

NAYAK AVIATION CORPORATION
9410 E. Terminal Dr.
San Antonio, Texas 78216

24031
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S/N 34-757084
R/N ~~412GA~~ 52MC

FAA APPROVED

AIRPLANE FLIGHT MANUAL SUPPLEMENT

FOR

PIPER PA-31-200T SENECA, SERIAL NUMBERS 34-7570001 AND UP,
WITH PIPER FLIGHT MANUAL REPORT VB-628

This supplement must be attached to the Airplane Flight Manual when the Nayak Aviation Corporation Nacelle Fuel Tank Installation is installed in accordance with STC #SA2205SW. The information contained herein supplements the information of the basic aircraft flight manual; for limitations, procedures and performance data not contained in this document, consult the manual proper.

I. LIMITATIONS:

- A. Do not transfer fuel until main tanks are at one-half full or less.
- B. Transfer fuel in level flight only.
- C. Previously approved operation in icing conditions prohibited unless Piper non-icing vents #43910-00 and #43910-01 are installed at Nayak vent locations under this STC.

PIACARDS:

- A. Adjacent to switches

Do not transfer until main tank is below half full.

II. PROCEDURES:

Transfer control switches are located on instrument panel.

Approximately 30 minutes are required to transfer all the fuel out of the Nacelle tanks.

(2 MIN. PER GAL.)

III. PERFORMANCE:

No change.

IV. WEIGHT AND BALANCE DATA:

Nacelle tanks C.G. Location: 90.1 in. aft datum

FAA Approved: 6-26-75

Revised: 11-3-76

FUEL MOMENT

<u>GAIS.</u>	<u>WT.</u>	<u>MOMENT</u>
30	180	16218
20	120	10812
10	60	5406
5	30	2703

FAA APPROVED:

for Jack E. Owens
Don P. Watson
Chief, Engineering and
Manufacturing Branch
Southwest Region
Ft. Worth, Texas 76101

DATE: June 26, 1975

REVISED: November 3, 1976

United States of America
Department of Transportation — Federal Aviation Administration
Supplemental Type Certificate

Number SA2205SW

This certificate, issued to Nayak Aviation Corporation
9410 E. Terminal Drive
San Antonio, Texas 78216

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 23 of the Federal Aviation Regulations:

Original Product — Type Certificate Number: A7SO
Make: Piper
Model: PA-34-200T

Description of Type Design Change: Installation of 15 gallon auxiliary fuel cells in each engine nacelle according to Drawing List No. 24000, Revision B, dated 8/28/76, or later FAA approved revision.

Limitations and Conditions:

FAA Approved Airplane Flight Manual Supplement dated June 26, 1975; or Supplement dated June 26, 1975, revised November 3, 1976, is required.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: May 23, 1975

Date received: 12/9/76; 3/9/77
Revision 2

Date of issuance: July 2, 1975

Date amended:



By direction of the Administrator

Coleman Hatcher
(Signature)
for Don P. Watson
Chief, Engineering and Manufacturing Branch
(Title)

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.

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AIRPLANE FLIGHT MANUAL SUPPLEMENT
FOR PA-34-200T SENECA II

ALTIMATIC IIIC AUTOPILOT INSTALLATION

THIS DOCUMENT MUST BE ATTACHED
TO THE AIRPLANE FLIGHT MANUAL

MANUFACTURER'S MODEL: PA34-200T

MANUFACTURER'S SERIAL: 34-7570084

REGISTRATION: 52MC
N12CA

FAA APPROVED BY: Ward Evans
 Ward Evans
 PIPER AIRCRAFT CORPORATION
 DOA NO. SO-1
 VERO BEACH, FLORIDA

DATE OF APPROVAL: Nov. 4 1974

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AIRPLANE FLIGHT MANUAL SUPPLEMENT

This supplement must be attached to the PA-34-200T Airplane Flight Manual, Report Number VB-628, when the Altimatic IIIC Autopilot Installation is installed and the Airplane Flight Manual does not reflect the information contained herein. The information herein supplements the information in that Airplane Flight Manual. For limitations, procedures and performance data not contained in this document, consult the Airplane Flight Manual.

