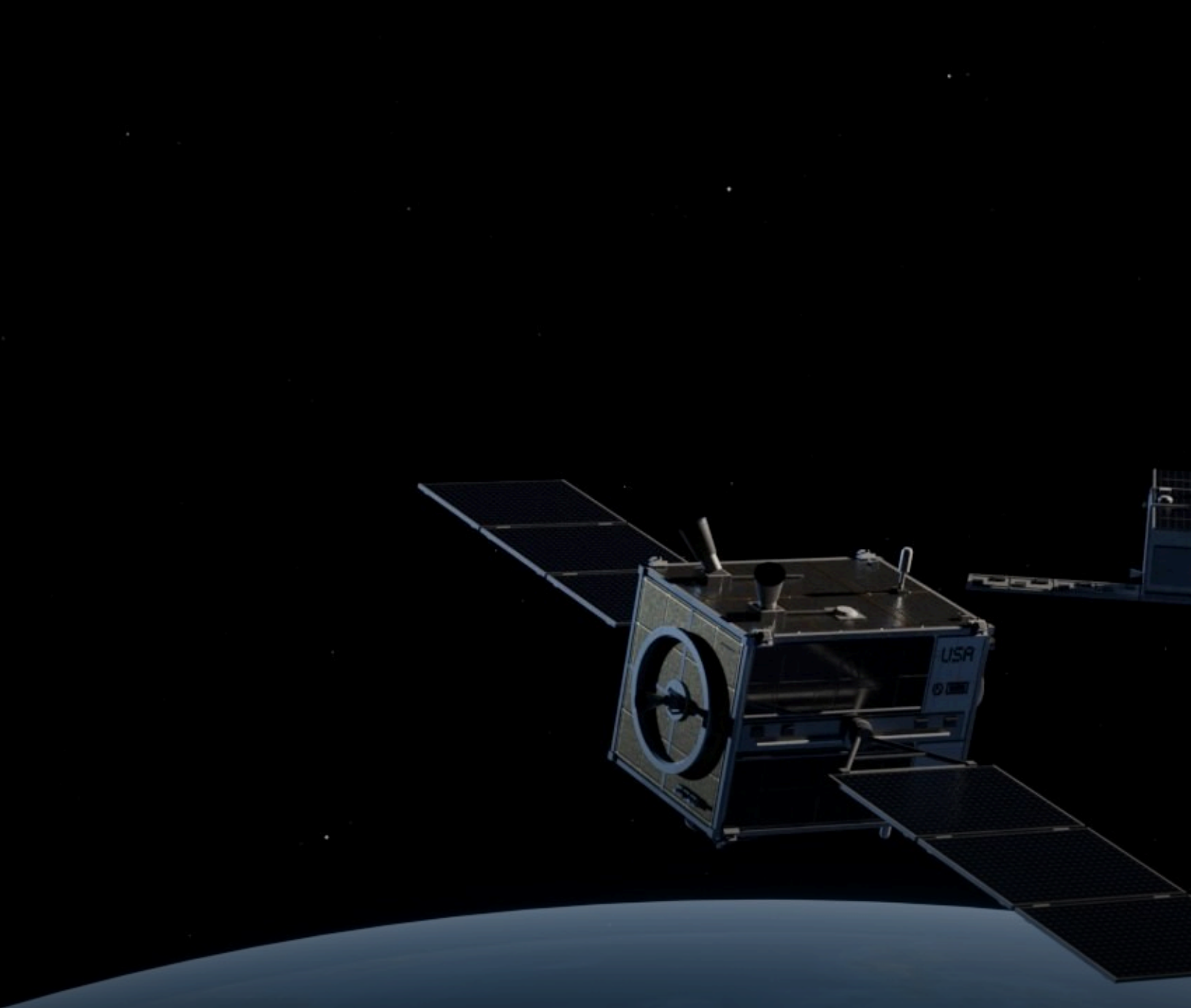


OPERATOR'S HANDBOOK

xGEO

LIVE

How to play on PC, and how to win CLOSE PASS, your first operation, in low Earth orbit.

