Chincul PA-A-38 Tomahawk

History

The PA-38-112 Tomahawk was designed as a relatively inexpensive to acquire and operate two seat trainer to tackle the firmly established definitive basic trainer in the 1970s, the Cessna 150 and 152, and to take over the spot in Piper's model range then occupied by two seat variants of the PA-28 Cherokee series.

Piper announced the development of the Tomahawk during late 1977 and first deliveries were made in early 1978. Despite an initial mixed reaction to the new trainer from the flying public, the Tomahawk was an instant sales success with over 1000 built in the first year of production alone. In service the Tomahawk proved to be economical to operate, but the aircraft was dogged by quality control problems (some 19 Airworthiness Directives were issued by the FAA in the PA-38's first four years) and unpredictable stalling characteristics, resulting in a number of stall/spin accidents.

Besides being a widely used primary trainer, it is also an effective budget cross-country aircraft for two persons with its spacious and comfortable cabin. Though it shares similar performance and costs of operation to the Cessna 152, the PA-38 has more shoulder room. It also has good cabin ventilation, using automotive-style air ducts. Common cruise speeds range from 90 to 110 knots

The Tomahawk was manufactured under licence of Piper Aircraft in Argentina by Chincul S.A. as PA-A-38 "Tomahawk". The PA-A-38 is, basically, the original Piper Aircraft, with Lycoming 0-235 112 HP engine, and the same flight characteristics.

Chincul S.A. have your factory in San Juan, Argentina and manufacture several models of Piper Aircraft besides Tomahawk, as Arrow, Arrow 2, Cherokee, Archer, Cheyenne, Seneca, Lance, Navajo and Pawnee in standard, special and Turbo versions, between 1977 and 1995, year in which aircraft production cesed and the factory is definitively close...

Many flight schools in Sudamerica adopt the Tomahawk as training aircrat, and for many years the "Tommy" instruct hundred of pilots, and continues "training" new excelent pilots today...

The Model

The aircraft modelled is a PA-A-38 "Tomahawk" manufactured by Chincul S.A. This Aircraft is powered by a Lycoming 0-235 112 HP engine and have NARCO Comunication and navigation equipment.

In particular, this aircraft is equiped with a NARCO NAV122 Navigation system, a NARCO COM 120 TSO Communication Radio, a NARCO ADF 141 TSO ADF frequency Selector and a NARCO AT 155 TSO Transponder.

Features

Full moving parts as control surfaces, rotating wheels, doors, noosewheel steering, propeller, etc.

Four Original Libraries wiht original paint schemes of Tomahawk manufactured by chincul.
    LV-MNO of Flight Tango Flight School.
    LV-OLI A private aircraft
    LV-OHX and LV-OLU of Mendoza Flight Club

Custom Gauges and panels with several subpanels emulating all sistems and flight instruments.

Fully functional Virtual Cockpit.

Important Note

I'm, simply, a Flight Simulator ethusiast. I haven't contact with real flight world and I never see or flight this aircraft in real life. Althroug, I tryed to make it as real as posible, based on photographs, data and information from friend simmers and from WWW. Unfortunatelly I can't ensure the exact simlitude of this Flight Simulator model with the real aircraft. I apologize for the inconvenience.

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Specifications

Powerplant	Lycoming 0-235, 112 hp @ 2,600 rpm
Recommended TBO	2,400 hr
Propeller	Sensenich, fixed pitch, 72-in dia
Length	22 ft
Height	9 ft 1 in
Wingspan	34 ft
Wing area	124.7 sq ft
Wing loading	13.39 lb/sq ft
Power loading	14.9 lb/hp
Seats	2
Empty weigh	1,088 lb
Useful load	582 lb
Payload w/full fuel	402 lb
Maximum takeoff weight	1670 lb
Maximum landing weight	1670 lb
Fuel capacity, std	32 gal (30 gal usable)
Oil capacity	6 qt
Baggage capacity	100 lb, 20 cu ft

Performance

Takeoff distance, ground roll	820 ft
Takeoff distance, over 50 ft obstacle	1440 ft
Maximum demonstrated crosswind component	15 kt
Rate of climb sea level	720 fpm

