DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

2A4
Revision 46
Twin Commander

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April 3, 2000

TYPE CERTIFICATE DATA SHEET NO.2A4

This data sheet, which is a part of Type Certificate No. 2A4 prescribes conditions and limitations under which the product for which the Type Certificate was issued meets the airworthiness requirements of the Civil Air Regulations.

Type Certificate Holder: Twin Commander Aircraft Corporation
19003 - 59th Drive N.E.
Arlington, Washington 98223

I - Model 680, 7 PCLM (Normal Category), Approved October 14, 1955 (See NOTE 3 for RL-26-D (See NOTE 7 for conversion to Model 680E)

Engines: 2 Lycoming GSO-480-A1A6, Carburetor Bendix PS-7BD, Part Listing No. 391663-3, -4, -5, -6, or -7, or GSO-480-B1A6 (See NOTE 4).

Fuel: 100/130 minimum grade aviation gasoline.

Engine Limits: (Straight line manifold pressure variation with altitudes shown)

	HP.	R.P.M.	M.P.	ALT.
Takeoff	340	3400	48.0	S.L.
Takeoff	340	3400	44.5	8000
Maximum continuous	320	3200	45.0	S.L.
Maximum continuous	320	3200	43.0	8000

Propeller and Propeller Limits: 2 Hartzell 3-Bladed feathering propellers

a. H.C.-83x20-2 Hubs with 9333c blades
Pitch settings at 30 in. Station: Low 17°, Feather 83°
Diameter: 93 in., no cutoff permitted
NOTE: Letters appearing after the dash numbers of the above listed hub model do not affect eligibility; however, for best synchronization, hubs with different numbers should not be combined on the same aircraft.

b. Spinner: 2 Hartzell, Dome C-888-3, Bulkhead C-807-3 or 2 Hartzell 835-10 assemblies or 2 Hartzell 836-7A assemblies (installed with alcohol anti-icing system per P/N 5890047).

c. Governor: 2 Woodward 210075

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I - Model 680 (cont'd)

Airport Limits	Maneuvering	160 m.p.h.	(139K) True Ind.
	Max. Struc. cruising	210 m.p.h.	(182K) True Ind.
	Never exceed	270 m.p.h.	(235K) True Ind.
	Flaps extended - half	150 m.p.h.	(230K) True Ind.
	Flaps extended - full	130 m.p.h.	(113K) True Ind.
	Landing gear extended	180 m.p.h.	(156K) True Ind.

C.G. range: (+166.4) to +175.8) (Gear extended)
Effect of retracting landing gear +6655 in.-lb.

Empty Weight C.G. range: None

Datum: 152 in. forward of wing landing edge at center section.

Leveling means: Longitudinal - Top of fuselage on centerline aft of wing trailing edge.
Lateral - Transverse beams a: front or rear of baggage compartment floor.

Maximum weight: 7000 lb.

No. of seats: 7 (2 at +95, 2 at +128, and 3 at +168)

Maximum baggage: 350 lb. (+200)

Fuel capacity: Center tank 158.5 gal. (+187), usable fuel 156 gal. Outboard tanks 33.5 gal. each (+178), usable fuel 33.5 gal. each.
Total capacity 225.5 gal., usable fuel 223 gal.
(See NOTE 1 for system fuel)

Oil capacity: 8.5 gal. total (4.25 gal. each tank) (+191)
8.5 gal. usable (See NOTE 1 for system oil)

Control surface	Elevator	Up	$20° \pm 1$ / 0	Down	$10° \pm 2$ / 0
	Elevator tab	Up	$20° \pm 2$ / 0	Down	$20° \pm 2$ / 0
	Rudder	Right	$20° \pm 2$ / 0	Left	$20° \pm 2$ / 0
	Rudder tab	Right	$26° \pm 2$ / 0	Left	$26° \pm 2$ / 0
	Aileron	Up	$23° \pm 2$	Down	$15° \pm 2$
	Flap outboard			Down	$40° \pm 2$
	Flap inboard			Down	$40° \pm 2$

Serial Nos. eligible: Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to approve design and production charges on airplane serial numbers 680-244-2 to 680-658-255. (See NOTES 15 and 22)

II. - Model 680-E, 7 PCLM (Normal Category) Approved June 19, 1958

(Same as Model 680 except for extended wing and increased maximum weight)

Engines: 2 Lycoming GSO-480-B1A6, Carburetor Bendix PA-7 BD, Part Listing No. 391663-3, -4, -5, -6, and -7.

Fuel: 100/130 minimum grade aviation gasoline.

II. - Model 680-E (cont'd)

Engine limits

(Straight line manifold pressure variation with altitudes shown)

	HP.	R.P.M.	M.P.	ALT.
Takeoff	340	3400	48.0	S.L.
Takeoff	340	3400	44.5	8000
Maximum continuous 320	3200	45.0	S.L.	
Maximum continuous 320	3200	43.0	8000	

Propeller and Propeller Limits

2 Hartzell 3-Bladed feathering propellers

a. HC-83x20-2 or HC-A3x20-2 Hubs with 9333c blades.
Pitch settings at 30 in. Station: Low 17°, Feather 83°
Diameter: 93 in., no cutoff permitted
NOTE: Letters appearing after the dash numbers of the above listed hub model do not affect eligibility; however, for best synchronization hubs with different numbers should not be combined on the same aircraft.

b. Spinner: 2 Hartzell, Dome C-888-3, Bulkhead C-807-3 or 2 Hartzell 835-10 assemblies or 2 Hartzell 836-7A assemblies (installed with alcohol anti-icing system per P/N 5890047) or 2 Hartzell 836-22S assemblies (installed with alcohol anti-icing system per P/N 5890047).

c. Governor: 2 Woodward 210075

Airspeed Limits

Maneuvering	160 m.p.h.	(139K) True Ind.
Max. Struc. cruising	210 m.p.h.	(182K) True Ind.
Never exceed	270 m.p.h.	(235K) True Ind.
Flaps extended - half	150 m.p.h.	(130K) True Ind.
Flaps extended - full	135 m.p.h.	(117K) True Ind.
Landing gear extended	180 m.p.h.	(156K) True Ind.

