NEMETH DESIGNS

SIAI/Marchetti S.205-18/R

FOR MS FLIGHT SIMULATOR

The S.205-18/R is a single engine, low wing monoplane of all metal construction, employing an electrically retractable tricycle landing gear with conventional air-oil struts. The airplane configured with four seats, one pilot and 3 passengers. Distinctive feature of the airplane is the honeycomb panels which replace the conventional wing skin. The use of large honeycomb panels for the wing skin assures the perfect construction of the laminar wing airfoil, and permits to reduce the riveting to a minimum. This results in an improvement of aerodynamic and performance characteristics of the airplane.

ENGINE

The S205-18/R is powered by an Avco Lycoming O-360 , four-cylinder, air-cooled, horizontally opposed, wet sump engine. It is rated at 180 horsepower at 2700 RPM. The engine is equipped with a geared starter, alternator, float type carburetor, two magnetos and shielded ignition systems. The engine mount is of aluminum alloy cantilever structure and steel tubing construction and incorporates vibration absorbing rubber pads. The engine cowling has a large-hinged section on each side of the engine. These sections may be opened to facilitate access for maintenance and are provided with quick-release fasteners.

The engine controls consist of the throttle, mixture, and propeller controls. The throttle control, located on the center sub panel just below the instrument panel. Push the knob in to advance the throttle or pull out to retard. The mixture control, located on the center sub panel and next to the throttle. Push the control in to enrich the mixture and pull out to lean. To stop the engine, pull the knob to "idle-cut-off" (fully out) position.

A propeller control knob is located on the center sub panel and next to the mixture control. It changes the setting of the propeller governor to control the engine speed. With the control knob full in the propeller is in the "High RPM" position. Pulling the control knob full out the propeller is in the "Low RPM" position. When increased power is required, increase the RPM first, then open the throttle. To decrease power, close the throttle first, then decrease the RPM. After take-off, or other high engine RPM demanding situations reduce throttle first, then reduce the RPM.

The key-operated ignition switch, located on the control sub panel, controls the dual magneto ignition system. The four switch positions are OFF "R', "L" and "BOTH". Always operate the engine on both magnetos, when the engine is not operating, the switch always must be in the "OFF" position.

The starter switch, located on the control sub panel, it is a toggle type and operates when raised, automatically engaging the starter through a relay. Never operate the starter switch when the engine is running because the starter drive mechanism may be damaged.

Provisions for both hot and cold air induction are included in the carburetor air induction system. Heated alternated air to the carburetor is provided to prevent possible carburetor icing formation.

The carburetor heat control consists of a push-pull handle located on the control sub panel, next to the ignition switch. It's throttle valve type by which the cold or warm air to the carburetor may be selected. Pulling the control handle out, the cold air supply is shut off and the warm air is drawn into the carburetor. Pushing the control handle full in, only the cold air is supplied to the carburetor.

PROPELLER

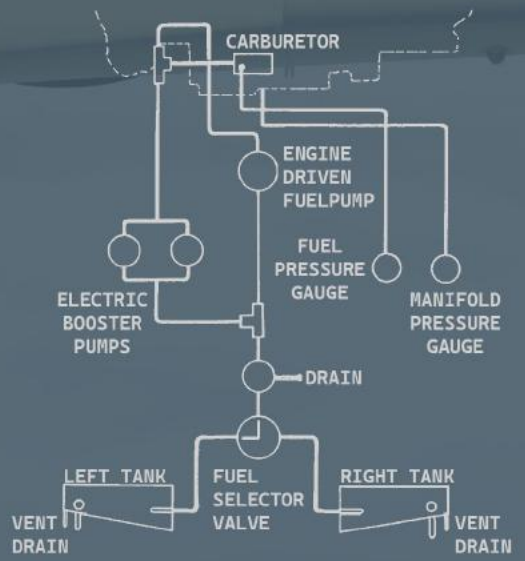
The airplanes use a two bladed, constant speed propeller. Operation of this propeller is completely automatic. Once the desired propeller speed is established by the pilot, the blades automatically change their pitch. The propeller utilizes engine oil pressure to change from low to high pitch. The propeller governor, which is mounted on the accessory section of the engine, controls the speed of the propeller and the engine by decreasing the oil pressure when the RPM is too low.

