PA-28R TURBO ARROW III/IV

OPERATIONS MANUAL

Just Flight™

Also available for Microsoft Flight Simulator 2020/2024

PA-28R ARROW III

PA-28-161 WARRIOR II

RJ PROFESSIONAL

F28 PROFESSIONAL

HAWK T1/A ADVANCED TRAINER

AVRO VULCAN B MK. 2, K.2 & MRR

PA-28R TURBO ARROW III/IV

Operations Manual

Please note that Microsoft Flight Simulator must be correctly installed on your PC prior to the installation and use of this PA-28R Turbo Arrow III/IV simulation.

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INTRODUCTION

The PA-28R Turbo Arrow III and Arrow IV are four-seater, turbocharged piston-engine aircraft equipped with retractable tricycle landing gear and a constant-speed propeller – ideal for touring and instrument training.

The origins of the Arrow start with the Piper Cherokee, which began production in 1961. The Cherokee was introduced as a more affordable alternative to Piper's Comanche and to compete with the popular Cessna 172. Piper introduced the original Cherokee Arrow in 1967 and it was the first of the Cherokee family to feature retractable landing gear. The Arrow II followed in 1972 with a stretched fuselage to provide increased leg room for the rear passengers, and the Arrow III arrived in 1977 with larger fuel tanks for improved range and a semi-tapered wing and longer stabilator for improved low-speed handling.

First available in 1977, the Turbo Arrow III was the first turbocharged variant of the PA-28R Arrow, retaining the conventional tail of the Arrow III and with a new cowling which housed the six-cylinder turbocharged engine. The Turbo Arrow IV followed in 1979 and featured the distinctive T-tail which was common amongst other Piper aircraft.

Over 6,000 PA-28Rs have been built and the Arrow III and IV continue to be flown all around the world.

Aircraft specifications (Arrow IV)

Dimensions

Length	8.3 m (27.3 ft)
Wingspan	10.8 m (35.5 ft)
Height (to top of tail)	2.5 m (8.3 ft)
Wing area	15.8 m^2 (170 ft^2)

Engine

Type	Continental TSIO-360 six cylinder, horizontally opposed, turbocharged piston
Power	200 horsepower (sea level to 12,000 ft)
Propeller	Three-blade, constant-speed, hydraulically actuated

Weights

Empty weight	1,810 lb (821 kg)
Maximum take-off/landing weight	2,900 lb (1,315 kg)
Maximum baggage weight	200 lb (91 kg)
Maximum useful load	1,090 lb (494 kg)

Fuel and oil

Fuel capacity	77 US gallons
Usable fuel	72 US gallons
Oil capacity	8 US quarts

Performance

VNE (never exceed speed)	193 KIAS
VNO (max. cruising speed)	152 KIAS
VA (manoeuvring speed)	124 KIAS (at 2,900 lb) 97 KIAS (at 1,893 lb)
VFE (max. flap speeds)	108 KIAS
VLE (max. gear extension speed)	133 KIAS
VSO (stall speed)	61 KIAS (landing configuration)
Service ceiling	20,000 ft
Range (max. payload)	695 nautical miles

Paint schemes

The Turbo Arrow III is supplied in the following five paint schemes:

- N48427 (USA)
- D-ERMT (Germany)
- G-OBAK (UK)
- HB-PMB (Switzerland)
- VH-LLA (Australia)

The Turbo Arrow IV is supplied in the following five paint schemes:

- D-EAIV (Germany)
- G-BOGM (UK)
- OE-KFT (Italy)
- OK-MAN (Czech Republic)
- N3023K (USA)

INSTALLATION, UPDATES AND SUPPORT

You can install this Arrow III/IV software as often as you like on the same computer system:

1. Click on the 'Account' tab on the Just Flight website.
2. Log in to your account.
3. Select the 'Your Orders' button.
4. A list of your purchases will appear and you can then download the software you require.

Accessing the aircraft

To access the aircraft:

1. Click on 'World Map' (MSFS 2020) or 'Free Flight' (MSFS 2024).
2. Open the aircraft selection menu by clicking on the aircraft thumbnail in the top left.
3. Use the search feature or scroll through the available aircraft to find the 'Piper PA28 Turbo Arrow'.
4. After selecting the aircraft, use the 'Liveries' menu to choose your livery.

Uninstalling

To uninstall this product from your system, use one of the Windows App management features:

Control Panel -> Programs and Features
or
Settings -> Apps -> Apps & features

Select the product you want to uninstall, choose the 'Uninstall' option and follow the on-screen instructions.

Uninstalling or deleting this product in any other way may cause problems when using this product in the future or with your Windows set-up.

Updates and Technical Support

For technical support (in English) please visit the Support pages on the Just Flight website.

As a Just Flight customer, you can get free technical support for any Just Flight or Just Trains product.

If an update becomes available for this aircraft, we will post details on the Support page and we will also send a notification email about the update to all buyers who are currently subscribed to Just Flight emails.

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SYSTEMS GUIDE

Airframe

The PA-28R-201T Turbo Arrow III and PA-28RT-201T Turbo Arrow IV are single-engine, all-metal aircraft with retractable landing gear. They have seating for up to four occupants, a 200-pound luggage compartment and a turbocharged 200 HP engine. The Turbo Arrow IV features the tail surfaces in a 'T' configuration.

The basic airframe is constructed out of aluminium alloy. Aerobatics are prohibited in this aircraft since the structure is not designed for aerobatic loads. The fuselage is a semi-monocoque structure. There is a front door on the right side and a cargo door is installed aft of the rear seat.

The wing is of conventional semi-tapered design and employs a laminar flow NACA 652-415 airfoil section. The main spar is located at approximately 40% of the chord aft of the leading edge. The rear spar, in addition to taking torque and drag loads, provides a mount for flaps and ailerons. The four-position wing flaps are mechanically controlled by a handle located between the front seats. When fully retracted, the right flap locks into place to provide a step for cabin entry. Each wing contains one fuel tank.

A vertical stabiliser, an all-movable horizontal stabilator and a rudder make up the empennage. The stabilator (which is mounted on top of the fin on the Turbo Arrow IV) incorporates an anti-servo tab which improves longitudinal stability and provides longitudinal trim. This tab moves in the same direction as the stabilator but with increased travel.

Fuel system

The fuel system was designed with simplicity in mind. Fuel is contained in two 38.5 US gallon tanks, one in each wing. Of the total 77-gallon capacity, only 72 gallons are usable.

The tanks are attached to the leading edge of the wing with screws and are an integral part of the wing structure.

A fuel tank selector allows the pilot to control the flow of fuel to the engine and is located on the left sidewall below the instrument panel. It has three positions: OFF, LEFT TANK and RIGHT TANK. The arrow on the handle of the selector points to the tank which is supplying fuel to the engine.

Normally fuel is supplied to the engine through an engine-driven fuel pump. An electric fuel pump serves as a back-up feature. The electric fuel pump is controlled by a three-position rocker switch on the switch panel above the engine control quadrant, with LO (low), HI (high) and OFF positions. When the HI (high) auxiliary fuel pump is activated, an amber light near the annunciation panel is illuminated.

In the case of a failed engine-driven fuel pump, the auxiliary electrical fuel pump should be set to HI (high).

The electric fuel pump should be set to LO (low) when switching fuel tanks and during take-offs and landings.

A spring-loaded primer button is located on the instrument panel and is used to select HI (high) auxiliary fuel pump operation for priming, irrespective of other switch operations. The primer button may be used for both hot and cold engine starts.

Fuel quantity and flow/pressure are indicated on gauges on the instrument panel. There is a separate fuel quantity gauge for each tank.

Electrical system

All switches are grouped in a switch panel above the throttle quadrant. The circuit breaker panel is located on the lower right side of the instrument panel. Each breaker is clearly marked to show which circuit it protects.

Standard electrical accessories include alternator, starter, electric fuel pump, stall warning horn, ammeter and annunciator panel.

The annunciator panel includes alternator, low oil pressure, low vacuum indicator and overboost warning lights. The annunciator panel lights are provided only as a warning to the pilot that a system may not be operating properly, and that they should check and monitor the applicable system gauge to determine when or if action is required.

The primary electrical power source is a 14-volt, 60-amp alternator which is protected by an alternator control unit that incorporates a voltage regulator and an over-voltage relay. The alternator provides full electrical power output even at low engine RPM. This provides improved radio and electrical equipment operation and increases battery life by reducing battery load.

Secondary power is provided by a 12-volt, 35-ampere-hour battery. The ammeter as installed does not show battery discharge; rather it shows the electrical load placed on the system. With all the electrical equipment off, and the battery master (BATT MASTR) and alternator (ALT.R) switches on, the ammeter will indicate the charging rate of the battery. As each electrical unit is switched on, the ammeter will indicate the total ampere draw of all the units, including the battery. For example, the average continuous load for night flying with radios on is about 30 amperes. The 30 ampere value plus 2 amperes for charging the battery will then show on the ammeter, indicating the alternator is functioning properly.

Vacuum system

The vacuum system is designed to operate the air-driven gyro instruments. This includes the directional and attitude gyros when installed.

The system consists of an engine vacuum pump, a vacuum regulator, a filter and the necessary plumbing. The vacuum gauge, mounted on the left instrument panel, provides valuable information to the pilot about the operation of the vacuum system. A decrease in pressure, or zero pressure, over an extended period may indicate a problem with the vacuum system.

A vacuum regulator is provided in the system to protect the gyros. The valve is set so the normal vacuum reads 4.8 to 5.1 inches of mercury, a setting which provides sufficient vacuum to operate all the gyros at their rated RPM.

Pitot-static system

The system supplies both pitot and static pressure for the airspeed indicator, altimeter and vertical speed indicator.

Pitot pressure is picked up by the pitot head on the bottom of the left wing. The switch for pitot heat is located on the switch panel. Static pressure is sensed by button-type vents on each side of the aft fuselage. Push-button-type pitot and static drains are located on the lower left sidewall of the cockpit.

Lighting system

Lights fitted to the aircraft include navigation, anti-collision, landing, instrument panel and cabin dome lights. The Turbo Arrow III is fitted with a tail-mounted beacon light.

The navigation lights are controlled by a rheostat switch on the main switch panel.

Panel lights are controlled by rheostat switches located below and to the right of the pilot's yoke, adjacent to the engine instruments.

A light mounted in the overhead panel provides instrument and cockpit lighting for night flying. The light is controlled by a rheostat switch located adjacent to the light.

The anti-collision and landing lights are controlled by rocker switches on the main switch panel.

Instrument markings

Airspeed indicator markings

MARKING	KIAS VALUE OR RANGE	SIGNIFICANCE
White arc	61-108	Full flap operating range. Lower limit is maximum weight VSO in landing configuration. Upper limit is maximum speed permissible with flaps extended.
Green arc	66-152	Normal operating range. Lower limit is maximum weight VS1 with flaps retracted. Upper limit is maximum structural cruising speed.
Yellow arc	152-193	Operations must be conducted with caution and only in smooth air.
Red line	193	Maximum speed for all operations.

Engine indicator markings

INSTRUMENT	Red line or arc Minimum limit	Yellow arc Caution range	Green arc Normal operating	Red line Maximum limit
Tachometer	----------	----------	500-2,575 RPM	2,575 RPM
Oil temperature	----------	----------	100-240°F (38-116°C)	240°F (116°C)
Fuel pressure Fuel flow	----------	----------	3.5-19 PSI 0-24 gal/hr	19 PSI 24 gal/hr
Oil pressure	10 PSI	10-30 PSI (idle) and 80-100 PSI (start/warm-up)	30-80 PSI	100 PSI
Vacuum gauge	----------	----------	4.8-5.1 inHg	6.0 inHg
Manifold pressure	----------	----------	10-41 inHg	41 inHg

Limits

Weight limits

Maximum weight: 2,900 lb (1,315 kg)

Maximum weight in baggage compartment: 200 lb (91 kg)

Centre of gravity limits

Weight (lb)	Forward limit Inches aft of datum	Rearward limit Inches aft of datum
2,900	89.0	93.0
2,400 and below	85.0	93.0

The datum used is 78.4 inches ahead of the wing leading edge at the intersection of the straight and tapered section.

Manoeuvre limits

This aircraft is certificated in the normal category. The normal category is applicable to aircraft intended for non-aerobatic operations. These include any manoeuvres incidental to normal flying, stalls (except whip stalls), lazy eights, chandelles and steep turns in which the angle of bank is no more than 60° and pitch is no more than 30°.

Aerobatic manoeuvres, including spins, are not approved.

Flight load factor limits

Positive load factor (maximum): + 3.8 G

Negative load factor (maximum): No inverted manoeuvres approved

Types of operation

The aircraft is approved for the following operations:

- Day VFR
- Night VFR
- Day IFR
- Night IFR
- Non-icing

This simulation includes support for the MSFS visual icing system. Ice build-up will be visible on the windows, propeller, engine cowling and leading edge surfaces. Take immediate action in the event of icing.

Fuel limitations

Total capacity: 77 US gallons

Unusable fuel: 5 US gallons (2.5 gallons per wing tank)

Usable fuel: 72 US gallons (36 gallons per wing tank)

Landing gear

The Turbo Arrow is equipped with retractable tricycle landing gear which is hydraulically actuated by an electrically powered reversible pump. The pump is controlled by a selector switch on the instrument panel, to the left of the control quadrant. The landing gear is retracted or extended in about seven seconds.

For emergency gear extension, the emergency gear lever, located between the front seats to the left of the flap handle, must be in the down position to manually release hydraulic pressure and permit the gear to freefall. The nose gear is spring-assisted.

The aircraft is fitted with an automatic gear extension system. The system automatically extends the landing gear when engine power is reduced with the airspeed at or below approximately 87 KIAS. The system is triggered by differential air pressure sensed by a static source mast on the left side of the fuselage.

The emergency gear lever can also be used to override the automatic gear extension system. The lever has three positions:

- **UP** – automatic extension system overridden. Used for situations such as take-off, practising stalls and low speed handling, and for maximising glide ratio. AUTO EXT OFF light flashes.
- **MID** – automatic extension system enabled. Landing gear will automatically extend when power is reduced below 14 inches of manifold pressure and airspeed drops below 87 KIAS.
- **DOWN** – push down for manual emergency gear extension when below 87 KIAS.

Gear down and locked positions are indicated by three green lights located to the left of the selector. A red WARNING GEAR UNSAFE light, located at the top of the panel, illuminates while the gear is in transit, or not in the fully up or locked down position. An all lights out condition indicates that the gear is up. The landing gear should not be retracted above a speed of 111 KIAS and should not be extended above a speed of 133 KIAS.

A microswitch in the throttle quadrant activates a warning horn and red WARNING GEAR UNSAFE light under the following conditions:

a. Gear up and power reduced below approximately 14 inches of manifold pressure, or automatic extension triggered and gear handle in UP position.

b. Gear selector switch UP while on the ground and throttle in retarded position.

c. Whenever the flaps are extended beyond the approach position (10°) and the landing gear is not down and locked.