Limiting and Recommended airspeeds - Kias

Vx - Best angle of climb	61
Vy - Best rate of climb	70
Va - Design Maneouvering	103
Vfe - Max flaps extended	89
Vno - Max estructural criusing	110
Vne - Never exceed	138
Vr- Rotation	53
Vs - Stall clean	48
Vso - Stall In landing configuration	46

Cruise speed endurance (fuel consumption)

At 75% power and 5,000 ft   100 to 103 kt/4.4 hr, (35 pph/5.8 gph)

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Main Panel

Main instrument panel distribution

1 - Analogic Clock
2 - Airspeed Indicator
3 - Attitude Indicator
4 - Sucction
5 - Alternator Warning Light
6 - Barometric Altimeter
7 - NAV 1
8 - COMM 1
9 - ADF
10 - Transponder
11 - Turn Indicator
12 - Directional Gyro
13 - Vertical Speed Indicator
14 - ADF indicator
15 - Master Battery Switch
16 - Alternator Switch
17 - Magnetos and Ignition Switch
18 - RPM Indicator
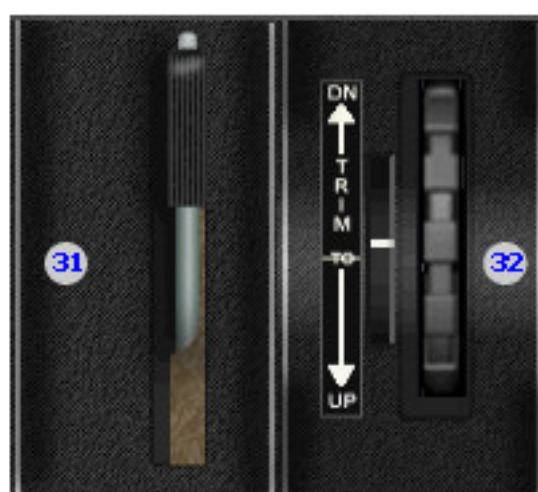19 - Carburator Heat Switch

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20 - Engine Primer
21 - Auxiliary Fuel Pump Switch
22 - Landing Light Switch
23 - Anticollision Lights
24 - Pitot Heater Switch

Engine Instrument Panel

25 - Ammeter
26 - Fuel Pressure Indicator
27 - Oil Temperature
28 - Oil Pressure indicator
29 - Navigation Light Switch
30 - Instrument Panel Light Switch

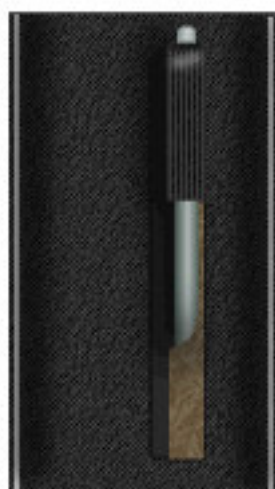## Flaps and Trim Panel

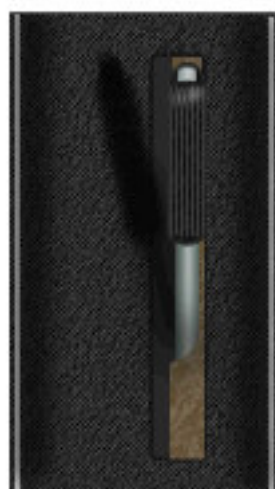31 - Wing Flaps Control and Position Indicator
32 - Elevator Trim Control Wheel and Indicator