ALPHA 0.5 · KEYBOARD & MOUSE

WELCOME

BEFORE YOU PLAY

xGEO runs in your browser. Open the game page, wait for it to load, and click inside it once so it gets your keyboard.

CONTENTS

1	The situation	3
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WHAT YOU NEED

A PC
Desktop or laptop. Phones and touch screens aren't supported.

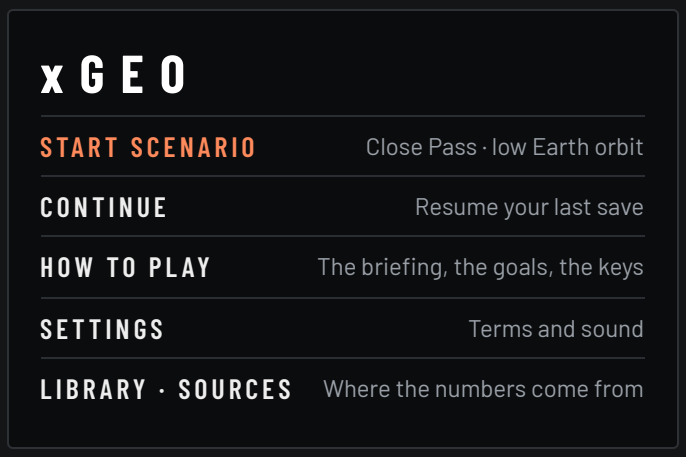
A BROWSER
Current Chrome, Edge or Firefox with WebGL 2.

MOUSE AND KEYBOARD
A wheel or trackpad for zooming.

130 MB
The first load takes a minute. Your browser then keeps it.

1920 × 1080 OR LARGER
Smaller works, but windows overlap. F11 for full screen.

THE MAIN MENU

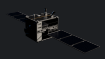


Choose **START SCENARIO**. The game starts paused, with the tutorial on.

> **FIRST TIME?** Follow the tutorial card in the game. Each step names one thing to do and carries you to a win. This handbook is the same plan on paper.

1 · THE SITUATION

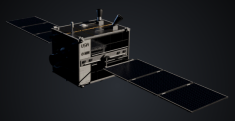
LOW EARTH ORBIT, OCTOBER 2026



YOUR ORDERS

A Russian inspector is creeping up on ICEYE-X36, a US radar satellite. Make it leave. You have no weapons. No war.

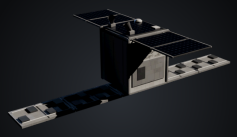
WHO'S WHO



YOU · BLUE

WATCHMAN-1

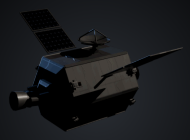
Your inspector. No weapons: an engine, a telescope and a radio receiver. About 260 m/s of fuel for two days.



PROTECT · GREEN

ICEYE-X36

A US radar satellite that takes pictures of the ground. It has no engine, so it can't get out of the way.



THE INSPECTOR · RED

COSMOS 2612 · TRK 4423

Parked 5 km behind X36. It plans three moves to study X36 up close, then goes home with what it came for.



YOUR EYES · BLUE

FIVE GROUND RADARS

Radar sites in Alaska, Texas, Arizona, New Zealand and the Pacific. Each sees it only while it passes overhead.