The gear warning horn emits a 90Hz beeping sound, in contrast to the stall warning horn which emits a continuous sound.

The nose gear is steerable through a 30-degree arc each side of centre by use of the rudder pedals. As the nose wheel retracts, the steering linkage disengages to reduce rudder pedal loads in flight. The nose wheel is equipped with a hydraulic shimmy damper to reduce nose wheel shimmy. A bungee assembly is also included to reduce ground steering effort and to dampen shocks and bumps during taxiing.

The standard brake system includes toe brakes on the left and right set of rudder pedals and a hand brake located below and near the centre of the instrument panel. The toe brakes and the hand brake have individual brake cylinders, but all cylinders use a common reservoir. The parking brake is incorporated in the lever brake and is operated by pulling back on the lever and depressing the knob attached to the top of the handle. To release the parking brake, pull back on the brake lever and then allow the handle to swing forward.

Doors and exits

The aircraft is fitted with a passenger door and a baggage door.

The passenger door can be opened from within the virtual cockpit by clicking on the two door latches to rotate them to the OPEN position and then clicking on the door armrest to push it open. It can be closed by clicking on the door armrest to pull it closed and then clicking on the two door latches to rotate them to the LATCH position.

Note: *If both latches are not rotated to the LATCH position, the passenger door will not shut fully and significant wind noise will enter the cabin at higher airspeeds.*

The passenger, baggage and engine inspection (oil) doors can be opened/closed using the ‘Doors’ controls on the EFB.

Flight controls

Dual flight controls are provided as standard equipment. A cable system provides actuation of the control surfaces when the flight controls are moved. The horizontal surface (stabilator) features a trim tab/servo mounted on the trailing edge. This tab serves the dual function of providing trim control and pitch control forces.

The trim function is controlled by a trim control wheel located on the control console between the two front seats. Rotating the wheel forward gives nose-down trim and rotation aft gives nose-up trim.

The rudder is conventional in design and incorporates a rudder trim. The trim mechanism is a spring-loaded recentring device. The trim control is located on the right side of the pedestal below the throttle quadrant. Turning the trim control clockwise results in nose-right trim and anti-clockwise rotation results in nose-left trim.

Manually controlled flaps are provided. They are extended by a control cable and are spring-loaded to the retracted (up) position. The control is located between the two front seats on the control console. To extend the flaps, pull the handle up to the desired flap setting of 10, 25 or 40 degrees. To retract, depress the button on the end of the handle and lower the control.

The aircraft will experience a pitch change during flap extension or retraction. This pitch change can be corrected by either stabilator trim or increased control wheel force. When the flaps are in the retracted position the right flap, provided with an over-centre lock mechanism, acts as a step.

Engine

The Turbo Arrow is powered by a six-cylinder, horizontally opposed, fuel-injected, turbocharged engine, rated at 200 horsepower at 2,575 RPM and 41 inches MAP from sea level to 12,000ft density altitude. It is equipped with an oil cooler and engine-mounted oil filter.

The turbocharger control system is a fixed orifice (fixed wastegate), adjusted to provide 41 inches MAP at full throttle at 12,000ft density altitude. Throttle positions control engine power and no separate turbocharger control system is utilised. An overboost valve prevents manifold pressure from exceeding 42 inHg should the throttle be opened too far below 12,000ft. Should this occur, the amber ‘overboost’ warning light in the annunciator panel will illuminate.

A turbocharger on the engine is operated by engine exhaust gases, which drive a turbine wheel which is coaxial with a compressor wheel. Induction air entering the compressor wheel is compressed and delivered to each engine cylinder.

The engine is fitted with a starter, 60-ampere 14-volt alternator, ignition, vacuum pump drive, fuel pump, propeller governor and an induction air filter.

The aircraft is equipped with a constant speed, controllable-pitch propeller. The propeller control is located on the throttle quadrant between the throttle and mixture controls. A mixture control lock is provided to prevent activation of the mixture control instead of the pitch control. Left-click on the lock to disengage or engage it, or use the spoiler toggle assignment (/). With the lock engaged, the mixture lever cannot be moved below approximately 40%.

An oil cooler is located on the forward lower right side of the firewall, with the air inlet for the cooler located on the right side of the bottom cowling.

Engine controls

The engine controls consist of a throttle control, a propeller control and a mixture control lever. These controls are located on the control quadrant on the lower centre of the instrument panel, where they are accessible to both the pilot and the co-pilot.

The throttle lever is used to adjust the manifold pressure. It incorporates a gear-up warning horn switch which is activated during the last portion of travel of the throttle lever to the low power position. If the landing gear is not locked down, the horn will sound until the gear is down and locked or until the power setting is increased. This is a safety feature to warn of an inadvertent gear-up landing.

The propeller control lever is used to adjust the propeller speed from high RPM to low RPM.

The mixture control lever is used to adjust the air-to-fuel ratio. The engine is shut down by placing the mixture control lever in the fully lean position. In addition, the mixture control has a lock to prevent activation of mixture control instead of pitch control.

The alternate air control is located to the right of the control quadrant. When the alternate air lever is in the up (closed) position, the engine is operating on filtered air. When the lever is in the down (open) position, the engine is operating on unfiltered, heated air.

Engine instruments

Indicators enable the pilot to check oil pressure, oil temperature, tachometer, manifold pressure, fuel flow and EGT. The engine instruments are located on the mid and lower portions of the left panel and the lower portion of the right panel.

Ignition and starter system

Engine ignition is provided by a dual magneto on two spark plugs per cylinder. Ignition is controlled by a key-operated rotating selector on the lower left portion of the left panel. The selector operates clockwise, with right, left, left/right and start positions.

Induction system

The induction system incorporates a fuel injector. The injector is based on the principle of differential pressure, which balances air pressure against fuel pressure. The regulated fuel pressure established by the servo valve when applied across a fuel control makes the fuel flow proportional to air flow.

The fuel flow portion of the manifold pressure/fuel flow gauge is connected to a flow divider and monitors fuel pressure. This instrument converts fuel pressure to an indication of fuel flow in gallons per hour and percentage of rated horsepower.

The alternate air source of the induction system contains a door that functions automatically or manually. If the primary source is obstructed, the door will open automatically. It may be opened manually by moving the selector on the right side of the quadrant. The primary source should always be used for take-off.

Stall warning system

An approaching stall is indicated by a stall warning horn which is activated between five and ten knots above stall speed. Mild airframe buffeting and gentle pitching may also precede the stall. Stall speeds are shown on graphs in the OPERATING DATA MANUAL.

The stall warning horn emits a continuous sound, in contrast to the gear warning horn which emits a 90Hz beeping sound. The stall warning horn is activated by a lift detector installed on the leading edge of the left wing. The battery master (BATT MASTR) switch must be ON for the stall warning system to function.

Propeller

The aircraft is fitted with an all-metal, three-blade, constant-speed, governor-regulated propeller. The propeller control actuates on the governor. According to the control position, the governor determines propeller rotation speed and thus the engine speed to be maintained. The governor controls the flow of engine oil, boosted to high pressure by the governing pump, onto a piston located in the propeller hub. Oil pressure twists the blades toward high pitch (low RPM). When oil pressure to the piston is relieved, the blades twist to low pitch (high RPM).

PANEL GUIDE

The instrument panel is designed to accommodate the customary advanced flight instruments and the normally required power plant instruments.

The altitude and directional gyros, located in the centre of the left-hand instrument panel, are vacuum-operated. The vacuum gauge is located on the right-hand instrument panel. The turn indicator on the left side is electrically operated.

The radios are located in the centre section of the panel and the circuit breakers are in the lower right corner of the panel.

An annunciator panel is mounted in the upper instrument panel to warn the pilot of a possible malfunction in the alternator, oil pressure or vacuum systems, or operation of the overboost valve.

Additional features include a pilot storm window and two sun visors.

A large baggage area, located behind the rear seats, is accessible either from the cabin or through a large outside baggage door on the right side of the aircraft. It is the pilot's responsibility when baggage is loaded to be sure that the aircraft's centre of gravity falls within the allowable CG range.

Left main panel

1. Vacuum gauge
2. Airspeed indicator (ASI) – a true airspeed indicator is incorporated into the airspeed indicator. The true airspeed indicator consists of a rotatable ring which is controlled using the knob located below the ASI. To set the indicator, rotate the ring until the pressure altitude is aligned with the outside air temperature (OAT). To obtain the pressure altitude, set the barometric scale of the altimeter to 29.92 inHg / 1013.2 hPa and then read the pressure altitude. With the ring set, the true airspeed can be read along the bottom scale.
3. Attitude indicator (AI) – a pitch reference knob allows for the pitch bars (aircraft symbol) position to be adjusted nose-up or nose-down.
4. Gear unsafe warning light – illuminates while the gear is in transit, or not in the fully up or locked down position. Refer to the Landing gear section of this manual for more information.
5. Starter engaged light
6. Altimeter – a barometric pressure scale is provided for hPa/mb or inHg, depending on which unit of measurement is currently active in the simulator settings.
7. Annunciator press-to-test button – press to test annunciator lights
8. Annunciator lights
9. VOR 1 / ILS indicator – driven by KX 170B (or GNS 530/GTN 750 if installed)
10. Low voltage warning light
11. Primer button
12. ADF indicator – driven by KR 85 ADF system. HDG knob controls rotation of the compass card.
13. Turn and bank indicator
14. Direction indicator or horizontal situation indicator
15. Vertical speed indicator (VSI)
16. VOR 2 indicator – driven by KX 175B (or GNS 430 / GTN 650 if installed)
17. NAV/GPS source switch – controls which source is used by the HSI, VOR 1 / ILS indicator and autopilot

Direction indicator

The caging knob (bottom left) controls the rotation of the compass card. The HDG knob (bottom right) controls the heading bug.

Horizontal situation indicator

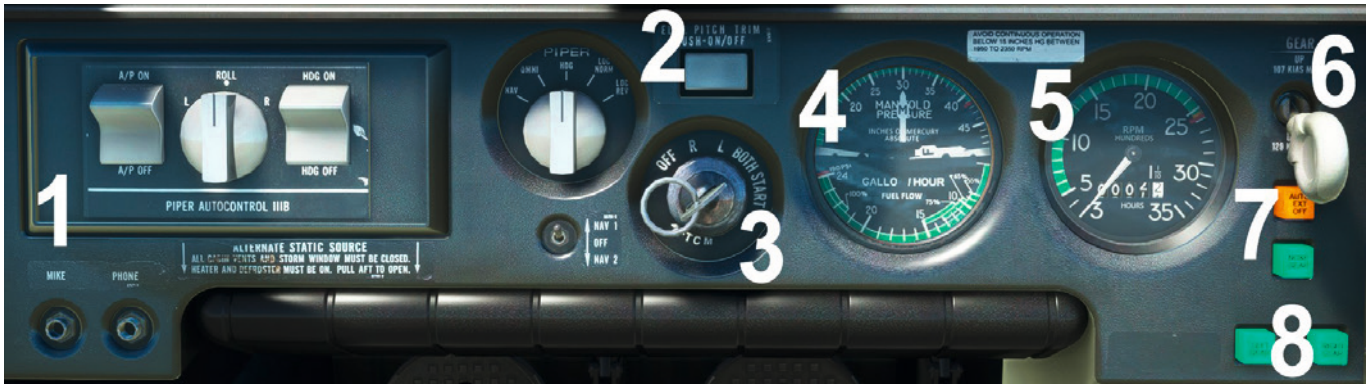
This is driven by the KX 170B (or GNS 530/GTN 750 if installed).

The course knob (bottom left) controls the rotation of the course pointer. The HDG knob (bottom right) controls the heading bug.

Left mid panel

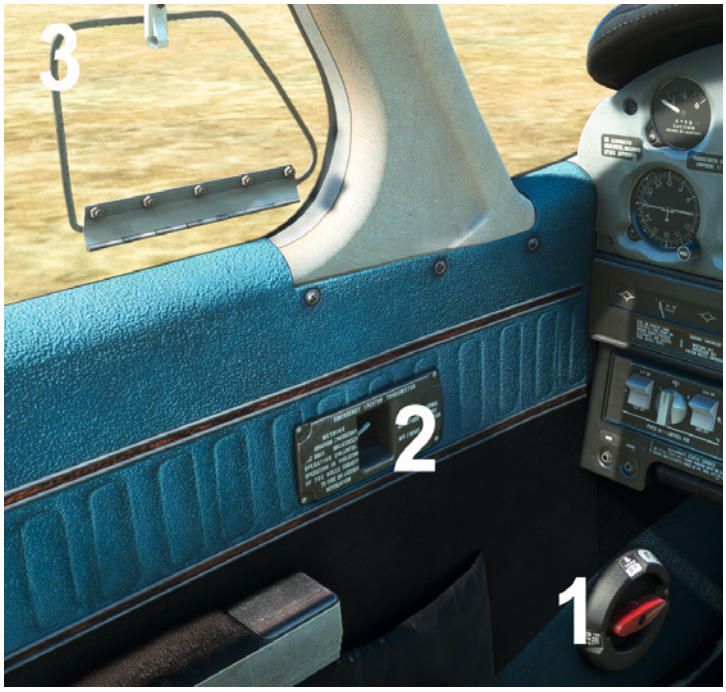
1. Oil pressure indicator
2. Oil temperature indicator
3. Ammeter
4. Yoke toggle click-spot (same location on right yoke)
5. Left fuel tank quantity indicator
6. Fuel pressure indicator
7. Right fuel tank quantity indicator

Left lower panel



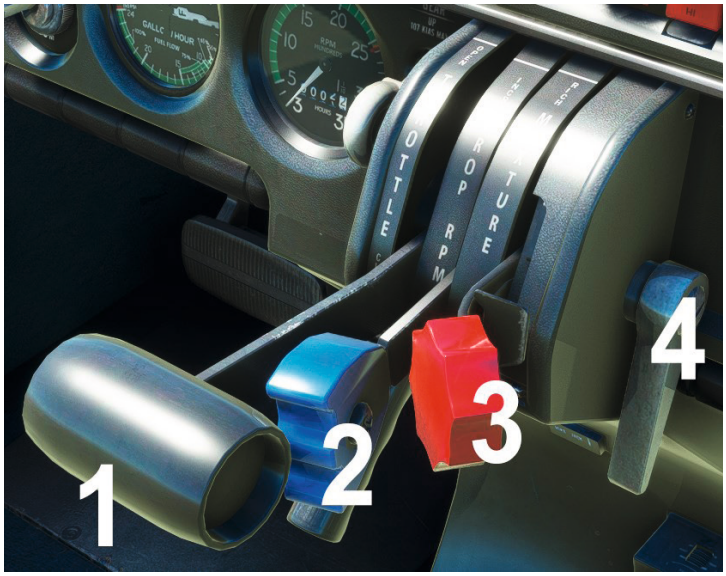
1. Autopilot controls – refer to the AUTOPILOT section for more information.
2. Electric pitch trim push-button – push in to enable the electric pitch trim (rocker switch located on yoke).
3. Magneto/start selector
4. Manifold pressure (inHg) and fuel flow / fuel pressure (gallons per hour / PSI)
5. Tachometer (RPM)
6. Landing gear lever
7. Automatic gear extension warning light
8. Gear position lights

