

A2A SIMULATIONS ACCU-SIM

AEROSTAR 600 MANUAL



For Microsoft Flight Simulator

A2A
simulations



A2A SIMULATIONS ACCU-SIM AEROSTAR 600 MANUAL

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RISKS & SIDE EFFECTS

ERGONOMIC ADVICE

- ▶ Maintain at least 45 cm distance from the screen to avoid eye strain.
- ▶ Sit upright, with legs at a right angle and upper/forearm angle $>90^\circ$.
- ▶ Position the screen's top edge at or below eye level, tilted slightly backward.
- ▶ Reduce screen brightness and use a flicker-free, low-radiation monitor.
- ▶ Ensure the room is well-lit and take breaks every hour.
- ▶ Avoid playing when tired.

EPILEPSY WARNING

Some individuals may experience epileptic seizures from flashing lights or patterns. Consult a doctor if you or a family member have an epileptic condition. Stop playing immediately if you experience dizziness, altered vision, twitching, confusion, loss of awareness, or convulsions.



CONTENTS

4	Developer Notes	28	Avonics
5	Features	40	Procedures
6	General	44	Aircraft Servicing and Configuration
7	Limitations	54	Credits
8	Performance		
18	Weight & Balance		
20	Airplane & System Descriptions		



■ DEVELOPER NOTES

After years of refining Accu-Sim technology, A2A Simulations proudly presents the Aerostar 600. This aircraft was created with a physics-based approach to aerodynamics, engine modeling, and aircraft systems. The Aerostar 600, a high-performance, twin-engine aircraft, was chosen because I owned and operated one for several years. Unfortunately, during a routine test flight, a failure in the landing-gear system forced my son Jake and me to make a controlled gear-up landing. On final, I turned to Jake and said, “I’ve always wanted to do a belly landing,” because I knew how well-built this airplane was and that it wouldn’t come apart on touchdown. Sure enough, it didn’t: it settled beautifully on its belly, and we exited without incident.

This experience, among many others, is what I pour into these airplanes. Moments like this force you to grow; they trigger curiosity and push you to become an even better pilot.

The Aerostar 600’s unique blend of speed, reliability, and handling makes it an ideal platform to experience both in real life and in simulation. The model I flew was normally aspirated, meaning it did not have turbochargers. When purchasing, I had a choice between a normally aspirated engine and a turbocharged one, and I chose the former. The normally aspirated Aerostar just feels perfect: solid yet responsive. The

turbocharged version, while faster at higher altitudes, isn’t as balanced as the “straight 600.” My airplane was also just a few serial numbers away from the Aerostar flown in Tom Cruise’s *American Made*, definitely worth a watch if you fly an Aerostar.

Development involved extensive research and testing, leveraging real-world Aerostar data to ensure authenticity. From the Lycoming IO-540-G1B5 engines to the dynamic hydraulic and electrical systems, every aspect is simulated with unprecedented fidelity.

Our simulation captures the Aerostar’s responsive flight characteristics, while the pilot’s tablet offers intuitive control over loading, maintenance, and system monitoring. This manual, inspired by the Piper Aerostar 600 Owner’s Manual, is tailored for Microsoft Flight Simulator, blending real-world procedures with simulator-specific features.

Thank you for supporting A2A Simulations. The Aerostar 600 represents our commitment to pushing the boundaries of flight simulation, and we’re excited to share this journey with you.

Scott Gentile
President,
A2A Simulations Inc.

FEATURES

- **Accu-Sim 2.0 Aerodynamics:** Physics-based external aerodynamics engine for realistic flight dynamics, validated against real-world Aerostar performance.
- **Per-Cylinder Engine Simulation:** Complete physics-based model of twin Lycoming IO-540-G1B5 engines, simulating fuel injection, ignition, and wear.
- **Dynamic Ground Physics:** True weight-on-wheels simulation, tire side-loading, and surface-specific responses (e.g., pavement, grass).
- **Advanced Turbulence and Wing Flex:** Subtle wing flex and turbulence effects responsive to weather, ground conditions, and fuel load.
- **Sophisticated Vibration Physics:** Realistic ground roll and engine vibration effects, unique to the Aerostar's twin-engine configuration.
- **Authentic Fuel System:** Simulates fuel lines, crossfeed, boost pumps, and contamination risks, with 174.5 gallons usable capacity.
- **Custom Oil System:** Dynamic viscosity and contaminants that degrade oil, affecting engine performance.
- **Advanced Starter Simulation:** Physically turns engines through compression cycles, with realistic starting challenges.
- **Physics-Driven Sound Environment:** Over 1,000 dynamic sound effects, including engine rumble, hydraulic pumps, and cockpit interactions.
- **Detailed Modeling:** High-fidelity external and internal textures with wear effects, dynamic registration decals, and animations.
- **Custom Avionics Stack:** Collins Microline avionics with AMR-350 audio panel, VHF-251 COM radios, VIR-351 nav receivers, IND-451 DME, ANS-351 RNAV, ADF-650 and TDR-950 transponder
- **GPS Integration:** Supports MSFS default GNS 430W/530W, PMS GTN 750/650, TDS GTN 750Xi/650Xi and freeware KLN-90B (if installed).
- **Century NSD-360A HSI:** Custom needle-smoothing physics for realistic navigation.
- **Century IV Autopilot:** Fully custom two-axis autopilot simulation interfacing with modern GPS units through GPSS adapter.
- **Digital Engine Monitors:** panel option for either JPI EDM 790 or EDM 760, with authentic displays and leaning procedures. Both Rich of Peak and Lean of Peak modes are available.
- **Native MSFS2024 Pilot's 2D/3D Tablet:** Intuitive interface for fuel, payload, maintenance, and engine analysis, with environmental data display and more. Compatible with other MSFS EFB apps like flightplanner, simbrief, navigraph charts, etc.
- **Interactive Walkaround:** Inspect moving parts (e.g., control surfaces, gear) with failure and wear simulation.
- **Persistent Aircraft:** Customizable wear and failure rates, adjustable via tablet, with persistence by livery.
- **Graphical Engine Analyzer:** Detailed insight into engine operation, including cylinder pressures and temperatures.
- **Real-Time Load Manager:** Dynamic weight and balance with graphical CG indicator.
- **Electrical System Analyzer:** Functional circuit breakers and system monitoring.
- **Optimized Performance:** Fully Native MSFS2024 model with all the LOD and performance features that comes with a native model. Fluid in-sim performance comparable to default MSFS2024 aircraft.



GENERAL

ENGINES

Number of Engines: 2
Manufacturer: Lycoming
Model: IO-540-G1B5
Rated Horsepower: 290 hp each @ 2575 RPM
Type: 6-cylinder, horizontally opposed, direct drive, air-cooled, fuel-injected
Bore: 5.125 inches
Stroke: 4.375 inches
Displacement: 541.5 cubic inches
Compression Ratio: 8.5:1
Dry Weight: 396 lbs per engine

PROPELLERS

Number of Propellers: 2
Manufacturer: Hartzell
Model: HC-C3YR-2/C8468-8R
Number of Blades: 3 per propeller
Diameter: 78 inches
Type: Constant speed, full feathering
Governor: Hartzell full-feathering propeller governor

FUEL

Main Fuel Capacity: 177.0 gallons (174.5 gallons usable)
Fuselage Tank: 44.0 gallons (42.0 gallons usable)
Wing Tanks: 66.5 gallons each (66.25 gallons usable each)
Fuel Grade: 100/130 octane aviation gasoline (minimum) • Specified Octane: 100LL

OIL

Oil Capacity: 12 quarts per engine (24 quarts total)
Oil Specification: SAE 40 or 50 (detergent oil recommended)
Oil Viscosity:
Above 60°F: SAE 50 or multi-viscosity 40/50
30°-90°F: SAE 40
0°-70°F: SAE 30 or 20W-30
Below 10°F: SAE 20 or 20W-30

MAXIMUM WEIGHTS

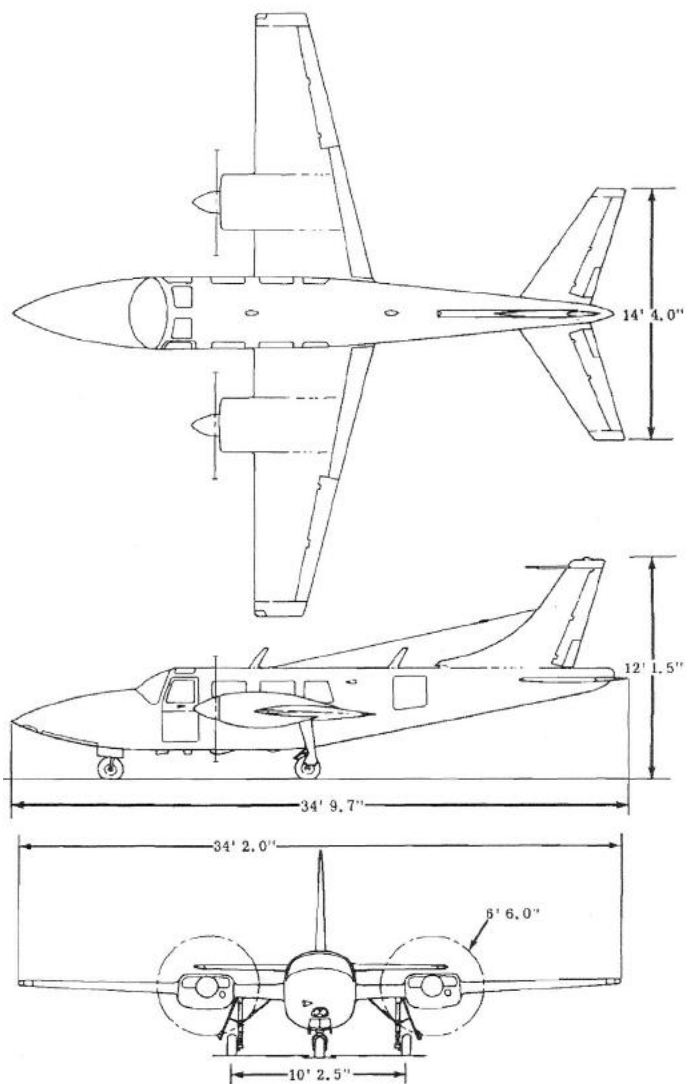
Maximum Takeoff Weight: 5500 lbs
Maximum Landing Weight: 5500 lbs
Maximum Baggage Weight: 240 lbs

STANDARD AIRPLANE WEIGHTS

Standard Empty Weight: 3425 lbs (includes unusable fuel, full oil)
Maximum Useful Load: 2075 lbs

SPECIFIC LOADINGS

Wing Loading: 32.4 lbs/sq ft
Power Loading: 9.5 lbs/hp





LIMITATIONS

AIRSPEED LIMITATIONS:

- Never Exceed (Vne):** 260 mph (226 kts) CAS
- Maximum Structural Cruising (Vno):** 225 mph (195 kts) CAS
- Maneuvering Speed (Va):** 144 mph (125 kts) CAS at 5500 lbs
- Maximum Flap Extension (Vfe):** 125 mph (109 kts) CAS
- Maximum Gear Extension (Vlo):** 150 mph (130 kts) CAS

POWERPLANT LIMITATIONS:

- Minimum Fuel Grade:** 100/130 octane
- Maximum Power:** 290 BHP @ 2575 RPM (no time limit)
- Maximum Cylinder Head Temperature:** 246°C (232°C if leaned above 75% power)
- Maximum Oil Temperature:** 118°C
- Oil Pressure:** 60-90 psi (normal), 25 psi (idling), 100 psi (starting)

WEIGHT AND CG:

- Maximum Takeoff/Landing Weight:** 5500 lbs
- CG Range:**
 - Forward:** 157.66 in. (12% MAC) @ 4600 lbs
 - Aft:** 167.88 in. (28% MAC) @ 5500 lbs
- Maneuvers:** Normal category aircraft; aerobatic maneuvers, including spins, prohibited.
- Load Factors:** Flaps up: +4.0g, -1.6g; Flaps down: +2.0g
- Operations:** Approved for day/night VFR/IFR operations with required equipment. Flight into known icing conditions prohibited.



■ PERFORMANCE

Note: The performance information presented in this section is based on measured Flight Test Data corrected to ICAO standard day conditions and analytically expanded for the various parameters of weights, altitude, temperature, etc. The performance charts are unfactored and do not make any allowance

for varying degree of pilot proficiency or mechanical deterioration of the aircraft. The performance however can be duplicated by following the stated procedures in a properly maintained airplane.

Effects of conditions not considered on the charts must be evaluated by the pilot,

such as the effect of soft or grass runway surface on takeoff and landing performance, or the effect of winds aloft on cruise and range performance. Endurance can be greatly affected by improper leaning procedures, and in-flight fuel flow and quantity checks are recommended.

TAKEOFF DISTANCE (FLAPS UP)

Ground Run: 1440 ft (5500 lbs, sea level, 0° flaps)
Total Distance over 50 ft Obstacle: 1850 ft
Conditions: Level hard surface runway, maximum power

RATE OF CLIMB

Twin Engine (5500 lbs, sea level): 1800 fpm
Single Engine (5500 lbs, sea level): 450 fpm
Single Engine (4500 lbs, sea level): 860 fpm
Best Rate of Climb Speed: 138 mph IAS @ 5500 lbs
(decrease 1 mph per 100 lbs below 5500 lbs)
Conditions: Gear up, flaps up, maximum power

CRUISE PERFORMANCE

Top Speed (Sea Level): 260 mph (226 kts)
Cruise (70% Power, 10,000 ft): 250 mph (217 kts)
Cruise (65% Power, 10,000 ft): 240 mph (209 kts)
Cruise (55% Power, 10,000 ft): 225 mph (195 kts)
Conditions: Aircraft trimmed for cruising flight

RANGE

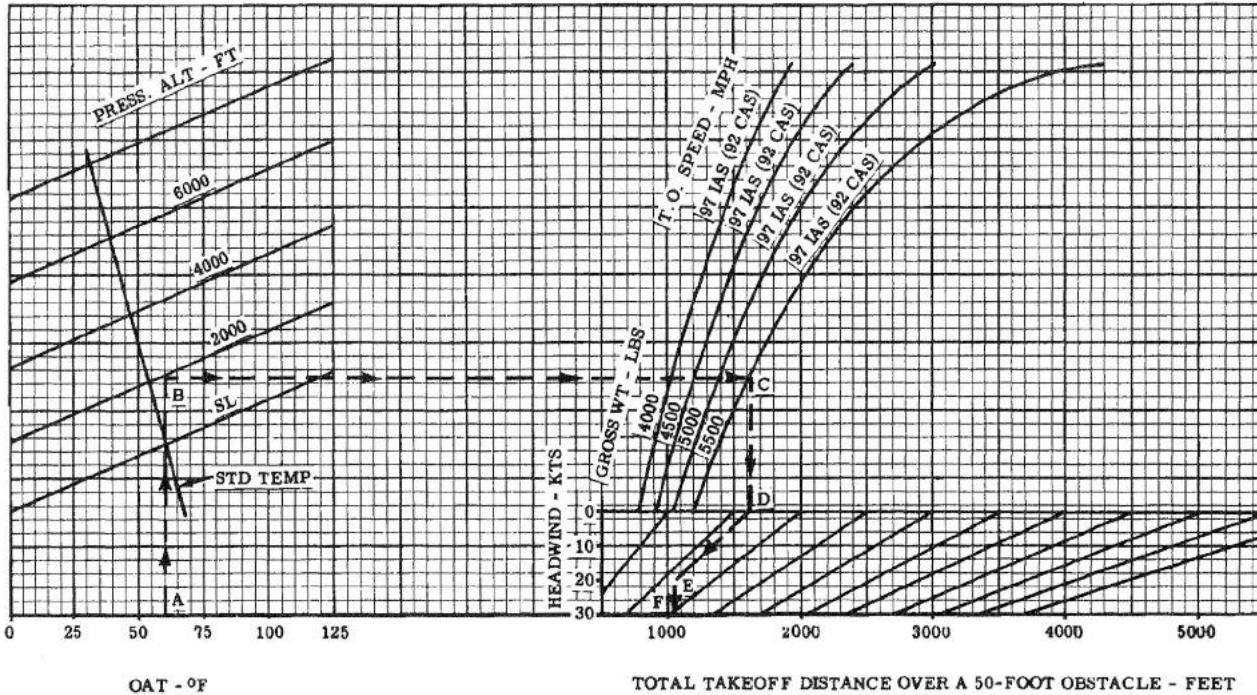
65% Power (2400 RPM, 10,000 ft): 1400 miles (170 gal, 30 min reserve)
45% Power (2200 RPM, 10,000 ft): 1650 miles
Conditions: Normal climb, cruise leaned to best economy, zero wind

LANDING DISTANCE

Landing Roll: 895 ft (5500 lbs, sea level, 45° flaps)
Total Distance over 50 ft Obstacle: 2420 ft
Conditions: Level hard surface runway, 3° approach angle, heavy braking

CONDITIONS:

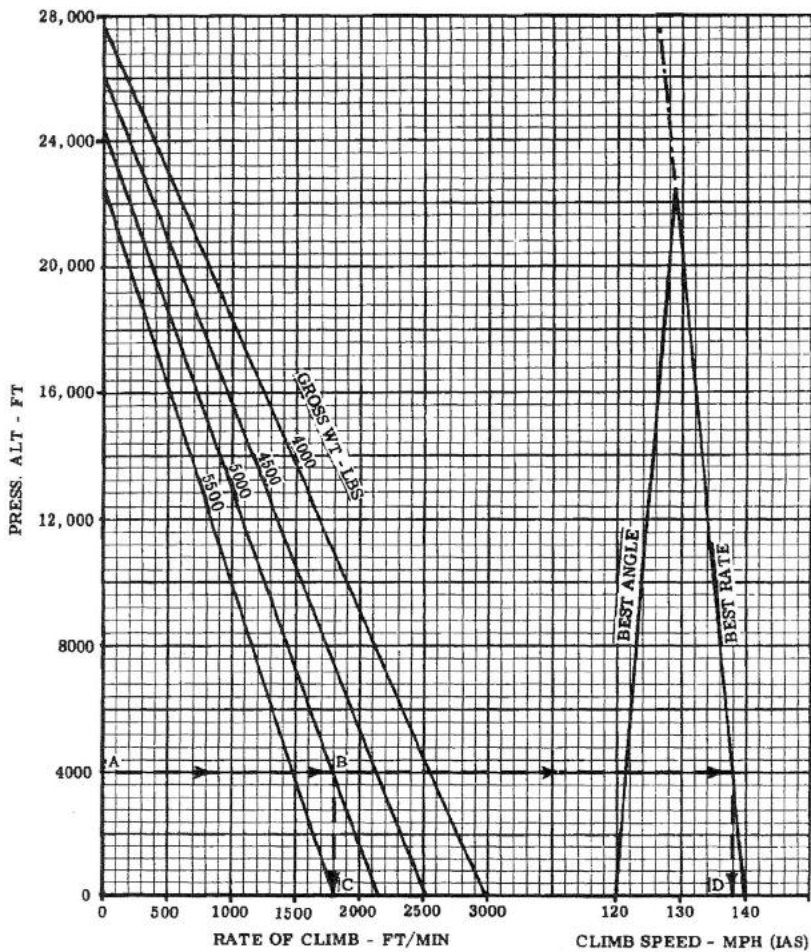
1. Level Hard Surface Runway
2. Wing Flaps - 20°
3. Maximum Power