HOW YOU WIN



FLY TO IT

Plot move, then Match orbit

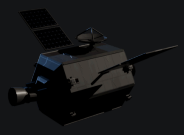
→

5 km

CROWD IT

Come that close and it gives way

→



IT LEAVES

Crowd it again until it gives up

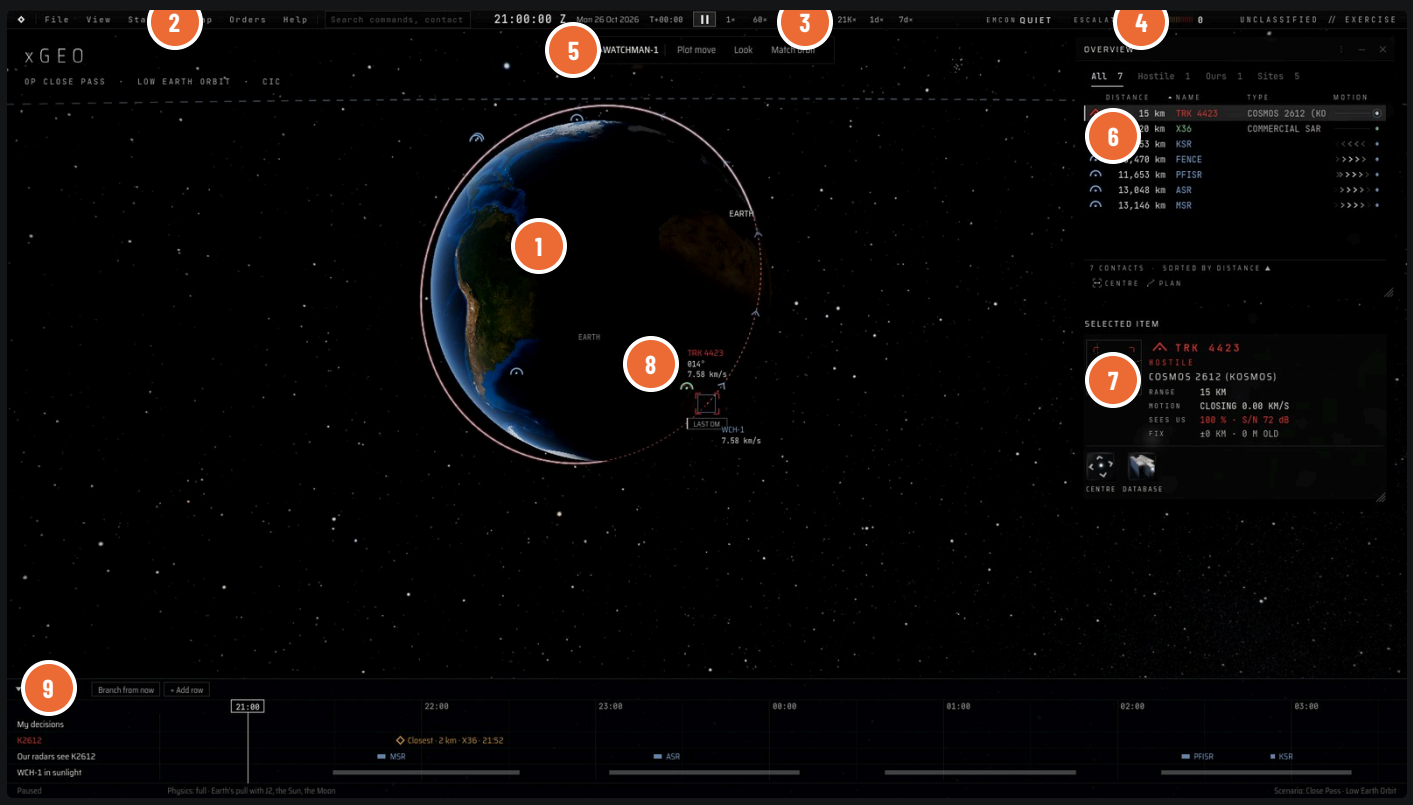
YOU LOSE IF

- **IT FINISHES** all three of its moves round X36
- **SCORE MORE:** keep it over 1 km from X36
- **SCORE MORE:** use no more than half your fuel
- **ESCALATION** reaches 100: open conflict
- **SCORE MORE:** keep a good track on it 80% of the time

Press F1 in the game to see these goals.

ONE SCREEN, NINE PARTS

Hover over anything in the game and a card explains it.



1. **3-D VIEW** The Earth and every craft you know of. Drag to turn it, scroll to zoom.
2. **MENU BAR** File, View, Stations, Map, Orders, Help: every command, with its key.
3. **CLOCK** The date and time (Z is UTC). Pause, or run up to a week a second.
4. **EMCON & ESCALATION** QUIET means you only listen. Escalation 100 loses.
5. **ACTION BAR** The ship you act from, and its orders: Plot move, Look, Match orbit.
6. **OVERVIEW** Every contact, nearest first. Click a row to select it.
7. **SELECTED ITEM** All you know about the contact you picked: range, motion, whether it sees you.
8. **A CONTACT** TRK 4423 is Cosmos 2612. The ring round it shows how unsure you are of where it is.
9. **TIMELINE** What's coming: its closest pass to X36, when our radars see it, when you're in sunlight.