Left sidewall



1. Fuel tank selector
2. Emergency locator transmitter switch
3. Storm window (note that the latch must be moved prior to opening/closing the window)

Throttle quadrant

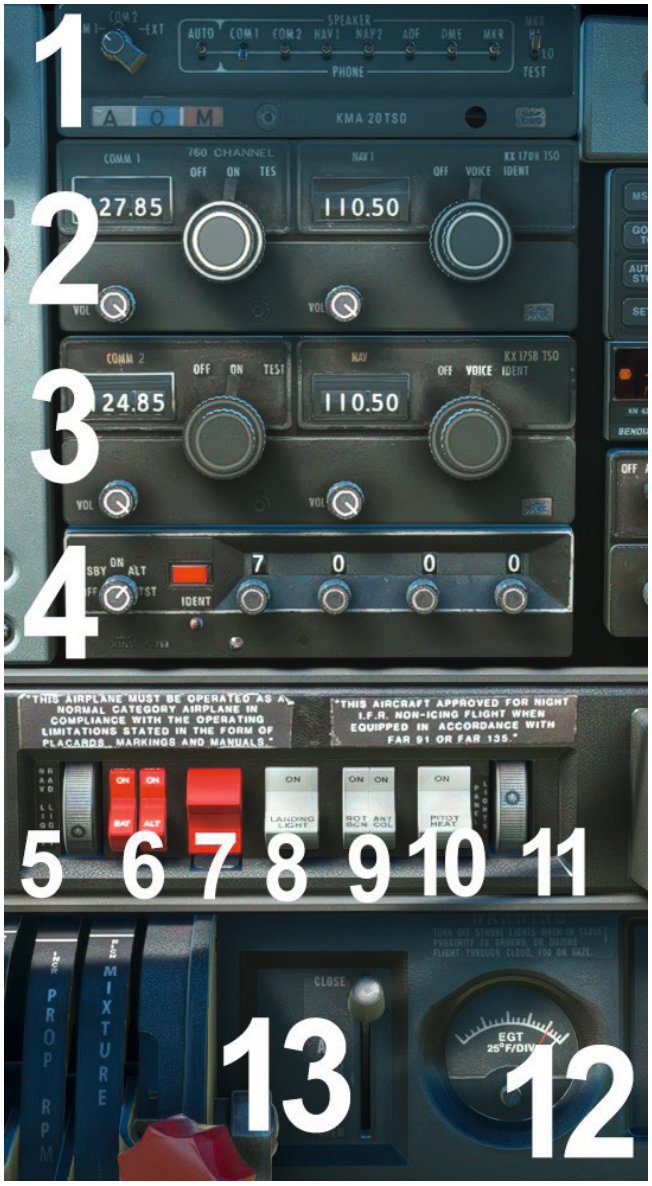


1. Throttle lever
2. Propeller control lever
3. Mixture lever – the mixture lever is fitted with a lock. Left-click on the lock to disengage or engage it. The lock must be disengaged before the lever can be moved below 40%.
4. Friction control

Right panel

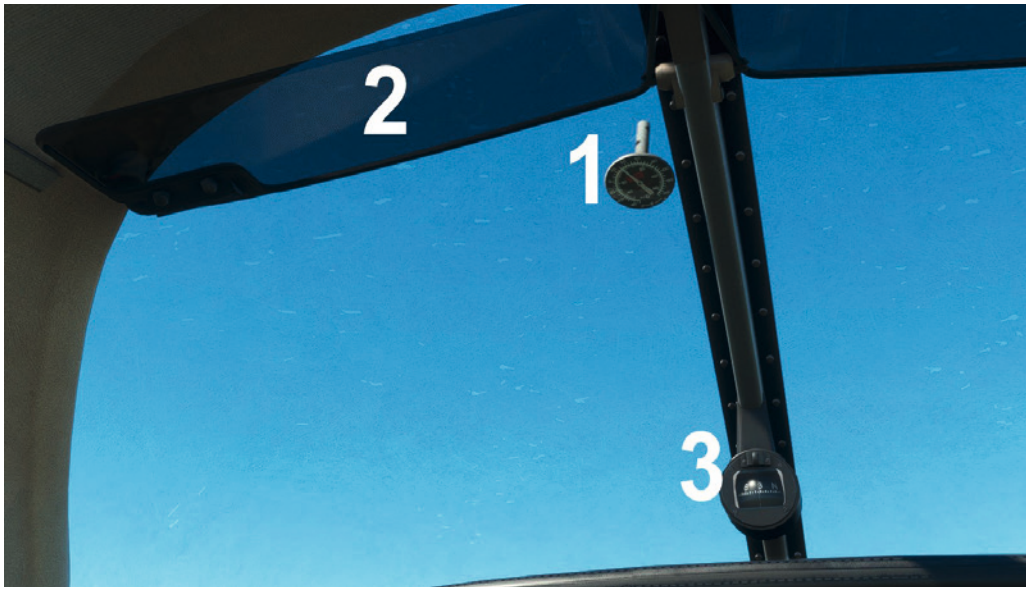
1. Intercom switch – controls visibility of the EFB.
2. DME selector switch – selects whether the KX 170B (or GNS 530/GTN 750 if installed) or KX 175B is used as the input to the KN 62.
3. GPS 100
4. KN 62A DME
5. KR 85 ADF
6. Standby altimeter – a barometric pressure scale is provided for hPa/mb. The pressure setting knob tooltip displays the currently selected pressure in hPa/mb or inHg, depending on which unit of measurement is currently active in the simulator settings.
7. DATCON hour meter
8. Heating control levers
9. Fan control switch
10. Circuit breaker panel

Centre panel



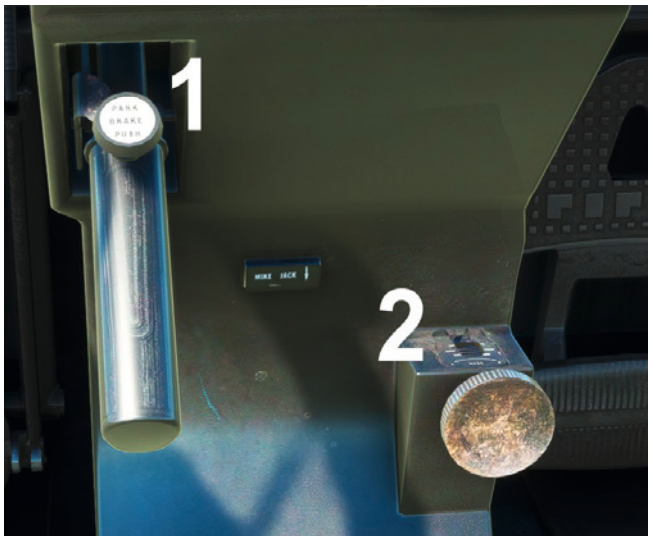
1. KMA 20 audio selector
2. KX 170B COM 1 / NAV 1 radio
3. KX 175B COM 2 / NAV 2 radio
4. KT 76A transponder
5. Navigation and radio light switch
6. Battery master and alternator switches
7. Fuel pump switch
8. Landing light switch
9. Rotating beacon (Turbo Arrow III only) and anti-collision lights switches
10. Pitot heat switch
11. Panel lights switch
12. Exhaust gas temperature (EGT) indicator – rotate screw to control the position of the red (maximum value) needle.
13. Alternate air control lever

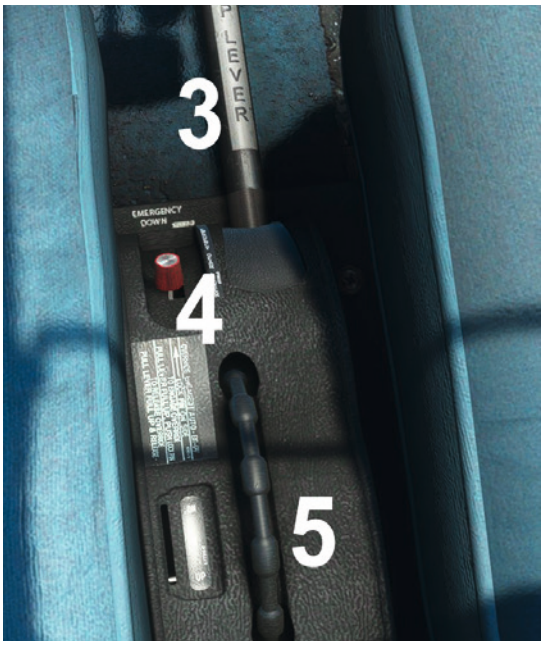
Upper cockpit



1. Outside air temperature indicator
2. Sun visors
3. Whiskey compass

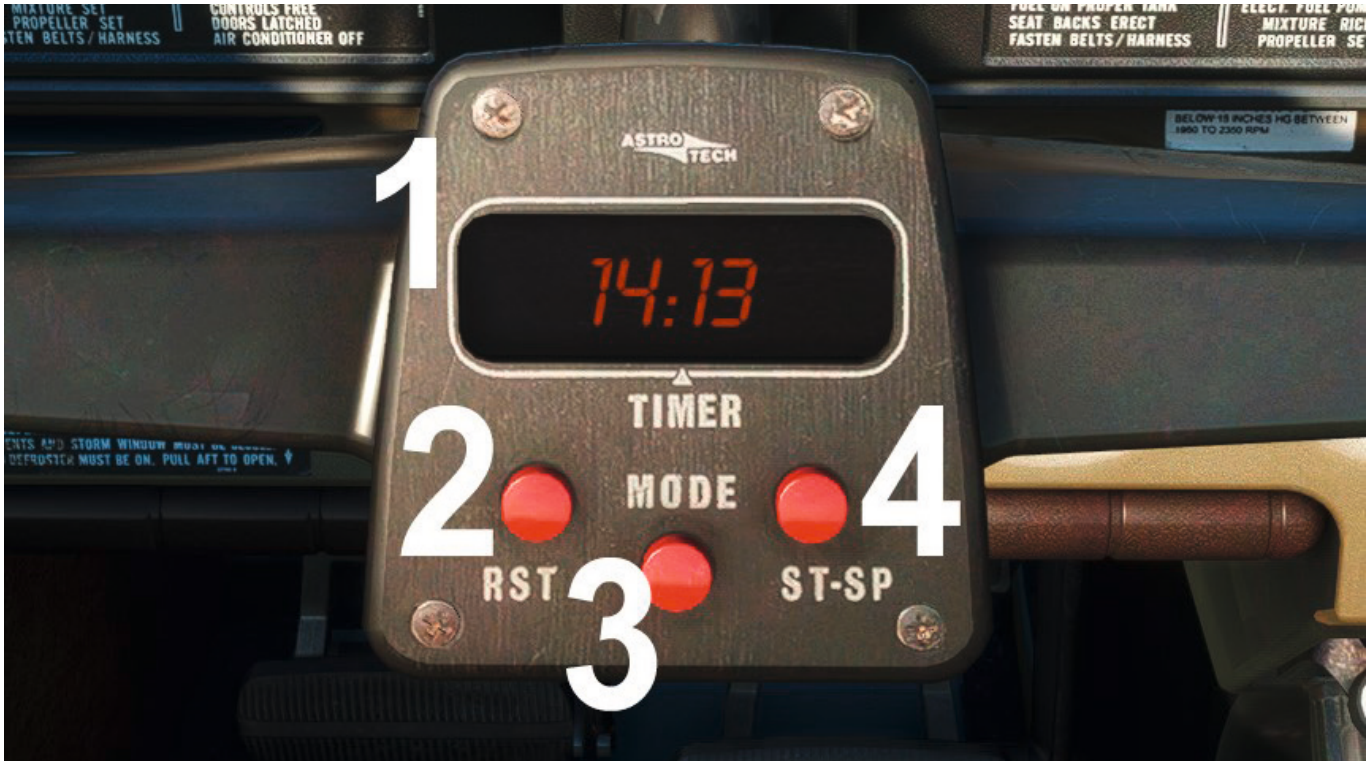
Lower cockpit





1. Parking brake handle
2. Rudder trim knob and indicator – turning the trim control clockwise results in nose-right trim and anti-clockwise rotation results in nose-left trim.
3. Flap lever
4. Emergency gear lever – refer to the Landing gear section for more information.
5. Elevator trim wheel and indicator – rotating the wheel forward gives nose-down trim and rotation aft gives nose-up trim.

Yoke timer



1. Timer display
2. Reset button
3. Mode button
4. Start/stop button

The yoke is fitted with a digital chronometer. The mode button allows you to toggle between either clock mode or timer mode.

With timer mode selected, the start/stop and reset buttons can be used to control the timer. Press the reset (RST) button so that the time reads zero and then press the start/stop (ST-SP) button to start and stop the timer. The timer will count in minutes and seconds until 59 minutes and 59 seconds, at which point the timer will change to count in hours and minutes.

With clock mode selected, the current local time will be shown in hours and minutes.

KMA 20 – audio selector

1. Microphone selector switch
2. AUTO switch
3. Receiver selector switches
4. Marker beacon sensitivity and lamp test switch
5. Marker beacon lights

The KMA 20 is an audio control system which provides control over transceiver and receiver outputs through the use of selector switches.

The COM 1 and COM 2 switches are used to toggle the COM 1 and COM 2 transceiver audio, allowing you to select COM 1 and/or COM 2 as the audio sources to monitor.

The NAV, DME, MKR and ADF switches are used to toggle the associated audio sources.

When the AUTO switch is placed in either the SPEAKER or PHONE position, the unit will automatically match the corresponding receiver audio with the selected transmitter. For example, with COM 1 selected on the microphone selector knob, the COM 1 audio source will be automatically enabled.

The microphone selector knob connects the microphone to the selected output.

KX 170B – COM 1 / NAV 1 radio

1. COM 1 frequency display
2. COM 1 power/test switch
3. COM 1 frequency selector knobs
4. COM 1 volume knob
5. NAV 1 frequency display
6. NAV 1 power/mode switch
7. NAV 1 frequency selector knobs
8. NAV 1 volume knob

The KX 170B is a very simple COM/NAV radio and acts as COM 1 / NAV 1 in the Arrow.

COM controls

Rotate the power/test switch to the ON position. Turn up the volume using the volume knob and then rotate the concentric selector knobs to tune in a COM frequency.

The COM radio will operate with either ON or TEST selected.

NAV controls

Rotate the power/mode switch to the VOICE position. Turn up the volume using the volume knob and then rotate the concentric selector knobs to tune in a NAV frequency.

Rotate the power/mode switch to the IDENT position to hear the audio identifier.

KX 175B – COM 2 / NAV 2 radio

The KX 175B is identical in operation to the KX 170B and acts as COM 2 / NAV 2 in the Arrow.