FUEL SYSTEM

The fuel system consists of two aluminum alloy fuel tanks, one located in each wing. Each tank has a useful capacity of 27. 5 U.S. gallons (104 liters). A line from each tank connects to a three-way fuel selector valve by which the right- or left-wing fuel tank may be selected (one at a time). The fuel selector valve is controlled by a handle installed on the center pedestal located between the front seats. This denouement requires continuous attention to the fuel level of the tank being selected and manual operation of the selector lever if required.

The fuel from the selector valve flows through a large capacity fuel filter to a tee fitting which is connected to two parallel-connected electric fuel booster pumps and to the engine-driven fuel pump. The electric fuel pumps are connected by a hose to a tee fitting installed on the inlet hose of the carburetor. A hose from the engine-driven fuel pump outlet fitting connects to the tee fitting installed on the carburetor inlet hose. By this arrangement, when the electric fuel pump are operating and the engine-driven fuel pump is OFF, the fuel flows to the carburetor through the electric pumps and by-passes the engine driven pump and vice versa.

The electric fuel booster pumps serve as emergency fuel boost in the event of failure of the engine-driven fuel pump or providing enough fuel pressure during engine start or high engine power demanding procedures. They must be turned ON during the engine starting, take-off and landing, and must be turned OFF during normal flight. The electric fuel pump control switch is installed on the right side of the instrument panel and the fuel pump warning light on the left side.



ELECTRICAL SYSTEM

Electrical energy for the airplane is supplied by a 24-volt, direct-current, single wire, negative ground return electrical system. A 24-volt, 24-Amperes-hour battery supplies power for starting and furnishes a reserve source of power in the event of alternator failure. An engine-driven alternator of 50-Ampere capacity supplies normal electric power during flight and maintains a battery charge controlled by a voltage regulator. An external power receptacle, located on the right side of fuselage, behind the baggage compartment. is provided to supplement the battery-alternator system for starting and ground operation, in order to avoid the discharge of the battery. The battery-alternator system comprises a battery relay, a voltage regulator, an ammeter, an external power receptacle, a battery switch, an alternator switch, and a bus bar. All primary circuits are fed through circuit breakers from the bus bar system and the structure of the airplane is used as the common ground return for all circuits. The battery and alternator switches are located on the left instrument panel. All other electrical switches are also located on the left instrument panel.

FLIGHT CONTROLS

The ailerons, flaps, elevator, trim tab and rudder are of all metal construction. Conventional wheel and rudder pedal controls for the pilot and copilot operate the flight control surfaces by cable systems. To trim the airplane longitudinally, the left elevator is provided with an adjustable trim tab cable-controlled by a control wheel installed in the center pedestal located between the front seats. Nose attitude of the airplane is indicated by a mechanical trim tab position indicator labelled "NOSE UP" and ' NOSE DOWN", installed on the control pedestal. The wing flaps are cable controlled by a manually operated flap control lever located at the center pedestal between the front seats. The angular travels of flaps are 15 degrees down for take-off; 15, 30, and 43 degrees down for landing. The flap control lever has four positions corresponding to the above flap settings. The first position (lever full down) is 0 degrees flap setting. The second, third and fourth positions are the 15-, 30- and 43-degrees.

LANDING GEAR SYSTEM

The airplanes are equipped with an electrically retractable landing gear. The shock struts are of the air-oil type and the main wheel brakes are of the hydraulic single-disc type and are self-compensating. The nose wheel is steerable through cable linkage to the rudder pedals. During retraction of the gear, the steering mechanism disconnects automatically to reduce rudder pedal loads in flight and the nose wheel is returned to its center position so that the gear can retract in the nose wheel freely. The landing gear extension/retraction is actuated by a selector handle installed on the center sub panel located below the instrument panels. The selector switch can be identified by its small wheel shaped knob. When released, the knob automatically locks in the slot of the selected position. The landing gear indicating lights are located on the extreme left side of the instrument panel. The lower green indicating light is the indication that all gears are fully down. The upper red light is the gear up indication. The red gear indicating light flashes when power is reduced (below approximately 14 inches manifold pressure) and the gear is not down. A crank located on the left side of cabin permits the manual extension of the gear when electrical extension failure. The gear cannot be retracted manually in flight. The master brake cylinders incorporate a parking brake valve controlled by a parking brake handle, located on the left instrument panel.