MAP COLOURS Blue · ours · Green · protected · Yellow · unknown · Red · hostile · Dashed · its predicted path

THE ACTION BAR

WATCHMAN-1 has three orders, on the bar at the top and on keys 1 to 3. None of them is a weapon.



PLOT MOVE

Open the planner on your target

USES FUEL



LOOK

Point the telescope at it. The I key does it too

QUIET



MATCH ORBIT

Brake alongside your target

USES FUEL



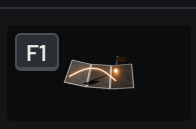
ITS OPTIONS

Right-click a contact: every order against it, and its price



A grey order can't be done now: hover over it to see why. The Orders menu lists the same three, with their keys.

STATIONS



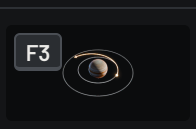
CAMPAIGN

Your goals



SIGINT

Listen, identify



PLANNER

Plan a move



OVERVIEW

All contacts



DATABASE

Every craft and sensor



TRACKER

A ground camera



HEAT

When you're seen



LAYERS

What's drawn



SIGNALS

All you've heard



SOLAR

Sun, Earth, Moon



TERMS

Plain or military



DETAILS

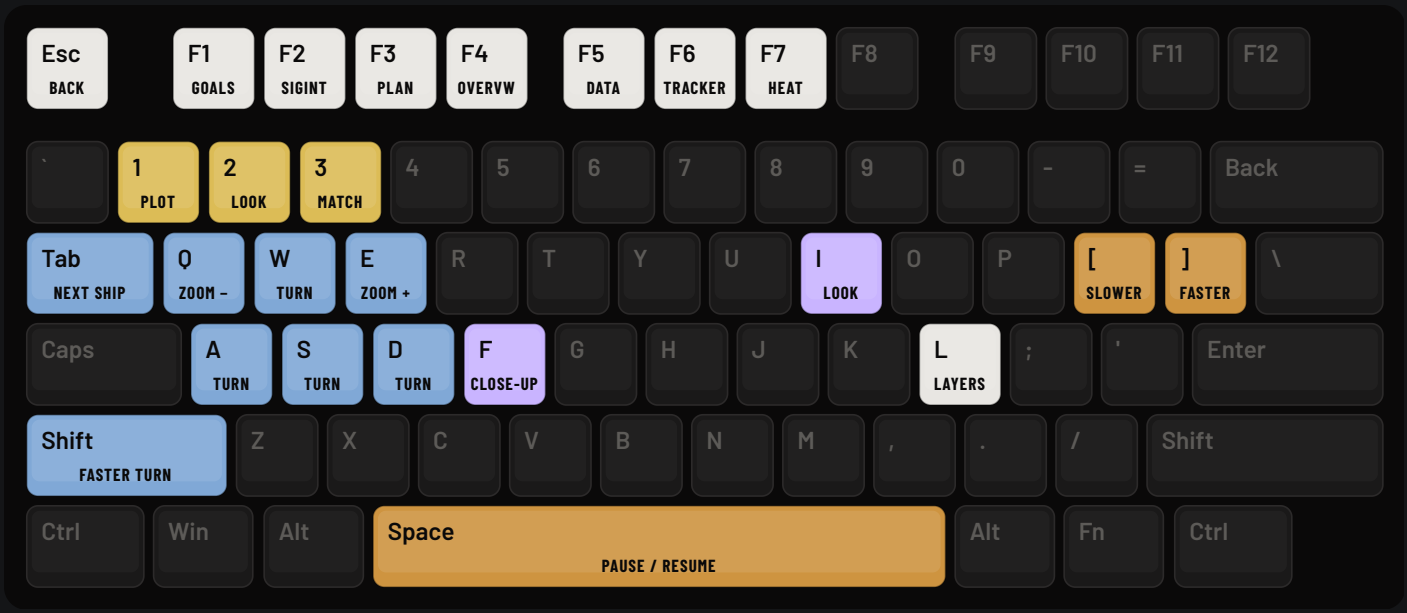
The maths

STATIONS and VIEW MENU: no key. Open them from the menu bar along the top. ANY NUMBER: click a number and it opens to show how it is worked out. Esc always closes the last window you opened.