KT 76A – transponder

1. Function selector knob
2. Reply light
3. Identification push-button
4. Code windows
5. Code knobs

Operating the KT 76A

The function selector knob should be in the OFF position before starting the aircraft's engine. Select the required reply code by rotating the four code knobs (one per code digit). The code will be displayed in the four code windows.

After starting the engine, turn the function selector to standby (SBY). The transponder will take approximately 45-50 seconds to become operational. Once airborne, turn the function selector to ON, enabling normal Mode A operation.

Turn the function selector to the altitude (ALT) position for altitude reporting (Mode C) to ATC.

Important codes

7700: Emergency

7600: Communications failure

7500: Hijacking

0000: Reserved for military aircraft

Squawk ident

When you are asked to ident by ATC, press and release the ident push-button. Your aircraft will be positively identified to the air traffic controller.

Reply light

During normal operation, the reply light will flash to indicate that the KT 76A is functioning properly and replying to interrogations from ground radar. Interrogations occur at 10-15 second intervals, corresponding to each radar sweep.

GPS 100 – GPS unit

1. MSG – selects the messages page
2. GOTO key – selects the go-to page
3. ON/OFF key – controls power to the unit
4. RTE key – selects the active route page
5. WPT key – cycles through the nearest pages (intersection, airport, VOR and NDB)
6. NAV key – cycles through the navigation pages (CDI, present position, density altitude/TAS, winds aloft and fuel plan)
7. Arrow keys
8. CLR key
9. ENT key

The GPS 100 unit is a basic unit by modern standards. This simulation features several ‘pages’ which display a range of information related to your aircraft’s position and GPS flight plan, if loaded.

The front panel consists of a 3-line, 22-character LCD display.

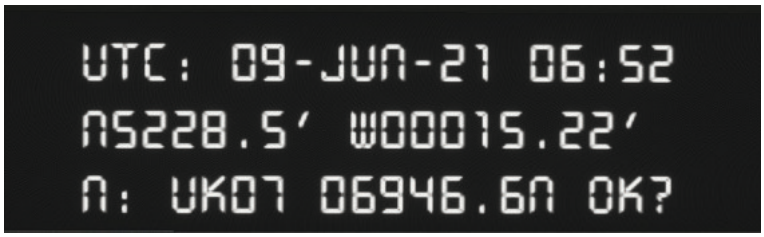
The GPS can be turned on/off using the OFF/ON key.

Self-test page

The first page to be displayed is the self-test page. The unit will carry out a self-test which should take a couple of seconds.

The initialisation page will then be displayed.

Initialisation page



The initialisation page shows the current UTC time and date, latitude and longitude, nearest airport, and the bearing and distance (in nautical miles) to that airport.

Satellite status page

Press the ENT (enter) key to bring up the satellite status page. The GPS will go through the process of acquiring satellites.

The receiver status is shown in the top left of the page:

SEARCH SKY – the GPS 100 is in the process of searching the sky for visible satellites.

ACQUIRING – the GPS 100 is in the process of acquiring visible satellites.

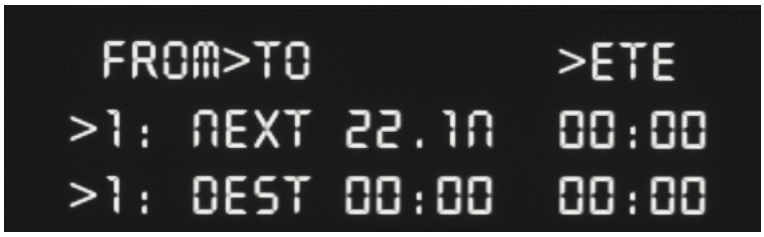
3D NAV – the GPS 100 is acquiring enough satellites to begin navigation.

Note: *The GPS 100 will only display navigation information when the status is 3D NAV.*

The estimated position error (in feet) is shown in the top right of the page and this will decrease as more satellites are acquired.

The unique ID character for each of the satellites is shown on the second line and the signal strength (from 0 to 9) is shown on the third line.

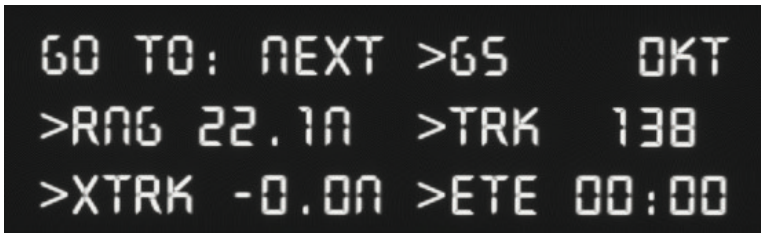
Active route page



The active route page shows information regarding the GPS flight plan (if one is loaded):

- Distance (nautical miles) and estimated time en route to the next flight plan waypoint
- Distance (nautical miles) and estimated time en route to destination

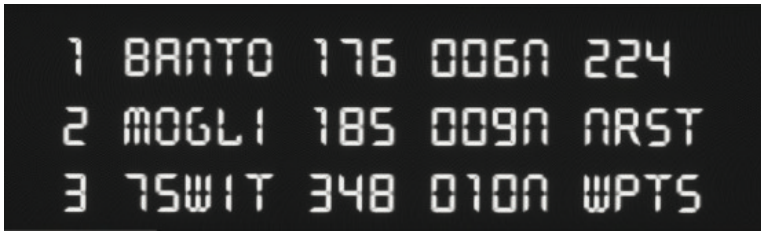
Go-to page



The go-to page shows you information related to the next waypoint in your flight plan:

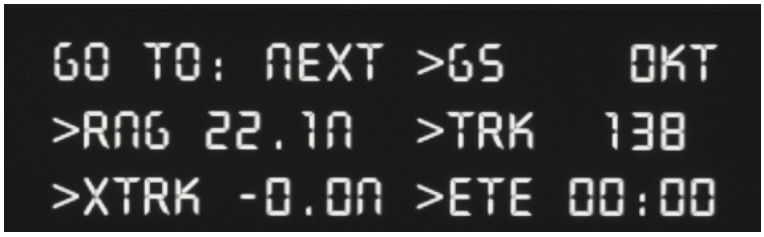
- Groundseed (knots)
- Distance to next waypoint (nautical miles)
- Desired track to next waypoint
- Cross-track distance (nautical miles)
- Estimated time en route (hours/minutes)

Nearest intersection page



The nearest intersection page shows the closest waypoints: intersections, airports, VORs and NDBs. The name, bearing and distance (in nautical miles) to each waypoint is shown. Use the arrow keys to scroll through the list of waypoints and press the WPT key to cycle through the waypoint types (intersections, airports etc.).

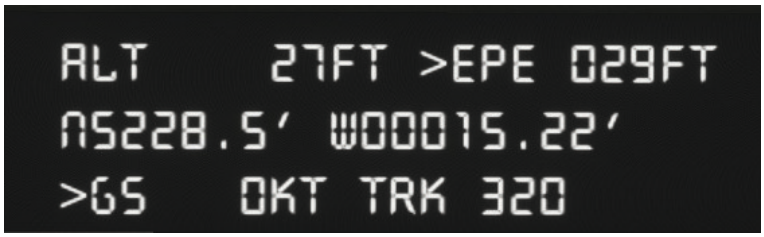
CDI page



The CDI page shows you information related to the current leg of your flight plan:

- Groundspeed (knots)
- Distance to next waypoint (nautical miles)
- Desired track to next waypoint
- Cross-track distance (nautical miles)
- Estimated time en route (hours/minutes)

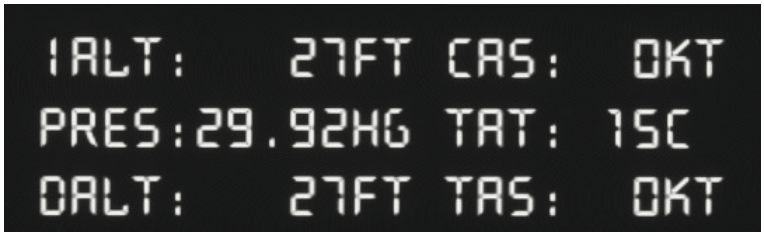
Present position page



The present position page shows you information related to your current position:

- Current altitude (feet)
- Estimated position error (in feet)
- Current latitude/longitude
- Groundspeed (knots)
- Current track (magnetic)

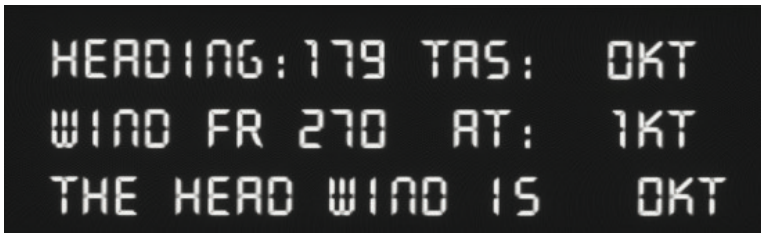
Density altitude and TAS page



The density altitude and TAS page displays critical aircraft performance data:

- Indicated altitude (feet)
- Calibrated airspeed (knots)
- Barometric pressure setting (inHg)
- Total air temperature (Celsius)
- Density altitude (feet)
- True airspeed (knots)

Wind aloft page



The wind aloft page displays information related to the current wind conditions:

- Current aircraft heading
- True airspeed (knots)
- Wind direction
- Wind speed
- Head or tail wind component

Fuel planning page

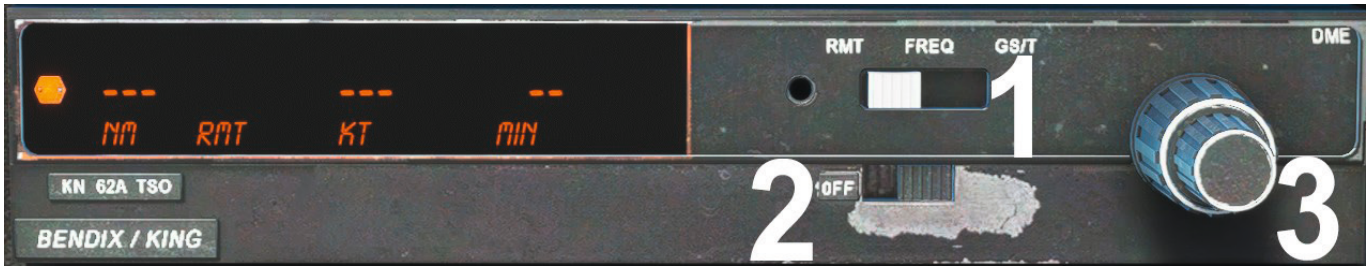
The fuel planning page calculates fuel requirements for the GPS flight plan:

- Current airspeed
- Estimated time en route for current leg
- Current fuel flow (US galllons per hour)
- Fuel required for the leg (US gallons)

Message page

This page is not simulated and “NO MESSAGES” will be shown.

KN 62A – DME



1. Three-position function switch – determines the information that is displayed and the channelling source.

   On the Frequency (FREQ) setting, the unit can be channelled internally.

   On the Groundspeed/Time-to-Station (GS/T) setting, the unit holds the internally selected frequency and also displays distance, groundspeed and time-to-station information.

   On the Remote (RMT) setting, the DME is channelled when you select your NAV frequency on the NAV 1 receiver (KX 170) and displays distance, groundspeed and time-to-station.

2. ON/OFF switch – controls power to the unit.

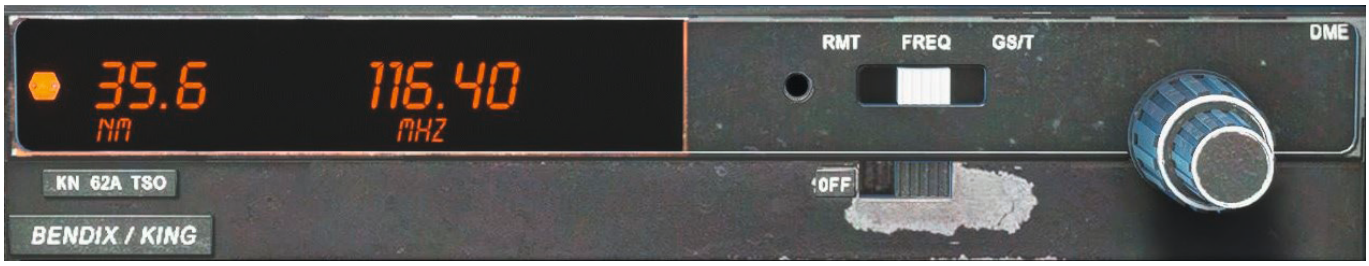
   The KN 62A should be powered on only after engine start-up and should be turned off prior to engine shutdown.

3. Frequency selector knobs – used to alter the internally selected frequency.

   With the inner knob pushed in, it changes the 0.1MHz digit (0.0, 0.1, 0.2 etc.). With the inner knob pulled out, it adds 0.05MHz to the frequency and tunes the frequency in 0.1MHz steps (0.05, 0.15, 0.25 etc.). Turning the outer knob changes the larger digits (1MHz, 10MHz etc.).

The KN 62A is a Distance Measuring Equipment (DME) system. It can be channelled remotely through the NAV 1 receiver (KX 170) or the NAV 2 receiver (GNC 255), depending on the position of the DME selector switch, or tuned directly with its own frequency selection knobs. This dual channelling compatibility makes two DME frequencies available to you at all times, allowing for DME holds.

Frequency mode



In this mode the DME displays distance and the internally selected frequency. You can alter the frequency using the frequency knobs.

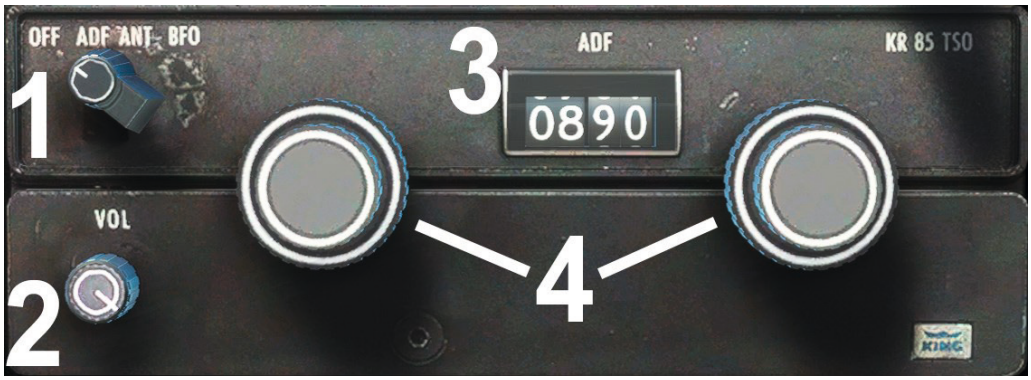
Groundspeed/Time-to-Station mode

In this position the DME holds the internally selected frequency while displaying distance, groundspeed and time-to-station. A ‘frequency hold’ feature prevents you from accidentally altering the frequency when it isn’t displayed.