C.G. range

(+166.0) to (+175.1) (Gear extended)
Effect of retracting landing gear +6655 in.-lb.

Empty Weight C.G. Range

None

Datum

152 in. forward of wing leading edge at center section.

Leveling means

Longitudinal - Top of fuselage on centerline aft of wing trailing edge.
Lateral: Transverse beams at front or rear of baggage compartment floor.

Maximum Weight

7500 lb.

No. of seats

7 (2 at +94, 2 at +128, and 3 at +168)

Maximum baggage

350 lb. (+200)

Fuel capacity

Center tank 158.5 gal. (+187), usable fuel 156 gal.
Outboard tanks 33.5 gal. each (+178), usable fuel 33.5 gal. ea.
total capacity 225.5 gal., usable fuel 223 gal.
(See NOTE 1 for system fuel)

Oil capacity

8.5 gal. total (4.25 gal. each tank) (+191)
8.5 gal. usable (See NOTE 1 for system oil)

II. - Model 680-E (cont'd)

Control surface movements

Elevator	Up	30° ± 1 0	Down	10° ± 2 0
Elevator Tab	Up	2 1/2° ± 2 1/2	Down	20° ± 2 0
Rudder	Right	20° ± 2 0	Left	20° + 2 0
Rudder tab	Right	26° ± 2 0	Left	26° + 2 0
Aileron	Up	23° ± 2	Down	15° ± 2
Flap outboard			Down	40° ± 2
Flap inboard			Down	40° ± 2

Serial Nos. eligible

Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to approve design and production changes on airplane serial numbers 680-E-242-102, 680-E-623-1 to 680-E-892-100. (See NOTES 15 and 22.)

III. - Model 720, 6 PCLM (Normal Category), Approved December 5, 1958

(Same as Model 680 except for pressurized cabin, structural modifications to the fuselage, extended wing and increased maximum weight)

Engines

2 Lycoming GSO-480-B1A6, AMC Carburetor Bendix PS-7BD, Part Listing Nos. 391714-1, -2, -3, and -4.

Fuel

100/130 minimum grade aviation gasoline.

Engine limits

(Straight line manifold pressure variation with altitudes shown)

	HP	R.P.M.	M.P.	ALT.
Takeoff	340	3400	48.0	S.L.
Takeoff	340	3400	44.5	8000
Maximum continuous	320	3200	45.0	S.L.
Maximum continuous	320	3200	43.0	8000

Propeller and Propeller Limits

2 Hartzell 3-Bladed feathering propellers

a. HC-83x20-2 Hubs with 9333c blades
Pitch settings at 30 in. Station: Low 17°, Feather 83°
Diameter: 93 in., no cutoff permitted
NOTE: Letters appearing after the dash numbers of the above listed hub model do not affect eligibility; however, for best synchronization hubs with different numbers should not be combined on the same aircraft.

b. Spinner: 2 Hartzell, Dome C-888-3, Bulkhead C-807-3 or 2 Hartzell 835-10 assemblies or 2 Hartzell 836-7A assemblies (installed with alcohol anti-icing system per P/N 5890047).

c. Governor: 2 Woodward 210075

Airspeed Limits

Maneuvering	160 m.p.h.	(139K) True Ind.
Max. Struc. cruising	210 m.p.h.	(182K) True Ind.
Never exceed	270 m.p.h.	(235K) True Ind.
Flaps extended - half	150 m.p.h.	(130K) True Ind.
Flaps extended - full	135 m.p.h.	(117K) True Ind.
Landing gear extended	180 m.p.h.	(156K) True Ind.

C.G. Range

(+166.0) to (+175.1) (Gear extended)
Effect of retracting landing gear +6655 in.-lb.

Empty Weight C.G. Range

None

Datum

152 in. forward of wing leading edge at center section.

III. - Model 720 (cont'd)

Leveling means: Longitudinal - top of fuselage on centerline aft of wing trailing edge.
Lateral - Transverse beams at front or rear of baggage compartment floor.

Maximum weight: 7500 lb.

No. of seats: 6 (2 at +94, 2 at +128, and 3 at +168)

Maximum baggage: 175 lb. (+200)

Fuel capacity: Center tank 158.5 gal. (+187), usable fuel 156 gal.
Outboard tanks 33.5 gal. each (+178), usable fuel 33.5 gal. ea.
Total capacity 225.5 gal., usable fuel 223 gal.
(See NOTE 1 for system fuel)

Oil capacity: 8.5 gal. total (4.25 gal. each tank) (+191)
8.5 gal. usable (See NOTE 1 for system oil)

Control surface movements:

Elevator	Up	30° ± 1 0	Down	10° ± 2 0
Elevator tab	Up	2 1/2° ± 2 1/2	Down	20° ± 2 0
Rudder	Right	20° ± 2 0	Left	20° ± 2 0
Rudder tab	Right	26° ± 2 0	Left	26° ± 2 0
Aileron	Up	23° ± 2	Down	15° ± 2
Flap outboard			Down	40° ± 2
Flap inboard			Down	40° ± 2

Serial Nos. eligible: Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to approve design and production changes on airplane serial numbers 720-501-1 to 720-850. (See NOTES 15 and 22).

IV - MODEL 680-F, 7 PCLM (Normal Category), Approved August 23, 1960

(Same as 680-E, except for fuel injection engine, new nacelles, new main gear and increased maximum weight.)
(See NOTE 5 for pressurized version).

Engines: 2 Lycoming IGSO-540-B1A or IGSO-540-B1C, fuel injector Simmonds Model 580, Parts Listing No. 580056-B or Model 582 Parts Listing No. 582025 or Model 582, Parts Listing No. 582026.