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Flaps Position indicator
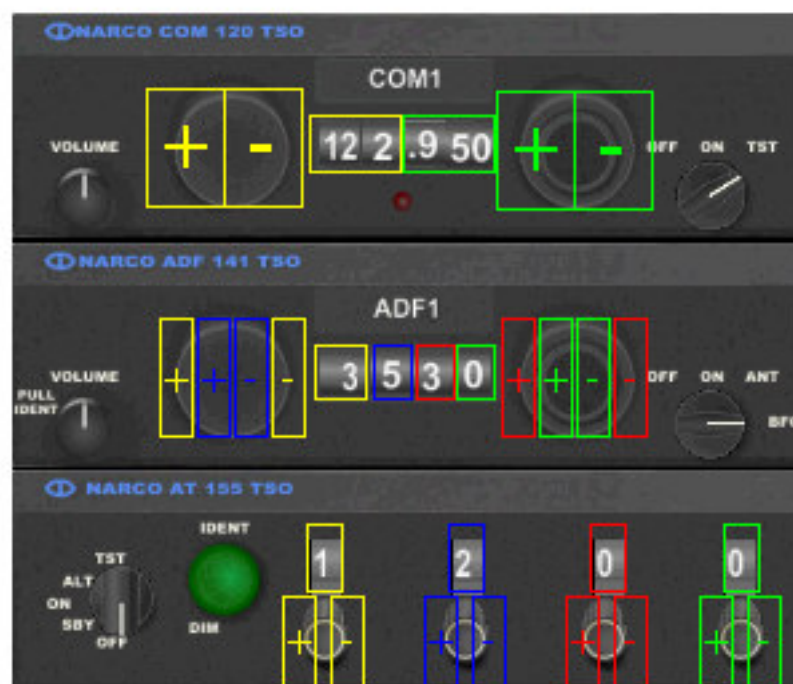

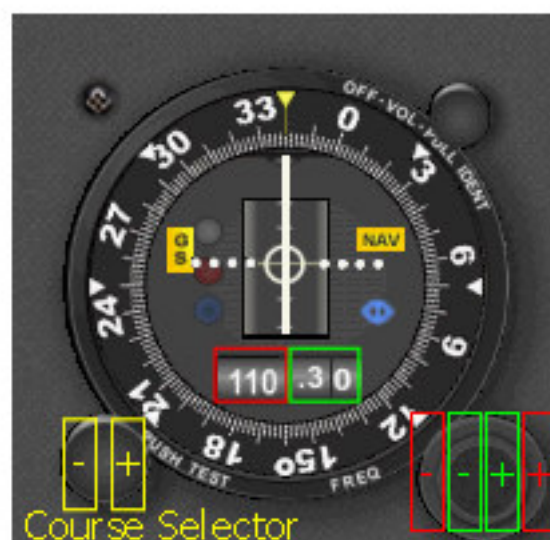Flaps 0 (Up) Flaps 21 (Down) Flaps 34 (Full)

Throttle Quadrant

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31 - Left Fuel Tank Quantity Indicator
32 - Right Fuel Tank Quantity Indicator
33 - Fuel Tank Selector
34 - Throttle Control
35 - Mixture Control

Radio Stack Interactive Areas

NARCO NAV122 Interactive Areas
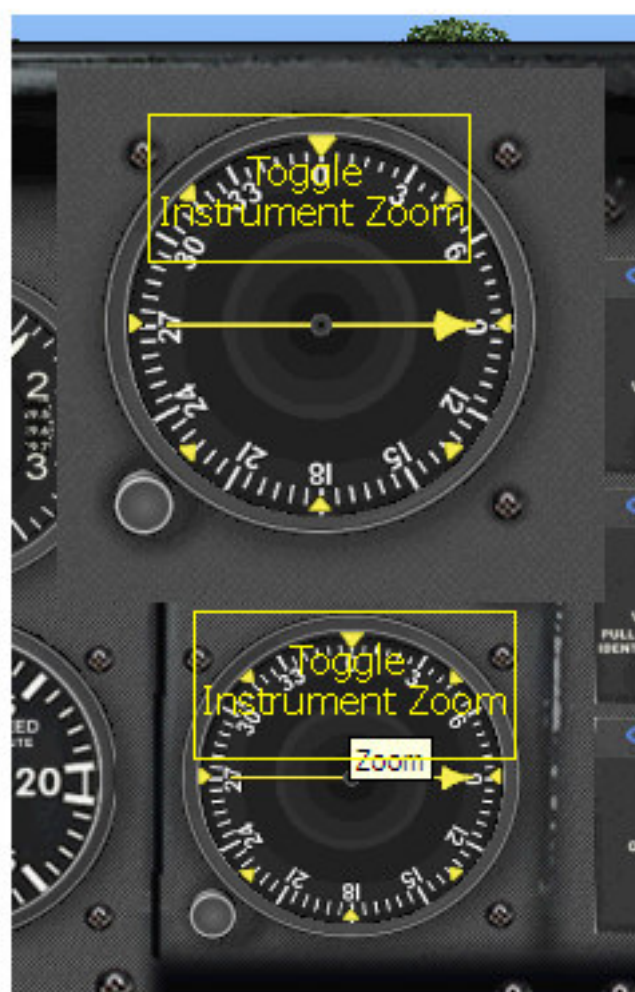
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Instrument Zoom Function