Remote mode

With the Remote mode selected, the DME uses the frequency that is selected on the NAV 1 receiver (KX 170) or the NAV 2 receiver (KX 175), depending on the position of the DME selector switch. Distance, groundspeed and time-to-station is shown. Dashes will be displayed when there is no valid signal.

KR 85 – ADF



1. Power/mode selector knob – selects ADF, ANT or BFO mode.
2. Volume knob
3. Frequency display
4. Frequency select knobs – tune the ADF frequency.

Frequency selection

The ADF frequency is displayed on three counters.

The frequency is selected using the frequency select knobs which are rotated either clockwise or anti-clockwise. The right inner knob tunes the 1s. The right outer knob tunes the 10s. The left knob tunes the 100s and the 1,000s.

The KR85 has no controls for the fractional part of the ADF frequency. In the real world, selecting a frequency of 383 kHz would allow for reception of an NDB with a frequency of 383.5 kHz but that isn't simulated in MSFS. Therefore we have added our own simulation of this. If there is no valid NDB signal on the selected frequency then it will search through all the fractional frequencies until one is found, e.g. 383.1, 383.2 etc. A tooltip on the right inner selector knob indicates the currently selected frequency.

Operating modes

ANT mode provides improved audio reception from the station tuned and is usually used for identification. The bearing pointer on the ADF indicator will be deactivated and immediately turn to the 90° relative position and remain there during ANT reception.

ADF mode activates the bearing pointer on the ADF indicator, causing it to point in the direction of the station relative to the aircraft heading.

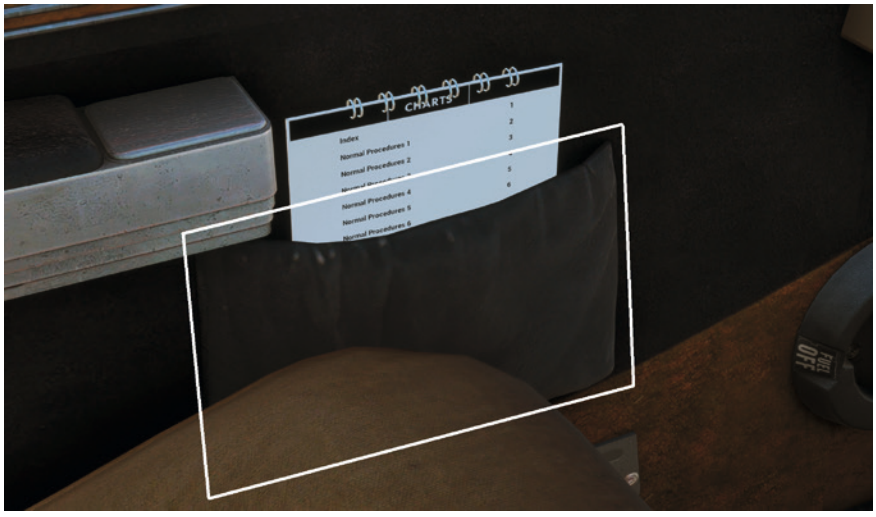
BFO mode permits the carrier wave and the associated Morse code identifier broadcast on the carrier wave to be heard.

ADF test

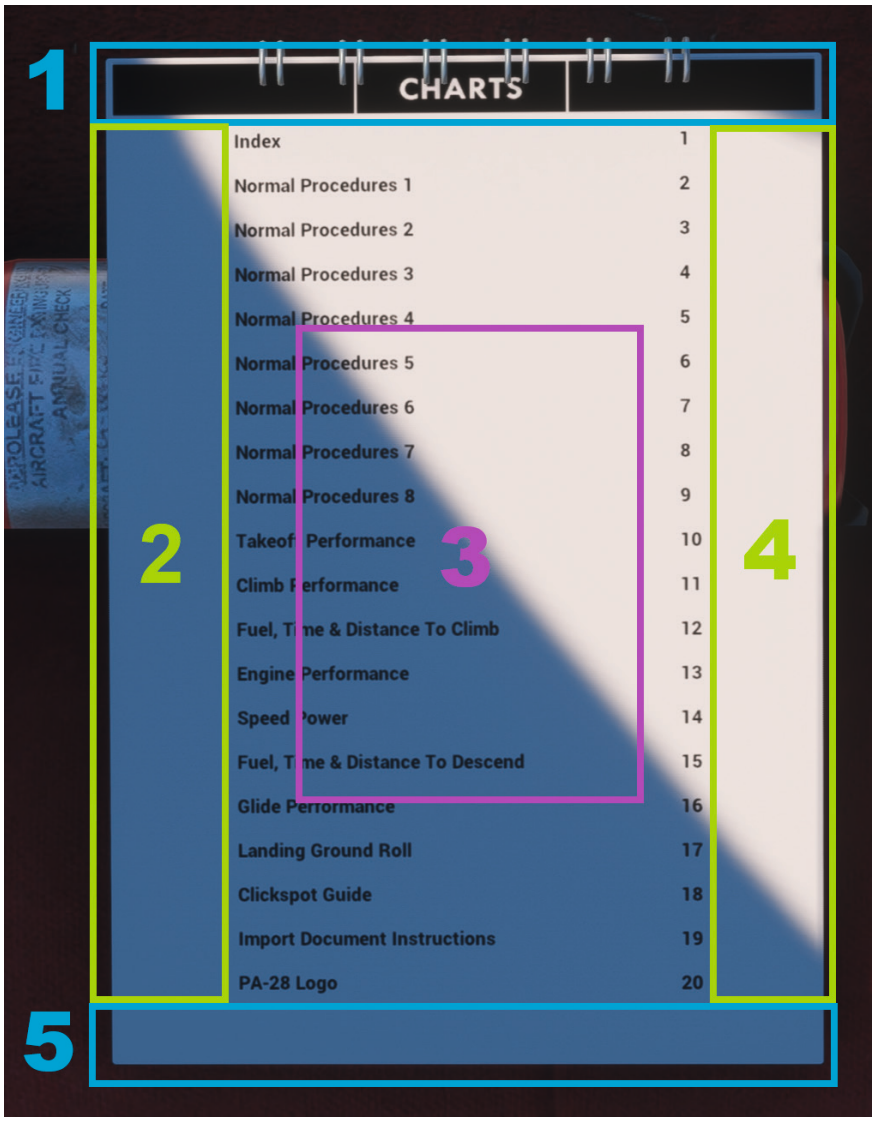
Select ANT mode and confirm that the bearing pointer moves directly to the parked 90° position. Make sure that the unit is tuned to a usable frequency and then select ADF mode. Confirm that the needle moves to the station bearing.

Interactive paper charts

Paper charts can be placed on the pilot's lap by left-clicking the chart holder on the lower cockpit sidewall. The paper charts will automatically move between the left and right sides of the cockpit based on the cockpit camera selection.



Once in view, up to 20 chart pages can be selected from the Index page and can be cycled through by using a variety of clickspots located around the page:



1. Rotate anti-clockwise
2. Previous page
3. Index page
4. Next page
5. Rotate clockwise

The chart can be rotated to be in a horizontal or vertical orientation by clicking the relevant clickspots.

A useful tooltip will briefly appear at the bottom of the page when the mouse is over a clickspot, indicating that clickspot's purpose.

The paper charts will automatically move between the left and right seats depending on which camera is selected in the MSFS Camera menu.

A selection of charts are included by default with our PA-28R Turbo Arrow III/IV and additional documents can be added by placing a .PNG file in the following file directory: …\Community\justflight-aircraft-pa28-turboarrow-iii\Data\Images\Chart

In order for the documents to display correctly in the simulator, the document should be A4 size (724 x 1024) and in a .PNG format. If you wish to change the file names of the charts, or add any additional charts, the PA28_chart_list.ini file (located in the same file directory) must be updated to reflect the change in file name and chart numbers.

If the simulator is running when document changes are made, a restart of the flight will be required to see any changes to the charts.

AUTOPILOT

1. Autopilot engage switch
2. Roll command knob
3. Heading switch
4. Vertical speed hold click spot – click the blank area to the right of the heading switch to toggle the vertical speed hold mode. Once engaged, vertical speed can be adjusted by moving your mouse over the vertical speed hold clickspot and rotating your mouse wheel.
5. Navigation/approach coupler knob – click on the Piper label above the knob to toggle altitude hold mode. The tooltip text indicates whether altitude hold mode is engaged.
6. Coupler radio selector switch

By modern standards the AutoControl III B is quite a primitive autopilot. It controls the roll axis of the aircraft but is not equipped to control the pitch axis.

Controls

The controls for the system consist of:

- Console with engage and heading switches, and a roll command knob
- Navigation/approach coupler knob
- Coupler radio selector switch
- Heading bug on the direction indicator gauge or horizontal situation indicator
- NAV/GPS source switch (located to the right of the VOR 2 indicator)

Navigation/approach coupler

The coupler has five modes:

- Heading (HDG) mode – the autopilot operates without coupling (refer to the Use of heading hold and preselect section).
- OMNI mode – the coupler will automatically intercept, track and make crosswind corrections on any desired VOR radial the pilot selects.
- Navigation (NAV) mode – the coupler will automatically intercept, capture, track and correct for crosswind on any desired VOR radial the pilot selects. It is recommended procedure to use only the OMNI mode for VOR approach work.

- LOC NORM (localiser normal) – the coupler will automatically intercept, capture, track and correct for crosswind conditions during ILS approach work. This mode automatically adjusts for the increased sensitivity that accompanies the ILS system.
- LOC REV (localiser reverse) – the coupler will automatically intercept, capture, track and correct for crosswind conditions during ILS approach work, when it is necessary to correct away from the course deviation indicator. This mode automatically adjusts for the increased sensitivity that accompanies the ILS system.

Coupler radio selector switch

This switch connects the coupler to either the NAV 1 or the NAV 2 radio. It can also be placed in the OFF position to disconnect the coupler from both radios.

Heading bug

When the autopilot is engaged, the heading bug becomes the primary control of the aircraft around the roll axis. When the heading of the aircraft matches the heading bug, the autopilot will maintain the heading. To turn to a new heading, rotate the heading bug to the desired heading and the aircraft will turn to the newly selected heading.

NAV/GPS source switch

This switch connects the coupler to either the NAV radio that has been selected by the coupler radio selector switch or the GPS (GPS 100, GNS 530 or GTN 750), allowing the autopilot to follow the GPS route.

Operation

Pre-flight ground check

To ground check the autopilot:

1. Move heading switch to OFF.
2. Centre roll command knob.
3. Engage ON/OFF switch.
4. Rotate the roll command knob right and left – observe that the yoke moves in the same direction.
5. Return the roll command knob to the centre position.

Preselect

1. Set the heading bug to align with the current heading.
2. Rotate the coupler knob to the heading (HDG) position.
3. Engage the heading switch.
4. Rotate the heading bug to the right – observe that the yoke moves right.
5. Rotate the heading bug to the left – observe that the yoke moves left.
6. Centre the heading bug until the yoke ceases to turn to either side.

Coupler

1. Tune in an available VOR station on the NAV 1 radio.
2. Centre the VOR 1 CDI needle with a ‘TO’ flag using the OBS knob.
3. Set the heading bug to match the selected OBS value.
4. Place the coupler selector switch in the NAV 1 position.
5. Rotate the coupler knob to the OMNI position.
6. Rotate the OBS knob to swing the CDI needle to full right deflection – observe that the yoke moves right.
7. Rotate the OBS knob to swing the CDI needle to full left deflection – observe that the yoke moves left.
8. Disengage the autopilot – this completes the ground check.

Engaging in flight

Before engaging the autopilot, make certain the aircraft is trimmed for hands-off level flight with the slip-ball centred.

Use of heading hold and preselect

1. Rotate the coupler knob to the heading (HDG) position.
2. Set the heading bug to align with the current heading.
3. Engage the ON/OFF switch.
4. Centre the roll command knob.
5. Engage heading switch.

Heading changes are now made by setting the heading bug to the desired heading. With the heading switch engaged, the roll command knob is inoperative.

Use of roll command function

To employ this function the heading switch must be OFF. Bank angles of approximately 30 degrees can be achieved with the roll command knob in the maximum left or right position.

Override

Applying a large control input will override the autopilot when engaged.

The override should be checked prior to each flight:

1. Rotate the coupler knob to the heading (HDG) position.
2. While the heading bug is set for a left turn, apply a large right input to the yoke.
3. While the heading bug is set for a right turn, apply a large left input to the yoke.

Operation of coupler

Intercepting VOR radials

1. While flying with the autopilot engaged and operating in the heading (HDG) mode, tune in a VOR and set the OBS to the desired radial.
2. Rotate the heading bug to align with the selected OBS.
3. Rotate the coupler from heading (HDG) mode to either navigation (NAV) or OMNI mode.
4. The aircraft will turn to intercept the desired radial at an angle not exceeding 45°.
5. The coupler will roll the aircraft onto the selected radial and will establish a crosswind corrected heading.

Note: *When flying with a crosswind, the heading bug will not align with the course flown by the autopilot. The difference between the two is the wind correction (crab) angle.*

VOR navigation

1. The aircraft is inbound and coupled to the 045° radial to VOR 'A'.
2. When flying over VOR 'A', the autopilot will bank the aircraft left and right to indicate passage over the station. At this point, select the desired outbound radial (140° in this example) using the OBS knob and align the heading bug to the same course.
3. The autopilot will bank the aircraft left to intercept the 140° radial of VOR 'A', compensating for any crosswind.
4. As the aircraft moves out of range of VOR 'A', tune VOR 'B' into the KX-175B (NAV 2) radio and rotate the OBS knob to select the desired inbound radial.
5. Move the coupler radio selector switch to the NAV 2 position.
6. The autopilot will continue to bank the aircraft to maintain the radial to VOR 'B'.
7. This procedure is repeated, as described, from VOR to VOR as the aircraft progresses along its route.

Note: *If you wish to use the same VOR receiver for navigating to VOR 'B', the coupler should be placed in heading (HDG) mode while VOR 'B' is tuned in.*

VOR approach

1. The aircraft is inbound on the 032° radial with compass, direction indictor, heading bug and OBS reading 212°. The coupler is tracking the radial with navigation (NAV) mode selected.
2. When passing overhead the VOR, select the 140° radial in the OBS, set the heading bug to 140° and rotate the coupler mode selector to the OMNI position.
3. The coupler will automatically intercept the 140° radial outbound.
4. When reaching the time for the procedure turn, select the heading (HDG) mode on the coupler and rotate the heading bug to the left to agree with the published outbound heading of the procedure turn (095°).

   Note: *You must compensate for winds while in HDG mode.*
5. At the end of the first leg of the procedure turn, rotate the heading bug to the right to the reciprocal heading (275°).
6. It is recommended that the OBS be set to the inbound course (320°) while flying the outbound leg of the procedure turn.
7. With the aircraft turning right, set the heading bug further right to the inbound radial of 320° to match the OBS. Rotate the coupler mode selector to the OMNI position.
8. The coupler will now intercept the 140° radial inbound.