Fuel: 100/130 minimum grade aviation gasoline.

Engine limits: (Straight line manifold pressure variation with altitudes shown)

		HP	R.P.M	M.P.	ALT.
Takeoff (2 min.limit)	380	3400	47.0	S.L.	
Takeoff (2 min. limit)	380	3400	43.5	12,000	
Maximum continuous	360	3200	45.0	S.L.	
Maximum continuous	360	3200	40.5	11,500	

Propeller and Propeller Limits: 2 Hartzell 3-Bladed feathering propellers

a. HC-B3Z-30-2 Hubs with 9349 or 9349-6.5 propellers
Pitch settings at 30 in. Station: Low 18°, Feather 86°
Diameter: (For 9349) 93.5 in.
(For 9349-6.5) 87.0 in., no cutoff permitted
NOTE: Letters appearing after the dash numbers of the above listed hub model do not affect eligibility; however, for best synchronization hubs with different numbers should not be combined on the same aircraft.

IV - MODEL 680-F (cont'd)

b. Spinner: 2 Hartzell C2504 assemblies or 2 Hartzell C2535 assemblies (installed with alcohol anti-icing system per P/N 5890047).
c. Governor: 2 Woodward B210310 or 2 Woodward B210410 (when propeller unfeathering system, Drawing 5640030, is installed). NOTE: Prefix B on part number or type number denotes based orientation only and may or may not be stamped on the nameplate. Governor part numbers may differ from governor type numbers. For best synchronization, governors with different part numbers should not be combined on the same aircraft.

Airspeed Limits

Maneuvering	157 m.p.h.	(137K) True Ind.
Max. Struc. cruising	230 m.p.h.	(200K) True Ind.
Never exceed	288 m.p.h.	(250K) True Ind.
Flaps extended - half	150 m.p.h.	(130K) True Ind.
Flaps extended - full	136 m.p.h.	(118K) True Ind.
Landing gear extended	180 m.p.h.	(156K) True Ind.

C.G. Range

(+167.4) to (+174.4) (Gear extended)
Effect of retracting landing gear +10,073 in.-lb.

Empty Weight C.G. Range

None

Datum

152 in. forward of wing leading edge at center section.

Leveling means

Longitudinal - Top of fuselage on centerline aft of wing trailing edge.
Lateral - Transverse beams at front or rear of baggage compartment floor.

Maximum weight

8000 lb.

No. of seats

7 (2 at +94, 2 at +128, and 3 at +168)

Maximum baggage

350 lb. (+200)

Fuel capacity

Center tank 158.5 gal. (+187), usable fuel 156 gal.
Outboard tanks 33.5 gal. each (+187), usable fuel 33.5 gal. ea.
Total capacity 225.5 gal., usable fuel 223 gal.
(See NOTE 1 for system fuel)

Oil capacity

10 gal. total (5.00 gal. each tank) (+191)
9.12 gal. usable (See NOTE 1 for system oil)

Control surface

Elevator	Up	$30° +1\ 0$	Down	$10° +2\ 0$
Elevator tab	Up	$2\ 1/2° +2\ 0$	Down	$20° +2\ 0$
Rudder	Right	$20° +2\ 0$	Left	$20° +2\ 0$
Rudder tab	Right	$26° +2\ 0$	Left	$26° +2\ 0$
Aileron	Up	$23° \pm 2$	Down	$15° \pm 2$
Flap outboard			Down	$40° \pm 2$
Flap inboard			Down	$40° \pm 2$
*Elevator tab 680-F-971 and up		Down	$26° \pm 2\ 0$	

Serial Nos. eligible

Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to approve design and production changes on airplane serial numbers 680-F-871-1, 680-F-820-2 to 680-F-1447-152. (See NOTES 15 and 22.)

V - Model 560-F, 7 PCLM (Normal Category), Approved February 8, 1961

(Same as Model 680-F except unsupercharged engine and reduced gross weight)

Engine

2 Lycoming IGO-B1A or 2 Lycoming IGO-540 B1C with Aero Commander Vapor Separator 4630193 installed, fuel injector Bendix Model RS10ED2, Parts Lifting No. 391825-1 (or any combination of these installations).

Fuel

100/130 minimum grade aviation gasoline.

Engine limits

	HP.	R.P.M.
Takeoff (2 min.)	350	3400
Minimum continuous	325	3000

Propeller and Propeller Limits

1. 2 Hartzell 3-Bladed feathering propellers
   a. HC-B3Z-20-2 Hubs with 9349 blades
      Pitch settings at 30 in. Station: Low 15°, Feather 87°
      Diameter: 93.5 in., no cutoff permitted
      NOTE: Letters appearing after the dash numbers of the above listed hub model do not affect eligibility; however, for best synchronization hubs with different numbers should not be combined on the same aircraft.
   b. Spinner: 2 Hartzell C2504 assemblies or 2 Hartzell C2535 assemblies (installed with alcohol anti-icing system per P/N 5890047).
   c. Governor: 2 Woodward B210310 or 2 Woodward B210410 (when propeller unfeathering system, Drawing 5640030, is installed). NOTE: Prefix B on part number or type number denotes based orientation only and may or may not be stamped on the nameplate. Governor part numbers may differ from governor type numbers. For best synchronization, governors with different part numbers should not be combined on the same aircraft.
2. 2 Hartzell 3-Bladed feathering propellers
   a. HC-B3Z-30-2 Hubs with 9349-6.5 blades
      Pitch settings at 30 in. Station: Low 18°, Feather 86°
      Diameter: 87.0 in., no cutoff permitted
      NOTE: Letters appearing after the dash numbers of the above listed hub model do not affect eligibility; however, for best synchronization hubs with different numbers should not be combined on the same aircraft.
   b. Spinner: 2 Hartzell C2504 assemblies or 2 Hartzell C2535 assemblies (installed with alcohol anti-icing system per P/N 5890047).
   c. Governor: 2 Woodward B210310 or 2 Woodward B210410 (when propeller unfeathering system, Drawing 5640030, is installed). NOTE: Prefix B on part number or type number denotes based orientation only and may or may not be stamped on the nameplate. Governor part numbers may differ from governor type numbers. For best synchronization, governors with different part numbers should not be combined on the same aircraft.