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I. LIMITATIONS:

- A. The maximum speed for Autopilot operation is 200 MPH CAS. (Autopilot Vmo)
- B. Autopilot operation not authorized with greater than 25° of flap extension.
- C. Autopilot OFF for take off and landing.
- D. Placard P/N 13A660 "Conduct Trim Check Prior to Flight (See AFM)" to be installed in clear view of pilot.

II. PROCEDURES:

A. Pre-Flight

1. Roll Section

- a. Place Radio Coupler in "Heading" mode and place Roll rocker switch "ON" to engage roll section. Rotate roll command knob left and right and observe that control wheel describes a corresponding left and right turn, then center knob.
- b. Set proper D.G. Heading on D.G. and turn Heading Bug to aircraft heading. Engage "Heading" mode rocker switch and rotate heading bug right and left. Aircraft control wheel should turn same direction as bug. Grasp control wheel and manually override servo, both directions.
- c. Disengage Autopilot by depressing trim switch. Check Aileron operation is free and A/P is disconnected from controls.

2. Pitch Section

- a. Engage "Roll" rocker switch.
- b. Center pitch command disc and engage "Pitch" rocker switch.
- c. Rotate pitch command disc up and then down and check control yoke moves same direction. Check to see that servo can be overridden by hand at control wheel.

NOTE: Autopilot might not be able to raise elevators, on ground, without assistance from pilot.

- d. Hold control yoke and disengage Autopilot by pressing Master A/P Disconnect/Trim Interrupt switch button. Check Roll and Pitch controls to assure autopilot has disconnected.

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3. Trim System

General

This preflight check procedure is designed to uncover hidden failures that might otherwise go undetected. Proper operation of the electric elevator trim system is predicated on conducting the following preflight check before each flight. If the trim system fails any portion of the procedure, pull the trim circuit breaker out until trim system is repaired. Substitution of any trim system component for another model is not authorized. For emergency interrupt information, refer to Section II(D) of this Supplement.

The Command Electric Trim Switch on the left hand portion of the pilot's control wheel has two functions:

- When the top bar (AP OFF) is pressed, it disconnects the Autopilot.
- When the top bar is pressed AND the rocker is moved forward, nose down trim will occur when moved aft, nose up trim will occur.

Pre-Flight: Command Trim - Before Each Flight

- Check trim circuit breaker - IN.
- Trim Master Switch - ON.
- AP OFF - Check normal trim operation - UP. Grasp trim wheel and check override capability. Check nose down operation. Recheck override.
- Activate center bar only - Push rocker fore and aft - only. Trim should not operate with either separate action.

Autotrim - Before Each Flight

- AP ON - (Roll and Pitch Sections) Check automatic operation by activating autopilot pitch command UP then DN. Observe trim operation follows pitch command direction.

NOTE: a. In autopilot mode, there will be approximately a 3 second delay between operation of pitch command and operation of trim.

- Press center bar (AP OFF) - release - check autopilot disengagement.
- Rotate trim wheel to check manual trim operation. Reset to take-off position prior to take off.

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B. In-Flight

1. Trim airplane (Ball centered).
2. Check pressure gauge to ascertain that the directional gyro and attitude gyro are receiving sufficient air.
3. Roll Section
 - a. To engage Center ROLL knob, push ROLL rocker to "ON" position. To turn, rotate console ROLL knob in desired direction.
 - b. For heading mode, set directional gyro with magnetic compass. Push directional gyro HDG knob in, rotate to select desired heading. Push console heading rocker (HDG) to "ON" position. (Maximum angle to bank will be 20° with heading lock engaged).
4. Pitch Section (Roll section must be engaged prior to pitch section engagement).
 - a. Center pitch trim indicator with the pitch command disc.
 - b. Engage pitch rocker switch. To change attitude, rotate pitch command disc in the desired direction.
5. Altitude Hold