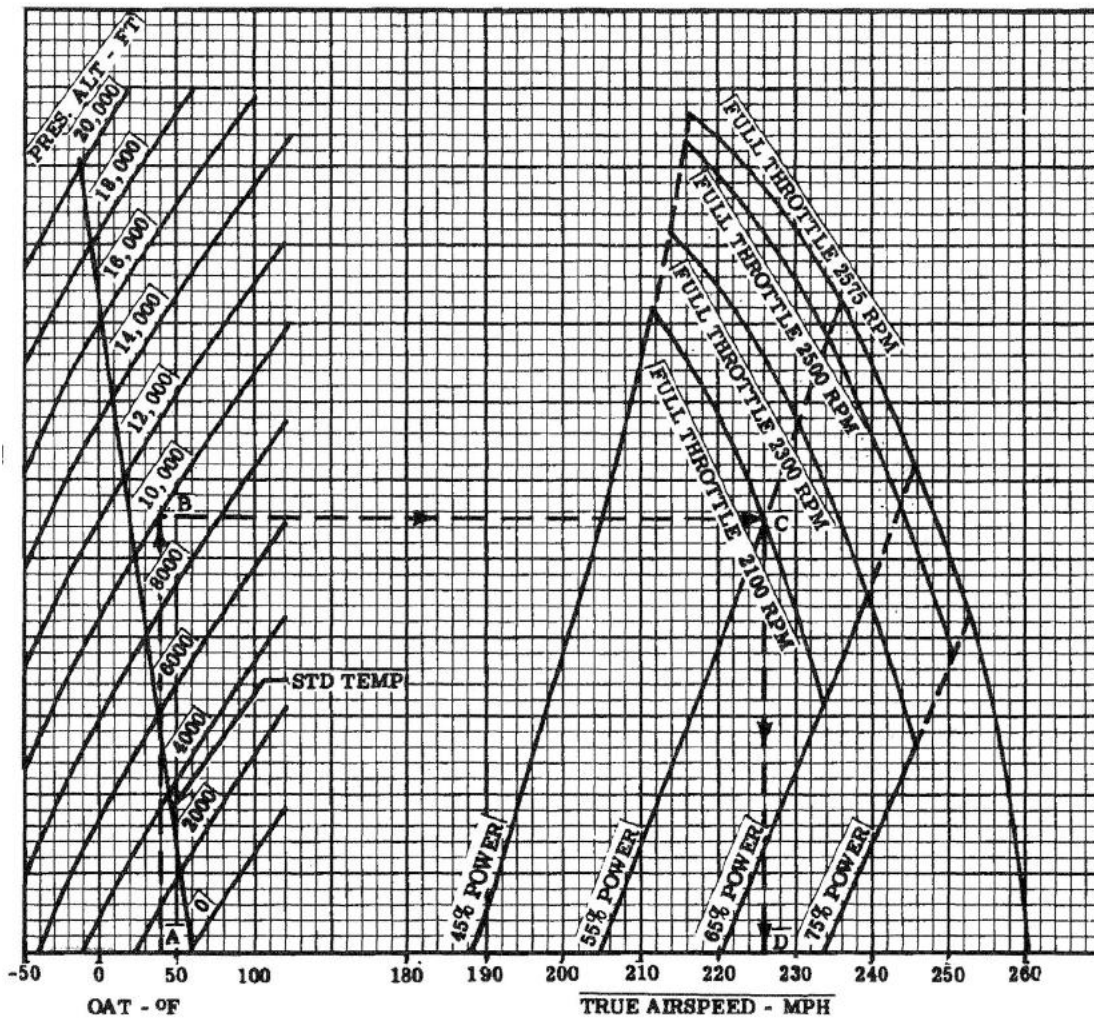
Takeoff Distance Chart - A graph plotting total distance vs. pressure altitude, weight, and headwind, with dashed lines for sample calculations (e.g., 1050 ft at 2000 ft pressure altitude, 60 F, 5500 lbs, 20 kts headwind).

CONDITIONS:

1. Landing Gear - UP
2. Wing Flaps - UP
3. Maximum Power
4. Speed for Best Rate of Climb



Twin Engine Rate of Climb Chart - A graph showing climb rate vs. pressure altitude and weight, with sample points (e.g., 1800 fpm at 4000 ft, 5000 lbs).



Cruise Speeds Chart - A graph plotting true airspeed vs. power setting, altitude, and temperature (e.g. 226 mph at 55% power, 10000 ft, 40 F).

CONDITIONS:
1. Aircraft Trimmed for Cruising Flight



MIXTURE LEANED TO BEST POWER

RPM	MAP	%BHP	TAS	Total gals/hr	Endurance 100 gals	Range 100 gals	Endurance 150 gals	Range 150 gals	Endurance 170 gals	Range 170 gals
2400	F.T.	79	249.5	35.5	2.82	704	4.23	1055	4.79	1195
	24	76	246.0	34.4	2.91	716	4.36	1073	4.95	1218
	23	72	240.5	33.0	3.03	729	4.55	1094	5.15	1239
	22	68	235.0	31.6	3.16	743	4.74	1114	5.37	1262
	21	64	229.5	30.4	3.29	755	4.94	1134	5.59	1283
2300	F.T.	75	245.0	33.5	2.99	733	4.49	1100	5.08	1245
	24	73	242.0	32.7	3.06	741	4.59	1111	5.20	1258
	23	69	236.5	31.4	3.18	752	4.77	1128	5.41	1279
	22	65	231.0	30.0	3.33	769	5.00	1155	5.66	1307
	21	61	224.5	28.6	3.50	786	5.25	1179	5.95	1336
2200	23	67	234.5	30.2	3.31	776	4.97	1165	5.63	1320
	22	63	226.0	28.8	3.47	784	5.21	1177	5.90	1333
	21	59	220.0	27.4	3.65	803	5.48	1206	6.21	1366
	20	55	214.5	26.0	3.85	826	5.78	1240	6.55	1405
	19	51	205.5	24.8	4.03	828	6.05	1243	6.85	1408
2100	23	63	229.0	28.2	3.55	813	5.33	1221	6.04	1383
	22	59	222.5	27.0	3.70	823	5.55	1235	6.29	1400
	21	56	216.0	25.9	3.86	834	5.79	1251	6.56	1417
	20	52	208.5	24.6	4.07	849	6.11	1274	6.92	1443
	19	49	202.0	23.6	4.24	856	6.36	1285	7.21	1456

NOTE: Cruise performance (including True Airspeed) is based on Standard Conditions, zero wind, no reserve fuel, no takeoff or climb fuel, and 5500 lbs Gross Weight.

MIXTURE LEANED TO BEST ECONOMY

RPM	MAP	%BHP	TAS	Total gals/hr	Endurance 100 gals	Range 100 gals	Endurance 150 gals	Range 150 gals	Endurance 170 gals	Range 170 gals
2400	24	68	235.0	27.2	3.68	865	5.52	1297	6.26	1471
	23	64	229.5	26.0	3.85	884	5.78	1327	6.55	1503
	22	59	221.5	24.4	4.10	908	6.15	1362	6.97	1544
	21	55	214.5	23.1	4.33	929	6.49	1392	7.36	1579
	20	52	209.0	22.3	4.48	936	6.73	1407	7.62	1593
2300	24	65	231.0	25.8	3.88	896	5.82	1344	6.60	1525
	23	61	224.5	24.6	4.07	914	6.11	1372	6.92	1554
	22	57	218.0	23.3	4.29	935	6.44	1404	7.30	1591
	21	53	211.0	22.0	4.55	960	6.82	1439	7.73	1631
	20	49	203.5	20.8	4.81	979	7.21	1467	8.17	1663
2200	24	63	226.0	24.8	4.03	911	6.05	1367	6.85	1548
	23	59	221.5	23.6	4.24	939	6.36	1409	7.21	1597
	22	55	214.5	22.3	4.48	961	6.72	1442	7.62	1634
	21	51	205.5	21.2	4.72	970	7.08	1455	8.02	1648
	20	48	201.5	20.0	5.00	1008	7.50	1511	8.50	1713
2100	24	59	221.5	23.2	4.31	955	6.47	1433	7.33	1624
	23	56	216.0	22.2	4.50	972	6.75	1458	7.65	1652
	22	52	209.0	21.0	4.76	994	7.14	1492	8.09	1691
	21	49	202.0	20.0	5.00	1010	7.50	1515	8.50	1717
	20	45	196.0	19.3	5.18	1015	7.77	1523	8.81	1727

NOTE: Cruise performance (including True Airspeed) is based on Standard Conditions, zero wind, no reserve fuel, no takeoff or climb fuel, and 5500 lbs Gross Weight.

MIXTURE LEANED TO BEST POWER

RPM	MAP	%BHP	TAS	Total gals/hr	Endurance 100 gals	Range 100 gals	Endurance 150 gals	Range 150 gals	Endurance 170 gals	Range 170 gals
2400	F.T.	72	245.5	33.0	3.03	744	4.55	1117	5.15	1264
	21	67	238.5	31.0	3.23	770	4.85	1157	5.49	1309
	20	62	230.5	29.5	3.39	781	5.09	1173	5.76	1328
	19	58	224.0	28.0	3.57	800	5.36	1201	6.07	1360
	18	54	217.5	26.9	3.72	809	5.58	1214	6.32	1375
2300	F.T.	69	241.0	31.4	3.18	766	4.77	1150	5.41	1304
	22	68	240.0	30.8	3.25	780	4.88	1171	5.53	1327
	21	63	232.5	29.2	3.42	795	5.13	1193	5.81	1351
	20	59	225.5	28.0	3.57	805	5.36	1209	6.07	1369
	19	56	220.5	26.8	3.73	822	5.60	1235	6.34	1398
2200	F.T.	66	237.0	29.7	3.37	799	5.06	1199	5.73	1358
	22	65	236.0	29.3	3.41	805	5.12	1208	5.80	1369
	21	61	229.0	28.0	3.57	818	5.36	1227	6.07	1390
	20	57	222.5	26.8	3.73	830	5.60	1246	6.34	1411
	19	53	215.0	25.5	3.92	843	5.88	1264	6.66	1432
2100	F.T.	63	232.5	28.2	3.55	825	5.33	1239	6.04	1404
	22	62	231.5	27.9	3.58	829	5.38	1245	6.09	1410
	21	59	225.5	27.0	3.70	834	5.55	1252	6.29	1418
	20	54	217.5	25.5	3.92	853	5.88	1279	6.66	1449
	19	50	209.5	24.2	4.13	865	6.20	1299	7.02	1471

NOTE: Cruise performance (including True Airspeed) is based on Standard Conditions, zero wind, no reserve fuel, no takeoff or climb fuel, and 5500 lbs Gross Weight.

MIXTURE LEANED TO BEST ECONOMY

RPM	MAP	%BHP	TAS	Total gals/hr	Endurance 100 gals	Range 100 gals	Endurance 150 gals	Range 150 gals	Endurance 170 gals	Range 170 gals
2400	22	68	230.5	25.5	3.92	904	5.88	1355	6.66	1535
	21	58	224.0	24.2	4.13	925	6.20	1389	7.02	1572
	20	54	217.5	22.8	4.39	955	6.59	1433	7.46	1623
	19	49	208.0	21.5	4.65	967	6.98	1452	7.91	1645
	18	46	202.0	20.5	4.88	986	7.32	1479	8.30	1677
2300	22	59	225.5	23.8	4.20	947	6.30	1421	7.14	1610
	21	56	220.5	23.0	4.35	959	6.53	1440	7.40	1632
	20	51	212.0	21.6	4.63	982	6.94	1471	7.87	1668
	19	47	204.0	20.4	4.90	1000	7.35	1499	8.33	1699
	18	44	197.5	19.5	5.13	1013	7.70	1521	8.72	1722
2200	22	57	222.5	23.0	4.35	968	6.53	1453	7.40	1647
	21	53	215.0	21.8	4.59	987	6.89	1481	7.80	1677
	20	49	208.0	20.4	4.90	1019	7.35	1529	8.33	1733
	19	45	200.0	19.4	5.15	1030	7.73	1546	8.76	1752
	18	42	194.0	18.6	5.38	1044	8.06	1564	9.14	1774
2100	22	54	217.5	21.7	4.61	1003	6.92	1505	7.84	1705
	21	50	209.5	20.5	4.88	1022	7.32	1534	8.30	1739
	20	47	204.0	19.4	5.15	1040	7.73	1577	8.76	1787
	19	43	196.0	18.1	5.52	1082	8.28	1623	9.38	1838
	18	40	190.0	17.0	5.88	1117	8.82	1676	10.00	1900

NOTE: Cruise performance (including True Airspeed) is based on Standard Conditions, zero wind, no reserve fuel, no takeoff or climb fuel, and 5500 lbs Gross Weight.

MIXTURE LEANED TO BEST POWER

RPM	MAP	%BHP	TAS	Total gals/hr	Endurance 100 gals	Range 100 gals	Endurance 150 gals	Range 150 gals	Endurance 170 gals	Range 170 gals
2400	F.T.	66	243.0	31.0	3.23	785	4.85	1179	5.49	1334
	20	64	239.5	30.4	3.29	788	4.94	1183	5.59	1339
	19	60	233.0	29.0	3.45	804	5.18	1207	5.87	1368
	18	56	226.0	27.6	3.62	818	5.43	1227	6.15	1390
	17	52	218.0	26.3	3.80	828	5.70	1243	6.46	1408
2300	F.T.	63	238.0	29.2	3.42	814	5.13	1221	5.81	1383
	20	61	234.5	28.6	3.50	821	5.25	1231	5.95	1395
	19	57	228.0	27.2	3.68	839	5.52	1259	6.26	1427
	18	54	222.5	26.2	3.82	850	5.73	1275	6.49	1444
	17	50	216.5	25.0	4.00	866	6.00	1299	6.80	1472
2200	F.T.	60	233.0	27.8	3.60	839	5.40	1258	6.12	1426
	20	58	229.5	27.1	3.69	847	5.54	1271	6.27	1439
	19	55	223.0	26.0	3.85	859	5.78	1289	6.55	1461
	18	51	216.0	24.8	4.03	870	6.05	1307	6.85	1480
	17	47	208.0	23.5	4.25	884	6.38	1327	7.23	1504
2100	F.T.	57	228.0	26.2	3.82	871	5.73	1306	6.49	1480
	20	56	226.0	25.9	3.86	872	5.79	1309	6.56	1483
	19	52	219.0	24.6	4.07	891	6.11	1338	6.92	1515
	18	49	212.0	23.6	4.24	899	6.36	1348	7.21	1529
	17	46	205.5	22.7	4.41	906	6.62	1360	7.50	1541

NOTE: Cruise performance (including True Airspeed) is based on Standard Conditions, zero wind, no reserve fuel, no takeoff or climb fuel, and 5500 lbs Gross Weight.

MIXTURE LEANED TO BEST ECONOMY

RPM	MAP	%BHP	TAS	Total gals/hr	Endurance 100 gals	Range 100 gals	Endurance 150 gals	Range 150 gals	Endurance 170 gals	Range 170 gals
2400	20	56	226.0	23.6	4.24	958	6.36	1437	7.21	1629
	19	52	218.0	22.3	4.48	977	6.72	1465	7.62	1661
	18	48	210.5	21.2	4.72	994	7.08	1490	8.02	1688
	17	43	199.0	20.1	4.98	991	7.47	1487	8.47	1686
2300	20	54	222.5	22.4	4.46	992	6.69	1489	7.58	1687
	19	50	216.5	21.3	4.69	1015	7.04	1524	7.97	1726
	18	46	205.5	20.0	5.00	1028	7.50	1541	8.50	1747
	17	41	195.0	19.0	5.26	1026	7.89	1539	8.94	1743
2200	20	51	216.0	21.2	4.72	1020	7.08	1529	8.02	1732
	19	47	208.0	20.0	5.00	1040	7.50	1560	8.50	1768
	18	44	201.5	19.1	5.24	1056	7.86	1584	8.91	1795
2100	20	49	212.0	20.0	5.00	1060	7.50	1590	8.50	1802
	19	46	205.5	19.2	5.21	1071	7.82	1607	8.86	1821
	18	42	197.0	18.1	5.52	1087	8.28	1631	9.38	1848

NOTE: Cruise performance (including True Airspeed) is based on Standard Conditions, zero wind, no reserve fuel, no takeoff or climb fuel, and 5500 lbs Gross Weight.

MIXTURE LEANED TO BEST POWER

RPM	MAP	%BHP	TAS	Total gals/hr	Endurance 100 gals	Range 100 gals	Endurance 150 gals	Range 150 gals	Endurance 170 gals	Range 170 gals
2400	F.T.	60	238.0	29.0	3.45	821	5.18	1233	5.87	1397
	18	59	236.0	28.6	3.50	826	5.25	1239	5.95	1404
	17	54	227.0	26.9	3.72	844	5.58	1267	6.32	1435
	16	49	216.5	25.5	3.92	849	5.88	1273	6.66	1442
	15	46	209.0	24.4	4.10	857	6.15	1285	6.97	1457
2300	F.T.	57	232.5	27.2	3.68	856	5.52	1283	6.26	1455
	18	56	231.0	26.8	3.73	862	5.60	1294	6.34	1465
	17	52	223.0	25.6	3.91	872	5.87	1309	6.65	1483
	16	48	214.0	24.2	4.13	883	6.20	1327	7.02	1503
	15	44	205.0	23.0	4.35	892	6.53	1339	7.40	1517
2200	F.T.	54	227.0	25.8	3.88	881	5.82	1321	6.60	1498
	18	53	225.0	25.5	3.92	882	5.88	1323	6.66	1499
	17	49	216.5	24.2	4.13	894	6.20	1342	7.02	1520
	16	46	209.0	23.2	4.31	901	6.47	1352	7.33	1532
	15	42	200.5	21.8	4.59	920	6.87	1377	7.79	1562
2100	F.T.	52	223.0	24.6	4.07	908	6.11	1363	6.92	1543
	18	51	220.5	24.4	4.10	904	6.15	1356	6.97	1537
	17	47	211.5	23.0	4.35	920	6.53	1381	7.40	1565
	16	43	203.0	21.5	4.65	944	6.98	1411	7.91	1606
	15	40	196.0	20.1	4.98	976	7.47	1464	8.47	1660

NOTE: Cruise performance (including True Airspeed) is based on Standard Conditions, zero wind, no reserve fuel, no takeoff or climb fuel, and 5500 lbs Gross Weight.

MIXTURE LEANED TO BEST ECONOMY

RPM	MAP	%BHP	TAS	Total gals/hr	Endurance 100 gals	Range 100 gals	Endurance 150 gals	Range 150 gals	Endurance 170 gals	Range 170 gals
2400	18	49	216.5	21.5	4.65	1007	6.98	1511	7.91	1713
	17	46	209.0	20.5	4.88	1020	7.32	1530	8.30	1735
	16	42	202.0	19.7	5.08	1025	7.61	1538	8.63	1743
2300	18	48	214.0	20.5	4.88	1044	7.32	1566	8.30	1776
	17	44	205.0	19.5	5.13	1052	7.70	1579	8.72	1788
2200	18	46	209.0	19.6	5.10	1066	7.65	1599	8.67	1812
	17	42	200.5	18.2	5.46	1095	8.19	1642	9.28	1861
2100	18	43	203.0	18.1	5.52	1121	8.28	1681	9.38	1904
	17	40	196.0	17.0	5.88	1152	8.82	1729	10.00	1960

NOTE: Cruise performance (including True Airspeed) is based on Standard Conditions, zero winds, no reserve fuel, no takeoff or climb fuel, and 5500 lbs Gross Weight.

MIXTURE LEANED TO BEST POWER

RPM	MAP	%BHP	TAS	Total gals/hr	Endurance 100 gals	Range 100 gals	Endurance 150 gals	Range 150 gals	Endurance 170 gals	Range 170 gals
2400	F. T.	54	231.5	26.9	3.72	861	5.58	1292	6.32	1463
	16	51	225.0	26.0	3.85	866	5.78	1301	6.55	1474
	15	47	215.5	24.8	4.03	868	6.05	1304	6.85	1476
2300	F. T.	52	225.0	25.6	3.91	880	5.87	1321	6.65	1496
	16	49	220.0	24.7	4.05	891	6.08	1338	6.89	1516
	15	45	210.0	23.5	4.26	895	6.39	1342	7.24	1520
2200	F. T.	50	221.5	24.4	4.10	908	6.15	1362	6.97	1544
	16	47	215.5	23.5	4.26	918	6.39	1377	7.24	1560
	15	43	207.0	22.4	4.46	923	6.69	1385	7.58	1569
2100	F. T.	48	217.0	23.3	4.29	931	6.44	1397	7.29	1582
	16	45	211.5	22.4	4.46	943	6.69	1415	7.58	1603
	15	41	203.0	21.4	4.67	948	7.01	1423	7.94	1612

NOTE: Cruise performance (including True Airspeed) is based on Standard Conditions, zero winds, no reserve fuel, no takeoff or climb fuel, and 5500 lbs Gross Weight.