Airspeed Limits

Maneuvering	155 m.p.h.	(135K) True Ind.
Max. Struc. cruising	230 m.p.h.	(200K) True Ind.
Never exceed	288 m.p.h.	(250K) True Ind.
Flaps extended - half	150 m.p.h.	(130K) True Ind.
Flaps extended - full	136 m.p.h.	(118K) True Ind.
Landing gear extended	180 m.p.h.	(156K) True Ind.

C.G. Range

(+167.4) to (+174.4) (Gear extended)
Effect of retracting landing gear +10,073 in.-lb.

Empty Weight C.G. Range

None

Datum

152 in. forward of wing leading edge at center section.

V - Model 560-F (cont'd)

Leveling means	Longitudinal - Top of fuselage on centerline aft of wing trailing edge. Lateral - Transverse beams at front or rear of baggage compartment floor.				
Maximum weight	7500 lb.				
No. of seats	7 (2 at +94, 2 at +128, and 3 at +168)				
Maximum baggage	350 lb. (+200)				
Fuel capacity	Center tank 158.5 gal. (+187), usable fuel 156 gal. Outboard tanks 33.5 gal. each (+178), usable fuel 33.5 gal. ea. Total capacity 225.5 gal., usable fuel 223 gal. (See NOTE 1 for system fuel)				
Oil capacity	10 gal. total (5.0 gal. each tank) (+191) 9.12 gal. usable (See NOTE 1 for system oil)				
Control surface movements	Elevator	Up	30° ± 1 0	Down	10° ± 2 0
	Elevator tab	Up	2 1/2° ± 2 1/2	Down	26° ± 2 0
	Rudder	Right	20° ± 2 0	Left	20° ± 2 0
	Rudder tab	Right	26° ± 2 0	Left	26° ± 2 0
	Aileron	Up	23° ± 2	Down	15° ± 2
	Flap outboard			Down	40° ± 2
	Flap inboard			Down	40° ± 2
Serial Nos. eligible	Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to approve design and production changes on airplane serial numbers 560-F-951-1 to 560-F-1496-73. (See NOTES 15 and 22).				

VI - MODEL 680-FL, 11 PCLM (Normal Category), Approved May 24, 1963

(Same as 680-F, except extended fuselage)

Engines: 2 Lycoming IGSO-540-B1A or IGSO-540-B1C, fuel injector Simmonds Model 580, Parts Listing No. 580056-B or Model 582 Parts Listing No. 582025 or Model 582 Parts Listing No. 582026. (582026 required for 8500 lb. aircraft.)

Fuel: 100/130 minimum grade aviation gasoline

Engine limits: (Straight line manifold pressure variation with altitudes shown)

	HP	R.P.M.		M.P.	ALT.
Takeoff (2 min. limit)	380	3400	47.0	S.L.	
Takeoff (2 min. limit)	380	3400	43.5	12,000	
Maximum continuous	360	3200	45.0	S.L.	
Maximum continuous	360	3200	40.5	11,500	

Propeller and Propeller Limits: 2 Hartzell 3-Bladed feathering propellers

a. HC-B3Z-30-2 Hubs with 9349 or 9349-6.5 propellers
Pitch settings at 30 in. Station: Low 28°, Feather 86°
Diameter: (For 9349) 93.5 in.
(For 9349-6.5) 87.0 in., no cutoff permitted
NOTE: Letters appearing after the dash numbers of the above listed hub model do not affect eligibility; however, for best synchronization hubs with different numbers should not be combined on the same aircraft.

VI - Model 680-FL (cont'd)

b. Spinner: 2 Hartzell C2504 assemblies
c. Governor: 2 Woodward B210310 or 2 Woodward B210410 (when propeller unfeathering system, Drawing 5640030, is installed). NOTE: Prefix B on part number or type number denotes based orientation only and may or may not be stamped on the nameplate. Governor part numbers may differ from governor type numbers. For best synchronization, governors with different part numbers should not be combined on the same aircraft.

Airspeed Limits

Maneuvering	157 m.p.h. (137K) True Ind. @ 8000 lb. 161 m.p.h. (140K) True Ind. @ 8500 lb.
Max. Struc. cruising	230 m.p.h. (200K) True Ind. @ 8000 lb. and 8500 lb.
Never exceed	288 m.p.h. (250K) True Ind. @ 8000 lb. and 8500 lb.
Flaps extended - half	150 m.p.h. (130K) True Ind. @ 8000 lb. and 8500 lb.
Flaps extended - full	136 m.p.h. (118K) True Ind. @ 8000 lb. 146 m.p.h. (127K) True Ind. @ 8500 lb.
Landing gear extended	180 m.p.h. (156K) True Ind. @ 8000 lb. and 8500 lb.

C.G.Range (Gear extended)

Weight	Fwd.		Aft.	
lb.	Sta.(in)	% MAC	Sta.(in)	% MAC
Up to 7000	203.0	l0	218.4	32
8000	206.5	15	218.4	32
8500	208.3	17.5	218.4	32

Straight line variation between points given
Effect of retracting landing gear +10,073 in.-lb.

Empty Weight C.G. Range: None

Datum: 196 in. forward of wing leading edge at center section.

Leveling means: Longitudinal - Top of fuselage on centerline aft of wing trailing edge.
Lateral - Transverse beams at front or rear of baggage compartment floor.