ILS approach

1. When receiving vectors to the localiser, set the coupler to heading (HDG) mode and use the heading bug to maintain the provided headings.
2. When the aircraft is in a position for the localiser intercept, select the inbound heading of the localiser using the heading bug before rotating the coupler mode selector to the LOC NORM position.
3. The coupler will intercept the localiser and correct for crosswinds.
4. It is important to note that the coupler only controls the heading of the aircraft and cannot adjust the rate of descent for the glideslope. You must make pitch changes to maintain the glideslope.
5. When passing over the middle marker, disengage the autopilot and take over control of the aircraft. Select heading (HDG) mode on the coupler in case of a go-around.

Note: *The heading bug must be set to the inbound heading of the localiser.*

ILS back course approach

1. When receiving vectors to the back course of the localiser, set the coupler to heading (HDG) mode and use the heading bug to maintain the provided headings.
2. Set the inbound heading of the back course using the heading bug and switch to LOC REV mode on the coupler.
3. The coupler will intercept the back course and track inbound on the localiser, correcting for crosswinds.

Checklist

Engaging roll command

All switches	OFF
Direction indicator and compass	ALIGNED
Coupler	HDG
Engage switch	ON
Roll command knob	Rotate left/right for up to 30° bank

Engaging heading preselect

Heading bug	Aligned with current heading
Heading switch	ENGAGED
Heading bug	Rotate to select heading

Engaging radio coupling

NAV 1 / NAV 2	Valid VOR tuned in
Coupler radio selector switch	NAV 1 or NAV 2
Roll command knob	CENTRED
Heading switch	DISENGAGED
OBS	Centre CDI needle
Heading bug	Rotate to selected OBS
Coupler	NAV
Heading switch	ENGAGED

FLYING THE TURBO ARROW

In this tutorial flight we will be departing from Compton-Abbas airfield, 85 nautical miles south-west of London and 35 nautical miles south-east of Bristol. We will be heading east, passing north of Bournemouth Airport and over the top of Southampton Airport before approaching Shoreham Airport from the west. Covering a distance of approximately 72 nautical miles, this short flight is the ideal length for learning about the essential systems on board the PA-28R Turbo Arrow.

We will be using the Turbo Arrow IV for this flight, but the same procedures apply equally to the Turbo Arrow III.

Here are the details for today's flight:

EGHA – SAM (113.35) – GWC (114.75) – SHM (332.0) – EGKA

Estimated time en route: 40 minutes

Route distance: 72 nautical miles

Departure time: 1200 (local time)

Weather: Clear

Now that we are prepared for the flight we can proceed to the cockpit to begin our pre-flight checks. To load up the PA-28R Turbo Arrow tutorial flight, follow these steps:

1. Start Microsoft Flight Simulator.
2. Click **World Map** (MSFS 2020). Click **Free Flight** (MSFS 2024).
3. Click **More**, then **Load/Save** (MSFS 2020). Click **EFB**, then **Flight Planner**, then **Route** (MSFS 2024).
4. Click **Load From This PC**.
5. Browse to the **Documents** folder within the PA28 Turbo Arrow IV aircraft folder (located in the **Packages\ Community** folder) and select the **Just Flight PA-28R Turbo Arrow tutorial** flight file.
6. Select **Fly**.

You should now find yourself sitting in the cockpit at Compton-Abbas airfield. Before we continue, we need to configure the aircraft in a ‘cold and dark’ state, with all the cockpit systems switched off, as you would find the aircraft prior to the first flight of the day. By beginning in this configuration we will need to spend some additional time setting up the cockpit, but doing so will allow you to learn a considerable amount about the features and functions on board this light aircraft.

Use the EFB to configure the aircraft in a ‘cold and dark’ state. The engine will shut down and the electrical power will be switched off.

This tutorial will cover the necessary steps for you to get from point A to point B, but it will not explore each system in depth. Please refer to the rest of this manual for details of each system.

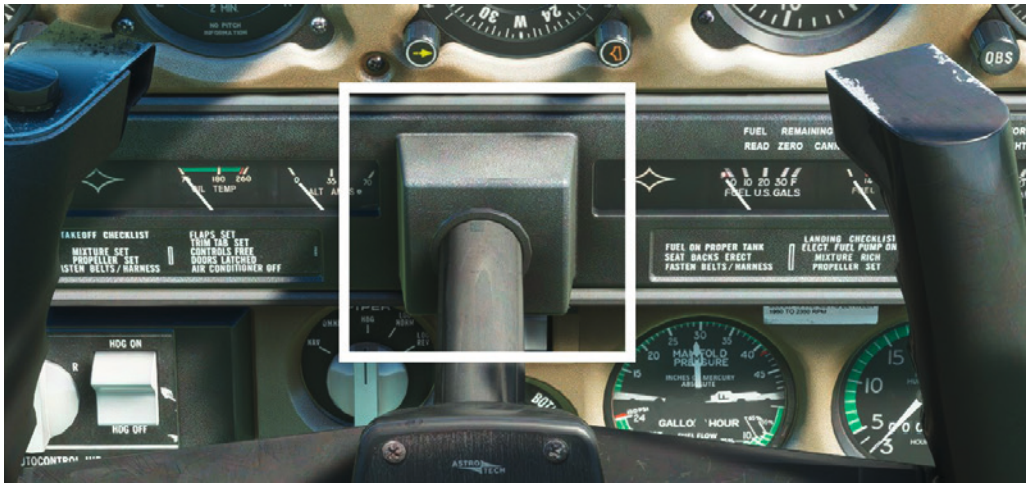
Getting started

The first step is to open the door to allow entry into the cockpit. In the virtual cockpit, click on the upper and lower door latches to rotate them to the **OPEN** position and then click on the armrest to push it open.

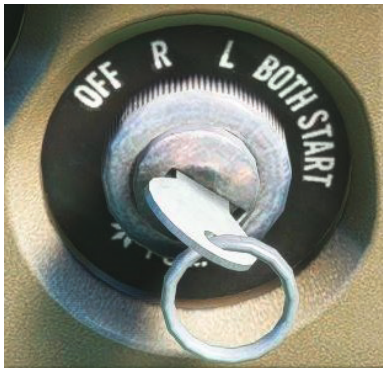
Use the EFB to open the baggage door before switching to the exterior view to confirm that the baggage door has opened and then return to the cockpit.

We can now start working through the pre-flight inspections.

To enable easier access to the controls, you may want to hide the yoke by using the clickspot at the base of the yoke, where it is mounted to the panel, or by using the EFB.



Check that the magneto selector is set to **OFF** (rotated fully anti-clockwise).



Confirm that the landing gear lever is in the **DOWN** position and that the parking brake handle is set **ON**.

Check that all avionics are **OFF** and the mixture lever is set to **IDLE CUT-OFF** and then switch **ON** the battery master.

Check the left and right fuel quantity gauges to confirm that we have full tanks (36 gallons per tank).

Confirm that the three green landing gear lights are illuminated.

Switch **ON** the navigation, anti-collision and landing lights.

Switch to the exterior (spot) view and confirm that all of the lights are illuminated before returning to the cockpit and switching them all **OFF**.

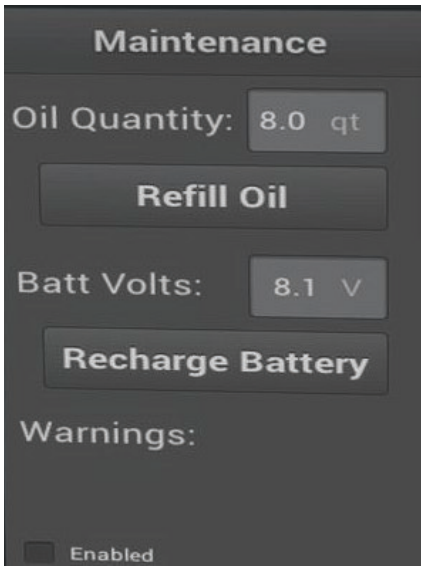
Confirm that all annunciator lights and the low voltage light are illuminated and then switch **OFF** the BATT MASTR.

Check that you have full and free movement of the flying controls and that the flaps extend and retract fully.

Move the elevator and rudder trims to the centre/neutral position.

Switch to the external (spot) view and carry out a visual inspection of the aircraft. The wheel chocks and tie-downs should be visible. Confirm that the towbar is not connected/visible.

Use the EFB to recharge the battery in case it has discharged while you've been finding your way around the cockpit and then check the oil quantity. If the oil quantity displayed is less than eight quarts, use the 'Refill Oil' option to top up the engine oil.



Starting the engine

Using the tablet EFB, remove the chocks and tie-downs.

To avoid battery draining we will start the engine before configuring the avionics for our departure.

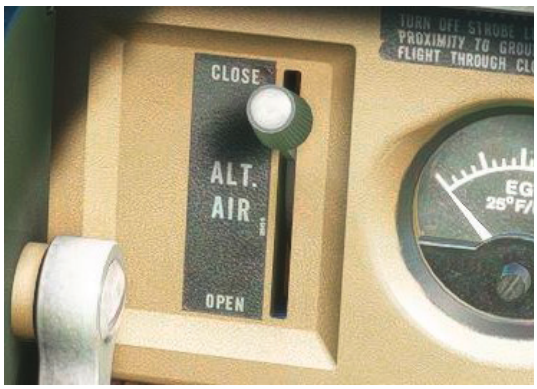
Close the baggage door using the EFB and then close the passenger door by first clicking on the door to pull it shut and then clicking on the door latches to rotate them to the **LATCH** position.

Check that the parking brake is set and that all circuit breakers are pushed in.

On the left sidewall, right-click on the fuel selector to rotate it to the **LEFT** position.

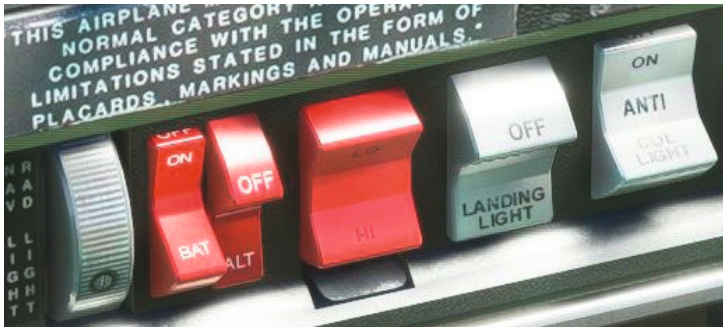
On the throttle quadrant, move the propellor lever to the **FULL FORWARD** position and advance the throttle lever to approximately **1/4 open**.

Confirm that the alternate air is set to **CLOSE** and that all avionics are still **OFF**.

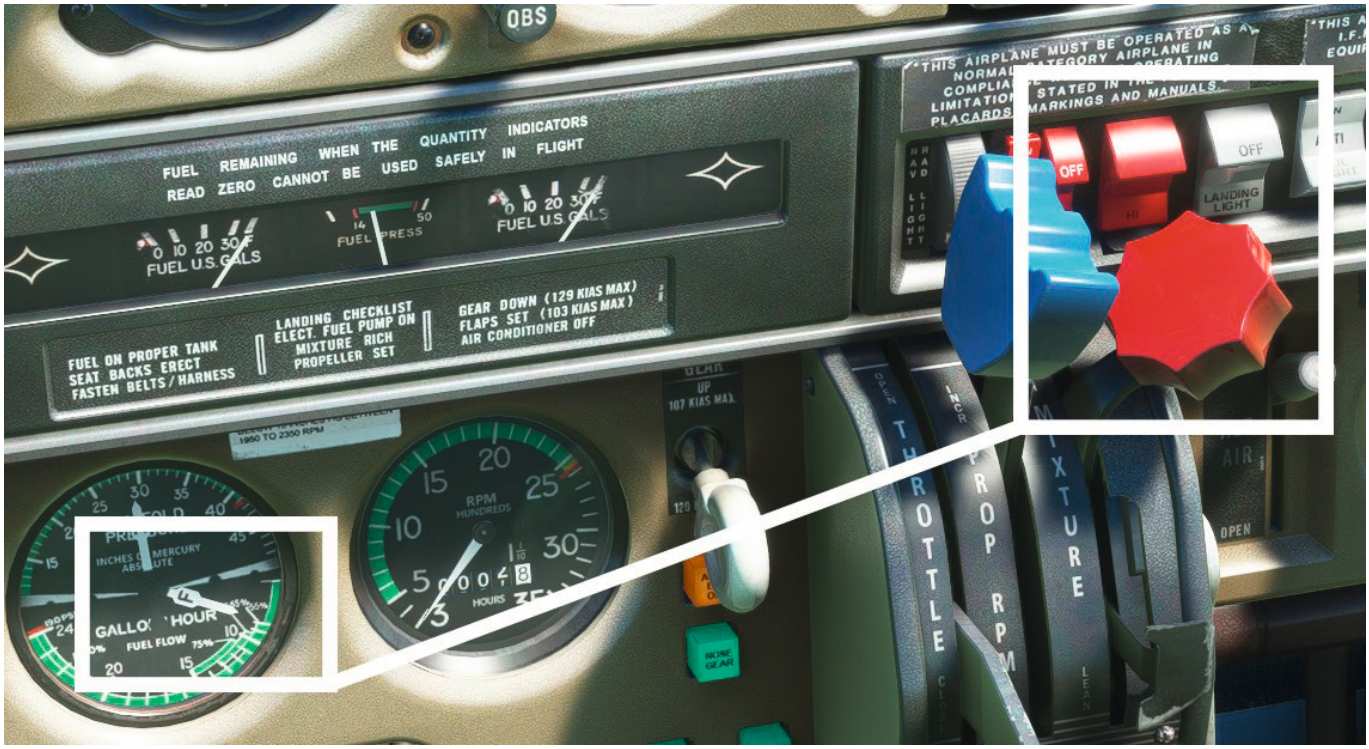


Switch **ON** the battery master to provide electrical power to the aircraft.

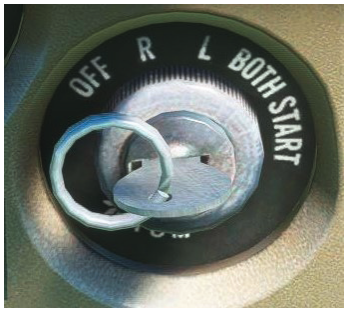
Turn **ON** the navigation lights, warning anyone in the area that we are about to start the engine.



Switch **OFF** the fuel pump and move the mixture lever to the **FULL RICH** (forward) position. Push and hold the **PRIMER** button until fuel flow is displayed, after approximately three seconds, then release the button.



Check that the area surrounding the aircraft is clear of obstructions and then rotate the magneto/start selector to the **START** (fully clockwise) position.



When the engine starts, release the magneto/start selector and set the fuel pump to **LO**. Check that the oil pressure and temperature are rising.

Switch **ON** the ALT (alternator) switch breaker and confirm that the associated warning light on the annunciator panel extinguishes.

Adjust the throttle to maintain **1,400-1,500 RPM** and check that the vacuum gauge shows suction within the given limits.

With the engine running and the alternator charging the battery, we can now switch on the avionics.