MIXTURE LEANED TO BEST ECONOMY

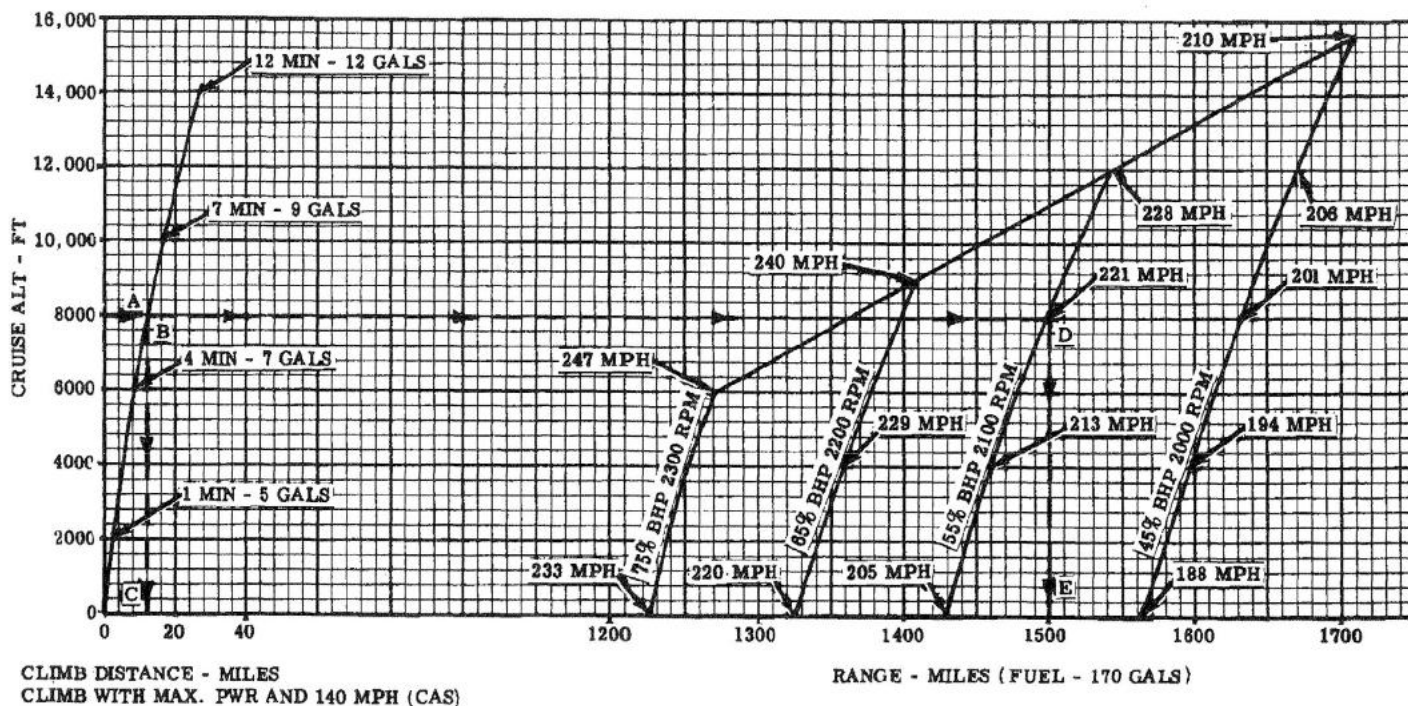
RPM	MAP	%BHP	TAS	Total gals/hr	Endurance 100 gals	Range 100 gals	Endurance 150 gals	Range 150 gals	Endurance 170 gals	Range 170 gals
2400	17	47	215.5	21.0	4.76	1026	7.14	1539	8.09	1743
2300	17	45	210.0	20.0	5.00	1050	7.50	1575	8.50	1785
2200	17	43	207.0	18.8	5.32	1101	7.98	1652	9.04	1871
2100	17	41	203.0	17.8	5.62	1141	8.43	1711	9.55	1939

NOTE: Cruise performance (including True Airspeed) is based on Standard Conditions, zero wind, no reserve fuel, no takeoff or climb fuel, and 5500 lbs Gross Weight.



CONDITIONS:

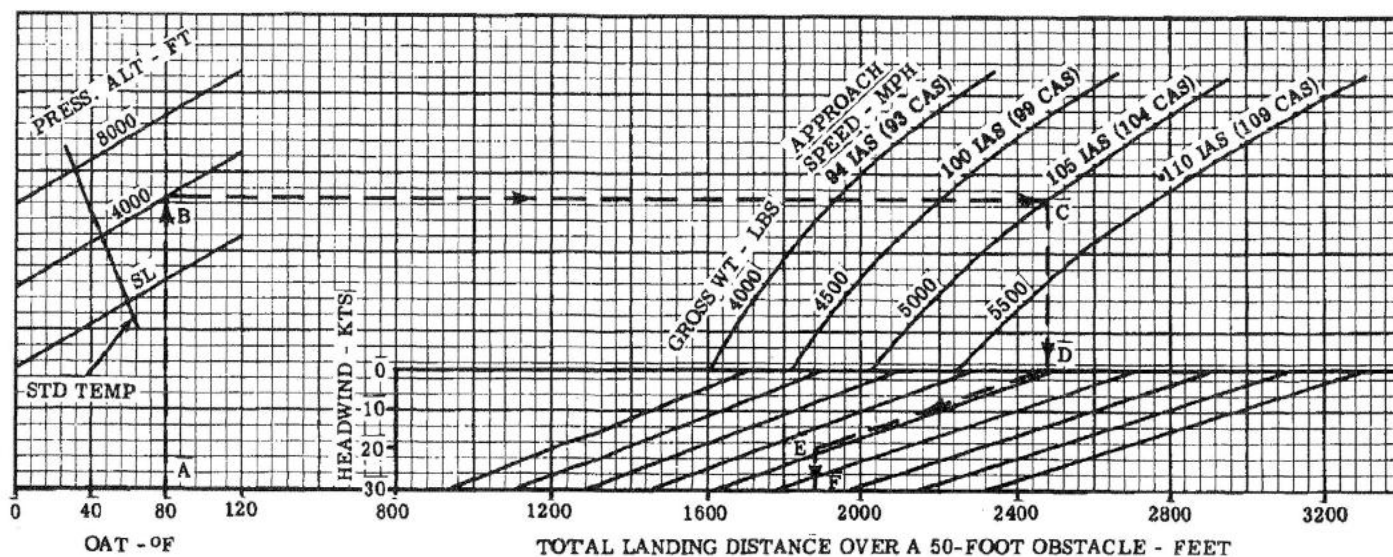
1. Takeoff Weight - 5500 Lbs
2. Normal Climb to Cruise Altitude
3. Cruise Fuel Flow Best Economy
4. Zero Wind
5. 45 Min. Reserve Fuel (14 Gals at 45% BHP)
6. Standard Day Conditions



Range Profile Chart - A graph showing range vs. altitude and power, with climb time, fuel used, and true airspeed (e.g., 1500 miles at 55% power, 8000 ft).

CONDITIONS:

1. Level Hard Surface Runway
2. Wing Flaps - 45°
3. Power for 3° Approach
4. Heavy Braking After Touchdown



Landing Distance Chart - A graph plotting total distance vs. altitude, weight, temperature, and headwind (e.g., 1880 ft at 4000 ft, 5000 lbs, 20 kts headwind).



WEIGHT & BALANCE

Proper weight and center of gravity (CG) management is critical to achieving the Aerostar 600's designed performance and handling in Microsoft Flight Simulator. As a six-place, twinengine aircraft with a 240 lbs baggage capacity and 174.5 gallons of usable fuel, the Aerostar offers flexible loading options but requires careful planning to stay within the approved envelope. Overloading can reduce takeoff and climb performance, while an improper CG—too far forward or aft—can affect stability, potentially leading to difficult rotations or pitch-up tendencies. The Accu-Sim 2.0 pilot's tablet provides a real-time load manager with a graphical CG indicator, ensuring compliance with weight and balance limits.

Use the tablet's Fuel and Payload page to adjust fuel (fuselage and wing tanks), passengers, and baggage. The default MSFS weight and balance menu is not supported due to Accu-Sim's external simulation, which dynamically models fuel burn, wear, and load effects. Always verify CG before takeoff to ensure safe operation.

WEIGHT AND BALANCE LOADING FORM

Below are two example loading scenarios to illustrate proper CG calculation:

Example 1: Full Fuel, Two Passengers, Maximum Baggage Two 170 lbs passengers, full fuel (174.5 gal), 240 lbs baggage

Item	Weight (lbs)	Arm Aft Datum (in.)	Moment (in-lbs)
Basic Empty Weight	3425	163.74	560,000
Front Seats (Pilot/Copilot)	340	96.0	32,640
Rear Seats (4 seats)	0	165.0	0
Fuselage Fuel (42 gal)	252	213.0	53,676
Wing Fuel (132.5 gal)	795	170.0	135,150
Baggage	240	250.0	60,000
Total	5052		841,466

CG Calculation: Total Moment / Total Weight = CG 841,466 / 5052 = 166.54 in. (within envelope: 157.66-167.88 in.)

Example 2: Partial Fuel, Four Passengers, No Baggage Four 170 lbs passengers, 100 gal fuel (wing tanks only), no baggage

Item	Weight (lbs)	Arm Aft Datum (in.)	Moment (in-lbs)
Basic Empty Weight	3425	163.74	560,000
Front Seats (Pilot/Copilot)	340	96.0	32,640
Rear Seats (2 passengers)	340	165.0	56,100
Fuselage Fuel (0 gal)	0	213.0	0
Wing Fuel (100 gal)	600	170.0	102,000
Baggage	0	250.0	0
Total	4705		750,740

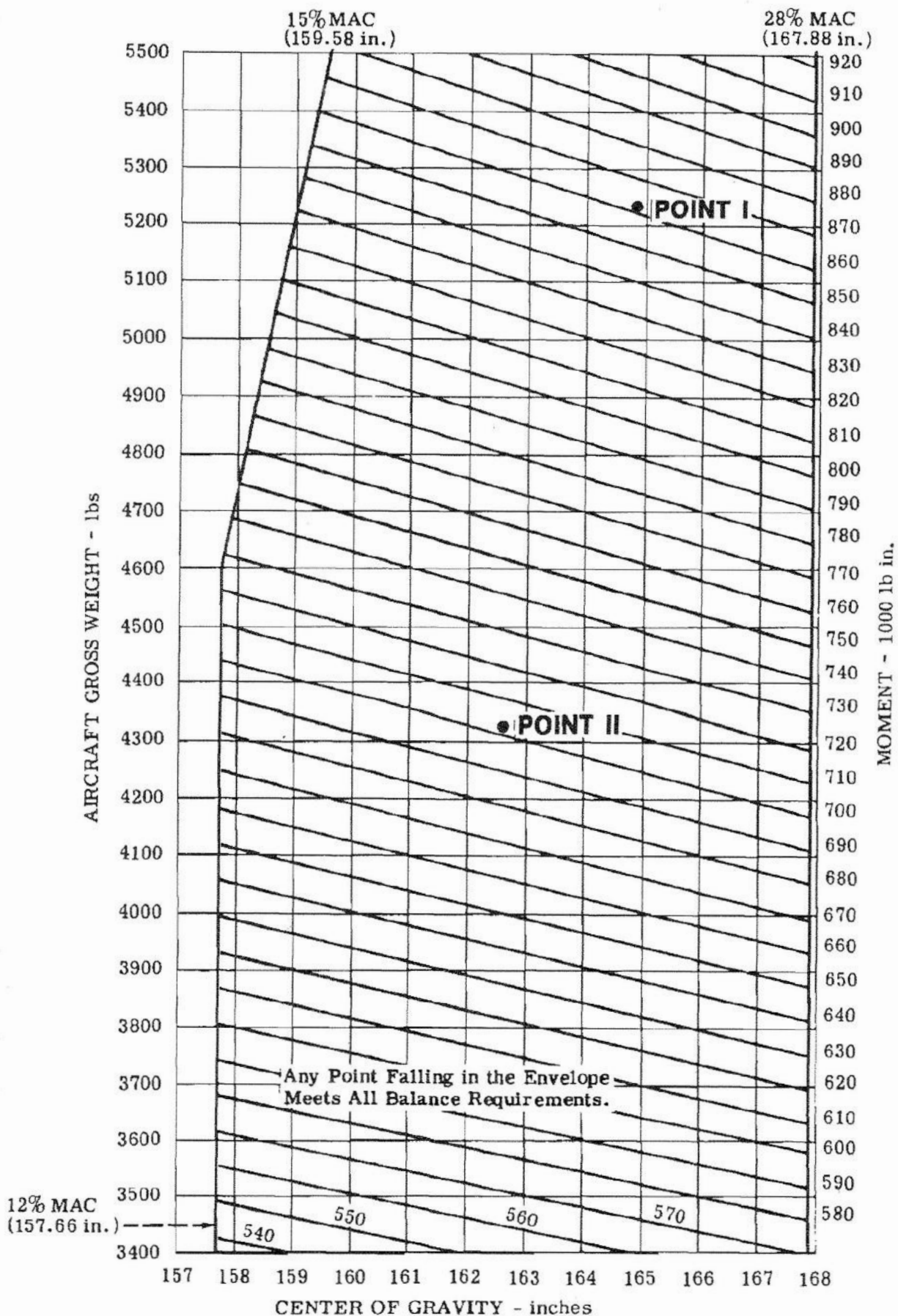
CG Calculation: 750,740 / 4705 = 159.56 in. (within envelope: 157.66-167.88 in.)

CG RANGE

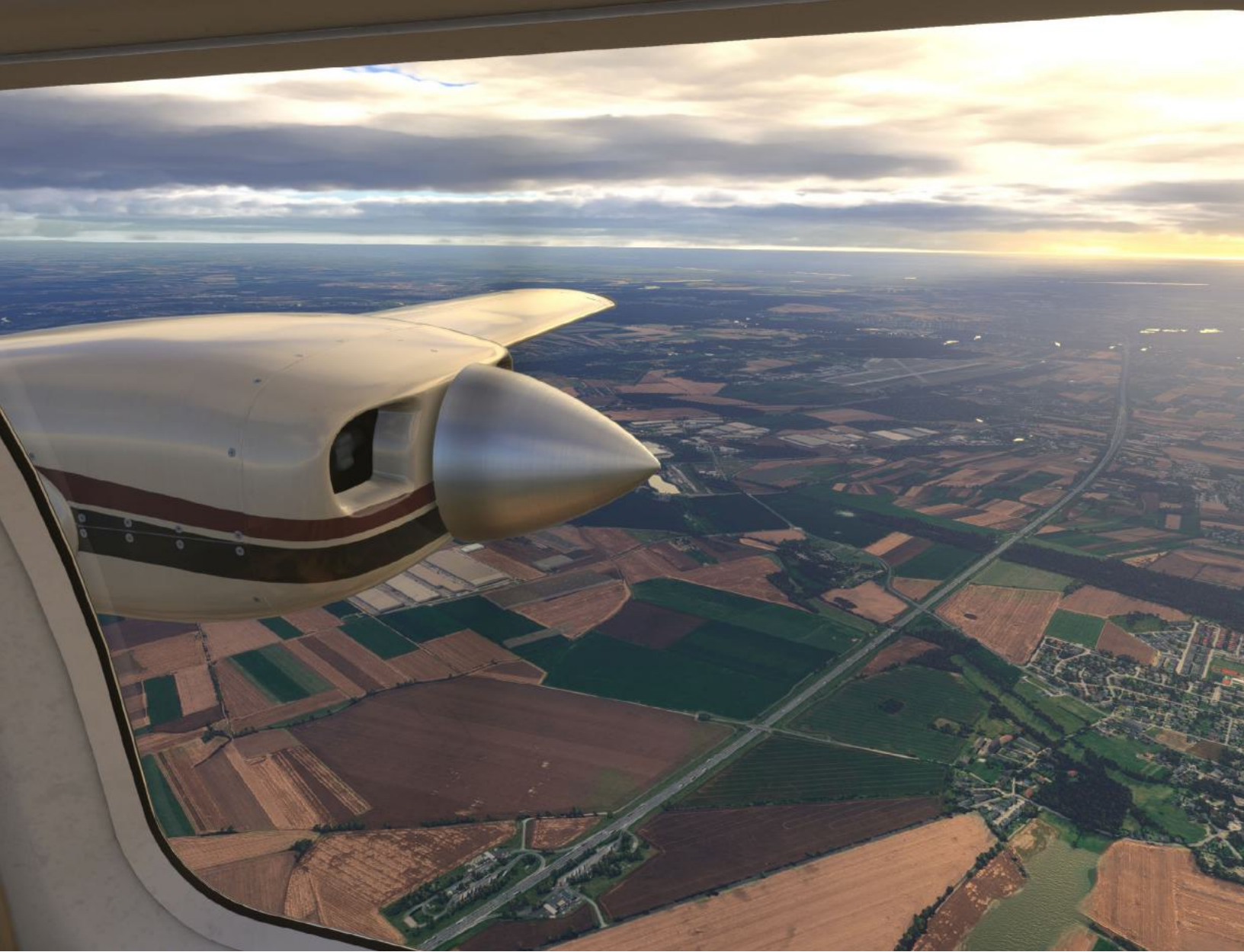
- Maximum Takeoff/Landing Weight: 5500 lbs
- Forward Limit: 157.66 in. (12% MAC) at 4600 lbs
- Aft Limit: 167.88 in. (28% MAC) at 5500 lbs
- Note: All weight above 5400 lbs must be wing fuel to maintain CG.

SIMULATOR NOTES

- **Tablet Integration:** The Fuel and Payload page provides sliders for fuel, passenger, and baggage weights, with a graphical CG indicator that updates in real time. Presets (e.g., full fuel, half fuel) simplify loading, and the JPI EDM 760 fuel state syncs automatically.
- **Dynamic Effects:** Accu-Sim simulates fuel burn and wear, affecting CG over time. Persistent aircraft may retain load configurations across sessions if "cockpit persistence" is enabled.
- **Baggage Compartment:** Located in the rear fuselage, the 240 lbs capacity (30 cu ft) is accessible via a 22x24 in. door. Use the tablet to simulate loading and check for CG shifts.
- **Fuel Management:** The 174.5 gal usable fuel (42 gal fuselage, 66.25 gal each wing) supports flexible loading. Crossfeed options are managed via cockpit switches, impacting CG during single-engine operations.



CG Weight and Moment Envelope - A graph with weight (3400-5500 lbs) on the y-axis and CG position (157-168 in.) on the x-axis. The envelope is a shaded trapezoid, with forward limit at 157.66 in. (4600 lbs) and aft limit at 167.88 in. (5500 lbs). Sample points (e.g., 166.54 in. at 5052 lbs, 159.56 in. at 4705 lbs) are plotted, with dashed lines showing calculations. Labels indicate 12% and 28% MAC lines.



AIRPLANE & SYSTEM DESCRIPTIONS

GENERAL AIRPLANE DESCRIPTION

The Aerostar 600 is a six place, all metal, mid-wing, twin engine, executive transport, with fully retractable tricycle gear.

It is powered by two Lycoming IO-540-G1B5 six cylinder, horizontally opposed, direct drive, fuel injected engines, which drive Hartzell three blade, constant speed, full feathering propellers. The airplane is equipped with a push-pull tube flight control system and an electrically operated landing gear, main landing gear wheel well doors, nose steering, and flaps.

Two engine-driven, self-exciting alternators supply electrical power to the fuselage fuel tank and two wet-wing fuel cells supply fuel to the engines and cabin heater. A complete dual IFR avionics system is standard equipment.