Upon reaching desired or cruising altitude, engage altitude hold mode rocker switch. As long as Altitude Hold mode rocker is engaged, aircraft will maintain selected altitude. For maximum passenger comfort, rate of climb or descent should be reduced to approximately 500 FPM prior to altitude hold engagement. For accurate Altitude Holding below 110 MPH, lower up to 25° of flaps.
6. Radio Coupling VOR-ILS with H.S I. type instrument display. (optional)

VOR Navigation

- a. Tune and identify VOR Station. Select desired course with O.B.S. (OMNI Bearing Selector) (Course Selector of H.S.I. Instrument).
- b. Select OMNI mode on Radio Coupler.
- c. Select HDG mode on autopilot console to engage coupler. Aircraft will turn to a 45° intercept angle to intercept the selected VOR course. Intercept angle magnitude depends on radio needle off-course magnitude, 100% needle deflection will result in 45° intercept angle, diminishing as the needle off-set diminishes.

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- d. NAV mode - NAV mode provides reduced VOR sensitivity for tracking weak, or noisy, VOR signals. NAV mode should be selected after the aircraft is established on course.

ILS-LOC Front Course.

- a. Set inbound, front, localizer course on O.B.S. (Course Selector Knob)
- b. Select LOC - Normal on Radio Coupler to intercept and track inbound on the localizer. Select LOC -REV to intercept and track the localizer course outbound to procedure turn area.
- c. Select HDG mode on autopilot console to engage coupler.

ILS-Back Course

- a. Set inbound, front, localizer course on O.B.S. (Course Selector Knob)
- b. Select LOC - REV on radio coupler to intercept and track inbound on the back localizer course. Select LOC - NOR to intercept and track outbound on the back course to the procedure turn area.
- c. Select HDG Mode on autopilot console to engage coupler.

7. Radio Coupler - VOR/ILS with standard directional gyro.

Radio Coupler operation in conjunction with a standard directional gyro and VOR/LOC display differs from operation with an integrated display (H.S.I.) only in one respect. The HDG bug is used as the radio course datum and therefore must be set to match the desired VOR/ILS course as selected on the O.B.S.

1. For VOR Intercepts and Tracking:
Select the desired VOR course and set the HDG bug to the same heading. Select OMNI mode on the coupler and HDG Mode on the autopilot console.
2. For ILS Front Course Intercepts and Tracking:
Tune the localizer frequency and place the HDG bug on the inbound, front course heading. Select LOC - NOR mode on the coupler and HDG mode on the autopilot console.
3. For LOC Back Course Intercepts and Tracking:
Tune the localizer frequency and place the HDG bug on the Inbound course heading to the airport. Select LOC REV mode with coupler and HDG mode on the autopilot console.

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C. Coupled Approach Operations

VOR or LOC

- a. After arrival at the VOR Station, track outbound to the procedure turn area as described in Section B(6) or (7), as appropriate, and slow to 120 - 125 MPH CAS and extend flaps 10°.
- b. Use HDG mode and Pitch or Altitude Hold modes as appropriate during procedure turn.
- c. At the F.A.F. inbound, return to pitch mode for control of descent and lower landing gear.
- d. At the M.D.A. Select Altitude Hold Mode and add power for level flight. Monitor altimeter to assure accurate altitude control is being provided by the autopilot.
- e. Go Around. For missed approach select desired pitch attitude with pitch command disc and disengage altitude hold mode. This will initiate the pitch up attitude change. Immediately add take-off power and monitor Altimeter and rate of climb for positive climb indication. After climb is established, retract landing gear and flaps. Adjust attitude as necessary for desired airspeed and select HDG mode for turn from the VOR final approach course.