FLIGHT INSTRUMENTS

The flight instruments are located on the left AND right instrument panels, in front of the pilot. The airspeed indicator is operated on ram mir from the Pitot and static air from the static ports, while the rate of climb indicator and the altimeter operate on static air alone. The turn and bank indicator is an electrically operated instrument. The flight instruments are as follows: Airspeed Indicator, Altimeter, Rate of Climb Indicator, Turn and Bank indicator, Gyro Horizon and Directional Gyro. Navigation instruments are the VOR and ADF indicators. Instruments also used as flight and navigation aids are the Clock, Chronometer, Magnetic Compass, Remote Compass Indicator, and outside air temperature gauge. The pitot system consists of the pitot head which incorporates the pitot heater, and the related plumbing and electrical wiring. Impact pressure entering the pitot head is transmitted by a line to the airspeed indicator. The pitot head is electrically heated to prevent the formation of ice in the pitot opening, with a resultant erroneous reading of the airspeed indicator. The pitot heater switch is located on the lower left side of the instrument panel, next to the alternator and battery switches. The static source consists of two static ports, lines from the static ports and tee fittings. The static lines from the tee fittings are routed to the airspeed indicator, altimeter and rate of climb indicator.

STALL WARNING SYSTEM

The stall warning system consists of a light and horn unit installed on the right side of the instrument panel and connected to a sensing unit on the leading edge of the right-wing panel. The sensing unit consists of a microswitch actuated by a small detector vane when the leading edge of the wing approaches a stalling condition. The microswitch actuates the light and horn unit thus giving to the pilot both visual and aural indication of an impending stall.

LIGHTING SYSTEM

The lighting system consists of the landing light, navigation lights, instrument lights, cabin and map lights, baggage compartment light and rotating beacon. The landing and taxiing light is installed in the front of the engine cowling and is controlled by a switch on the left instrument panel. A navigation light is mounted on each wing tip. The left-wing tip light red; the right is green. A white navigation light is installed in the tail cone fairing. The navigation lights are controlled by a switch on the left instrument panel. The optional rotating beacon is installed in the top of the vertical fin and is controlled by a switch on the left side of the sub panel. The instrument lights are controlled by a switch installed on the left instrument panel and the light intensity may be adjusted by a rheostat installed on the center sub panel located below the instrument panels. The cabin lights are mounted in the console installed on the cabin ceiling, this console also houses the loudspeaker and two map lights. The lights are controlled by switches located on the console.

SPECIFICATIONS

Aileron travel:	22° UP / 15° DOWN
Flap movement:	43° in three segments
Rudder travel:	+/- 25°
Elevator travel:	30° UP / 20° DOWN
Elevator trimtab travel:	22° UP / 26° DOWN
Nose wheel travel:	+/- 20°
Overall wingspan:	10.87 m (35.65 ft)
Overall lenght:	8.00 m (26.25 ft)
Overall height:	2.89 m (9.48 ft)
Wingspan:	10.62 m (34.87 ft)
Wingchord at tip:	2.25 m (7.38 ft)
Wing incidence:	+2° at center, -1° at tip
Wing dihedral:	5.5°
Wing sweepback:	2.1°
Flap lenght:	3.1 m (10.2 ft)
Aileron lenght:	1.55 m (5.1 ft)
Horizontal stabilizer span:	11.22 m (30.41 ft)
Vertical spabilizer span:	1.71 m (6.61 ft)
Wing area:	16.07 m³ (173 ft³)
Aileron area:	1.83 m³ (11.66 ft³)
Flap area:	1.17 m³ (23.32 ft³)
Elevator area:	1.23 m³ (13.2 ft³)
Rudder area:	0.61 m³ (6.6 ft³)
Range:	1500 km (810 nm)
Service ceiling:	5380 m (17650 feet)
VNE (never exceed):	323 km/h (174 knots)
Max gear/flap speed:	200 km/h (109 knots)
Cruise speed:	254 km/h (137 knots)
Stall speed:	85 km/h (45 knots)
Rate of climb:	4.4 m/s (~865 ft/min)
Sink rate:	4.4 m/s (~865 ft/min)
Roll rate:	35 degrees
Takeoff distance:	235m (771 feet)
Landing distance:	190 m (623 feet)
Empty weight:	750 kg (1.653 lbs)
Max. takeoff weight:	1.350 kg (2.976 lbs)
Fuel capacity:	208 L (45.75 gallons)
Fuel type:	Avgas