INSTRUMENTS

Pitot Static System - Pitot Heat

A pitot-static head is installed on a boom extending from the leading edge of the vertical stabilizer and static pressure is taken at the head and fed to the airspeed, altimeter, and rate of climb instruments. The pitot-static heating element, which is activated by a pitot heat switch located in the instrument panel switch grouping.

Engine Instruments

All engine instruments are direct reading except the electric tachometer which utilizes an engine driven tachometer generator as its source of information.

Electric Instruments

With the exception of the pitot-static and engine instruments, all other flight and navigation instruments, and position indicators are 24 volt, DC powered. Circuit breakers protect the systems from overloads.

AVIONICS

The airplane is equipped with a complete IFR avionics installation, including dual navigation-communication transceivers, localizer, glide slope, marker beacon, ADF, DME, ground speed, and transponder. Operating details for each avionics unit may be found in the appropriate operating manual included in the owners delivery kit.

FLIGHT CONTROLS

Primary Control System

Each Aerostar is equipped with dual flight controls as standard equipment. The primary movable control surfaces are operated by a system of push-pull tubes and bellcranks. No cables are used anywhere in the system. Bearings are permanently lubricated and require no servicing, and no adjustments should ever be required after the airplane leaves the factory.

Trim Control System

Electrically driven trim motors operate rudder and elevator trim tabs. The trim motors are controlled by switches located on the pedestal. A trim tab position indicator is mounted on the center instrument panel to show trim tab deflection.

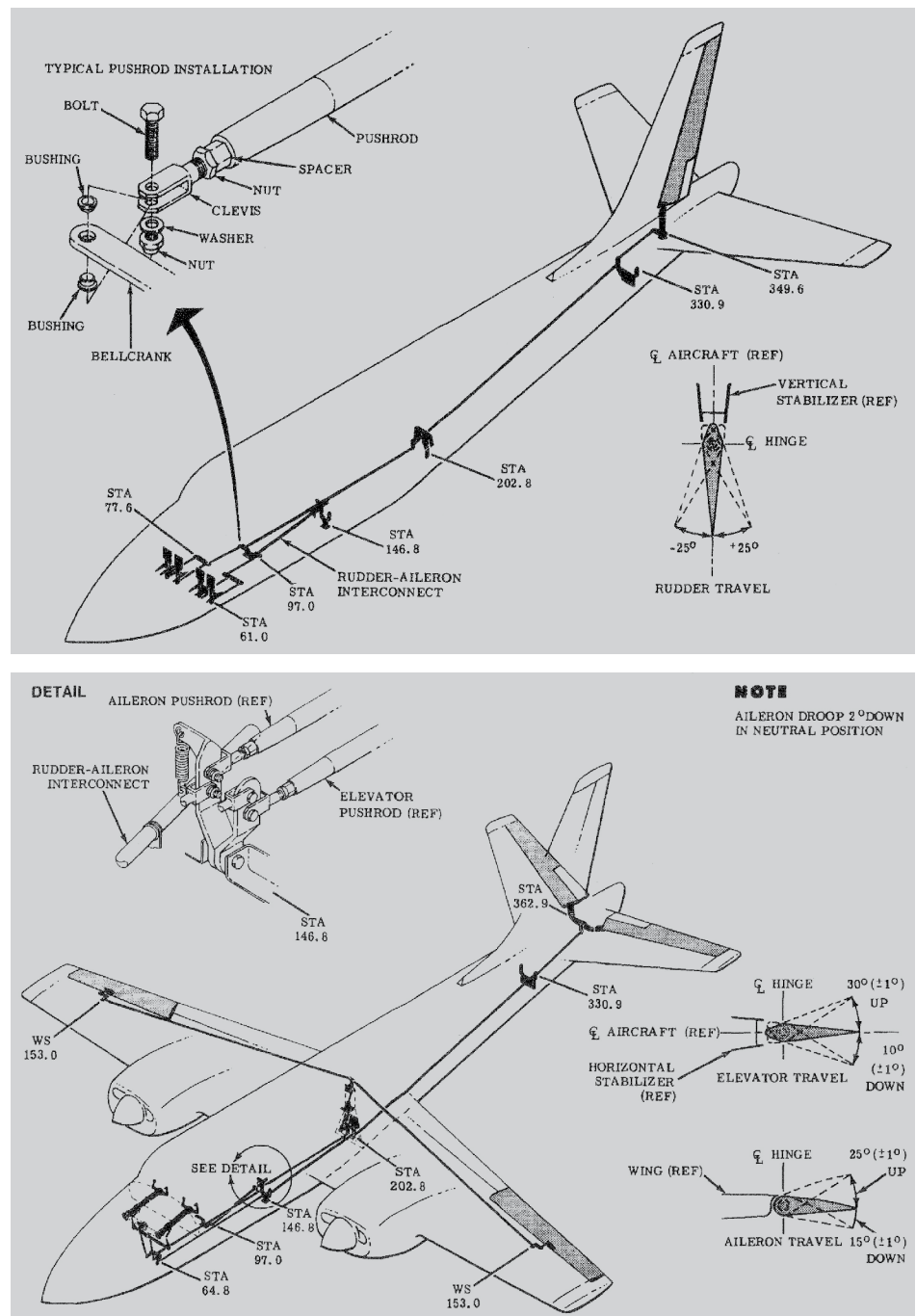
Flap Control System

Fowler type flaps are raised and lowered by two hydraulic actuating cylinders, one for each flap. The flap actuator cylinder selector valve is located along the pilot to set the flaps in any position from 0° to 45° by selecting either the UP or DOWN position, waiting until the flap position indicator reflects the desired flap setting, then placing the flap control lever in the NEUTRAL position to lock the flaps (When selecting full UP or DOWN, it is not necessary to reposition the flap handle in the NEUTRAL position).

POWER PLANTS

Engine Cooling

The engines installed in the Aerostar 600 are cooled without the use of cowl flaps through specially engineered engine cowlings and baffling. Cooling air is conducted to the engine by ram induction through the accessory section. It is exhausted through augmentor type exhaust tunnels. The accessory section is also cooled by air vented overboard through



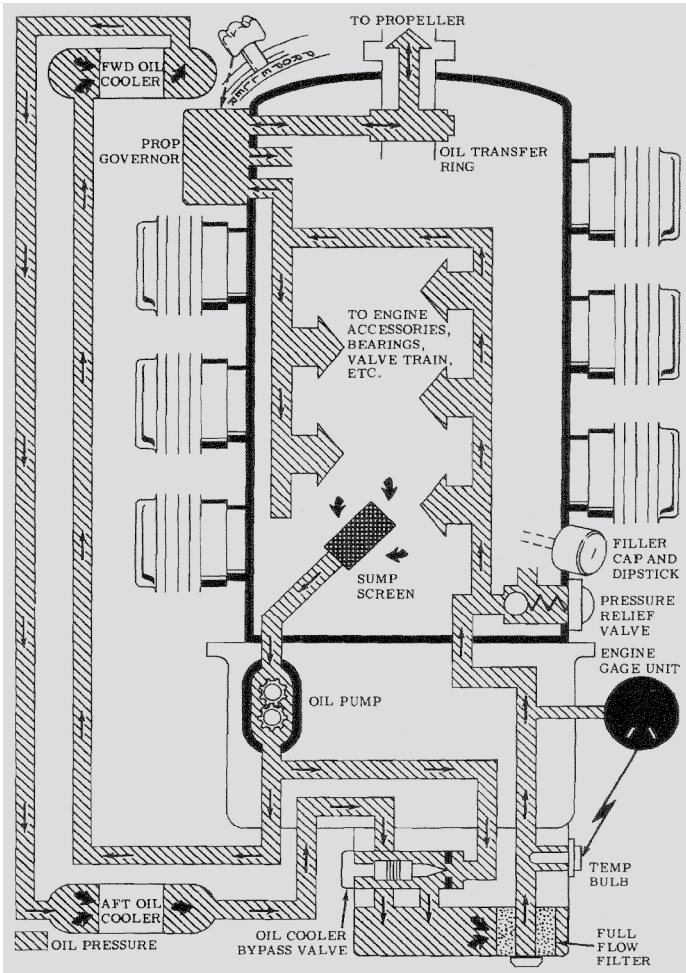
■ Primary Control System - A diagram showing pushpull tubes, bellcranks, and control surface linkages.

the exhaust tunnels. Two blast tubes mounted on the rear baffle direct cooling air to the magnetos.

Engine Oil System

The engine employs a full pressure, wet sump lubrication system. The sump is filled through a combination dipstick oil filler pipe. Lubricating oil is drawn through the oil sump inlet screen by the engine oil pump and sent to the oil coolers. The return from the oil coolers passes through a full flow oil filter to the oil pressure relief valve which regulates system oil pressure. The regulated oil is then routed through the main oil galleries to the various pressure lubrication points. Gravity returns the oil to the sump.

AIRPLANE & SYSTEM DESCRIPTIONS



Engine Oil System Schematic - A diagram showing oil flow from sump to coolers, filter, and engine components.

Oil Coolers

The engine oil system utilizes two drawn-cup-type oil coolers for oil temperature control. One cooler is mounted on the nose cowling, the other on the right rear engine baffle. Oil temperature is controlled by a vernier type thermostat located in the oil cooler return line. Should cold oil or an obstruction restrict oil flow through the coolers, the thermostatic bypass valve will open and allow the oil to flow directly from the oil pump to the oil filter through a passage in the engine accessory housing.

Fuel Injection System

Induction air is directed air to the fuel injection regulator. Should the air filter become obstructed, a spring loaded alternate air door will automatically open and supply air directly to the fuel injection regulator. The alternate air door is located on the airbox just below the air filter, and draws air from the accessory section.

Fuel Control

The engine is equipped with a Bendix RSA-10ED1 fuel injection system. An engine driven fuel pump supplies fuel under pressure to the fuel injection regulator which measures air flow and meters the corresponding fuel to the flow divider. The flow divider then directs the fuel to each individual cylinder injector nozzle.

Ignition System

Each AeroStar engine is equipped with a dual magneto ignition system. Additionally, an induction vibrator system simultaneously retards and intensifies the spark for easier starting. Each engine has its own combination ignition-starter switch. Moving the switch to the starting position grounds the right magneto, engages the starter, and activates the induction vibrator system, which provides a retarded, showering arc at the spark plugs. When the engine starts, the starter switch is released allowing it to return to the ON position, disconnecting the starter, terminating the operation of the induction vibrator system, and ungrounding the right magneto.

Propellers

Each engine drives a Hartzell, three blade, hydraulically operated, all metal, constant speed, full feathering propeller. A Hartzell governing system maintains selected engine speed regardless of engine load or aircraft attitude.

Powerplant Controls

All powerplant controls are located on the control pedestal. The levers are shaped to accepted standard configuration, and the control levers are of different lengths, so they can be readily identified by touch.

FUEL SYSTEM

The fuel supply system is composed of two wet-wing fuel cells, a fuselage fuel tank; sump assembly; shutoff valves; and boost pumps. The system has a total capacity of 177 gallons (174.5 gallons usable).

The fuselage tank is bladder type, with a capacity of 44 gallons (42 gallons usable). It is located between the rear cabin bulkhead and the forward bulkhead of the baggage compartment. Each wing section outboard of the engine nacelle is sealed, and forms a wet-wing fuel cell. Each wet-wing cell has a capacity of 66.5 gallons (66.25 gallons usable).

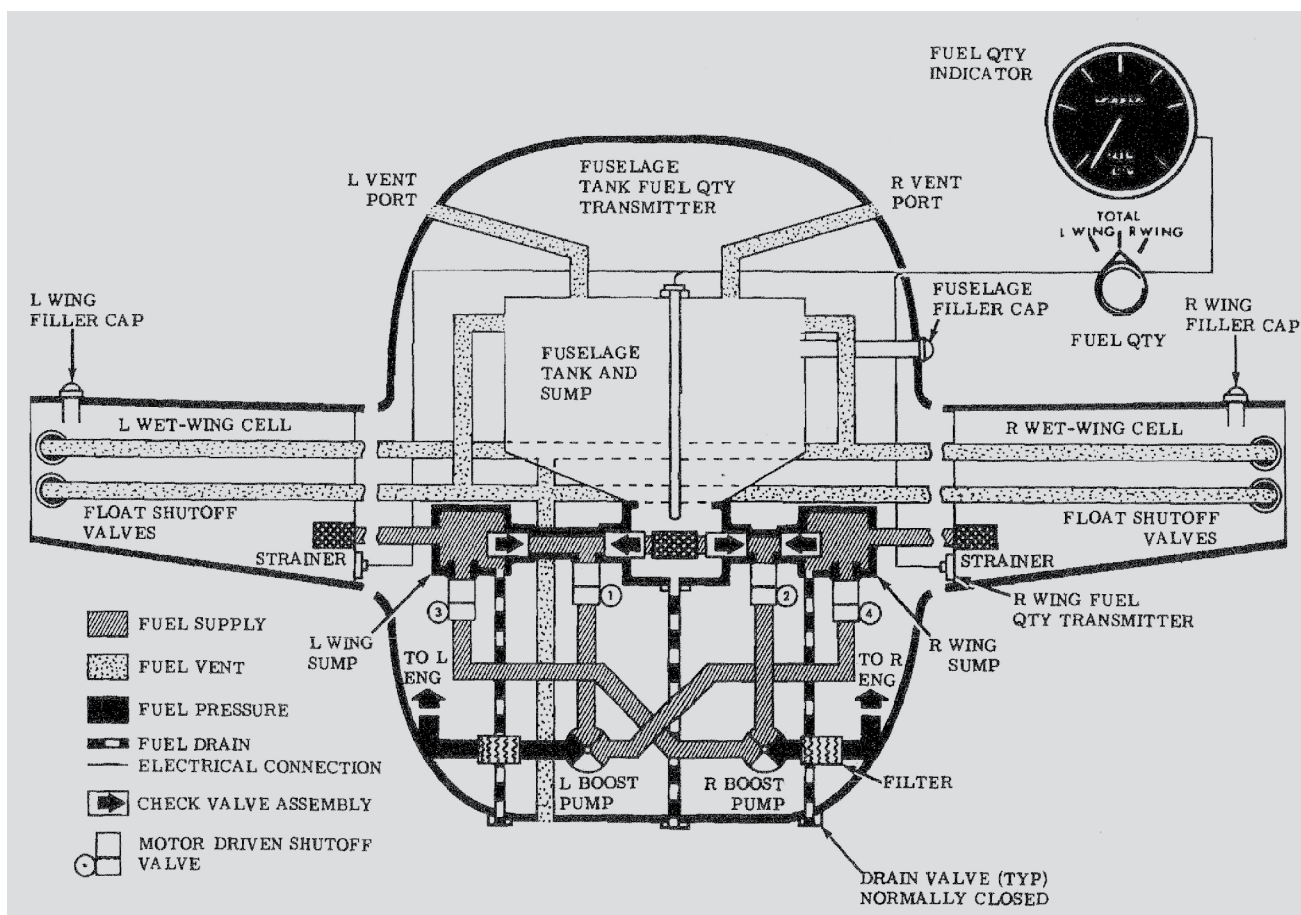
A multiple sump assembly is installed below the fuselage fuel tank. The center sump is the low point for the fuselage tank, and the outside sumps are the low points for each of the wet-wing cells. Each sump is equipped with five drain valves located on the aft of the wing. Fuel check valve assemblies mounted in the sump assembly. One check valve assembly is installed for each fuel source. The check valves operate simultaneously, however, in normal operation, each wet-wing cell valve feeds fuel to its respective engine, while the fuselage valve vents backflow of fuel from one tank to another.

A fuel strainer is located at the outlet of each wet-wing cell, and the fuselage tank strainer is located in the sump between the two sump outlet ports.

Boost Pumps And Fuel Shutoff Valves

One electric boost pump is installed in each engine fuel supply line downstream from the multiple sump assembly, and serves as backup for the engine-driven fuel pump. The control switch for each pump is mounted on the center panel in each engine grouping.

Four fuel shutoff valves are mounted on the fuel sump assembly. The operation of the valves is controlled by two fuel selector switches (one for each engine) mounted on the instrument panel in each engine switch grouping. The valves provide a positive means of shutting off fuel flow to the engines in case of engine fire, and by opening or closing a certain combination of valves, it is possible to select any fuel source for either engine.



Under normal operating conditions, the fuel selector is placed in the ON position, and only valves 1 and 3 are OPEN. Valves 3 and 4 are used only when selecting the crossfeed position on the selector switch.

Crossfeed System

The fuel system incorporates a crossfeed supply system to provide complete flexibility in fuel management. Crossfeed selection allows an engine to draw fuel from the opposite wet-wing cell, and can be used to correct lateral trim when prolonged single engine operation causes uneven fuel burnoff between the wet-wing cells. Crossfeed is selected simply by moving the selector switch on the operating engine to the crossfeed (X-Feed) position.

NOTE:

- Before moving the fuel selector switch between the ON and CROSSFEED positions, turn boost pumps ON to guard against momentary engine stoppage due to trapped air in the crossfeed supply line.
- Approach and landing while in single engine configuration should be made with the operating engine fuel selector switch in the ON (normal) position.

Fuel Quantity Indicator

A capacitance type fuel quantity probe is installed in each tank. A fuel quantity indicator mounted on the right instrument panel takes the total

capacitance inputs from the three probes and reads the total fuel supply. Consequently approximately 10 gallons in each wing are not readable and read its quantity. The switch is spring loaded to the total position.

HYDRAULIC SYSTEM

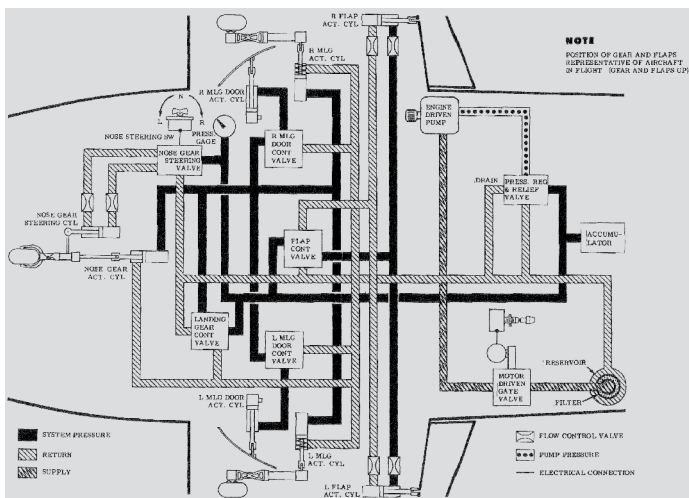
General System Operation

The hydraulic system provides hydraulic pressure for operation of the landing gear, main landing gear doors, flaps, and nose wheel steering. A hydraulic reservoir located just ahead of the main spar contains the supplied hydraulic fluid to the hydraulic pump installed on the right engine. An electrically driven power pack is installed in the fluid supply line to shut off fluid flow to the engine driven pump in event of an engine fire, and help facilitate maintenance on the system. A check valve is incorporated into the regulator to hold system pressure should the pump fail, and a relief valve in the regulator prevents system pressure from exceeding 1300 psi. An accumulator dampens pressure pulsations in the system. A system pressure gage is located on the right instrument panel.

System Controls

The landing gear control lever on the instrument panel is mechanically linked to the landing gear control valve under the cabin floor, which routes pressure to the landing gear actuating cylinders and main landing gear door control valves. The main landing gear door control valves are actuated by the main landing gear retracting linkage, and direct pressure to the main shut.

AIRPLANE & SYSTEM DESCRIPTIONS



■ Hydraulic System Schematic - A diagram showing reservoir, pump, regulator, and actuators.

The wing flap control lever on the instrument panel is mechanically linked to the wing flap actuating cylinders to raise or lower the flaps. A neutral position is provided in addition to up and down positions. When flow control valves are installed the flap system to control the amount of fluid going to the actuating cylinders, and a restrictor is located at each cylinder's downline port to prevent a rapid flap retraction should the downline rupture when the flaps are down.

Nose wheel steering is accomplished by an actuating cylinder controlled by the rudder pedals.

Landing Gear Emergency Extension

NOTE Section 4 details the recommended procedures to follow for emergency landing gear extension in case of hydraulic failure.