4 · CONTROLS

KEYS AND MOUSE

Only the coloured keys matter. Some browsers keep F1–F7 for themselves until you have clicked inside the game.



Time · Moving the view · Stations · Orders · Looking



LEFT DRAG · CLICK	Turn the view · select a contact
RIGHT DRAG · CLICK	Slide the view (middle drag too) · right-click a contact for every option and its price
WHEEL	Zoom; keep going out to see the Moon's orbit
DOUBLE-CLICK	Centre on a ship and follow it round the Earth

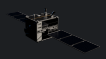
INSIDE SIGINT (F2)

↑ ↓ pick a recording · D find direction · I identify · B next band

TIME

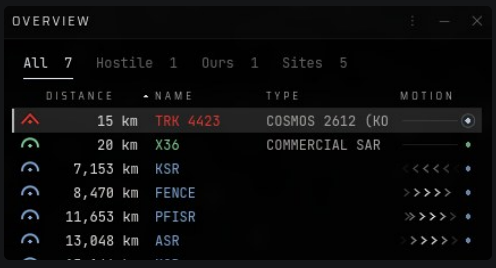
Space pause and resume · [ ] slower and faster. One trip round the Earth takes about 95 minutes. Use 60× near a target, 600–3,600× while you wait, and pause to think.

PART 1: GET YOUR BEARINGS



YOUR ORDERS

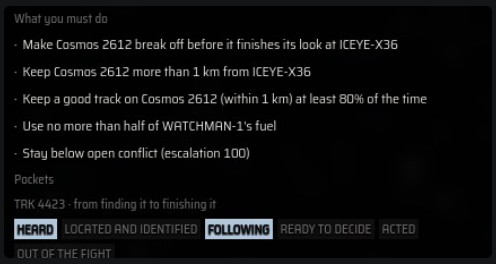
It reports home by radio as it passes over Moscow. Know where everyone is, and hear it, before you move.



1 MEET THE PLAYERS

CLICK X36, THEN TRK 4423, IN THE OVERVIEW

X36 is the satellite you protect. TRK 4423 is Cosmos 2612, 15 km away. You start 20 km behind X36.



2 READ YOUR GOALS

PRESS F1 CAMPAIGN

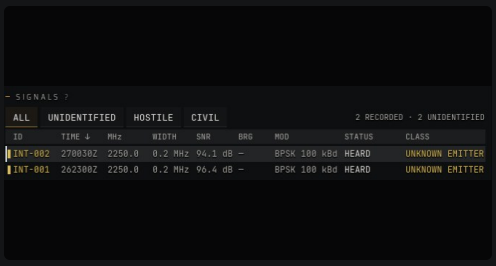
Five goals. Fail either of the two that lose the game and the mission is over. Esc closes it.



3 START THE CLOCK

] FASTER · SPACE PAUSE

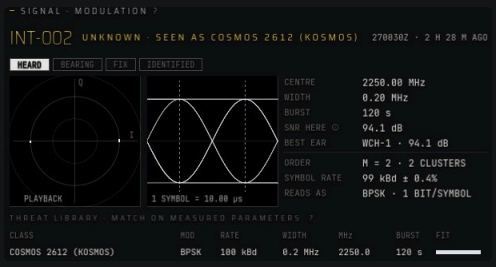
Run at 60×. The timeline at the bottom shows when Cosmos 2612 gets closest to X36, when our radars see it, and when you're in sunlight.



4 HEAR IT

F2 THEN CLICK ITS NEWEST REPORT

Each report is a two-minute radio burst. Recordings are kept one hour, so pick a fresh one. Speed time up while you wait.

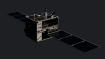


5 IDENTIFY IT

IDENTIFY SIGNAL · I

Matches the burst to a known radio: now you know it is Cosmos 2612 talking. Optional, but it is how you learn what you're up against.