Starting at the top of the centre panel and working down, switch on the KX 170B, KX 175B, KT 76A, GPS 100 (or GNS 430 / GNS 530 / GTN 650 / GTN 750 if installed), KN 62A and KR 85 units.

We will leave the autopilot unit switched off for now.

Finally, rotate the fuel selector switch to the **RIGHT** and then the **LEFT** position, checking that the engine operates correctly on both tanks before selecting the fullest tank.

Configuring the avionics

We now need to configure the avionics for our departure.

For the initial climb we are going to maintain the runway heading, so rotate the heading bug on the horizontal situation indicator to **080 degrees**.

Once we are settled into our climb to the east we will make a turn to fly towards the first waypoint on the route, Southampton (SAM) VOR. In preparation, tune the VOR frequency (**113.35**) into the KX 170B (NAV 1) unit.

Tune the second waypoint on our route, Goodwood VOR (**114.75**), into the KX 170B (NAV 2) unit.

Check that the NAV/GPS source switch is set to **NAV**, and the function switch on the KN 62A is set to the **RMT** (remote) position and that the DME selector switch, located above the GPS 100 unit, is set to **NAV 1**.

Selecting the remote function allows the KN 62A to display DME information from either NAV1 (the KX 170B) or NAV 2 (the KX 175B), rather than its own internal NAV receiver. The DME selector switch controls which of the two radio units the KN 62A receives its DME information from – in this case the KX 170B, which we have just tuned to the Southampton VOR.

Taxi

We can now taxi to the runway. Check that the area around the aircraft is clear of obstacles and then release the parking brake. Apply power slowly to get the aircraft rolling and then start your taxi to the threshold of runway 08.

Steering the aircraft with the rudder pedals only is generally sufficient. The combined use of the rudder pedals and the brakes permits, if necessary, tight turns.

Check the operation of gyroscopic instruments (horizontal attitude, heading and turn and bank indicators) by means of alternate turns.

Stop at the holding point just short of runway 08. We can carry out the power (ground) check here.

Set the parking brake and confirm that the propeller lever is in the **FULL FORWARD** position.

To carry out a magneto check, advance the throttle lever to obtain 2,000 RPM and then rotate the magneto selector to the **LEFT** position, note the RPM drop and then rotate it back to the **BOTH** position. Repeat the process for the right magneto.

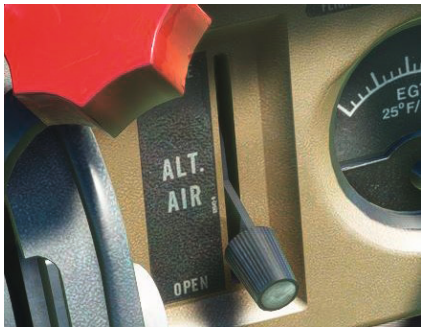
Check that the vacuum, oil temperature, oil pressure and ammeter readings are within limits.

Use the PRESS-TO-TEST button to confirm that all the annunciator lights illuminate.

Make sure that the mixture lever is set to **FULL RICH** (fully forward) and the fuel selector is set to the fullest tank.

To carry out a propeller check, advance the throttle lever to obtain 2,000 RPM and then cycle the propeller lever twice, moving it aft towards the **high pitch/low RPM** position and then forwards towards the **low pitch/high RPM** position. Note the RPM drop on the tachometer. Reset the lever to the **FULL FORWARD** position.

To carry out an alternate air check, move the alternate air lever down and check that the manifold pressure doesn't drop, then return the alternate air lever to the up position.



Check the operation of the fuel system by switching the fuel pump **OFF** and confirming that the fuel pressure is still within the green sector.

Finally, reduce the throttle to idle and check for rough running.

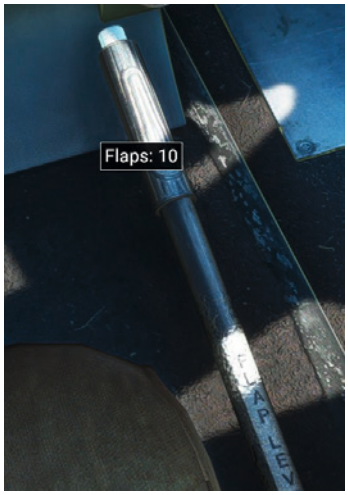
We can now run through the before take-off checks.

Confirm that the battery master and alternator switches are both set to **ON**.

Rotate the fuel selector to the fullest tank and move the fuel pump switch to LO (low).

Check that the alternate air lever is set to **CLOSE**, and that the mixture and propeller levers are in the **FULL FORWARD** position.

Lower the flaps to the **10°** (first stage) position.



Confirm the magneto selector is in the **BOTH** position and switch **ON** the landing and anti-collision lights.

Rotate the pitch trim wheel until the indicator sits in the neutral/centre position.

Confirm that both doors are **LOCKED** and that you have full and free movement of the flying controls.

Finally, switch **ON** the PITOT HEAT switch.

With the before take-off checks complete, have a look left and right, verify that nothing is on approach and that the runway is clear, and then taxi onto the runway.

Take-off

Line up with the runway centre line and then come to a stop. Smoothly apply power to achieve approximately 41 inHg manifold pressure and 2,575 RPM, and as the aircraft starts to gather speed, keep it running down the centre line with rudder inputs. As you approach **70 knots** start to raise the nose of the aircraft.

The aircraft will begin to climb away from the runway and once you are safely airborne, tap the brakes and then raise the landing gear using the **[G]** key.

Make elevator inputs as required to maintain a climb speed of approximately **90 knots**, holding the runway heading (080 degrees) and retracting the flaps as you pass through **300ft** AGL.

Climb

Once stable in the climb, adjust your pitch to maintain the **97 knots** climb speed and maintain your heading.

Switch **OFF** the fuel pump and landing light on reaching 1,000 feet.

As you climb through 2,000 feet, the Southampton VOR should be within range of the aircraft. The NAV flag on the VOR 1 indicator will disappear to indicate that a valid signal is being received and the KN 62A will display the DME distance (nautical miles), groundspeed (knots) and time-to-station (minutes).

Rotate the OBS knob on the HSI until the CDI needle centres with a TO flag visible – approximately 095 degrees.

Bank the aircraft to the right to bring it onto the OBS course, so that you are tracking inbound to the VOR.

To reduce your workload we will now engage the autopilot and command it to maintain the course to the VOR.

Move the autopilot engage switch to the **A/P ON** position to engage the autopilot, and move the heading switch to the **HDG ON** position to enable the autopilot to take control of the aircraft's heading.

Check that the coupler radio selector switch is set to **NAV 1**. This switch connects the coupler to either the NAV 1 or the NAV 2 radio and, as we've tuned the Southampton VOR into the NAV radio, we need to couple the autopilot to that same radio.

Finally, make sure that the navigation/approach coupler knob is set to **NAV**. This selects navigation hold mode.

The autopilot will now control the heading and maintain our course to the VOR. Note that the autopilot is not controlling the aircraft's pitch, so continue to adjust your pitch to maintain the climb.

Cruise

As you approach 4,000 feet, place your mouse cursor over the navigation/approach coupler knob 'Piper' label and press the left button on your mouse. Alternatively, you can use the default key assignment: **[Ctrl]+[Z]**.

This toggles altitude hold mode. The autopilot will capture and hold the current altitude (rounded to the nearest hundred feet). A tooltip indicates whether altitude hold mode is engaged.

The real-life Piper AutoControl IIIB doesn't feature altitude hold mode but it has been included for convenience.

As the aircraft levels out and begins to accelerate, reduce the throttle to obtain 28 inHg on the manifold pressure gauge and then reduce the propeller lever to obtain **2,300 RPM** on the tachometer. This is a typical cruise power setting.

It is important to remember that the engine is only being fed with fuel from a single tank at any given time, therefore the quantity in each tank should be carefully monitored. It is recommended that you change fuel tanks every half hour and do not exceed a fuel imbalance of 10 US gallons.

If you want to avoid worrying about switching fuel tanks, enable the automatic fuel selector in the EFB.

You can now relax for a while as the autopilot takes care of controlling the aircraft. The leg to the Southampton VOR should take approximately 10 minutes, as displayed on the KN 62A. This is the ideal opportunity to take a closer look at some of the features of the aircraft.

The Turbo Arrow has some very useful IFR-capable avionics. We'll take a quick look at some of the features of those avionics. Make sure you keep an eye on the distance remaining to the Southampton VOR, as we'll need to return to navigating the aircraft once we are five miles from the VOR.

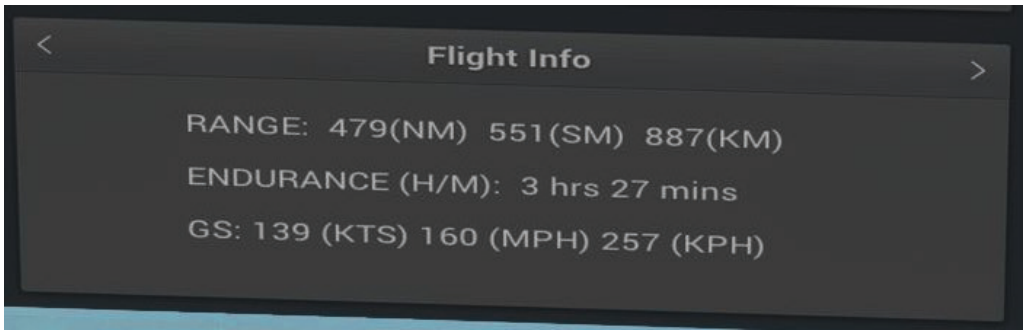
Sliding over to the KN 62A unit, move the function switch to the **FREQ** (frequency) position. With this function selected we can tune the KN 62A's internal receiver (NAV 3).

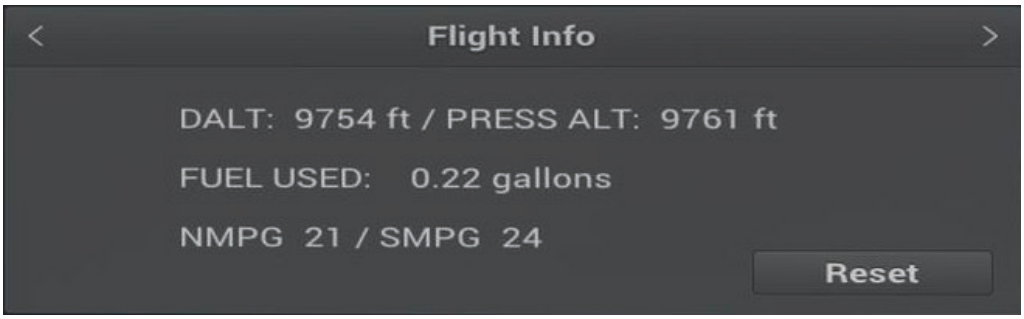
Rotate the frequency selector knobs to tune in **114.35**, the frequency for the Compton VOR/DME which is commonly used by airliners transiting the London airspace. The DME distance (nautical miles) to the VOR will be shown on the left of the display.

Move the function switch to the **GS/T** (groundspeed/time) position to show the DME distance (nautical miles), groundspeed (knots) and time-to-station (minutes) to the London VOR. Note that the display is identical to that shown with RMT (remote) selected, but this display shows the information for the internally tuned frequency rather than the remote frequency (NAV 1 – KX 170 or NAV 2 – KX 175).

Return the function switch to the **RMT** (remote) position so we can continue to monitor the distance to the next waypoint.

Another useful feature for navigation is the Flight Info section of the EFB which shows a variety of real-time information related to everything from speed to fuel burn/flow and range/endurance.





With five miles to run to the Southampton VOR, rotate the OBS knob on the VOR 2 indicator until the CDI needle centres with a TO flag visible – approximately 105 degrees – and then move the coupler radio selector switch to **NAV 2**.

The autopilot will now bank the aircraft to maintain the selected course to the VOR tuned into the KX 175 (NAV 2) – Goodwood VOR.

Set the DME selector switch to **NAV 2** so that we can monitor the distance to the Goodwood VOR on the KN 62.

We can now tune in the Shoreham (SHM) NDB, which is situated on the airfield. Using the selector knobs on the KR 85, tune in **0332** (332 kHz) and make sure that the mode knob is set to **ADF**.

The needle on the ADF indicator will point towards the Shoreham NDB when it comes within range (approximately 20 miles out from the Goodwood VOR), which should be ahead of the aircraft and on a similar heading to the VOR which is located close by.

When the KN 62 shows that we are three miles from the Goodwood VOR, rotate the heading bug on the HSI to match up with your current heading and then rotate the navigation/approach coupler knob to the **HDG** position. The autopilot will now maintain our current heading.

Now use the heading bug to track towards the NDB, using the ADF indicator to estimate what heading is required for a direct routing to the NDB.

Note: *The compass card on the ADF indicator is not a directional gyro and therefore it will not rotate automatically as the aircraft changes heading. To read the bearing to the NDB, use the HDG (heading) knob to align the compass card with your current heading and then read the needle bearing.*

Descent

We need to begin our descent when we are approximately seven miles past the Goodwood VOR. The distance from the VOR is still available on the KN 62 although we are now using the ADF indicator for navigation.

Move the propeller lever forwards to the **fully forward (high RPM)** position and then reduce the throttle to obtain 20 inHg on the manifold pressure gauge. The airspeed will start to decrease.

Once the airspeed has reduced to 100 knots, start the descent by disengaging altitude hold mode and then pitching down to obtain a -500ft/min descent rate.

As the aircraft stabilises in its descent, adjust the throttle to maintain **100 knots**.

Approach and landing

As Shoreham Airport comes into view, position the aircraft to join the base leg for runway 02, using the heading bug to turn the aircraft right, towards the coastline. Continue to follow the coastline east towards the airport.

As you approach **1,000ft**, reduce your vertical speed to enter level flight and increase the throttle as the aircraft levels out to maintain your airspeed.

Disengage the autopilot by moving the heading switch to **HDG OFF** and the engage switch to **A/P OFF**.

Switch **ON** the landing light and move the fuel pump switch to **LO** (low).

Confirm that the propeller and mixture levers are fully forward and that the fuel selector is set to the fullest tank.

Once established on the base leg for runway 02, reduce your airspeed to **100 knots** and extend the flaps to the **10°** position.

With the airfield in the 10 o'clock position, extend the landing gear and confirm that you see three greens.

Reduce your airspeed further to **85 knots** and extend the flaps to the **25°** position. Begin a descending turn to position yourself on final for runway 02.

Once established on final, extend the flaps to the **40°** (fully down) position. Reduce power to begin slowing to a touchdown speed of approximately **75 knots**.

As the aircraft arrives over the runway, start to bring the aircraft into a flare, gently raising the nose just above the horizon. Reduce the throttles to idle and the aircraft should touch down smoothly.

Apply gentle braking and once the aircraft has slowed to a fast walking pace, turn right off the runway. When you are safely off the runway, raise the flaps and switch **OFF** the landing and anti-collision lights.