ELECTRICAL SYSTEM

Power Supply

Two self-exciting, 50 amp alternators, one on each engine, provide 28 volt, negative ground, DC electrical power to operate the various circuits and electrical components in the aircraft. Each alternator is capable of providing enough power to meet all normal operating requirements. Two 12 volt batteries connected in series are located in the tail cone. An external power plug receptacle, which will accept a standard power unit plug, is located behind an access door on the bottom of the tail cone immediately aft of the batteries.

CAUTION:

The battery and alternator switches must be turned OFF before connecting or disconnecting an external power unit. Both LEFT OFF units are connected, to protect the voltage regulators and system electrical equipment from voltage transients and possible damage.

Battery And Alternator Switches

Individual battery and alternator switches are provided as a means for checking alternator circuit operation and permits such a circuit to be cut off. Should an alternator fail or be taken off the line during response an alternator switch should be turned off. Since the alternators installed on the Aerostar are self-exciting, turning the battery switch OFF will not affect alternator operation.

Voltmeter

The voltmeter is located on the center instrument panel and reads the current flow of the entire system, or of each individual alternator. Pushing a button on the side of the volt-ammeter causes the meter to read system voltage. A three position selector switch mounted on the same panel reads the current flow of the entire system, or individual alternator current flow can be selected.

NOTE:

To read individual alternator voltage, it is necessary that the left alternator switch be OFF to check the right alternator and conversely, the right alternator be OFF to check the left alternator. This is because both alternators feed a common bus.

Overvoltage Relay

Overvoltage relays are incorporated in both alternator circuits to protect the electrical system from an excessive voltage output from either alternator. The relays will open and cut off the alternators when a voltage higher than a preset maximum voltage is sensed. The relays are reset by turning the alternator OFF.

Circuit Breakers

An equipment circuit breaker panel is located on the right instrument panel. Current flows through the circuit it controls. After allowing the breaker to cool for 3-4 minutes, it can be reset by pushing it in until a click is heard or felt. If the circuit breaker opens a second time, it should be left open until the cause of the circuit and its components is isolated, and damage can occur.

Each alternator circuit incorporates a 50 amp remote circuit breaker to protect the alternator from shorting due to an excessive current demand. Should this situation ever occur, the remote alternator circuit breaker will open the equipment circuit breaker panel. Pushing in the small circuit breaker resets both breakers.

LANDING GEAR

The landing gear is fully retractable, and incorporates a steerable nose wheel. Wheel well doors fully enclose the landing gear when in the up position, and partially enclose the wheel well area when the gear is down to protect them from water spray, mud slingers, and melting snow or ice thrown up by the aircraft wheels.

Landing Gear Warning Horn

The landing gear warning horn will sound if the landing gear is up and the throttle is retarded below approximately 13 inches Hg. manifold pressure.

Landing Gear Position Lights

Four landing gear position lights are installed on the left instrument panel. A single amber light is located above the gear control lever. The lights are push-to-test type with adjustable iris shutters. Amber lights illuminate and stay on when full up position. The three green lights illuminate when the gear is down and locked with the nose gear light top, and the main gear lights below. Each light illuminates when its respective gear is down and locked. Whenever the gear up light and one of the gear down lights are not illuminated, the respective gear is in a transient position.

Emergency Gear Extension

Should the hydraulic pump fail, the hydraulic system accumulator will provide pressure to hold the gear up. Moving the gear control lever to the

DOWN position releases that pressure, and allows the landing gear to free-fall down. Springs installed in the main landing gear actuators pull the gear down and lock it. A free-fall lockage spring on the nose gear aids free-fall, and ensures a positive down lock.

NOTE:

Section 4 details the recommended procedures to follow for emergency landing gear extension in case of hydraulic failure.

NOSE WHEEL STEERING

Nose wheel steering is accomplished by intermittently depressing a spring loaded rocker switch on the control pedestal. The switch directs electrical current to a solenoid pilot valve, which routes hydraulic pressure to the nose wheel actuator cylinder. Releasing the switch stops the wheel motion, and returns the wheel to the centered position.

If hydraulic power is lost, nose wheel steering is accomplished by conventional differential braking and power application.

The nose wheel is prevented from moving out of the centered position when retracted by a centering cam in the nose gear strut. Additionally, the steering system is deenergized when the downlock switch opens during electrical power to the steering system.

BRAKES

The Aerostar features dual control, multiple disk brakes to give maximum braking performance and reliability. The brake system consists of two master cylinders, brake lines, parking brake valve, and a common brake fluid reservoir. The loss of one brake will not affect the other, and since the reservoir is not connected to the aircraft hydraulic system, hydraulic failure will have no effect on the brake system.

Parking Brake

A parking brake handle is located below and to the left side of the instrument panel. The handle is mechanically linked to the parking brake valve which locks pressurized fluid in the brake lines. To set brakes, apply brakes, pull out on the parking brake handle, and turn clockwise to lock. To release the brakes, simply unlock the handle and push in.

ENVIRONMENTAL CONTROL SYSTEMS

Cabin Ventilation

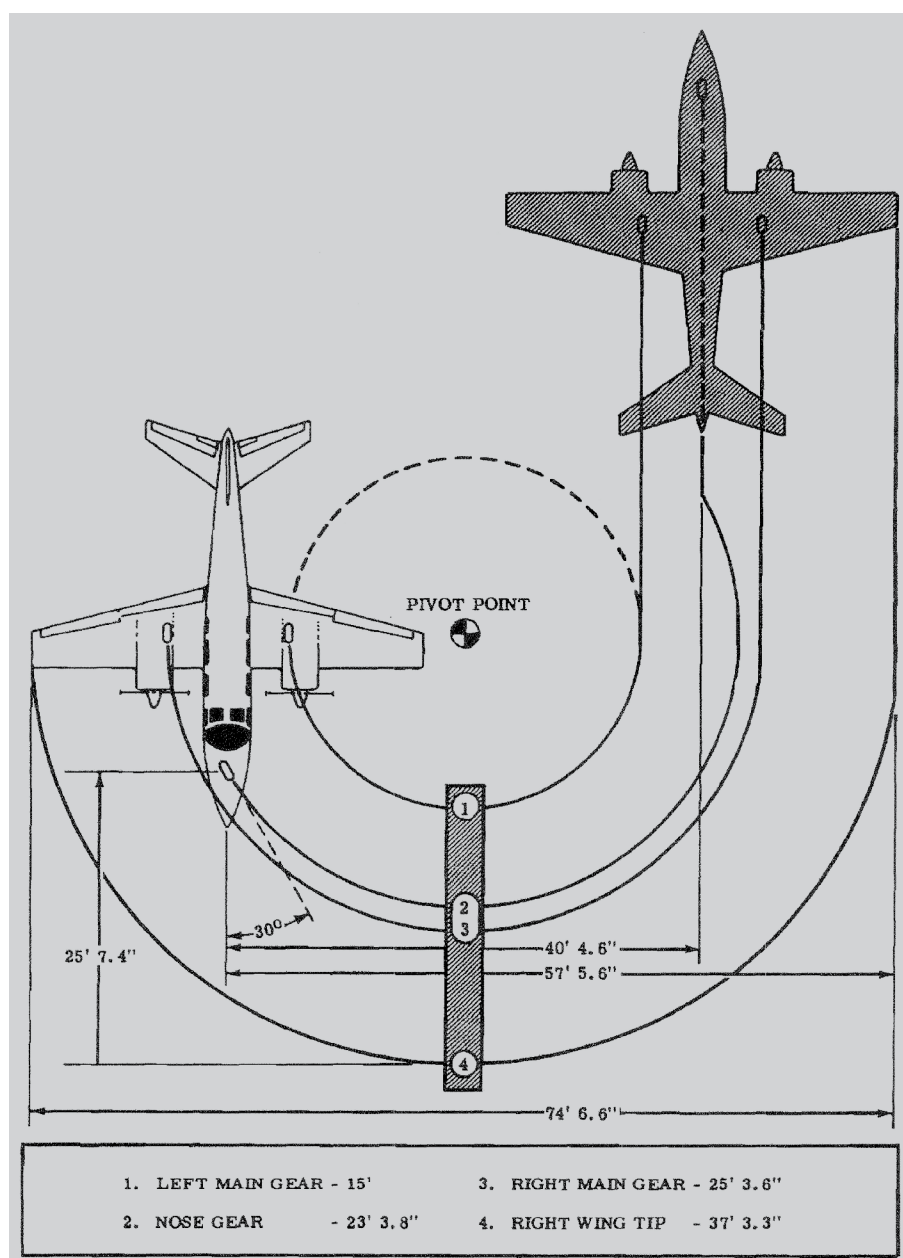
The cabin area is ventilated in two ways. An air inlet at the nose of the airplane directs air through ducting to eyeball-type vents installed in the cabin upholstery panel above each individual seat. Each vent can be adjusted to give the desired amount and direction of airflow.

In addition to the eyeball vents, the pilot and copilot may select ventilating air through two cabin vents located on the front cabin bulkhead slightly below the instrument panel. These vents are operated by two air control cables located on the forward cabin bulkhead by pulling the cable to the desired amount of airflow. An optional axial airflow blower can be installed to provide forced air ventilation through these vents while on the ground.

Ventilating air is also brought into the cabin through an inlet at the base of the dorsal fin, through the heater and heater ducting. By pulling out the Ventilation Control moves a butterfly valve to either open or close the cabin inlet duct.

Cabin Heater

A 35,000 BTU combustion heater is installed in the fuselage aft of the baggage compartment. Air enters the inlet at the base of the dorsal fin, is drawn through the heater fin, and passed through the heater where it is heated to approximately 250°F. The heated air is then forced into the cabin ducting and exhausted along both sides of the cabin floor.



AIRPLANE & SYSTEM DESCRIPTIONS

Operating Instructions - Ground Operation

1. Start engines or plug in external power.
2. Ventilation Control - pull OUT to open the heater duct.
3. Heater Fan Switch - ON.
4. Cabin Heater Switch - Press ON momentarily.

NOTE:

The heater will not operate unless the heater fan switch is ON. This insures adequate airflow through the heater, and guards against overheating while on the ground.

5. Adjust the Temperature Control to obtain the desired cabin temperature. (The Temperature Control is connected to a thermostat in the heater duct which cycles the heater to maintain a constant temperature. Pulling the control out sets the thermostat to a higher temperature).
6. To shut down the heater, momentarily press the cabin heater switch OFF. Turn heater fan OFF, and push in all heater controls.

Operating Instructions - Inflight

The heater is operated in flight exactly the same way as on the ground. Note that the heater still will not operate unless the heater fan switch is ON, even though ram air supplies the required air flow through the heater. To prevent the fan from running unnecessarily, a switch operated by the right main landing gear opens when the gear is raised, and turns the fan off. When the gear is lowered again, the switch is closed, and the fan comes back on.

Heater Protection Devices

A Cycling Switch cycles the heater to maintain a constant outlet temperature of 250°F. Should the Cycling Switch fail, and the outlet temperature reach 300-400°F, the Overheat Switch will open and shut down the heater. (This switch is manually reset on the heater.) The Combustion Air Pressure Switch senses differential pressure between combustion air flow and the cabin air inlet tube. Should the combustion air flow drop below a predetermined setting, the switch will open

and prevent heater operation. The entire heater electrical system is protected by a 10 amp circuit breaker located on the circuit breaker panel.

Windshield Defrosting

The Windshield Defrost Control is attached to a bow in the cabin air to direct the defroster extending along the bottom of the windshield. Pulling the control out provides maximum defrosting airflow.

AIRCRAFT LIGHTING

Exterior Lighting

Appropriate switches and circuit breakers on the instrument panel control all exterior lighting. A rotating beacon is installed on the top of the vertical stabilizer and beneath the fuselage. Conventional navigation lights are located in the wing tips and on the tail cone. Two combination landing and taxi lights are recessed in the bottom of the nose section. (Simultaneous ground operation of both lights for extended periods of time should be avoided as this could cause overheating and possible deformation of the plexiglas cover.)

Interior Lighting

The cabin light switch on the instrument panel supplies power to the individual cabin lights located in the upholstery panel above each passenger-seat. Each light can be turned on or off independently. Two map lights and instrument panel lights are installed under the glare shield and provide floodlight lighting for the instrument panel. All red or white panel lighting may be selected simply by adjusting the concentric control knobs of the panel lighting rheostat located on the instrument panel. The rheostat also serves as an ON-OFF switch, turning clockwise from OFF. A baggage compartment light is illuminated anytime the baggage door is open.

COMFORT AND CONVENIENCE FEATURES

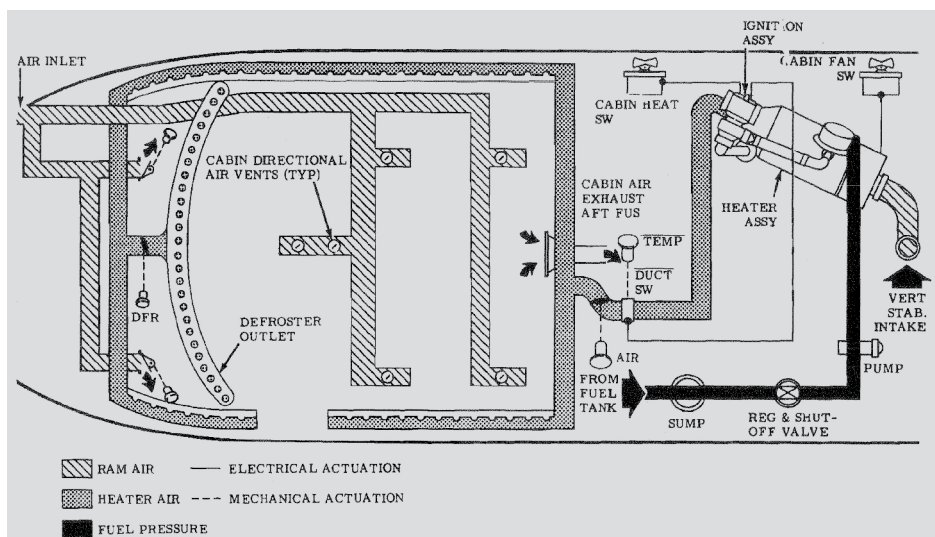
Seating

All seats are reclinable, and can be adjusted fore and aft along the two seat tracks fastened to the cabin floor structure. To facilitate easy cabin entry, the backs of the pilot and right front passenger seats fold down. The fore and aft adjustment is made by pulling up on the seat locking handle on the side of the seat, and rolling the seat on the tracks to the desired position.

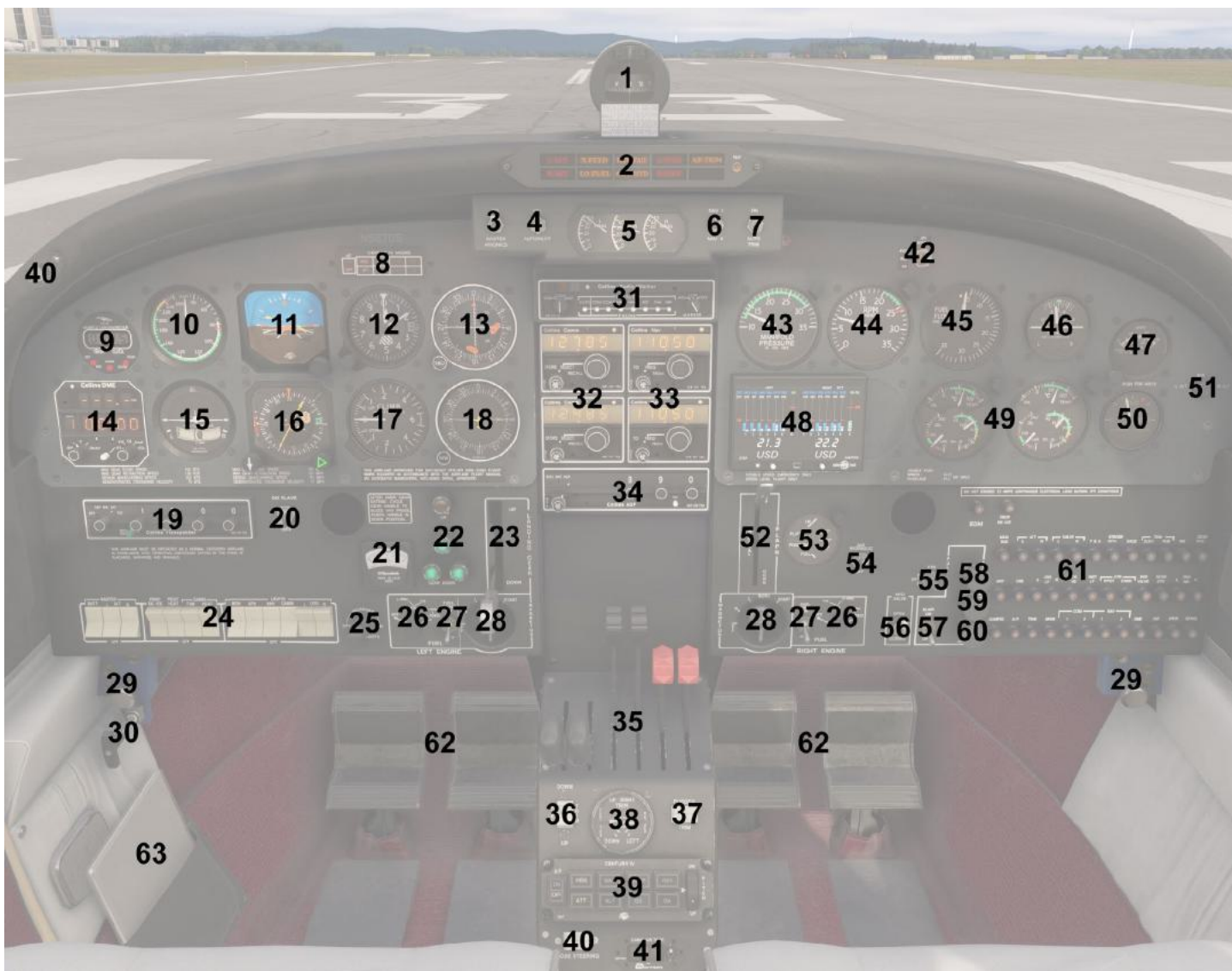
Any seat can be removed to provide space for bulky objects, cargo, special seating arrangements, interior cleaning, maintenance, or any other purpose where extra space is required.

Baggage Compartment

The rear cabin shell may be used for storage of hats, handbags, and other light personal belongings. The baggage compartment in the rear fuselage will accommodate up to 240 pounds of personal luggage, or cargo, and large professional golf clubs. There is also provision for full length hanging of several suits or coats. The compartment is fully upholstered to protect luggage, and is lighted to facilitate after dark loading and unloading.