Maximum weight: (See NOTE 6)

No. of seats: 11 (Pilot + 10 passengers; pilot, co-pilot + 9 passengers)

Maximum baggage (std): 400 lb. (+258)

Maximum baggage (with extended baggage compartment): 600 lbs. (+258)

Fuel capacity: Center tank 158.5 gal. (+231), usable fuel 156 gal.
Outboard tanks 33.5 gal. each (+222), usable fuel 33.5 gal. ea.
Total capacity 225.5 gal., usable fuel 223 gal. (See NOTE 1 for system fuel)

Oil capacity: 10 gal. total (5.00 gal. each tank) (+235)
9.12 gal. usable (See NOTE 1 for system oil)

Control surface movements

Elevator	Up	30° ± 1 0	Down	10° ± 2 0
Elevator tab	Up	2 1/2° ± 2 1/2	Down	26° ± 2 0
Rudder	Right	20° ± 2 0	Left	20° ± 2 0
Rudder tab	Right	26° ± 2 0	Left	26° ± 2 0
Aileron	Up	23° ± 2	Down	15° ± 2
Flap outboard			Down	40° ± 2
Flap inboard			Down	40° ± 2

VI - Model 680-FL (cont'd)

Serial Nos. eligible

(See NOTE 6). Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to: Issue Airworthiness Certificates for airplane serial numbers 680-FL-1553-107 and up; and approve design and production changes on airplane serial numbers 680-FL-1261 through 1853-157. (See NOTES 15 and 22).

VII - MODEL 680-FL(P), 11 PCLM (Normal Category), approved October 8, 1964

(Same as 680-FL, S/N 1461 and up, except pressurization)

Engines

2 Lycoming IGSO-540-B1A or IGSO-540-B1C, fuel injector Simmonds Model 582, Parts Listing No. 582026.

Fuel

100/130 minimum grade aviation gasoline.

Engine limits

(Straight line manifold pressure variation with altitudes shown)

	HP.	R.P.M	M.P.	ALT.
Takeoff (2 min. limit)	380	3400	47.0	S.L.
Takeoff (2 min. limit)	380	3400	43.5	12,000
Maximum continuous	360	3200	45.0	S.L.
Maximum continuous	360	3200	40.5	11,500

Propeller and Propeller limits

2 Hartzell 3-Bladed feathering propellers

a. HC-B3Z-30-2 Hubs with 9349-6.5 blades
   Pitch settings at 30 in. Station: Low 18°, Feather 86°
   Diameter: 87.0 in., no cutoff permitted
   NOTE: Letters appearing after the dash numbers of the above listed hub model do not affect eligibility; however, for best synchronization hubs with different numbers should not be combined on the same aircraft.
b. Spinner: 2 Hartzell C2504 assemblies
c. Governor: 2 Woodward B210310 or 2 Woodward B210410 (when propeller unfeathering system, Drawing 5640030, is installed). NOTE: Prefix B on part number or type number denotes based orientation only and may or may not be stamped on the nameplate. Governor part numbers may differ from governor type numbers. For best synchronization, governors with different part numbers should not be combined on the same aircraft.

Airspeed Limits

Maneuvering	161 m.p.h. (140K) True Ind.
Max. Struc. cruising	230 m.p.h. (200K) True Ind.
Never exceed	288 m.p.h. (250K) True Ind.
Flaps extended - half	150 m.p.h. (130K) True Ind.
Flaps extended - full	146 m.p.h. (127K) True Ind.
Landing gear extended	180 m.p.h. (156K) True Ind.

C.G. Range (Gear extended)

Weight	Fwd.		Aft.	
lb.	Sta.(in)	% MAC	Sta.(in)	% MAC
Up to 7000	203.0	l0	218.4	32
8500	208.3	17.5	218.4	32

Straight line variation between points given.
Effect of retracting landing gear +10,073 in.-lb.

Empty Weight C.G. Range

None

Datum

196 in. forward of wing leading edge at center section

Leveling means

Longitudinal - Top of fuselage on centerline aft of wing trailing edge.
Lateral - Transverse beams at front or rear of baggage compartment floor.

Maximum weight

8500 lb.

VII - MODEL 680-FL(P) (cont'd)

Maximum No. of seats	11 (Pilot - 10 passengers; pilot, co-pilot +9 passengers)
Maximum baggage	400 lb. (+258)
Fuel capacity	Center tank 158.5 gal. (+231), usable fuel 156 gal. Outboard tanks 33.5 gal. each (+222), usable fuel 33.5 gal. ea. Total capacity 225.5 gal. usable fuel 223 gal. (See NOTE 1 for system fuel)
Oil capacity	10 gal. total (5.00 gal. each tank) (+235) 9.12 gal. usable (See NOTE 1 for system oil)

Control surface movements

Elevator	Up	30° ± 1 0	Down	10° ± 2 0
Elevator tab	Up	6 1/2° ± 1	Down	24° ± 1
Rudder	Right	20° ± 2 0	Left	20° ± 2 0
Rudder tab	Right	26° ± 2 0	Left	26° ± 2 0
Aileron	Up	23° ± 2	Down	15° ± 2
Flap outboard			Down	40° ± 2
Flap inboard			Down	40° ± 2

Serial No. eligible: Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized: Issue Airworthiness Certificates for airplane serial numbers 680-FLP-1559-25 and up; and approve design and production changes on airplane serial numbers 680-FLP-1471-2 through 1854-38. (See NOTES 15 and 22)

VIII - MODEL 680-T - 11 PCLM (Normal Category), approved September 15, 1965

(See NOTE 9 conversion to Model 680V)

Engines	2 AiResearch Model TPE-331-43 Turboprop engines (Rockwell P/N 6610400-501) or TPE-331-43A (Rockwell P/N 6610400-505) (See NOTE 11 for requirements)
Fuel	Aviation turbine fuels ASTM designation D1655-63T, Types Jet A, Jet B, and Jet A-1; and MIL-J-5624G(1), Grades JP-4 & JP-5 and MIL-F-5516-1, JP-1 (See Aerocom Serv. Ltr. 170)
Oil	BRACO 880F (MIL-L-7808D) and Sinclair Turbo S Oil 15 (MIL-L-7808D&E) (See Aerocom Service Letter 170)