You can also switch **OFF** the fuel pump and pitot heat.

Shutdown

Begin your taxi to the nearest available parking spot.

Once you have come to a stop at your chosen parking spot, engage the parking brake and switch **OFF** the avionics.

Bring the throttle lever back to **IDLE** and then bring the mixture lever back to **IDLE CUT-OFF** to shut down the engine (remember to disengage the mixture lock!).

Once the engine comes to a stop, rotate the magneto selector to the **OFF** position.

Switch **OFF** the navigation lights, and then switch **OFF** the alternator and battery to disconnect the electrical power.

Rotate the fuel selector to the **FUEL OFF** position and open the passenger and baggage doors.

Congratulations – you have completed the Turbo Arrow tutorial flight!

NORMAL PROCEDURES

This simulation includes fully interactive checklists for each stage of the flight, using the built-in MSFS checklist system. These can be carried out manually or using the automated co-pilot option.

Airspeed (IAS) for safe operations

Best rate of climb (gear up, flaps up)	**97 KIAS**
Best rate of climb (gear down, flaps up)	**79 KIAS**
Best angle of climb (gear up, flaps up)	**79 KIAS**
Best angle of climb (gear down, flaps up)	**73 KIAS**
Operating speed in turbulent air	**124 KIAS**
Maximum flap speed	**108 KIAS**
Final approach speed (flaps 40)	**75 KIAS**
Maximum demonstrated crosswind	**17 KIAS**

Pre-flight

Cockpit

Landing gear lever	**DOWN**
Parking brake	**SET**
Avionics	**OFF**
Mixture	**IDLE CUT-OFF**
Magneto switch	**OFF**
BATT MASTR switch	**ON**
Fuel gauges	**CHECK QUANTITY**
Annunciator panel	**CHECK**
BATT MASTR switch	**OFF**
Primary flight controls	**CHECK OPERATION**
Flaps	**CHECK OPERATION**
Trim	**NEUTRAL**
Baggage door	**CLOSED**

Left/right wing

Flap and aileron	**CHECK**
Wing tip and lights	**UNDAMAGED**
Tie-down	**REMOVED**
Fuel tank	**CHECK LEVEL**

Nose section

Chocks	**REMOVED**
Towbar	**REMOVED (NOSE GEAR)**
Engine inspection door	**CLOSED**
Oil	**CHECK LEVEL**
Propeller	**GOOD CONDITION**
Air inlets	**CLEAR**
Landing light	**CHECK**

Tail section

Fin	**CHECK CONDITION**
Rudder	**CHECK CONTROLS**
Stabilator and trim tab	**CHECK CONTROLS**
Tail cone	**CHECK CONDITION**

Before starting engine

Brakes	**SET**
Circuit breakers	**IN**
Alternate air	**OFF**
Propeller	**FULL FORWARD**
Avionics	**OFF**
Fuel selector	**DESIRED TANK**

Engine starting

Caution: *If a positive oil pressure is not indicated within 30 seconds after an engine start, stop the engine and determine the trouble. In cold weather it will take a few seconds longer to get a positive oil pressure indication.*

Cold engine

Throttle	**½ INCH OPEN**
ALTR switch	**ON**
BATT MASTR switch	**ON**
Fuel pump	**LO (or use PRIMER button)**
Mixture	**RICH then IDLE CUT-OFF**
Propeller	**CLEAR**
Starter	**ENGAGE**
Mixture	**FULL RICH**

When the engine starts:

Magneto selector	**BOTH**

Throttle	**ADJUST**
Oil pressure	**CHECK**
Throttle	**1,400-1,500 RPM**

Hot engine

Throttle	**½ INCH OPEN**
ALTR switch	**ON**
BATT MASTR switch	**ON**
Fuel pump	**LO (or use PRIMER button)**
Mixture	**IDLE CUT-OFF**
Propeller	**CLEAR**
Starter	**ENGAGE**
Mixture	**ADVANCE**

When the engine starts:

Magneto selector	**BOTH**
Throttle	**ADJUST**
Oil pressure	**CHECK**
Throttle	**1,400-1,500 RPM**

Taxiing

Taxi area	**CLEAR**
Parking brake	**RELEASE**
Throttle	**APPLY SLOWLY**
Brakes	**CHECK**
Steering	**CHECK**

Steering the aircraft with the rudder pedals only is generally sufficient. The combined use of the rudder pedals and the brakes permits, if necessary, tight turns.

Check the operation of gyroscopic instruments (horizontal attitude, heading and turn and bank indicators) by means of alternate turns.

Ground check

Parking brake	**SET**
Propeller	**FULL FORWARD**
Throttle	**2,000 RPM**
Magnetos	**CHECK (max. drop 175 RPM)**
Vacuum	**4.8-5.1 inHg**
Oil temperature	**CHECK**
Oil pressure	**CHECK**
Ammeter	**CHECK**
Annunciator panel	**PRESS-TO-TEST**

Propeller	**EXERCISE then FULL FORWARD**
Alternate air	**CHECK**
Fuel pump	**OFF**
Fuel pressure	**CHECK**
Throttle	**RETARD**

Before take-off

BATT MASTR switch	**ON**
ALTR switch	**ON**
Flight instruments	**CHECK**
Fuel selector	**AS REQUIRED**
Fuel pump	**LO**
Engine checks	**CHECK**
Alternate air	**CLOSED**
Mixture	**SET**
Propeller	**SET**
Flaps	**SET**
Trim	**SET**
Controls	**FREE**
Doors	**LATCHED**

Take-off

Lined up on runway	**CHECK COMPASS**

Normal technique

Flaps	**SET**
Trim	**SET**

Accelerate to 70-77 KIAS.

Yoke	**Back pressure to rotate smoothly to climb attitude**

Short field/obstacle clearance technique

Flaps	**25° (second notch)**

Accelerate to 53-64 KIAS depending on aircraft weight.

Yoke	**Back pressure to rotate smoothly to climb attitude**

After clearing the ground, accelerate to 59-68 KIAS depending on aircraft weight.

Gear	**UP**

Accelerate to best gear-up angle-of-climb speed 79 KIAS, slowly retract the flaps and climb past the obstacle. Accelerate to best gear-up rate-of-climb speed 97 KIAS.

Climb

Best rate (2,750 lb, gear up, flaps up)	**97 KIAS**
Best rate (2,750 lb, gear down, flaps up)	**79 KIAS**
Best angle (2,750 lb, gear up, flaps up)	**79 KIAS**
Best angle (2,750 lb, gear down, flaps up)	**73 KIAS**
En route	**104 KIAS**
Fuel pump	**OFF**

Cruise

Refer to the OPERATING DATA MANUAL for cruise power settings.

The normal maximum cruising power is 75% of the rated horsepower of the engine.

Use of the mixture control in cruising flight reduces fuel consumption significantly, especially at higher altitudes. The mixture should be leaned during cruising operation when 75% power or less is being used. If any doubt exists as to the amount of power being used, the mixture should be in the full RICH position for all operations.

The pilot should monitor weather conditions while flying and should be alert to conditions which might lead to icing. If induction system icing is expected, place the alternate air control in the ON position.

To keep the aircraft in best lateral trim during cruise flight, fuel should be used alternately from each tank at 15-minute intervals. Always remember that the electric fuel pump should be should be set to **LO** before switching tanks and should be left on for a short period thereafter.

Descent

Set the required power for descent.

Apply engine power every 1,500ft to prevent excess engine cooling and spark plug fouling. Avoid prolonged descents with a manifold pressure lower than 14 inHg.

Approach and landing

Fuel selector	**FULLEST TANK**
Fuel pump	**ON**
Mixture	**SET**
Propeller	**FULL FORWARD**
Gear	**DOWN (133 KIAS max.)**
Flaps	**SET (108 KIAS max.)**

Trim to 75 KIAS.

Shutdown

Flaps	**RETRACT**
Fuel pump	**OFF**
Avionics	**OFF**
Electrical switches	**OFF**
Propeller	**FULL FORWARD**
Throttle	**CLOSED**
Mixture	**IDLE CUT-OFF**
Magnetos	**OFF**
ALTR switch	**OFF**
BATT MASTR switch	**OFF**

Stalls

The stall characteristics of the Turbo Arrow are conventional. An approaching stall is indicated by a stall warning horn which is activated between five and ten knots above stall speed. Mild airframe buffeting and gentle pitching may also precede the stall.

The gross weight stalling speed of the Arrow with power off and full flaps is 61 KIAS. With the flaps up, this speed is increased by 5 knots. Loss of altitude during stalls can be as great as 300 feet, depending on configuration and power.

Note: *The stall warning system is inoperative with the battery master switch OFF.*

EMERGENCY PROCEDURES

Airspeed (IAS) for safe operations

Stall speed (2,750 lb, gear up, flaps 0)	**66 KIAS**
Stall speed (2,750 lb, gear down, flaps 40)	**61 KIAS**
Manoeuvring speed (2,750 lb)	**124 KIAS**
Manoeuvring speed (1,865 lb)	**97 KIAS**
Never exceed speed	**193 KIAS**
Power off glide speed (2,750 lb, gear up, flaps 0)	**97 KIAS**

Engine failures

Engine failure during start

Starter	**CRANK ENGINE**
Mixture	**IDLE CUT-OFF**
Throttle	**OPEN**
Fuel pump	**OFF**
Fuel selector	**OFF**

Engine failure during take-off

If sufficient runway remains for a normal landing, leave gear down and land straight ahead.

If area ahead is rough or if it is necessary to clear obstructions:

Landing gear lever	**UP**

If sufficient altitude has been gained to attempt a restart:

Fuel selector	**SET TO FULLEST TANK**
Fuel pump	**CHECK HI**
Mixture	**CHECK RICH**
Alternate air	**OPEN**

If power is not regained, proceed with power off landing.

Engine failure in flight

If at low altitude:

Airspeed	**75 KIAS minimum**

Prepare for power off landing.

If altitude permits:

Fuel selector	**SWITCH TO FULLEST TANK**
Fuel pump	**HI**
Mixture	**RICH**
Alternate air	**OPEN**
Engine gauges	**Check for indication of cause**

If no fuel flow/pressure is indicated, check tank selector position to be sure it is on a tank containing fuel.

When power is restored:

Alternate air	**CLOSE**
Fuel pump	**OFF**

If power is not restored, prepare for power off landing. Trim for 97 KIAS.

Power off landing

Trim for 97 KIAS. Locate suitable field and establish spiral pattern 1,000ft above field at downwind position for normal landing approach.

When field can be easily reached, slow to 75 KIAS for shortest landing.

Gear down emergency landing

Touchdowns should normally be made at the lowest possible airspeed with full flaps.

When committed to landing:

Landing gear lever	**AS REQUIRED**
Flaps	**AS DESIRED**
Throttle	**CLOSE**
Mixture	**IDLE CUT-OFF**
Ignition	**OFF**
BATT MASTR switch	**OFF**
ALTR switch	**OFF**
Fuel selector	**OFF**

Note: *If battery master switch is OFF, the landing gear cannot be retracted.*

Gear up emergency landing

If a gear up landing is required, proceed as follows:

Flaps	**AS DESIRED**
Throttle	**CLOSE**
Mixture	**IDLE CUT-OFF**
Ignition	**OFF**
BATT MASTR switch	**OFF**
ALTR switch	**OFF**
Fuel selector	**OFF**

Contact surface at minimum possible airspeed.

Fires

Engine fire in flight

Fuel selector	**OFF**
Throttle	**CLOSED**
Mixture	**IDLE CUT-OFF**
Fuel pump	**OFF**
Cabin heat	**OFF**

Proceed with power off landing procedure.

Electrical fire

BATT MASTR switch	**OFF**
ALTR switch	**OFF**
Cabin heat	**OFF**

Land as soon as possible.

Low oil pressure

Oil annunciator light	**ON**
Pressure indicator	**IN LOW SECTOR**
Throttle	**REDUCE AS FAR AS POSSIBLE**
Oil temperature	**CHECKED**
If oil temperature in red sector	**REDUCE THROTTLE**

Prepare for a forced landing and land as soon as possible.

Low fuel flow/pressure

Fuel pump	**HI**
Fuel quantity	**CHECKED**
Fuel selector	**SWITCH TANKS**

Propeller governor failure

In case of oil pressure drop in the governor system or pitch control failure, the propeller moves to low pitch.

Oil pressure	**CHECKED**
Oil temperature	**CHECKED**
Throttle	**AS REQUIRED**
Airspeed	**REDUCED**

Avoid rapid application of power – maximum RPM is 2,575.

Electrical failures

Check the circuit breakers panel. If the circuit breaker is open, close it only once. If it opens again do not try to close the circuit breaker as the equipment has failed.

ALT annunciator light illuminated:

Ammeter	**Check to verify inoperative alternator**

If ammeter shows zero:

ALTR switch	**OFF**

Reduce electrical loads to minimum:

ALNTR. FIELD circuit breaker	**Check and reset as required**
ALTR switch	**ON**

If power is not restored:

ALTR switch	**OFF**

If alternator output cannot be restored, reduce electrical loads and land as soon as practical. The battery is the only remaining source of electrical power.

Icing

IMPORTANT! *Flight into known icing conditions is prohibited.*

Alternate air	**OPEN**
Cabin heat	**FULL HOT**
Pitot heat	**ON**
Engine	**MAX. POWER/RPM**

Adjust course and/or altitude to obtain best outside air conditions. Divert to nearest airport.

Emergency landing gear extension

Prior to emergency extension:

BATT MASTR switch	**ON**
ALTR switch	**ON**
Circuit breakers	**Check**
NAV LIGHT switch	**OFF**

If landing gear fails to extend:

Airspeed	**Reduce below 88 KIAS**
Landing gear lever	**DOWN**

If gear has still failed to lock down, move and hold the emergency lever down to the Emergency Down position. If gear has still failed to lock down, yaw the aircraft abruptly from side to side with the rudder.

Spin recovery

Intentional spins are prohibited, but if an inadvertent spin does occur, the following recovery procedure is recommended:

Rudder	**HOLD OPPOSITE DIRECTION OF ROTATION**
Yoke	**FULL FORWARD, AILERONS NEUTRAL**
Throttle	**IDLE**

When spinning stops, centralise rudder, level the wings and ease out of the dive.

Airspeed indicating system failure

In case of erroneous indications in flight:

Pitot heat	**ON**

If erroneous indications persist, carry out a precautionary approach, maintaining an adequate airspeed margin above stall warning activation speed.

CREDITS

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Aircraft systems and cockpit programming	Martyn Northall
Flight dynamics	Paul Frimston
Sounds	SimAcoustics
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Special thanks to all the testers and to Flying Club Conington for providing access to their aircraft.

Ian Warren

This PA-28R Turbo Arrow III/IV add-on is dedicated to the memory of Ian Warren. As well as being a very active member of the flight simulation community and an aviation artist, Ian was a member of our beta team for several years, making important contributions towards many of our best-loved products, including the Arrow III and Turbo Arrow III/IV. Always humorous and engaging to converse with, he will be missed by many.

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