Environmental Control Diagram



■ COCKPIT DIAGRAM

- | | | | |
|--------------------------|--|--------------------------------|------------------------------------|
| 1. Compass | 18. ADF | 33. Nav radios | 49. Engine temps and pressure |
| 2. Warning panel | 19. Transponder | 34. ADF | 50. Hydraulic pressure |
| 3. Master avionics | 20. DGI Slave | 35. Throttle, prop and mixture | 51. Amps/volts selector |
| 4. Autopilot master | 21. Prop deice ammeter | 36. Elevator trim | 52. Flaps lever |
| 5. Fuel gauges | 22. Gear up/down lights | 37. Rudder trim | 53. Flaps indicators |
| 6. NavI/II selector | 23. Gear lever | 38. Trim indicators | 54. Aux hydraulic pump |
| 7. Auto Trim | 24. Power, alternator, prop de-ice, pitot heat, cabin fan and heat, lights | 39. Autopilot | 55. Cabin fan |
| 8. Autopilot modes panel | 25. Cockpit lights dimmers | 40. Nosewheel steering | 56. Hydraulic shutoff valve |
| 9. Chronometer | 26. Fuel selectors | 41. Cabin temp | 57. Blower (defroster) |
| 10. Airspeed | 27. Fuel pumps | 42. JPI mode | 58. Fresh air from rear heater fan |
| 11. Attitude | 28. Magnetos | 43. Manifold pressure | 59. Heater temperature |
| 12. Altitude | 29. Fresh air vents | 44. Tachometer | 60. Defroster strength |
| 13. VOR 2 | 30. Parking brake | 45. Fuel flow | 61. Breaker panel |
| 14. DME | 31. Audio panel | 46. Suction | 62. Rudder pedals |
| 15. Turn & Bank | 32. Comms radios | 47. Amps/volts | 63. Tablet |
| 16. HSI | | 48. JPI | |
| 17. Climb/descent | | | |



AVIONICS

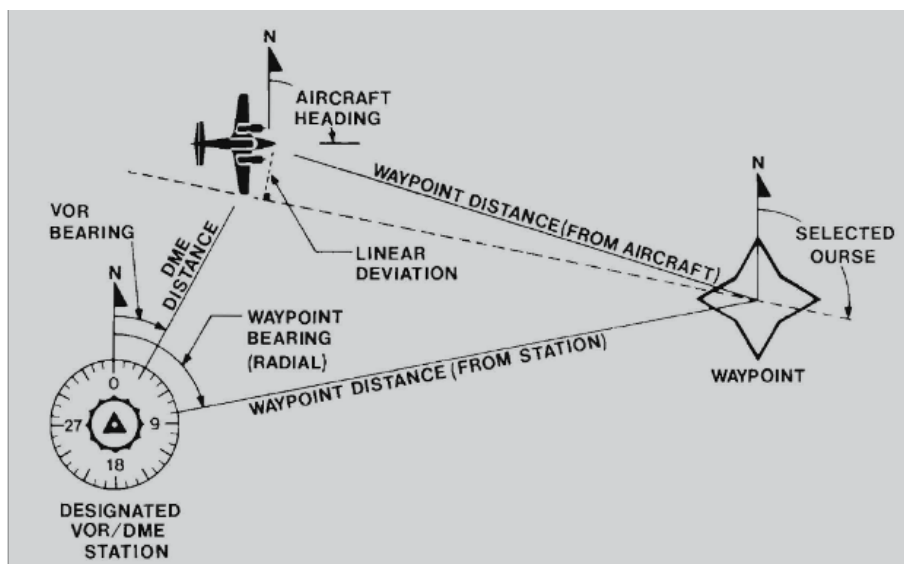
RNAV

Nowadays, the term RNAV (Area Navigation) is almost always associated with GPS/INS. These devices allow us to fly to any waypoint on the map, defined just by its Latitude and Longitude coordinates. But long before GPS came to existence, there was another RNAV implementation in the United States, which relied on existing VOR network. The ANS-351 unit we've added to the Aerostar is a relic from that era.

In the 1970's FAA maintained a system of RNAV routes and approaches that used VOR beacons as a basis. Instead of defining RNAV waypoints by their lat/lon coordinates as we do now, the waypoints were defined by their position relative to a nearby VOR: radial and distance from that beacon. A pilot would then enter these two parameters into his aircraft avionics, tune to that VOR, and could fly directly to the waypoint, as long as he remained in the range of the associated VOR station. It was also possible to fly directly to the destination, without the need to follow airways and overfly VORs along the way. Just pass close enough to VORs to receive their signal, so that RNAV equipment could do its job.

Such system was fairly easy to implement. It did not require any dedicated infrastructure on

the ground, other than existing network of VOR/DME beacons, and it only needed a relatively simple and inexpensive "computer" in the cockpit, that would do the necessary navigational calculations. But in the end, this RNAV did not gain much popularity and was phased out in the 1980's.





AVIONICS

ANS-351 OPERATION

ANS-351 enables such form of Area Navigation in the Aerostar. It is not a standalone unit, it operates together with IND-451 DME and VIR-351 NAV receiver to create an RNAV capable system. Bear in mind, this is not the “modern” RNAV. It requires VOR coverage and waypoints are defined as radial/distance from reference VOR station, not lat/lon. To make the most of this system in MSFS, you’ll have to get a bit creative and plan your routes accordingly. Flight planner tools like Little Navmap can be used to find radial and distance parameters for waypoints based on nearby VORs. There are also freeware scenery addons which restore the now defunct VOR stations in various locations all over the world to improve network coverage.

To use Collins ANS-351 Area Navigation Computer you first store the waypoints in the device. ANS-351 can hold eight waypoints in its memory, each defined by radial and distance from VOR station. Beware, the memory is reset when power is removed. The device does not store the associated VOR frequency itself. You have to note somewhere which VOR station is referenced by each waypoint, and tune that frequency on the NAV radio when switching between waypoints.

Once enroute, switching the Mode Selector on the DME-451 unit to “RNAV” position activates the system. This is indicated by “WPT” annunciators on both DME and NAV unit that is linked to the RNAV system. The active waypoint parameters are displayed on ANS-351. Both active and non-active waypoints can be edited on the fly.

If DME-451 mode selector is not in RNAV, the display will show ‘Vor’. If an ILS frequency is detected, RNAV system will deactivate and ANS-351 will show “Loc”, regardless of mode selector position. In both cases it is still possible to edit RNAV waypoints, but all of them are nonactive.

When navigation system is in RNAV mode, the instruments in the cockpit will show guidance to RNAV waypoint instead of the tuned VOR:

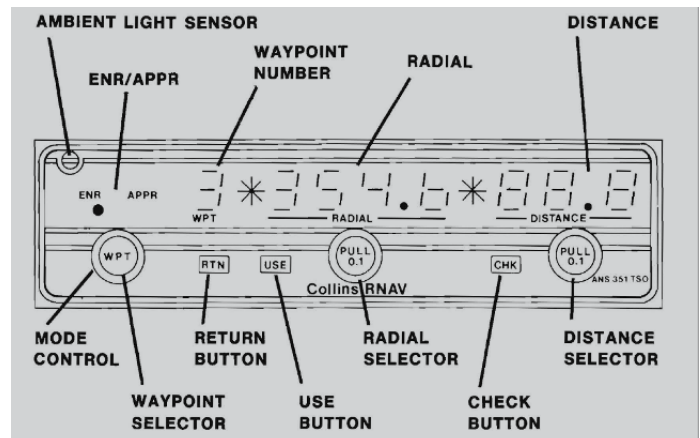
- DME will show distance to RNAV waypoint
- CDI will show linear deviation from the selected course to RNAV waypoint
- NAV radio TO and FROM modes will show bearing to RNAV waypoint

All in all, the system will behave much like flying directly to VOR station, except now it will guide you to an RNAV waypoint instead. The autopilot will follow RNAV guidance in NAV/APPR modes just like it would track VOR signals. There are two relatively minor, but important differences:

- Course deviation is shown as linear instead of angular measurement. One dot on the CDI equals to 1 nm deviation (cross track error), no matter how far are you from the waypoint. This is different than when using VOR, where each dot equals two degrees off course.
- Ground Speed readout on the DME display is valid for any stabilized direction of flight, not only when flying directly to/from waypoint. However, this requires some time to stabilize, and large changes in aircraft heading will temporarily affect the indicator.

ANS 351 DISPLAYS AND CONTROLS

ANS 351 does not have a power switch. It is powered when the associated NAV receiver is on.



Displays

- ENR/APPR – the light identifies selection of enroute sensitivity (5 nmi full scale) or approach sensitivity (1-1/4 nmi full scale).
- WPT – Identifies the waypoint defined by the displayed data. A winking number indicates a nonactive waypoint; continuously on number indicates the active waypoint.
- RADIAL – The VOR radial from the reference station on which the RNAV waypoint is located.
- DISTANCE – The distance in nautical miles from the reference station to the RNAV waypoint.



Controls

- Mode controls – Select ENR (enroute) or APPR (approach) modes of operation. In the enroute mode, CDI deviation is 5 nmi full scale. In approach, deflection is 1-1/4 nmi full scale.
- WPT – Sequences display waypoints from 1 through 9. Winking number indicates nonactive waypoint; continuously on number indicates the active waypoint.
- RTN – Pressing RTN (return) button returns the display to the active waypoint when a nonactive waypoint is currently being displayed.
- USE – Pressing the USE button converts the waypoint being displayed into the active waypoint.
- Radial selector – Two concentric knobs that set radial information into the display. Knobs control information as follows:
 - Large knob – changes display in 10 degree increments.
 - Small knob pushed in – changes display in 1 degree increments.
 - Small knob pulled out – changes display in 0.1 degree increments.
- CHK – Pressing CHK (check) button causes DME and bearing indicators to display raw distance and bearing information. RNAV computation, CDI/HSI deviation, to/from display, and autopilot tracking of RNAV path remain unaffected. The CHK button is spring loaded to prevent permanent actuation.
- Distance selector – Two concentric knobs that set distance information in nautical miles into the display. Knobs control information as follows:
 - Large knob – changes display in 10-nmi increments.
 - Small knob pushed in – changes display in 1-nmi increments.
 - Small knob pulled out – changes display in 0.1-nmi increment from 00.0 through 100 nmi. Beyond 100 nmi, changes display in 1-nmi increments.

AUTOPILOT

The Century IV flight director/autopilot installed in our Aerostar is a modern (by the late seventies standards), two-axis, attitude-based autopilot system. While it may look similar to autopilots found in other General Aviation aircraft in MSFS, it does have several unusual features, and its primary modes may work slightly different than expected. We have created a fully custom autopilot simulation, bypassing the limitations of the built-in MSFS autopilot, and that allows to recreate these oddities, as well as properly represent how such autopilot would interface with a modern GPS installed in the cockpit.

The autopilot gets aircraft pitch and roll from artificial horizon, while heading and course signals are taken from the HSI. The computed



steering commands are displayed for the pilot using flight director, while the control of the aircraft is achieved using three servomotors: roll, pitch and trim.

Autopilot controls consist of programmer unit with buttons located on the central pedestal and several additional switches on the glareshield. The remote annunciator located on the main panel next to artificial horizon shows currently selected modes of operation. In the simulator to control the autopilot functions you can also use the dedicated autopilot buttons on the EFB Controls page in the tablet, or use the standard MSFS autopilot key bindings. MSFS bindings should be rather self-explanatory, except that MSFS LOCALIZER binding activates GS mode on the Century IV.

Below is a short summary of various autopilot functions, for detailed operating procedures, please refer to:

[Century IV Pilot's operating handbook](#)

[Collins Microline operating instructions](#)

MAIN CONTROLS

Master Autopilot switch

This is the main power switch for the autopilot. You can think about it more as a "Flight Director" switch in a more modern aircraft. The system is ready to use immediately after powering up, with no warm up period required, as long as the gyroscopic instruments (AH, HSI) are operating.





Once powered, the autopilot begins to show steering guidance with the flight director, but the servos remain disengaged, so the pilot is still in control of the aircraft.

Autotrim switch

When the autopilot is on, it flies the aircraft using pitch and roll servos, which move the elevator and ailerons. It also adjusts the trim as needed to reduce the load on the pitch servo and keep the aircraft in trim. This switch disconnects the trim servo control from the autopilot. The autopilot will still fly the aircraft, but without trim adjustments it will have reduced authority in pitch.

Under normal circumstances this switch should be left on.

NAV I-II switch

The real Century IV POH warns, that the use of a NAV-1/NAV-2 selector switch involves complex operational techniques that would add confusion in moments of stress and its installation is therefore not encouraged.

But it was installed in the real aircraft, so we put it in the sim too.

This switch will select which NAV radio will be used for tracking in NAV/APPR/REV modes. If NAV-2 is selected, the autopilot will use steering signals shown on the VOR2 gauge in the cockpit. The confusing part is that the autopilot will still use selected course from the HSI, as this is the only gauge that can provide this information. Which means that even if you select NAV-2, you still have to adjust course selector on the HSI to match OBS setting on VOR2 gauge, even though the HSI is still linked to VOR1 frequency. Without that step the autopilot will not track correctly.

Programmer unit

It serves as Pilot Command Station and Master Annunciator. Active modes are brightly illuminated while inactive modes are dimly illuminated, except for the ON-OFF lights, where only one of the two is illuminated at a time. The eight mode buttons are arranged so that the top four control lateral modes and the bottom four are vertical modes. At least one lateral and one vertical mode is always active.

- ON-OFF button - used to engage or disengage the autopilot. Be aware that there is no audio signal warning when the autopilot is disengaged.
- HDG mode - the autopilot will turn the shortest direction and fly the heading selected on the HSI. Bank is limited to 20 degrees.
- NAV mode - the autopilot will intercept and track selected radial as configured on the HSI. It combines course direction data from HSI course selector and left-right CDI needle movement to steer the aircraft. Intended for cross country navigation.





- APPR mode - similar to the NAV mode, but with different gains in order to better track Localizer signal. Can also be used to track regular VORs if desired.
- REV mode - for localizer back courses and outbound legs of VORs, it will automatically fly the “tail” of the HSI course arrow (180 degrees from the direction it’s pointing).

Selected heading intercept feature

NAV, APPR, and REV modes will normally fly a 45 degree intercept angle from the course selected on the HSI. For example if you have set the course needle to 30 degrees and the CDI is to the right, then the autopilot will turn to the heading of 75 degrees and turn back to 30 degrees when it intercepts the selected radial. If this is not desired, you can use selected angle intercept feature. This mode is activated by simultaneously pressing the HDG and APPR buttons. In the simulator it can also be activated by clicking either HDG or APPR with the right mouse button, or LMB + RMB with legacy interaction scheme. Both buttons will lit, the system will remain in HDG mode and follow the heading bug setting, until CDI deviation reaches one-half scale. Then it will switch to APPR and complete the intercept.

You can also use this feature to track enroute VORs, in this case manually switch back from APPR to NAV after the intercept.

Vertical modes:

- ATT mode - aircraft pitch is controlled by the pitch command knob located on the extreme right of the programmer.
- ALT mode - the system will maintain the pressure altitude

existing at the time of engagement. The autopilot has its own pressure sensor, independent from the aircraft altimeter.

- GS mode - used for glideslope tracking. GS mode will arm automatically after 10-30 seconds if the lateral mode is APPR, the vertical mode is ALT, and GS needle is “UP” (aircraft intercepting from below). GS can also be armed manually by pressing the button, for example if there is not enough time for the automatic arming to occur. You can also activate GS mode by pressing the button when intercepting ILS from above, provided that glideslope needle on the HSI is higher than 80% down.
- If GS mode is active and glideslope needle falls below 80% down, GS mode will decouple and the autopilot will transition back to ALT as a safety measure.
- GA mode - this mode commands a fixed climb angle. The angle is preselected at installation to give single engine best rate of climb with other engine at zero thrust. If both engines are operating normally this will result in a rather shallow climb, so you may prefer to use ATT mode for go-arounds unless in an engine-out situation.

Pitch command knob

The knob is used to manually set the desired pitch in ATT mode. The knob is motorized and it will automatically sync its position to the aircraft pitch in the moment when ATT mode is activated. It will also follow aircraft pitch changes when the Pitch Sync button on the yoke is held down.

If the pitch command knob is left in the “pitch down” position during glideslope intercept, the safety circuit will cause ATT button light to flash as a reminder to reset pitch knob position.

TEST button is used to test all the lights (except ON/OFF) and the aforementioned safety circuit.

Yoke Pitch Sync button

Located in front of the yoke, not visible. This button is used to momentarily take control of the aircraft from autopilot and set a new pitch angle. When this button is pressed, it disengages autopilot servos, re-cycles pitch mode to ATT and syncs pitch command knob to the current aircraft pitch as long as it held down. The lateral mode will continue as programmed and the servos will re-engage when pitch sync button is released.

To use this button you have to map in MSFS control menus both “A600 AUTOPILOT PITCH SYNC PRESS” and “A600 AUTOPILOT PITCH SYNC RELEASE” commands, as explained in the Shortcuts section of this manual.

HDG-GPSS SWITCH

In real life, following GPS magenta line is not as easy as just pressing “NAV” button on the autopilot, unless you have a fancy new device



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built in the GPS era. Older autopilots like our Century IV do not have any auxiliary inputs that can be used to receive steering signals directly from GPS. What really happens when you set your CDI to GPS and engage NAV, is that the autopilot will fly in this setup using exactly the same logic as it does with VOR signal. It will simply use the course setting you've set on the HSI and follow left-right movement of CDI needle. It won't be able to fly any curved paths, holdings, smooth transitions between flightplan segments. Or to be precise, it will try to fly them using VOR tracking logic, with often unpredictable results. When following a GPS flightplan, you will have to manually adjust HSI course setting at each waypoint, because the autopilot in NAV mode is using the course needle as desired course input, not the actual DTK displayed on the GPS screen.

Obviously no one likes the increased workload and that's where "GPS Steering" (GPSS) comes into play. It's an aftermarket avionics box which reads digital steering commands from the GPS, converts them to a signal that the autopilot can understand (usually analog) and sends that as heading bug input to the autopilot. This allows the autopilot to fly all kinds of curved paths that GPS creates. But to do so, the autopilot has to be in HDG mode, and the HSI heading bug is disconnected from the system.

The one new thing in the cockpit is the addition of a HDG/GPSS switch next to the autopilot annunciator. If the switch is in HDG position, the autopilot in HDG mode will follow heading bug setting on the HSI, as usual. If the switch is in GPSS position, the autopilot in HDG mode will follow GPS guidance, and the heading bug on the HSI will have no effect on the autopilot.

GPSS switch position has no effect on autopilot operation in any mode other than HDG. But it's a good practice to set the switch back to HDG at any time you are not using GPSS, in case you suddenly receive vectors from ATC, or want to change heading for whatever other reason.

SUMMARY:

To fly a GPS flightplan without GPSS:

1. Set CDI source to GPS
2. Set HSI course to GPS desired track for the current leg (DTK)
3. Activate NAV mode on the autopilot.
4. At the end of each flightplan leg the GPS will notify you about the new course (DTK) you have to set on the HSI to continue tracking.

To fly a GPS flightplan with GPSS:

1. Set CDI source to GPS. That's not always necessary, but some GPS units won't cooperate otherwise, and it's good to have a reference on the HSI anyway.
2. Set HDG/GPSS switch to GPSS
3. Activate HDG mode on the autopilot (not NAV)

To fly WAAS approach at the end of the flightplan:

1. Set CDI source to GPS if not there already
2. Set Approach course on the HSI
3. Activate APPR/GS mode on the autopilot

To fly ILS approach at the end of the flightplan:

1. Set CDI source to VOR
2. Set Approach course on the HSI
3. Activate APPR/GS mode on the autopilot

DIGITAL ENGINE MONITOR

The JP Instruments EDM 760/790 is an advanced simulation of a digital engine monitor often retrofitted in real aircraft. It gives insight into engine operation, fuel consumption, constantly scans multiple engine parameters, warning you if they exceed alarm thresholds. It also includes a 'LeanFind' mode that will assist you in setting up the mixture correctly during cruise. However, it's not your primary engine instrument and it's normal that it is shut down during engine startup and turned on later with the rest of avionics.

For detailed information on operating the EDM 760/790, please refer to the Pilot's Guide.

[EDM 760/790 Pilot's Guide](#)

Below is just a short summary to get you started.

OVERVIEW

Cylinder bar graphs are shown in the central portion of the display, two for each of the 6 cylinders of each engine. Exhaust Gas Temperature (EGT) appears in blue. Cylinder Head Temperature (CHT) is shown in white when below redline and in red if this limit is exceeded. The redline on the EDM in our Aerostar is set to 400F, which is recommended temperature limit for economy cruise. You may exceed this limit on takeoff or with high power settings. Each engine has also a green bar indicating OIL temperature. The bars are scaled so that bottom of the scale is half of the max value, so the bars may not be visible immediately after startup until the engine has warmed up.

The lower section of the display presents dynamic readouts of various engine parameters and counters. Any alarms which are triggered, for instance high EGT, low oil pressure or low fuel quantity, will take priority in this area and flash in red.

EDM 760 is functionally identical to 790, but it's an older model using small LED display instead of a large LCD. On EDM 760 the current CHT is visualized as a missing segment on the EGT bar for each cylinder.