PART 2: CLOSE IN



YOUR ORDERS

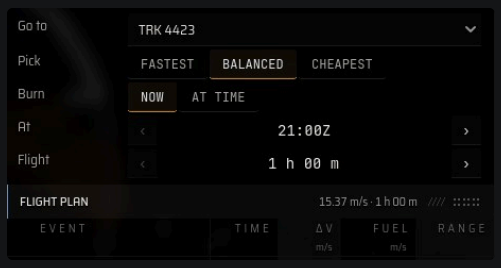
Get alongside it. The planner does the orbital maths; you choose how fast and how much fuel. Arriving isn't stopping: Match orbit stops you.



6 PLOT A MOVE

SELECT TRK 4423 · 1 PLOT MOVE

The planner opens on its OPERATIONAL tab: go to a target. The picture shows your path there.



7 PICK AND BURN

BALANCED · BURN NOW

At the start, BALANCED flies there in an hour for 7.75 m/s, then 7.62 m/s to stop. FASTEST costs more; CHEAPEST takes longer. CHECKS warns you of anything to fix.



8 LOOK AT IT

SELECT TRK 4423 · 2 LOOK · ESC CLOSES

Close in and in sunlight, the telescope sees its hull. In Earth's shadow it sees nothing: wait for the sun.



9 MATCH ORBIT

PRESS 3 MATCH ORBIT ON ARRIVAL

Brakes you onto its orbit, right beside it. Stop within 5 km of it.

FUEL About 260 m/s for two days, and no refuelling. To score the fuel goal, use no more than half. Small moves early cost less than big ones late.

PART 3: STAY ON IT



TRK 4423 · HOW IT BEHAVES

It keeps 5 km clear round itself. Crowd it while it's parked and it moves away. Leave it alone and it creeps closer to X36.



10 CROWD IT

PARK WITHIN 5 KM OF IT

It has to see you: the Selected item shows SEES US. It gives way to a new spot about 8 km off, on the far side of X36.



11 FOLLOW IT

1 PLOT MOVE AGAIN · 3 MATCH ORBIT

For a short hop, use the TACTICAL tab: small pushes by hand, up or down (R), forward or back (I), sideways (C). They fire when you press Burn now.



12 MIND THE GAP

STAY MORE THAN 1 KM FROM IT

Each time you crowd it adds 5 escalation. Inside 1 km of it, escalation climbs 12 an hour. Watch ESCALATION, top right.



13 SEE IT OFF

CROWD IT AGAIN UNTIL IT LEAVES

It gives way twice. The third time, it gives up, climbs to a higher orbit and drifts away. (In the tutorial it leaves the second time.) Let time run to the debrief.

IT WENT CLOSER TO X36? When none of ours is within 50 km, it moves in on X36 each time it moves. Stay near it, and it keeps its distance.

8 · AFTER THE OPERATION

ENDINGS

The debrief gives you a score out of 100, says which goal decided it, and what to try next time.

COSMOS 2612 LEAVES
Crowded one time too many, it gave up, climbed away and left. No weapons, no war, X36 untouched.

IT FINISHED ITS LOOK
All three of its moves done. **Try:** get alongside sooner and stay within 50 km.

OPEN CONFLICT
Escalation reached 100. **Try:** keep more than 1 km from it; don't crowd it more than you need.

TIME RAN OUT
Two days passed with it still at work: half marks for stopping it. **Try:** crowd it earlier.

A LOW SCORE
Out of 100: 40 for making it leave, 20 for keeping it off X36, 20 for the track, 10 for fuel, 10 for peace.

FIELD NOTES



IT WATCHES YOU
Its telescope can see you too. The planner's CHECKS say when.



USE THE SUNLIGHT
Your telescope needs it lit. The timeline shows when.



A TRACK IS A BELIEF
Radars see it only on passes. Your telescope fills the gaps.



SMALL MOVES EARLY
Plan the cheapest first, and let the orbit do the work.

