after replacing the power cells, for instance) follow the procedures on the next page.

Setting your Pulsar (continued)

Resetting Month. (1st press of ⑤ key). With the plastic tip of the command pen, press the ⑤ key once. This will cause month to light up. Press command button to cycle month to setting desired. Release command button. Next:

Resetting Date. (2nd press of ⑤ key). Again press the ⑤ key once with the command pen. This will cause date to light up. Press command button to cycle date to setting desired. Release command button. Next:

Resetting Hour. (3rd press of ⑤ key). Again press the ⑤ key once with the command pen. This will cause hour to light up, together with A for AM or P for PM. Press command button to cycle hour and AM/PM indicator to desired setting. Release command button. Next:

Resetting Minutes. (4th press of ⑤ key). Again press the ⑤ key once with the command pen. This will cause minutes to light up. Press command button to cycle minutes to desired setting (this automatically resets seconds to 00). Always set ahead by at least one minute to give yourself time to synchronize, as outlined below. Release command button. Then press ⑤ key once to blank the display. *Do not press the command button at this time.* (Pulsar will not begin time calculations until the command button is pressed.)

To synchronize to the exact second. Use an accurate time source such as a clock of known accuracy, or one of the international shortwave time stations listed on page 18. When your time source and the time you have set coincide, press the command button. This starts the Time Computer. Note that to properly synchronize the seconds, you must always start your Pulsar on the exact minute (such as 12:08:00).

To calculate with your Pulsar

To enter the calculate mode, press the key marked ⓪. A zero will be displayed on the right hand digit and the calculator is now functional.

Identification of keys

Data Keys: The data keys include the number keys 0 through 9 and the decimal point.

Arithmetic Operation Keys:

Add	⊕	Multiply	⊗	Equals	⊜
Subtract	⊖	Divide	⊘	Percent	%

Control Function Keys:

- Ⓐ (Add to Memory) This key adds the numbers being displayed to the memory register.
- Ⓢ (Subtract from Memory) This key subtracts the numbers being displayed from the memory register.
- Ⓡ (Memory Read/Clear) One push of this key will display contents of the memory register. Two successive pushes will clear the memory.
- Ⓔ (Clear Entry) This key clears the last number entered without affecting previous entries.
- Ⓒ (Clear) This key clears all previous entries except the contents of the memory register. The memory is automatically cleared when changing from calculate mode to time mode.

To calculate with your Pulsar (continued)

Display Blanking and Power Saver:
To save energy, the display will go out after 10 seconds of keyboard inactivity. To restore display without affecting calculations, press the Ⓔ (clear entry) key.

Constant:
When performing a calculation in multiply or divide mode, the multiplier or divisor can be used as a constant by successive pressings of the ⊗ ⊘ or ⊜ keys (see example nos. 4, 5, 7 and 8 on page 13 of this manual).

Negative Number Indicator:
The overflow dot to the left of the data screen also acts as a negative number indicator when the answer displayed is negative.

Overflow Condition:
A calculation that results in an answer of more than six digits to the left of the decimal point will cause an overflow condition (indicated by the overflow dot to the left of the first digit of the display). Calculations are possible up to 12 digits, however. In such cases, the first six significant digits will be displayed, and the decimal point will mark off millions (i.e., 90,560 × 1,364 = 123,523,840 will be displayed as 123.523). Overflow condition can be cleared only by pressing the Ⓒ (clear) key; all keys except Ⓒ become inoperative in overflow condition.

Arithmetic Examples

Arithmetic Operations and Examples:

Note: In calculate mode, display blinks to acknowledge entry of operation when depressing ⊕ ⊖ ⊗ ⊘ ⊜ % Ⓐ Ⓢ Ⓡ keys.

1. Addition:
14 + 9 = 23

Enter:	Display:
C	0.
14 +	14.
9 =	23.

2. Subtraction:
29 − 17 = 12

Enter:	Display:
C	0.
29 −	29.
17 =	12.

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43 × 9 = 387

Enter:	Display:
C	0.
43 ×	43.
9 =	387.

5. Raising numbers to a power: $7^4 = 2401$

Enter:	Display:
C	0.
7 ×	7.
=	49.
=	343.
=	2401.