In order to have more easy read and calibration, some instruments have a zoom interactive zone to magnify the instrument. Just click in this zone to toggle instrument zoom function.
This function are improved in the following instruments:

Altimeter
Airspeed indicator
ADF Indicator
NARCO NAV122
Directional Gyro

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Simicons Keypad

Toggle ATC Window

Toggle Map Window

Toggle Kneeboard Panel

Toggle Main Panel

Toggle Radio Stack

Toggle Compass Window

Toggle GPS Window

Toggle VFR Panel

Toggle Throttle Quadrant

Close Simicons keypad

Toggle Engine Panel

Toggle Flaps & Trim Panel
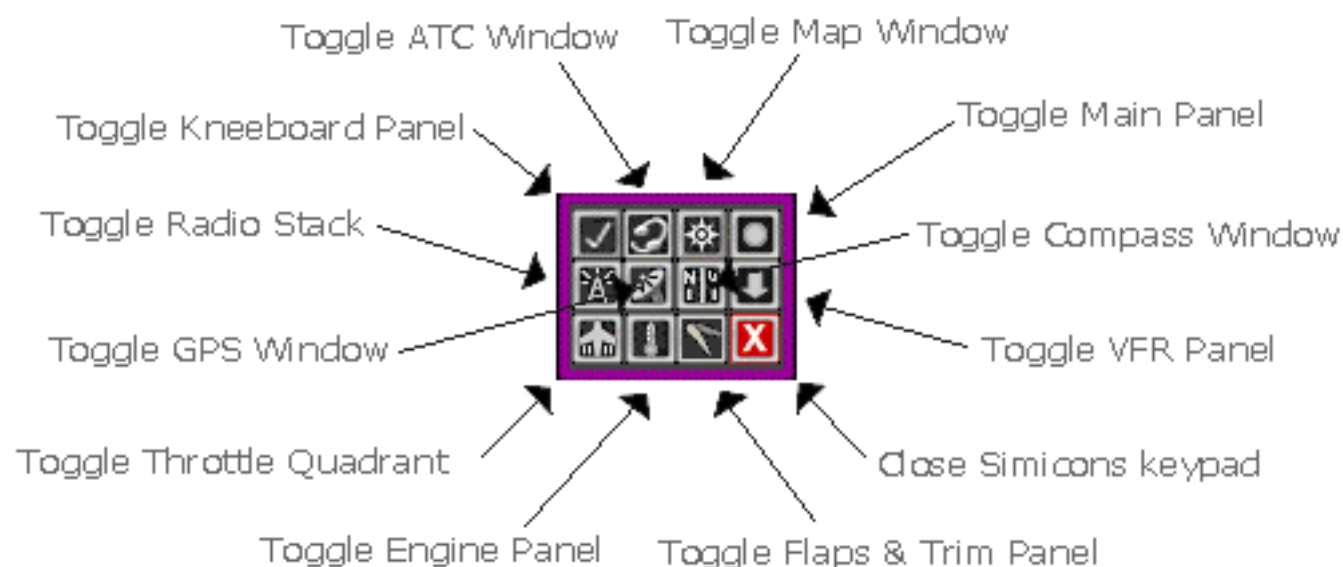
Simicons Keypad provides an easy and quickly access to all aircraft subpanels and Aditional Flight Simulator utility panels. If this panel is closed, it can be activated from Flight Simulator Main Menu. Just click in View -> Instrument Panels -> Icons

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Original Aircraft Checklists are modified to use it in Microsoft Flight Simulator. External structure checks and phisical elements check (as doors, seats, sealbelts, etc) are ommited from this checklists, for operational purposes.