NOTE: Please set the flight model to **MODERN** at the realism settings and the throttle controller to **Throttle 1** in the options menu otherwise the airplane won't function properly. Legacy mode is **NOT** supported.

COCKPIT LAYOUT

1. Turn and slip indicator
2. Gear retracted indicator
3 Gear extended indicator
4. Attitude indicator
5. Indicated airspeed (knots)
6. VOR2 indicator
   a) course adjustment knob
7. Fuel pressure low indicator
8. Barometric altimeter (feet)
   a) Baro pessure setting knob
9. Barometric altimeter (meters)
   a) Baro pressure setting knob
10. VOR1 indicator
    a) course adjustment knob
    b) marker sensitivity
11. Vertical speed (feet/minute)
12. Electronic compass
    a) Heading selector knob
13. Digital clock and chronometer
    a) Reset b) mode select
    c) start/stop
14. ADF indicator
    a) bearing set
15. NAV2 radio
    a) frequency swap b) frequency set
16. COM2 radio
    a) frequency swap b) frequency set
17. GNS 430 GPS radio
18. Transponder
19. Audio panel
20. Distance measuring equipment
21. Autopilot
    a) master switch b) heading hold
    c) altitude hold
22. Manifold pressure and fuelflow
23. Tachometer
24. Left fuel tank quantity
25. Right fuel tank quantity
26. Alternator current load indicator
27. Oil pressure (PSI)
28. Oil temperature (F°)
29. Cylinder-head temperature (F°)
30. Vacuum system suction indicator
32. Attitude indicator
33. Stall warning indicator
34. Fuel pressure indicator (PSI)
35. Exhaust temperature indicator (F°)
36. Fuel booster switch
37. Fuel booster operation indicator
38. Parking brake lever
39. Landing light
40. Position lights
41. Rotating beacon light
42. Luggage compartment light
43. Cockpit light
44. Instrument lights
45. Pitot heater
46. Turn and slip indicator switch
47. Generator
48. Battery
49. Starter switch
50. Magnetos switch
51. Carburator heater adjustment knob
52. Throttle lever
53. Fuel mixture lever
54. Instrument light dimming knob
55. Propeller RPM setting lever
56. Cabin heater setting knob
57. ADF radio
    a) mode select b) frequency set knobs
    c) freqency range select
58. Flaps lever
59. Fuel tank selector
60. Elevator trim setting indicator
61. Elevator trim setting lever
62. Manual gear extension lever

Notes:

Use mouse wheel UP/DOWN, or press and hold the left mouse button then drag the mouse left or right to adjust the rotating knobs (radios and navigation instruments).

Use mouse wheel UP/DOWN, or press and hold the left mouse button then drag the mouse left or right to adjust the fine turne levers (throttle, propeller pitch, sundhade, heaters, trim).

Once the manual gear extension was used the gears cannot be retracted anymore (emergency use).

Prime the engines with the throttle lever (pull it back and forth 4-5 times) before trying to startup the engine.

Only one fuel tank can feed the engine at a time. The pilot has to select between the left and right tanks periodically to balance out the fuel tanks.

Use the large frequency setting knob on the ADF instrument to set the hundred values of the NDB frequency. The small frequnecy setting knob sets the tents, whole and fraction frequency values. Press the left mouse button on the small setting knob to select between these frequency ranges to set.

Press the MODE button on the digital clock to select between the clock and chronometer mode. Press the start/stop button for chronometer operation, press the reset button for chronometer reset.