7. Successive division by a constant divisor:
26 ÷ 8 = 3.25
29 ÷ 8 = 3.625
30 ÷ 8 = 3.75

Enter:	Display:
C	0.
26 ÷	26.
8 =	3.25
29 =	3.625
30 =	3.75

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6 × 4 = 24,
6 × 17 = 102.
6 × 31 = 186.

Enter:	Display:
C	0.
6 ×	6.
4 =	24.
17 =	102.
31 =	186.

6. Division: 14 ÷ 5 = 2.8

Enter:	Display:
C	0.
14 ÷	14.
5 =	2.8

8. Reciprocals: ⅛ = 0.125

Enter:	Display:
C	0.
8 ÷	8.
=	1.
=	0.125

Number of square feet of carpet required to cover floor equals (10 × 20) − (2 × 6) +
(6 × 6) = 224 sq. ft.

Keyboard	Display	Memory
C	0.	0
10 ×	10	0
20 A	200	200
2 ×	2	200
6 S	188	200
6 ×	12	188
6 A	188	188
R	36	224
	224	224
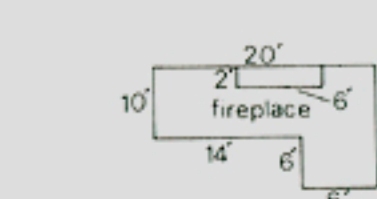
14. Calculation illustrating overflow condition
936,640 × 38 = 35,592,320

Enter:	Display:
C	0.
936,640 ×	936.640
38 =	•35.5923

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100 shares of A @ $56/share and 97 shares of B @ $27/share to purchase 500 shares of C @ 19/share. (100 × 56) + (97 × 27) − (500 × 19) = $1281 Due Broker

Keyboard	Display	Memory
C	0.	0
100 ×	100	0
56 A	5600	5600
97 ×	97	5600
27 A	2619	8219
500 ×	500	8219
19 S	9500	−1281
R	•1281	−1281

IMPORTANT:

When you have finished calculating, return to timekeeping mode by pressing the command button once.

Do not leave the unit in calculate mode for extended periods, as this causes excess power drain.

Conversion tables

Length	Inches × 2.54	=	Centimeters	**Volume**	Ounces × 0.02957	=	Liters
	Feet × 0.3048	=	Meters		Pints × 0.4732	=	Liters
	Miles × 1.609	=	Kilometers		Quarts × 0.9464	=	Liters
	Centimeters ÷ 2.54	=	Inches		Liters ÷ 0.9464	=	Quarts
	Meters ÷ 0.3048	=	Feet	**Weight**	Ounces × 0.03527	=	Grams
	Kilometers ÷ 1.609	=	Miles		Pounds × 2.205	=	Kilograms
	Centimeters ÷ 100	=	Meters		Grams × 0.03527	=	Ounces
	Meters ÷ 1000	=	Kilometers		Kilograms × 2.205	=	Pounds
					Grams ÷ 1000	=	Kilograms

International Shortwave Time Stations

Call Sign	Place	Carrier Frequency
WWV	Fort Collins, Colorado, USA	2.5 MHz; 5 MHz; 10 MHz; 15 MHz; 20 MHz; 25 MHz
WWVH	Maui, Hawaii, USA	2.5 MHz; 5 MHz; 10 MHz
CHU	Ottawa, Canada	3.33 MHz; 7.34 MHz; 14.67 MHz
MSF	Rugby, United Kingdom	2.5 MHz; 5 MHz; 10 MHz
HBN	Neuchatel, Switzerland	5 MHz
OMA	Prague, Czechoslovakia	2.5 MHz
FFH	Paris, France	2.5 MHz
IAM	Rome, Italy	5 MHz
IBF	Turin, Italy	5 MHz
Zuo	Johannesburg, Rep. of South Africa	10 MHz
ZUO	Olifantsfontein, Rep of South Africa	5 MHz
LOL	Buenos Aires, Argentina	5 MHz; 10 MHz; 15 MHz
JJY	Tokyo, Japan	2.5 MHz; 5 MHz; 10 MHz; 15 MHz
Ata	New Delhi, India	10 MHz
VNG	Lyndhurst, Australia	5.4 MHz; 7.5 MHz 12 MHz