Controls

The EDM 790 includes just two front panel operating buttons, the left one labeled STEP and the right one labeled LF (lean find). The function of these will be described in a little more detail below. These buttons can be operated with mouse click, or by mapping them to hardware buttons in MSFS Controls menu. Check the controls bindings section of this manual on how to map them correctly.

For some functions, both buttons have to be pressed at the same time. You can achieve that by clicking either one of them with right mouse button.

Setting Fuel

EDM 790 comes with built in fuel totalizer. It does not directly measure the fuel level you have in your tanks. Instead, it continuously measures engine fuel consumption and subtracts this value from initial fuel quantity that is stored in memory. This gives very accurate information about remaining fuel, as long as you've set the initial quantity correctly. As they say: garbage in, garbage out. If you don't set the fuel correctly, the device will eventually decide that you're running out of fuel and start nagging you with various fuel related alerts.

On power-up, once the initialization sequence has completed you will be prompted to enter any fuel you might have added to the tanks with FILL? prompt. If the aircraft hasn't been refueled, simply click the left button, now labeled EXIT. Otherwise press the right button now labeled REFUEL to select one of the 3 options below.

1. FILL 166 sets remaining fuel to fully filled fuselage and wing tanks.
2. FILL 42 sets remaining fuel to the fully filled fuselage and empty wing tanks. (light fuel load preset)
3. FILL + allows you to adjust remaining fuel by pressing or holding the LF button.

If you skipped fuel initialization, you can return to this page at any time by pressing both EDM buttons simultaneously. Using the buttons on the EDM 790 to enter the fuel total can be a little fiddly, so we've also

provided a shortcut on the fuel and payload page of the pilot's EFB to instantly synchronize this parameter from the actual fuel on board.

Manual and Automatic Scanner Modes

In normal operation the scanner area at the bottom of the screen will constantly cycle in sequence between all available measurements, showing each of them for several seconds. These measurements are:

- BAT OAT - battery voltage and outside air temperature
- DIF - difference between hottest and coldest EGT
- GPH - fuel flow rate
- USD - fuel used by each engine
- REM H.M - Fuel Remaining and time to empty at current fuel burn
- TOTL GAL USD - Total fuel used by both engines
- REQ RES - Estimated fuel required to GPS destination and fuel remaining at destination. Only present with GPS installed in the cockpit
- MPG NM - Current consumption as nautical miles per gallon, estimated remaining range. Only present with GPS installed in the cockpit
- EGT, CHT - digital readout of temperatures for selected cylinder
- OIL - oil temperature
- CLD - cooling rate of the fastest cooling cylinder, in degrees per minute. Zero if the engine is warming or at steady temperature.

Pressing STEP button pauses automatic cycling for several minutes and allows you to step manually through measurements (use short click to step forward, hold the button to cycle backwards). Measurements can be excluded from automatic scan by pressing both buttons simultaneously. Excluded measurements are marked with a dot displayed before the text. Exclusions are remembered between flights.

EGT-ALL-FF switch located on the main panel can be used to filter measurements. If the switch is in EGT position, only temperature related measurements are shown. In FF position, fuel flow related measurements are shown.

AVIONICS

Percentage and Normalize View

Pressing the LF button for 3 seconds will toggle between Percentage View and Normalize View. In Percentage View the columns indicate percent of EGT redline so hotter cylinders display higher columns than cooler cylinders. When Normalize View is activated, EGT columns are set to the same half-height level for trend analysis and any changes will be shown as an increase or decrease in column height. A one-segment change indicates a 10°F difference. Normalize View is most useful in cruise and run-up, but making large changes to power settings will cause columns to go off scale. When Normalize View is active, the NRM text indicator is visible at the top.



Leaning

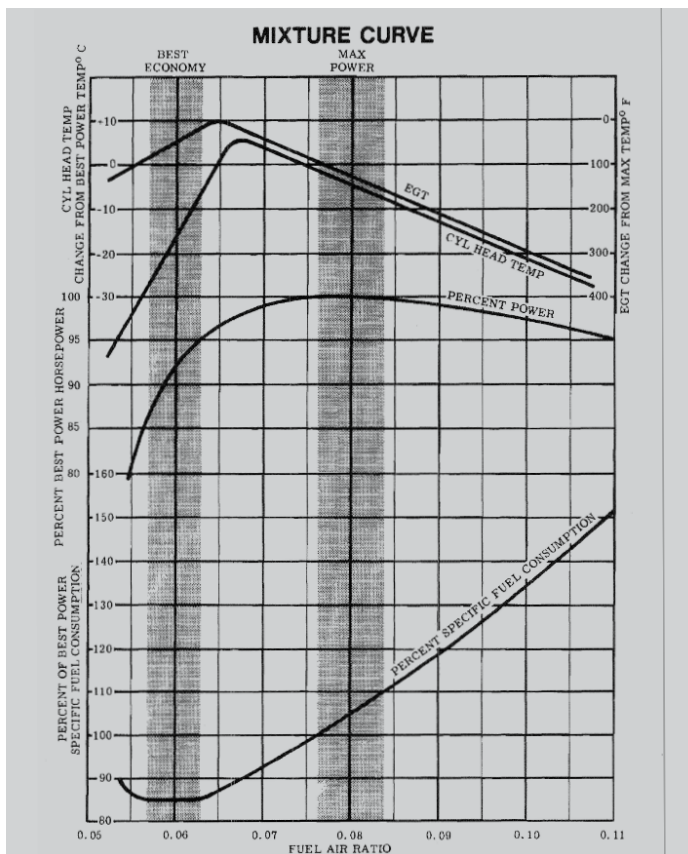
Leaning is an essential process when operating piston engines. The engine monitor will help you find the best mixture settings in any conditions, or you can rely on engine power tables from the manual. Whichever you prefer, we got you covered. Our fully custom engine simulation bypasses the limitations and bugs present in stock MSFS engine code and allows for realistic experience.

First a bit of theory. Combustion is a chemical reaction that requires a certain amount of oxygen molecules for each fuel molecule we use. This ideal ratio of air and fuel is called stoichiometric mixture, at this ratio all oxygen and all fuel in the mixture will be burned. That may sound like an ideal setting for the engine, but in real life it is often avoided, mostly because it generates a lot of heat. That extra heat causes accelerated engine wear, but also reduces engine performance and efficiency.

In the aircraft we use exhaust gas temperature (EGT) to monitor how the combustion process is going. Unlike cylinder head temperature (CHT), EGT reacts quickly to throttle and mixture changes, so it's easier to use for adjustments. The actual EGT value is not that important, it varies a lot based on power and altitude. But what matters is how EGT changes, because peak EGT happens approximately at stoichiometric mixture and from that we can determine where we are on the power and efficiency curve.

The best power setting is on the rich side of peak EGT (around 100-150 degrees ROP). The best economy setting is slightly on the lean side of peak EGT (0-50 degrees LOP). The area to avoid is slightly on the rich side of peak EGT, where CHT is highest and the engine is most stressed. On the other hand, lean mixture also increases the risk of detonation, and requires careful monitoring from the pilot.





The full explanation of this relation would require lots of graphs, text and is beyond the scope of this manual. The short version is that adding more fuel has a cooling effect which allows us to cram more oxygen and fuel into the cylinder (cooler = denser), thus producing more power even if some of the fuel is wasted unburnt in the process. Stoichiometric mixture also burns faster than usual, for which the engine may not be optimized. So that excessive energy at ideal mixture is wasted as heat, instead of being extracted by pistons and turned into work.

ROP vs LOP cruise

As mentioned in the previous section, best power setting is on the rich side of the mixture, while best economy is a bit on the lean side. For takeoff we set the engines to the full rich position. Even if this is not exactly the best power setting, the loss of power is negligible, while the additional cooling effect from extra fuel is very beneficial in this most critical phase of flight. For climb, especially at high power output, you want to keep the mixture rich, because of the cooling effect and lower risk of detonation. Lycoming does not recommend leaning the engines above 75% power setting.

Cruising at altitude, at lower power output, we have more freedom in setting the mixture. "Best power" mixture is not used very often unless you're in a hurry, as the difference is negligible while the fuel consumption is high. 50 degrees ROP is a common setting recommendation, that is usually a decent compromise between temperatures, power and fuel consumption, and does not require much precision from the fuel distribution system.

The best setting for economy cruise is around 25 degrees LOP. It trades a bit of engine power for much better fuel economy and cleaner combustion, at least from the engine perspective. The cruise speed will be a few knots slower, but the other benefits usually outweigh that. Here comes the problem though: if you look on the power vs mixture graph, the loss of power of the lean side happens much quicker and steeper than on the rich side. A bit too lean, and the engine may start running rough, or loose too much power.

Cylinders

Up until now, we've talked about the mixture like it's a single setting for the whole engine. After all, there is only one mixture lever for each engine in the cockpit, isn't it? But in reality each cylinder is a separate combustion chamber and it receives a slightly different mixture ratio. This is mostly visible in carbureted engines. The fuel is mixed with the air back in the carburetor, and then distributed to each cylinder through a long manifold. This causes very uneven mixture distribution between cylinders. A carbureted engine like we have in our Comanche basically cannot be run with all cylinders lean of peak. By the time the last cylinder reaches peak EGT, another one is already starved of fuel and runs rough.

A fuel injected engines like in our Aerostar are a different matter. With good quality, properly adjusted fuel injectors you can cruise lean of peak, no problem. The cylinders won't peak all at the same time, there is still a small variance between injectors, and combustion in each cylinder happens slightly different. But the difference is small enough to allow for lean of peak setting and you can observe it all on the engine monitor screen.

The lean find algorithm in the digital engine monitor ensures that all cylinders are on the correct side of peak EGT region. In ROP mode, it finds the first cylinder to peak (the leanest one), and then you enrich the mixture to ensure that all cylinders run on the rich side. In LOP mode, it finds the last cylinder to peak (the richest one), which means all other cylinders are already running lean, and from there you can lean further or stay at that setting.



Leaning ROP with EDM

The procedure for leaning using ROP mode is as follows.

1. Establish cruise and pre-lean the mixture to around 50°F rich of peak. Wait for a minute or so for the temperatures to stabilize.
2. Press the LF button and verify that LEAN R is displayed. If it displays LEAN L, press and hold both EDM buttons until it switches to LEAN R.
3. Lean the mixture at around 5°F per second continuously until PEAK EGT shows and the corresponding EGT column flashes.
4. At the point the display should change to show the difference from peak. If it does not, tap the LF button to switch between EGT peak, and EGT delta.
5. Slowly enrich the mixture to set the desired setting between -50 to -150 ROP.

Leaning LOP with EDM

The procedure for leaning using LOP mode begins just like ROP mode

1. Establish cruise and pre-lean the mixture to around 50°F rich of peak. Wait for a minute or so for the temperatures to stabilize.
2. Press the LF button and verify that LEAN L is displayed. If it displays LEAN R, press and hold both EDM buttons until it switches to LEAN L.
3. Lean the mixture at around 5°F per second continuously until "PEAK EGT" shows and the corresponding EGT column flashes. At this point the text display will change to show the difference from peak and graphs will switch to "waterfall" view where they show distance from peak for each cylinder.



4. Continue leaning until all 6 cylinders passed their peak EGT. When the last cylinder passed its peak and appeared on the graph, the "RICHEST" message will show, and that richest cylinder column will flash.
5. At the point the text display will show the difference from peak for the last cylinder that peaked. If it does not, tap the LF button to switch between EGT peak, and EGT delta. Hold the LF button to display fuel injector spread measured as fuel flow difference.
6. Slowly lean the mixture further for best economy as desired, usually at 0 to -25 degrees.

OTHER TIPS

Adjusting engine levers position

No two piston engines behave exactly the same. When flying the Aerostar you will often find that each engine requires slightly different amount of throttle, prop or mixture to get the same numbers on the instruments. This is easy to handle if you have a 6-lever throttle quadrant, and it's something that real multi-engine pilots deal with almost subconsciously.

But for those who do not have split throttles and control both engines with single joystick axis, we've implemented a simple assistance. You can fine tune your throttles position using mouse wheel or by dragging the levers in the cockpit. Then, when you use your joystick axis, we will move them both in unison and preserve that relative levers position for the rest of the flight, as long as you do not hit the end stops. This feature is fully automatic and does not require and custom mapping. It also works independently for throttles, propellers and mixtures axes.

Controls bindings

This aircraft comes with additional custom bindings which you can set in MSFS controls menu. Their names all start with A600 prefix for easy searching, and they only work if the Aerostar is selected. Most of them can be mapped the same way as any other MSFS binding, but those actions that have both `_PRESS` and `_RELEASE` functions have to be mapped in a specific way due to MSFS input system limitation:

1. Assign the button of your choice to the action named `_PRESS`
2. Assign the same button to the action named `_RELEASE`
3. For the `_RELEASE` action go into advanced options (gear icon next to it), deselect “Repeat on Press” and select “On release”

This way the simulation will be able to tell when the button was pressed, and when it was released, which is important for several buttons

with timed actions, like autopilot “pitch sync” button or JPI engine monitor keys.

For those who want to use the realistic steering option, you have to map either “INCREASE STEERING” and “DECREASE STEERING”, or “A600 STEERING SWITCH LEFT” and “A600 STEERING SWITCH RIGHT” in MSFS bindings, in order to control the steering switch. Both pairs perform the same function.

Also recommended is mapping “A600 STEERING SWITCH NEUTRAL” to “on release” action as described in the manual above, which will improve the switch responsiveness.

For those customers wanting even more flexibility in controls mapping, on our forums we will publish a list of custom simvars that can be mapped using 3rd party software like Axis and Ohs, Spad.Next, FSUIPC, etc.

edm	Search by input					
A600 EDM STEP PRESS	Specific	Digital		Q	1	⚙
A600 EDM STEP RELEASE	Specific	Digital		Q	1	⚙

Actions settings

^ Control options

Input repetition

Delayed input

Set control on release

Set inverted axis

Input value

Device input curve override

Tweak action curve

Delete assigned control

☒

0.00





PROCEDURES

These procedures are adapted from the Aerostar 600 Owner's Manual (Section 3) for simulator use. Use the pilot's tablet for checklists and system management. The Accu-Sim 2.0 simulation enhances realism with dynamic physics, wear effects, and interactive systems, so monitor the tablet's Flight Info and Engine Analyzer pages during operations.

BEFORE STARTING ENGINES

- Preflight COMPLETE (confirm via tablet checklist).
- Passengers BRIEFED.
- Seat belts SECURED.
- Cabin door CLOSED & LOCKED.
- Battery/ignition OFF.
- Landing gear handle DOWN.
- Gear DOWN (verify 3 green / gear lock lights ON).
- Flaps UP.
- Brakes TEST FOR FIRM; flight controls FREE.
- Parking brake SET.
- Switches ALL OFF; Battery ON.
- Elevator & rudder trim NEUTRAL.
- Hydraulic shutoff OPEN.
- Fuel CHECK; low fuel warning OFF.
- Circuit breakers IN.
- Altimeter & clock SET (tablet quick-set available).

STARTING ENGINES

- Start RIGHT engine first (hydraulic pump).
- Prop FULL FORWARD.
- Mixture IDLE CUTOFF; throttle CRACKED.
- Battery ON; low fuel warning OUT.
- Fuel selectors CYCLE & LISTEN (valve actuation).
- Right fuel boost ON.
- Right mixture FULL—check fuel flow—then OFF (prime).
- Right starter ENGAGE.
- As engine fires: Mixture FULL RICH; set 1,000 RPM.
- Right fuel boost OFF.
- Gyro pressure CHECK.
- Right alternator switch ON.
- REPEAT FOR LEFT ENGINE.

WARM-UP & RUN-UP

- Warm up at 1,000 RPM; engine temperatures CHECK.
- Prop FULL FORWARD; mixture RICH.
- Throttle 1,500 RPM; engine instruments CHECK.
- Alternator—check for 28 volts.
- Throttle SET FOR 2,100 RPM.
- Prop—CYCLE between ~1,000 RPM and max up to 4×
- Magnetos—175 RPM max drop.
- Gyro pressure CHECK.

BEFORE TAKEOFF

- Cabin door CLOSED & LOCKED.
- Controls FREE.
- Mixture FULL FORWARD.
- Fuel selectors ON.
- Prop FULL FORWARD.
- Boost pumps ON.
- Instruments CHECK.
- Radios SET.
- Flaps 0–20°.
- Trim SET.
- Pitot heat AS DESIRED.
- Parking brake RELEASED.
- Throttle FULL FORWARD (for takeoff roll).
- AFTER TAKEOFF
- Wheels BRAKE (stop rotation).
- Gear UP.
- Flaps UP.

CLIMB

- Maximum climb 122 kts.
- Fuel pump OFF at 1,000 ft AGL.
- Reduce power to 24" MP & 2,400 RPM.
- Trim for climb speed 122–160 kts.
- CRUISE
- Power SET.
- Mixtures SET AS DESIRED.
- Fuel quantity MONITOR.
- Fuel pump VERIFY OFF; fuel pressure CHECK.
- Engine gauges CHECK.



PROCEDURES

APPROACH

- Autopilot master OFF.
- Boost pumps ON.
- Mixture FULL RICH.
- Fuel selector ON.
- Flaps 20° below 175 kts.
- Gear DOWN below 157 kts.
- Gear lights ON (3 green).
- Hydraulic pressure CHECK.
- Airspeed 140 kts.

LANDING

- Flaps FULL DOWN.
- Reduce power—target ~100 kts.
- AFTER LANDING
- Prop FULL FORWARD.
- Flaps UP.
- Boost pumps OFF.
- Trim tabs NEUTRAL.
- Cabin heater OFF.

SHUTDOWN

- Parking brake SET.
- Idle for ENGINE COOLDOWN.
- Radios & lights OFF.
- Mixture IDLE CUTOFF.
- Magnetos OFF.
- Fuel selector OFF.
- Alternator OFF.
- Battery OFF.

EMERGENCY PROCEDURES

Adapted from Aerostar 600 Owner's Manual (Section 4) for simulator use.

ENGINE FAILURE DURING FLIGHT

- Prop & throttle FULL FORWARD.
- Gear UP.
- Flaps UP.
- Inoperative engine FEATHER.
- Best angle of climb 104 kts.
- Best rate of climb 113 kts.
- Operative engine BOOST PUMP ON.
- Trim AS DESIRED.
- Inop engine mixture IDLE CUTOFF.
- Inop engine boost pump OFF.
- Inop engine fuel selector OFF.
- Inop engine magneto OFF.
- Inop engine alternator OFF.
- LAND ASAP.



RESTARTING FEATHERED ENGINE

- Fuel selector ON.
- Boost pump ON.
- Mixture IDLE CUTOFF.
- Throttle CRACKED.
- Magneto BOTH.
- Prop FULL FORWARD.
- Starter ENGAGE.
- As engine rotates: MIXTURE FULL.
- After engine starts: BOOST PUMP OFF.
- Warm up at 2,000 RPM and 15" MP.
- Oil pressure CHECK (≥ 25 psi).
- Alternator ON.
- Trim SET.

ENGINE FIRE IN FLIGHT

- Mixture IDLE CUTOFF.
- Fuel selector OFF.
- Boost pump OFF.
- Hydraulic shutoff valve—IF RIGHT ENGINE FIRE, CLOSED.
- Prop FEATHER.
- Magneto OFF.
- Alternator OFF.
- LAND ASAP.

FUEL PUMP FAILURE IN FLIGHT

- Boost pump ON. (If engine stops, boost ON then perform air start.)
- HYDRAULIC PUMP FAILURE
- Slow aircraft to 130 kts.
- Flaps AS REQUIRED.
- Gear DOWN (will free-fall & lock).
- Gear—CYCLE UP and DOWN (if needed to confirm lock).
- Gear lights ON.

ALTERNATOR FAILURE

- Alternator OFF.
- Electrical load REDUCE.
- LOSS OF ELEVATOR IN FLIGHT
- Flaps 20°.
- Speed 104 kts. (Use elevator trim in place of the elevator.)

LOW FUEL WARNING – LANDING POSSIBLE

- Crossfeed DO NOT USE.
- Boost pumps ON.
- Fuel selectors BOTH ON.
- Aircraft—LAND ASAP.