ILS-Front Course Approach With Glide Slope Capture (Optional)

- a. Track inbound to L.O.M. as described in B(6) or (7) above and in altitude hold mode.
- b. Inbound to L.O.M. slow to 120 - 125 MPH IAS and lower flaps 10°.
- c. Automatic Glide Slope capture will occur at Glide Slope intercept if the following conditions are met:
 1. Coupler in LOC - Normal Mode.
 2. Altitude Hold Mode engaged (Altitude Rocker on Console.)
 3. Under Glide Slope for more than 20 seconds.
 4. Localizer radio frequency selected on NAV Receiver.

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- d. At Glide Slope Intercept immediately lower landing gear and reduce power to maintain 115 - 125 MPH CAS on final approach. Glide Slope capture is indicated by lighting of the green Glide Slope engage Annunciator Lamp and by a slight pitch down of the aircraft.
- e. Monitor localizer and Glide Slope raw data throughout approach. Adjust power as necessary to maintain correct final approach airspeed. All power changes should be of small magnitude and smoothly applied for best tracking performance. Do not change aircraft configuration during approach while autopilot is engaged.
- f. Conduct missed approach maneuver as described in C(e) above.

NOTE: Glide Slope coupler will not automatically decouple from Glide Slope. Decoupling may be accomplished by any of the following means:

1. Disengage Altitude Mode.
2. Switch Radio Coupler to HDG mode.
3. Disengage Autopilot.

D. Emergency Operations

This aircraft is equipped with a Master Disconnect/Interrupt Switch on the pilot's control wheel. When the switch button is depressed it will disconnect the autopilot. When depressed and held it will interrupt all electric elevator trim operations. Trim operations will be restored when the switch is released. If an autopilot or trim emergency is encountered, do not attempt to determine which system is at fault. Immediately depress and hold the Master Disconnect/Interrupt button. Turn off autopilot and trim master switch and retrim aircraft, then release the interrupt switch.

NOTE: During examination of this supplement, the pilot is advised to locate and identify the autopilot controls, the trim master switch and circuit breakers for both systems.

1. In the event of an autopilot malfunction the autopilot can be:
 - a. Overpowered at either control wheel.

CAUTION: Do not overpower autopilot pitch axis for periods longer than 3 seconds because the autotrim system will operate in a direction to oppose the pilot and will, thereby, cause an increase in the pitch overpower forces.

- b. Disconnected by depressing the Master Disc/Inter Switch.

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- c. Disconnect by depressing the Trim Switch "AP OFF" bar.
- d. Disconnect by pushing the roll rocker switch OFF.
- 2. In the event of a trim malfunction:
 - a. Depress and hold the Master Trim Interrupt Switch.
 - b. Trim Master Switch - OFF. Retrim aircraft as necessary using manual trim system.
 - c. Release Master Interrupt Switch - be alert for possible trim action.
 - d. Trim Circuit Breaker - Pull. Do not operate trim until problem is corrected.
- 3. If a trim runaway occurs with the autopilot operating, the above procedures will disconnect the autopilot which will immediately result in higher control wheel forces. Be prepared to manually retrim, as necessary to eliminate undesirable forces.
- 4. Altitude Loss During Malfunction
 - a. An autopilot malfunction during climb or cruise with a 3 second delay in recovery initiation could result in as much as 60° of bank and 200' altitude loss.
 - b. Altitude loss - high altitude descent - 3 second delay in recovery could result in a 60° bank and a 420' altitude loss.
 - c. An autopilot malfunction during an approach with a 1 second delay in recovery initiation could result in as much as 20° and 75' altitude loss. Maximum altitude loss measured in approach configuration gear down and operating either coupled or uncoupled, single or multi-engine.
- 5. Single Engine Operations
 - a. Engine failure during an autopilot approach operation: Disengage autopilot conduct remainder of approach manually.
 - b. Engine failure during go around: Disengage autopilot, retrim aircraft, perform normal aircraft engine out procedures then re-engage autopilot.
 - c. Engine failure during normal climb, cruise, descent: Retrim aircraft, perform normal aircraft engine out procedures.
 - d. Maintain aircraft yaw trim throughout all single engine operations.