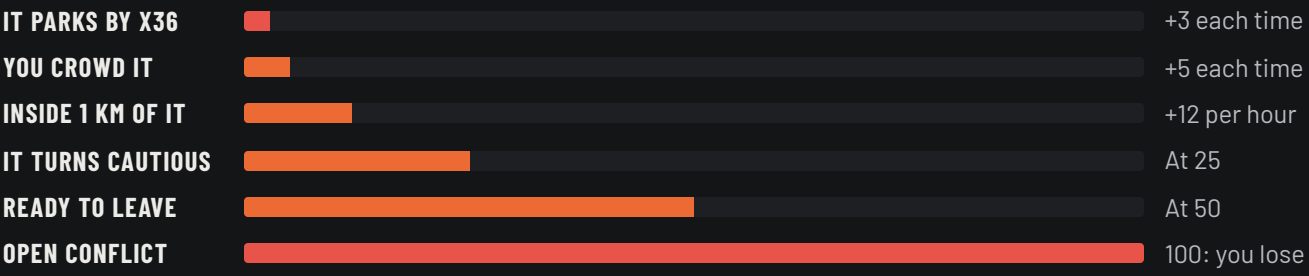


PICK THE RIGHT SPEED
60× near it, faster while you wait.



CLICK ANY NUMBER
It opens to show how it's worked out.

HOW TENSION BUILDS



At 25 it turns cautious: it gives way once fewer and stops creeping in. At 50 it leaves the next time you crowd it. Pressing hard wins sooner, at a price.

9 · CHEAT SHEET

ON ONE PAGE

Print this page and keep it beside the keyboard.

THE WINNING ORDER

1. Click X36, then TRK 4423, in the Overview
2. F1 read your goals
3.] speed time up to 60×
4. F2 click its newest report
5. I identify its signal
6. Select TRK 4423 · 1 Plot move
7. BALANCED · Burn now
8. 2 Look at it in sunlight
9. 3 Match orbit within 5 km
10. It gives way: plot and match again
11. Crowd it until it leaves; stay over 1 km off

WIN AND LOSE

Win	It leaves before it finishes its look at X36
Lose	It finishes its three moves · escalation 100
Score	It stays over 1 km from X36 · a good track 80% of the time · half your fuel or less

KEYS

Space	Pause / resume
[ ]	Slower / faster
F1	Campaign goals
F2	SIGINT station
F3	Planner
F4	Overview
F5	Database
F6	Ground tracker
F7	Heat forecast
L	Map layers
I	Look through the telescope
F	Close-up of the selected craft
Tab	Next ship
W A S D	Turn the view
Q E	Zoom
Esc	Back / menu

THE ACTION BAR

1	Plot move
2	Look
3	Match orbit

TENSION

+5	Each time you crowd it
+12/h	While you're inside 1 km of it
+3	It parks inside 1 km of X36
100	Open conflict: you lose

10 · WORDS YOU'LL SEE

GLOSSARY

Terms, in the VIEW menu on the menu bar, switches the game between plain words and military ones.

Δv How much you can still change your speed: your fuel, in m/s.

Rendezvous Reaching another craft. Matching its orbit so you stay is the second half.

Keep-out zone The space a craft keeps clear round itself. Cosmos 2612's is 5 km.

R · I · C Radial (up or down), in-track (forward or back), cross-track (sideways).

SIGINT Signals intelligence: listening to other people's radio.

Escalation How close the crisis is to open conflict. 100 is the end.

Track What you believe about a contact. Its ring shows how unsure you are.

RPO Rendezvous and proximity operations: one craft manoeuvring close to another.

Custody Keeping a good track: knowing where it is to within 1 km.

Earth's shadow The part of each orbit the Sun can't reach. A craft there can't be seen by telescope.

EMCON Emission control. QUIET means you only listen.

Z Time in UTC, the clock the whole world's satellites run on.

xGEO Live Operator's Handbook · Alpha 0.5. Play at kw-wargame.github.io/xgeo/game/. How the models work, with sources: xGEO Core, the research edition, at kw-wargame.github.io/satwar-releases-playtest/research/.

© 2026 Kevin Williamson. All rights reserved. xGEO is an independent educational project. ICEYE-X36 and Cosmos 2612 are real satellites, flown from their public orbits and specs, and the ground radars are real sites. WATCHMAN-1 is invented, and what happens in the game is fiction. Their operators have not reviewed or endorsed this game.