Engine limits

	HP.	R.P.M.	EGT
Takeoff	575	100%	576°C
Maximum continuous	500	100%	550°C

Propeller and Propeller Limits: 2 Hamilton Standard 3-bladed feathering and reversing propellers Rockwell Assembly No. 640050.

a. 33LF-325 Hubs with 1033A-O Blades
   Pitch settings at 30 in. Station: Flt. Idle 9.0° ± 0.2°,
   Feather 86.5° ± 0.5°, Reverse -9.5° ± 1.5°
   Diameter: 90 in., no cutoff permitted.
   NOTE: Use AiResearch oil transfer tube No. 866678-2.
b. Spinner: 2 Rockwell 2640050-7
c. Governor: 2 AiResearch 865423-4 or 865423-5-1

VIII - MODEL 680-T (cont'd)

Airspeed Limits	Maneuvering	164 m.p.h. ((143K) CAS
	Maximum Operating	250 m.p.h. (217K) CAS
	Flaps extended - half	150 m.p.h. (130K) CAS
	Flaps extended - full	146 m.p.h. (127K) CAS
	Landing gear extended	180 m.p.h. (156K) CAS

C.G. range

Rear:	217.78 (30.19%)	8950 lbs. (Gear down
	216.94 (29.02%)	5300 lbs. (Gear down)
Fwd:	208.14 (16.83%)	8950 lbs. (Gear down)
	203.50 (10.40%)	7500 lbs. (Gear down)

Straight line variation between points given.
Effect of retracting landing gear +10,073 in.-lb.

Datum: 196 in. forward of wing landing edge at center section

Leveling means: Longitudinal - Top of fuselage on centerline aft of wing trailing edge.
Lateral - Transverse beams at front of rear baggage compartment floor.

Maximum weight: Maximum takeoff 8950 lbs. (ramp weight 9000 lbs.)
Maximum landing 8500 lbs.

Maximum operating altitude: 25,000 feet

Maximum No. of seats: 11 (Pilot + 10 passengers; pilot, co-pilot + 9 passengers)

Maximum baggage: 400 lb. (+258)

Fuel capacity: Center tank 221.5 gal. (+231), usable fuel 219.5 gal.
Outboard tanks 33.5 gal. each (+222), usable fuel 33.5 gal. ea.
Total capacity 288.5 gal., usable fuel 286.5 gal.
(See NOTE 1 for system fuel) (See NOTE 12 for auxiliary fuel)

Oil capacity: 15.0 qts. total (7.5 qts. each tank) (+188)
11.8 qts. usable (See NOTE 1 for system oil)

Control surface movements

Elevator	Up	30° ± 1	Down	10° ± 2	
		0		0	
Elevator tab	Up	6 1/2° ± 1	Down		24° ± 1
Rudder	Right	20° ± 2	Left	20° ± 2	
		0		0	
Rudder tab	Right	26° ± 2	Left	26° ± 2	
		0		0	
Aileron	Up	23° ± 2	Down	15° ± 2	
Flap outboard			Down	40° ± 2	
Flap inboard			Down	40° ± 2	

Serial Nos. eligible: Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to: Issue Airworthiness Certificates for airplane serial numbers 680-T-1473, 680-T-1519, 680-T-1532, 680-T-1536, and 680-T-1550-11 and up; and approve design and production changes on airplane serial numbers 680-T-1473 through 1720. (See NOTES 15 and 22).

IX - MODEL 680-V, 11 PCLM (Normal Category), Approved June 13, 1967

Engines	2 AiResearch Model TPE-331-43 Turboprop engines (Rockwell P/N 6610400-501) or TPE-331-43A (Rockwell P/N 6610400-505) (See NOTE 11 for requirements).
Fuel	Aviation turbine fuels ASTM designation D1655-63T, Types Jet A, Jet B, and Jet A-1; and MIL-J-5624G(1), Grades JP-4 & JP-5 and MIL-F-5616-1, JP-1. (See Aerocom Serv. Ltr. 170)
Oil	BRACO 880F (MIL-L-7808D) and Sinclair Turbo S Oil 15 (MIL-L-7808D&E) (See Aerocom Service Letter 170)

Engine Limits

	HP.	R.P.M.	EGT
Takeoff	575	100%	576°C
Maximum continuous	500	100%	550°C

Propeller and Propeller Limits

2 Hamilton Standard 3-bladed feathering and reversing propellers.
Rockwell Assembly No. 640050.

a. 33LF-325 Hubs with 1033A-0 blades
   Pitch settings at 30 in. Station: Flt. Idle 9.0° ± 0.2°
   Feather 86.5° ± 0.5°, Reverse -9.5° ± 1.5°
   Diameter: 90 in., no cutoff permitted
   NOTE: Use AiResearch oil transfer tube No. 866678-2.
b. Spinner: 2 Rockwell 2640050-7
c. Governor: 2 AiResearch 865423-4 or 865423-5-1

Airspeed Limits

Maneuvering	164 m.p.h. (143K) CAS
Maximum Operating	250 m.p.h. (217K) CAS
Flaps extended - half	150 m.p.h. (130K) CAS
Flaps extended - full	146 m.p.h. (127K) CAS
Landing gear extended	180 m.p.h. (156K) CAS

C.G. Range

Rear: 215.68 (27.28%) 9450 lbs. (Gear down)
216.73 (28.73%) 9400 lbs. (Gear down)
217.87 (30.31%) 9346 lbs. (Gear down)
216.94 (29.02%) 5300 lbs. (Gear down)
Fwd: 209.74 (19.04%) 9450 lbs. (Gear down)
209.60 (18.83%) 9400 lbs. (Gear down)
203.50 (10.40%) 7500 lbs. (Gea down)
Straight line variation between points given.
Effect of retracting landing gear +10,073 in.-lb.

Datum: 196 in. forward of wing leading edge at center section.