LOW FUEL WARNING – LANDING NOT POSSIBLE

- Maintain COORDINATED FLIGHT.
- Boost pumps ON.
- Power REDUCE for MAX RANGE.
- Determine FUEL QUANTITY.
- Fuel selectors BOTH X-FEED.
- If power loss: FUEL SELECTORS ON (main).
- Aircraft—LAND ASAP.





AIRCRAFT SERVICING AND CONFIGURATION

ACCU-SIM PILOT'S TABLET

Located in the left cockpit pocket, the tablet manages fuel, payload, maintenance, and system monitoring. Click the bezel to access, drag to move, right click to attach to the yoke. Power off to stow.



HOME SCREEN

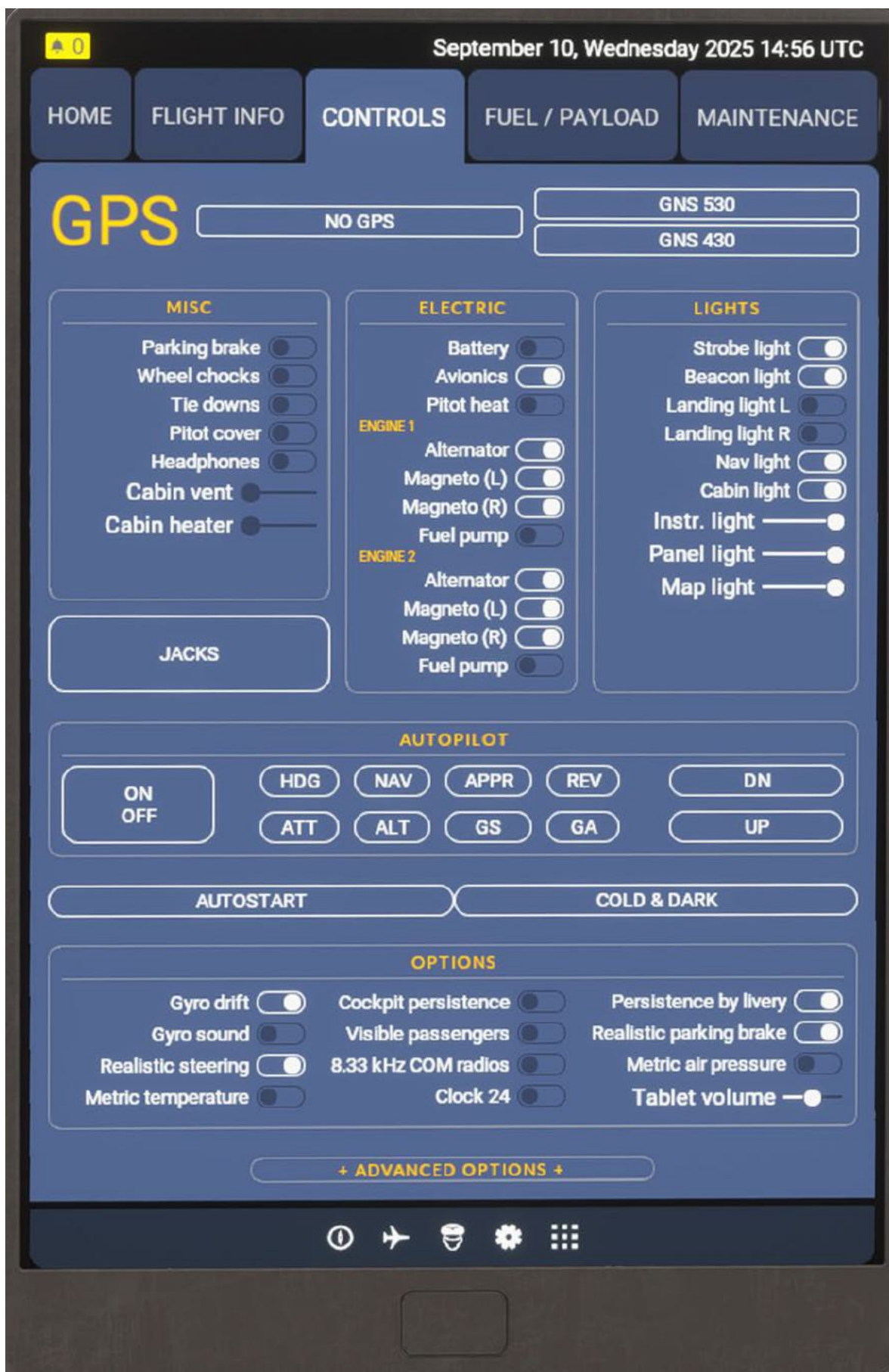
This is the main screen. It will also display any program errors if present.

AIRCRAFT SERVICING AND CONFIGURATION

FLIGHT INFO

General flight information is displayed here, including the altimeter, wind, visibility, outside air temperature, and precipitation. You'll also find estimated performance information, along with complete flight operation and emergency checklists.





CONTROLS

This section provides a convenient place to configure your airplane, including GPS settings, jacks, autostart, and cold-and-dark options. More advanced settings are available at the bottom. All items are self-explanatory.

FUEL AND PAYLOAD

September 10, Wednesday 2025 14:57 UTC

HOME FLIGHT INFO CONTROLS FUEL / PAYLOAD MAINTENANCE

TOTAL WEIGHT: 4918 lbs

Metric units ☐

AIRCRAFT WEIGHTS

Empty weight:	3656 lbs
Max. takeoff weight:	5500 lbs
Max. useful load:	1844 lbs
Max. baggage:	240 lbs

FUEL

Wing tanks capacity:	124 gals
Fuselage tank capacity:	41.5 gals

SPECIFIC LOADINGS

Wing loading:	28.9 lbs/ft ²
Power loading:	17.0 lbs/hp

PAYLOAD WEIGHT: 220 lbs

The diagram shows six seats arranged in two columns of three. SEAT 1 is highlighted in green and labeled with 170 lbs. Below the seats is a yellow box labeled BAGGAGE 50 lbs.

FUEL TOTAL: 165 gals (100%), 993lbs

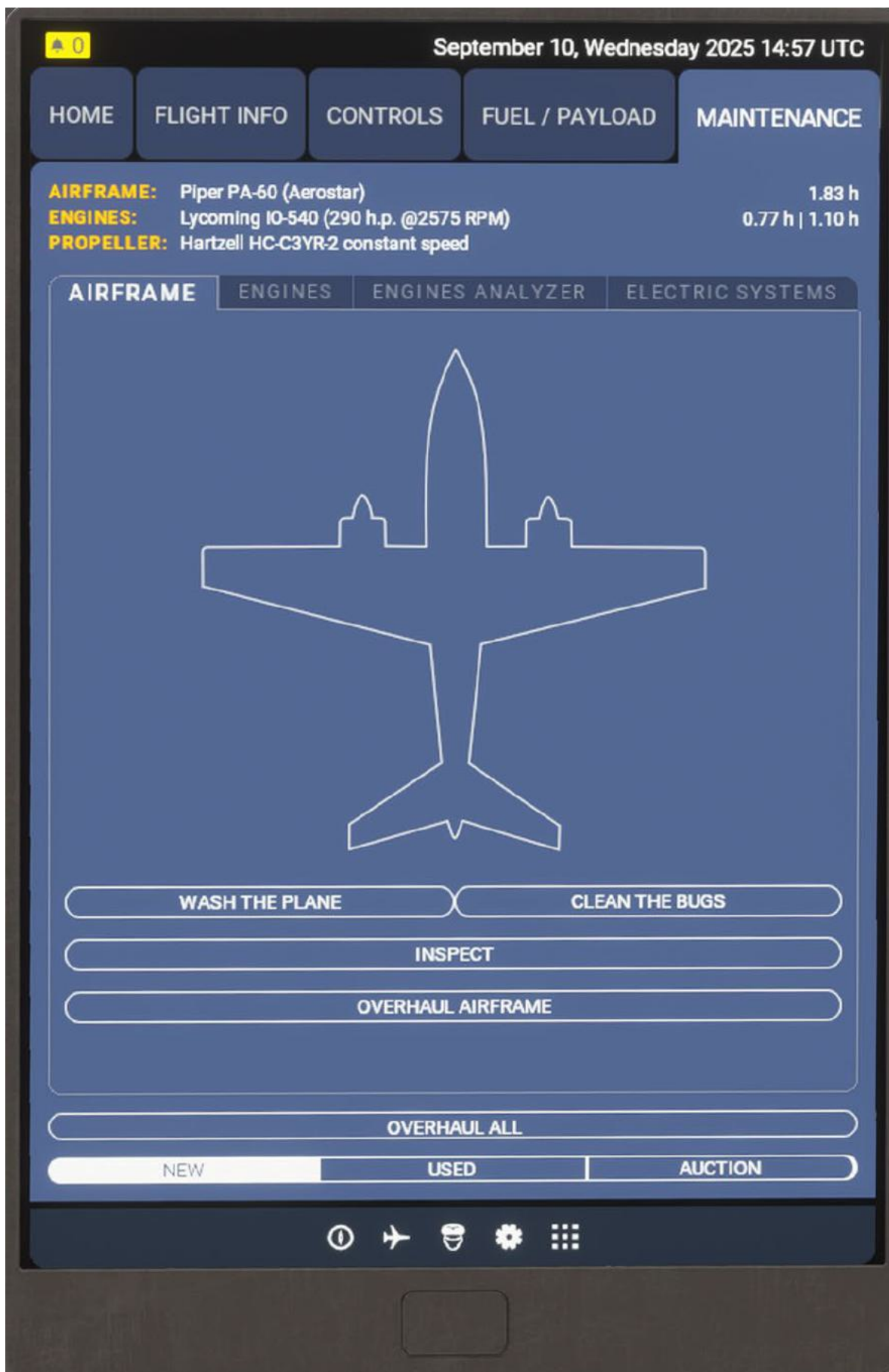
The diagram shows three blue boxes representing fuel tanks: LEFT WING (62 gals), FUSELAGE (42 gals), and RIGHT WING (62 gals).

LIGHT MEDIUM FULL

UPDATE DIGITAL ENGINE MONITOR

FWD limit: 158.3°
CoG: 163.8°
AFT limit: 167.9°

Navigation icons: Home, Flight Info, Controls, Fuel/Payload, Maintenance, Settings, and a grid icon.



MAINTENANCE

This main page allows you to inspect and service the airframe. You can also wash the airplane. At the bottom, you can quickly configure the airplane's overall condition:

- New: All components rebuilt to new condition.
- Used: Typical of the common used market, usually airworthy, but not perfect.
- Auction: More risky; some airplanes may be in poor condition or even unfit for flight.

AIRCRAFT SERVICING AND CONFIGURATION

ENGINES

You can select either engine to inspect and service, as well as adjust oil levels and grades. An oil additive option helps reduce corrosion if you plan not to use your simulator for a few weeks (yes, the airplane ages even while you're away from your computer).

0

September 10, Wednesday 2025 14:57 UTC

HOME

FLIGHT INFO

CONTROLS

FUEL / PAYLOAD

MAINTENANCE

AIRFRAME: Piper PA-60 (Aerostar)

1.83 h

ENGINES: Lycoming IO-540 (290 h.p. @2575 RPM)

0.77 h | 1.10 h

PROPELLER: Hartzell HC-C3YR-2 constant speed

AIRFRAME

ENGINES

ENGINES ANALYZER

ELECTRIC SYSTEMS

1

2

STARTER

CRANKSHAFT

ALTERNATOR

AIR FILTER

FUEL INJECTION

BAFFLING

1

2

3

4

5

6

DRY AIR PUMP

OIL PUMP

FUEL FILTER

ELEC. FUEL PUMP

FUEL LINES

MECH. FUEL PUMP

MAGNETO R.

MAGNETO L.

OIL FILTER

OIL LINES

INSPECT

OIL LEVEL

11 quarts, 89%

OIL GRADE

100AW

20W-50

25W-60

Additive

SPARK PLUGS

MASSIVE

FINE WIRE

CLEAN SPARK PLUGS

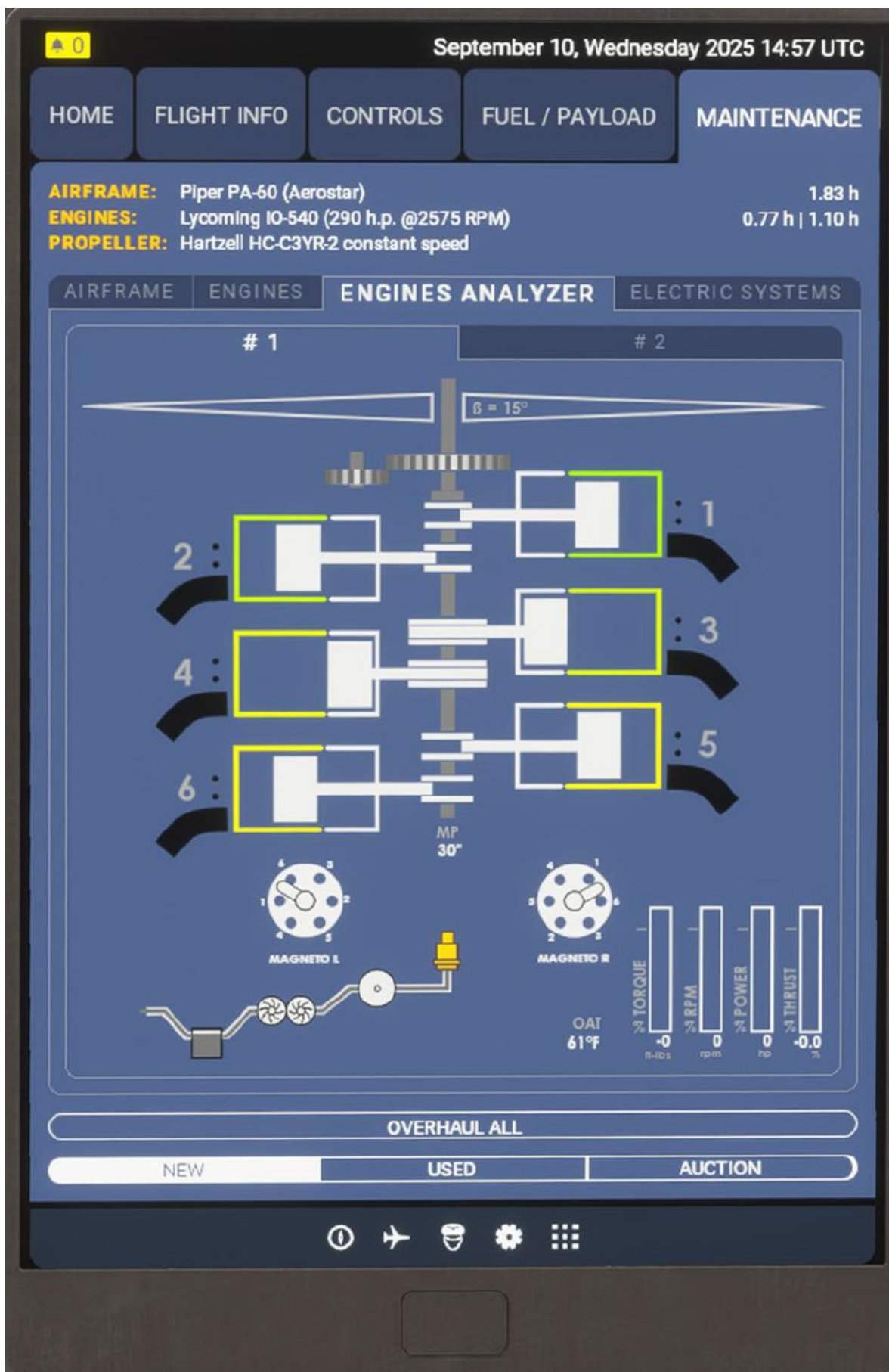
OVERHAUL ENGINE

OVERHAUL ALL

NEW

USED

AUCTION



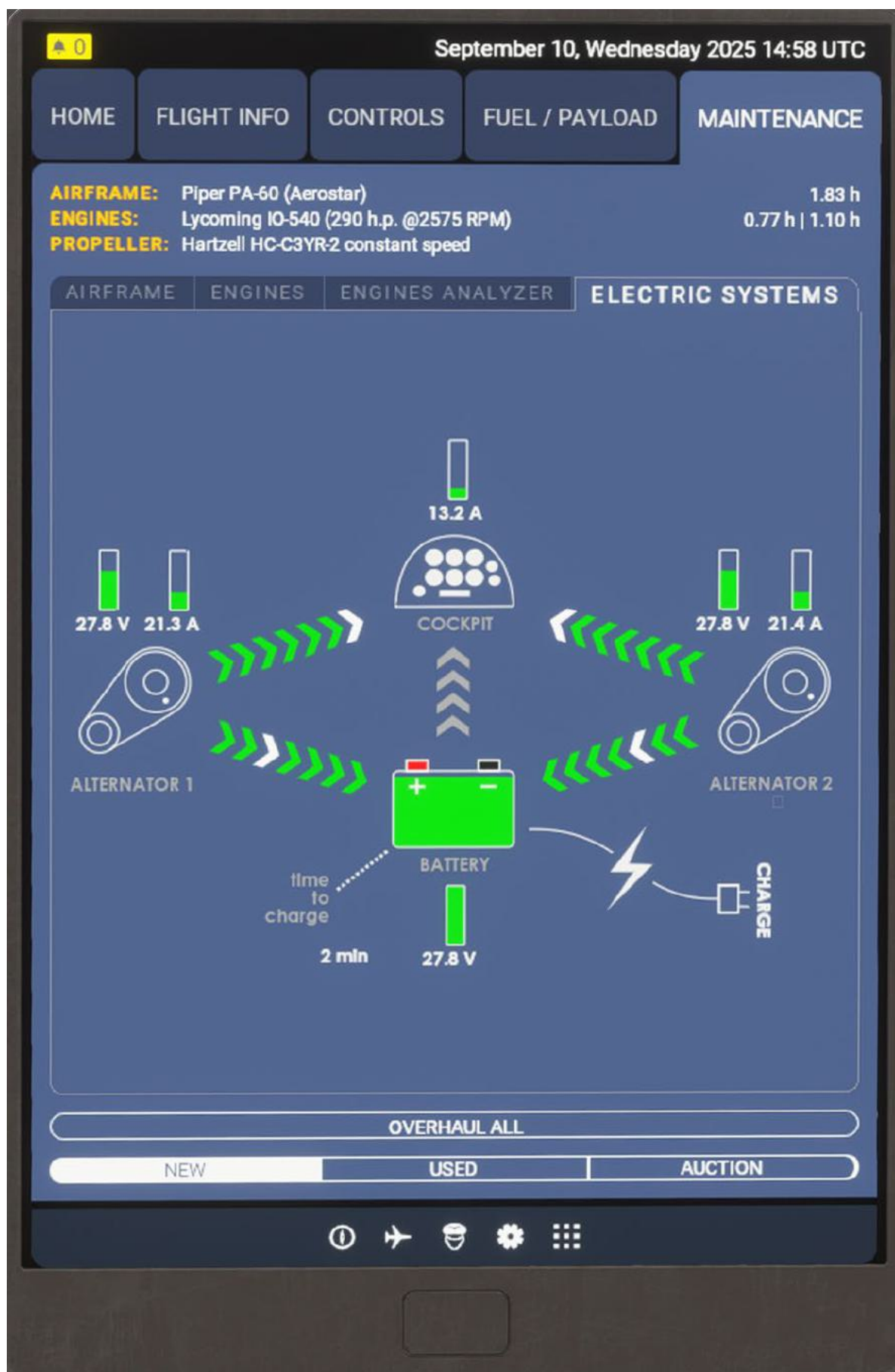
ENGINE ANALYZER

This is an inside view of the engine and its operation. It is mostly for educational purposes but very enjoyable to observe.

AIRCRAFT SERVICING AND CONFIGURATION

ELECTRICAL SYSTEMS

This provides a live look at what is happening in the electrical system. It is both educational and fun.







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Creators of Microsoft Flight Simulator
- **Special Thanks:**
Piper Aerostar community for
reference materials and insights.