Preliminary

Control Lock and Covers	Remove
Parking Brake	ON
Magneto Switch	Check OFF
Master Battery Switch	ON
Alternator Warning Light	Check ON
Pitot Heat	Check, then OFF
Navigation Lights	Check, then OFF
Anti-Collision Lights	Check, then OFF
Landing Lights	Check, then OFF
Fuel	Check both tanks, then OFF
Fuel Pump	ON, Check Fuel Pressure, then OFF
Trim	Check correct operation, then center
Flaps	Check All Stages, then UP
Carburator Heat	Check Correct Operation, Set Cold
Master Battery Switch	OFF
Throttle	Check free full movement, Set Idle
Mixture Lever	Check free full movement, Set Rich

Before Start

Parking Brake	ON
Radios and Avionics	OFF
Fuel Tank Selector	On Fuellest Tank

Engine Start (Normal Cold Engine)

Engine Primer	As Required
Battery Master Switch	ON
Propeller Area	CLEAR
Mixture Lever	Rich
Throttle	Open 1/4 Inch Aprox.
Nav Lights	ON
Fuel Pump	ON
Magnetos & Start Switch	All Phases, L, R, BOTH and START. Hold and release when engine start.

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Engine Start (Hot Engine)

Battery Master Switch	ON
Propeller Area	CLEAR
Mixture Lever	Rich
Throttle	Close
Nav Lights	ON
Fuel Pump	ON
Magnetos & Start Switch	All Phases, L, R, BOTH and START. Hold and release when engine start.

After Engine Start

R.P.M	Set to 1200.
Oil Pressure	Check in Green arc in 30 Sec.
Fuel Pump	OFF
Fuel Pressure	Check
Alternator Switch	ON
Alternator Warning Light	Check OFF
Ammeter	Check charging
Succion	Check
NAV And Radios	Turned and Check as required
Flight Instruments	Set as required
ATIS and Clearance for Taxi	Obtained

Taxying

Parking Brake	OFF
Brakes	Release and check as soon as possible
Rudder and Nosewheel Steering	Check
Flight Instruments	Check

Power Checks

Parking Brake	ON
Fuel Selector	Check on fullest tank
Engine parameters	Check on Normal values
R.P.M.	Set to 1800
Carburator Heat	Set Hot. Max drop 100 RPM. Set Cold
Magnetos	Check Left and Right. Max drop 175 RPM. Max drop between magnetos 50 RPM.
Succion	Between 4 and 5 in. HG.
R.P.M.	Set to Idle.

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Before Takeoff

Flight controls	Free and correct.
Trim	Set for Takeoff
Flaps	As required. 21 for short takeoff
Mixture Lever	Rich
Magnetos	Both
Anti-collision Lights	As Required
Fuel Pump	ON
Cleared for Takeoff	Obtained

Takeoff

Brakes	Release
Throttle	Full Power
Engine parameters	Check on normal values
Mixture Lever	Rich
Rotate	At 60 KIAS
Climb Speed (Vy)	70 KIAS
Fuel Pump	OFF at Security Altitude
Fuel Pressure	Check
Flaps	UP at desired Altitude
Climb Speed	Set to 70 - 80 KIAS

Cruise

Power	Between 2100 and 2400 RPM
Trim	Correct position for cruise
Engine parameters	Check on normal values
Mixture Lever	Above 3000 Ft. AGL Adjust to obtain maximum RPM
Fuel Selector	Change to ensure balance

Before Landing

Mixture Lever	Rich
Fuel Selector	Set to Fullest Tank
Engine parameters	Check on normal values
Carburator Heat	Set Hot If necesary
Landing Light	ON
Radios And instruments	Turned and set
Flaps	Down below 89 KIAS
Aproach Speed	Between 70 and 65 KIAS

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Go Around

Power	Full
Carburator Heat	OFF
Flaps	RETRACT one stage at time
Radios	GO AROUND Call. Obtain ATC Instructions

After Landing

Runway	Cleared
Carburator Heat	OFF
Flaps	UP
Landing Light	OFF
Anti-collision Lights	OFF
Fuel Pump	OFF
Transpnder	OFF
Radios	Set
Clearance for Taxi	Obtained

Shutdown And Secure

Parking Brake	SET
Radios	OFF
Throttle	Set to Ide
Mixture Lever	Lean until engine Shutdown
Magnetos	OFF
Nav and Panel Light	OFF
Fuel Selector	OFF
Alternator Switch	OFF
Master Battery Switch	OFF

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