Leveling means: Longitudinal - Top of fuselage on centerline aft of wing trailing edge.
Lateral - Transverse beams at front of rear baggage compartment floor.

Maximum weight: Maximum takeoff 9400 lbs. (ramp weight 9450 lbs.)
Maximum landing 9000 lbs.
Zero fuel 8000 lbs.

Maximum operating altitude: 25,000 feet

Maximum No. of seats: 11 (Pilot + 10 passengers; pilot, co-pilot + 9 passengers)

Maximum baggage: 500 lb. (+258)

Fuel capacity: Center tank 221.5 gal. (+231), usable fuel 219.5 gal.
Outboard tanks 33.5 gal. each (+222), usable fuel 33.5 gal. ea.
Total capacity 288.5 gal., usable fuel 286.5 gal.
(See NOTE 1 for system fuel) (See NOTE 12 for auxiliary fuel).

IX - MODEL 680-V, 11 PCLM (Normal Category), Approved June 13, 1967

Oil capacity: 15.0 qts. total (7.5 qts. each tank) (+188)
11.8 qts. usable (See NOTE 1 for system oil)

Control surface movements

Elevator	Up	30° + 1 0	Down	10° + 2 0
Elevator tab	Up	6 1/2° ± 1	Down	24° ± 1
Rudder	Right	20° + 2 0	Left	20° + 2 0
Rudder tab	Right	26° + 2 0	Left	26° + 2 0
Aileron	Up	23° ± 2	Down	15° ± 2
Flap outboard			Down	40° ± 2
Flap inboard			Down	40° ± 2

Serial Nos. eligible: Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to: Issue Airworthiness Certificates for airplane serial numbers 680-V-1550 through 680-V-1725; and approve design and production changes on airplane serial numbers 680-V-1473 through 1720. (See NOTES 15 and 22).

X - MODEL 680-W, 11 PCLM (Normal Category), approved February 5, 1968

Engines: 2 AiResearch Model TPE-331-43BL Turboprop engines (Rockwell P/N 6610400-503)

Fuel: Aviation turbine fuels ASTM designation D1655-63T, Types A, Jet B, and Jet A-1; and MIL-J-5624G(1), Grades JP-4 & JP-5; and MIL-F-5616-1, JP-1, (See Aerocom Serv. Ltr. 170)

Oil: BRACO 880F (MIL-L-7808D) and Sinclair Turbo S Oil 15 (MIL-L-7808D&E) (See Aerocom Service Letter 170)

Engine limits

	HP.	R.P.M.	EGT
Takeoff	575	100%	576°C
Maximum continuous	500	100%	550°C

Propeller and Propeller Limits: 2 Hamilton Standard 3-bladed feathering and reversing propellers.
Rockwell Assembly No. 640050.
a. 33LF-325 Hubs with 1033A-0 Blades
Pitch settings at 30 in. Station: Flt. Idle 9.0° ± 0.2°,
Feather 86.5° ± 0.5°, Reverse -9.5° ± 1.5°.
Diameter: 90 in., no cutoff permitted.
NOTE: Use AiResearch oil transfer tube No. 866678-2.
b. Spinner: 2 Rockwell 2640050-7
c. Governor: 2 AiResearch 869132-2-1

Airspeed Limits

Maneuvering	164 m.p.h. (143K) CAS
Maximum Operating	250 m.p.h. (217K) CAS
Flaps extended - half	150 m.p.h. (130K) CAS
Flaps extended - full	146 m.p.h. (127K) CAS
landing gear extended	180 m.p.h. (156K) CAS

C.G. Range
Rear: 215.68 (27.28%) 9450 lbs. (Gear down)
216.73 (28.73%) 9400 lbs. (Gear down)
217.87 (30.31%) 9346 lbs. (Gear down)
216.94 (29.02%) 5300 lbs. (Gear down)
Fwd.: 209.74 (19.04%) 9450 lbs. (Gear down)
209.60 (18.83%) 9400 lbs. (Gear down)
203.50 (10.40%) 7500 lbs. (Gear down)
Straight line variation between points given.
Effect of retracting landing gear +10,073 in.-lb.

X - MODEL 680-W (cont'd)

Datum	196 in. forward of wing leading edge at center section.				
Leveling means	Longitudinal - Top of fuselage on centerline aft of wing trailing edge. Lateral - Transverse beams at front of each baggage compartment floor.				
Maximum weight	Maximum takeoff 9400 lbs. (ramp weight 9450 lbs.) Maximum landing 9000 lbs. Zero fuel 8000 lbs.				
Maximum operating altitude	25,000 feet				
Maximum No. of seats	11 (Pilot + 10 passengers; pilot, co-pilot + 9 passengers)				
Maximum baggage	500 lb. (+258) Serial numbers eligible for Model 680-W-1721 through 1850.				
Fuel capacity	Center tank 221.5 gal. (+231), usable fuel 219.5 gal. Outboard tanks 33.5 gal. each (+222), usable fuel 33.5 gal. ea. Total capacity 288.5 gal., usable fuel 286.5 gal. (See NOTE 1 for system fuel.) (See NOTE 12 for auxiliary fuel.)				
Oil capacity	15.0 qts. total (7.5 qts. each tank) (+188) 11.8 qts. usable (See NOTE 1 for system oil)				
Control surface movements	Elevator	Up	30° ± 1 0	Down	10° ± 2 0
	Elevator tab	Up	6 1/2° ± 1	Down	24° ± 1
	Rudder	Right	20° ± 2 0	Left	20° ± 2 0
	Rudder tab	Right	26° ± 2 0	Left	26° ± 2 0
	Aileron	Up	23° ± 2	Down	15° ± 2
	Flap outboard			Down	40° ± 2
	Flap inboard			Down	40° ± 2
Serial Nos. eligible	Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to: Issue Airworthiness Certificates and approve design and production changes on airplane serial numbers 680-W-1721 through 1850, (See NOTES 15 and 22).				

XI - MODEL 681, 11 PCLM (Normal Category), Approved March 20, 1969

Engines	2 AiResearch Model TPE-331-43BL Turboprop engines (Rockwell P/N 6610400-507)			
Fuel	Aviation turbine fuels ASTM designation D1655-64T, Types Jet A, Jet B, and Jet A-1; and MIL J-5624G(1), Grades JP-4 & JP-5. (See Aerocom Service Letter 170)			
Oil	BRACO 880F (MIL-L-7808D) and Sinclair Turbo S Oil 15 (MIL-L-7808D&E) (See Aerocom Service Letter 170)			
Engine limits		HP.	R.P.M.	EGT
	Takeoff	575	100%	576°C
	Maximum continuous	500	100%	550°C

XI - MODEL 681 (cont'd)

Propeller and Propeller limits	2 Hamilton Standard 3-bladed feathering and reversing propellers Rockwell Assembly No. 640050. a. 33LF-325 Hubs with 1033 A-0 Blades Pitch settings at 30 in. Station: Flt. Idle 9.0° ± 0.2° Feather 86.5° ± 0.5°, Reverse -9.5 ° ± 1.5° Diameter: 90 in., no cutoff permitted. NOTE: Use AiResearch oil transfer tube No. 866678-2. b. Spinner: 2 Rockwell 2640050-7 c. Governor: 2 AiResearch 869132-2-1
Airspeed Limits	Maneuvering 164 m.p.h. (143K) CAS Maximum Operating 250 m.p.h. (217K) CAS Flaps extended - half 150 m.p.h. (130K) CAS Flaps extended - full 149 m.p.h. (129K) CAS Landing gear extended 180 m.p.h. (156K) CAS
C.G. Range	Rear: 215.68 (27.28%) 9450 lbs. (Gear down) 216.73 (28.73%) 9400 lbs. (Gear down) 217.87 (30.31%) 9346 lbs. (Gear down) 216.94 (29.02%) 5300 lbs. (Gear down) Fwd.: 209.74 (19.04%) 9450 lbs. (Gear down) 209.60 (18.83%) 9400 lbs. (Gear down) 203.50 (10.40%) 7500 lbs. (Gear down) Straight line variation between points given. Effect of retracting landing gear +10,073 in.-lb.
Datum	196 in. forward of wing leading edge at center section
Leveling means	Longitudinal - Top of fuselage on centerline aft of wing trailing edge. Lateral - Transverse beams at front of rear baggage compartment floor.
Maximum weight	Maximum takeoff 9400 lbs. (ramp weight 9450 lbs.) Maximum landing 9000 lbs. Zero fuel 8500 lbs.
Maximum operating altitude	25,000 feet
Maximum No. of seats	11 (Pilot + 10 passengers; pilot, co-pilot + 9 passengers)
Maximum baggage	500 lb. (+258)
Fuel capacity	Center tank 221.5 gal. (+231), usable fuel 219.5 gal. Outboard tanks 33.5 gal. each (+222), usable fuel 33.5 gal. ea. Total capacity 288.5 gal., usable fuel 286.5 gal. (See NOTE 1 for system fuel) (See NOTE 12 for auxiliary fuel)
Oil capacity	15.0 qts. total (7.5 qts. each tank) (+188) 11.8 qts. usable (See NOTE 1 for system oil)

Control surface movements					
	Elevator	Up	30° ± 1 0	Down	10° ± 2 0
	Elevator tab	Up	6 1/2° ± 1	Down	24° ± 1
	Rudder	Right	20° ± 2 0	Left	20° ± 2 0
	Rudder tab	Right	26° ± 2 0	Left	26° ± 2 0
	Aileron	Up	23° ± 2	Down	15° ± 2
	Flap outboard			Down	40° ± 2
	Flap inboard			Down	40° ± 2

XI - MODEL 681 (cont'd)

Serial Nos. eligible

Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized: Issue Airworthiness Certificates and approve design and production changes on airplane serial numbers 681-6001 through 6072. (See NOTES 15 and 22).

XII - MODEL 690, 11 PCLM (Normal Category), approved July 19, 1971

Engines

2 AiResearch Model TPE-331-5-251K Turboprop engines (Rockwell P/N 610495)

Fuel

Aviation turbine fuels ASTM designation D1655-68, Types Jet A, Jet B, and Jet A-1; and MIL-T-5624G(1), Grades JP-4 & JP-5. (See Rockwell Service Letter 170H)

Oil

MIL-L-23699A and MIL-L-7808G. (See Rockwell Service Letter 170H)

Engine limits

	HP.	R.P.M.	I.T.T.
Takeoff	717.5	101%	923°C
Maximum continuous	717.5	101%	923°C

Propeller and Propeller limits

2 Hartzell 3-bladed feathering and reversing propellers.
Rockwell Assembly No. 640053.

a. HC-B3TN-5FL Hubs with LT10282H-4 or LT10282H(B)+4 or LT10282+4 or LT10282(B)+4 or LT10282A+4 or LT10282AB+4 blades

OR HC-B3TN-5DL or HC-B3TN-5NL hubs with LT10282A+4 or LT10282AB+4 blades.

Pitch settings at 30 in. Station: Low 13.5° ± 0.2°,
Feather 90.0° ± 0.5°, Reverse -8.0° ± 0.5°,
Start Locks +2.5° ± 0.2°
Diameter: 106 in, 1/2 in. reduction per blade allowed.
NOTE: Use AiResearch oil transfer tube No. 866533-3.
See NOTE 16.

b. Spinner: 2 Hartzell 836-57
c. Governor: 2 AiResearch 895490-1 or 895490-3.

Airspeed Limits

Maneuvering	167 m.p.h. (145K) CAS
Maximum Operating	280 m.p.h. (234K) CAS
Flaps extended - half	180 m.p.h. (156K) CAS
Flaps extended - full	157 m.p.h. (136K) CAS
Landing gear extended	230 m.p.h. (200K) CAS

C.G. Range

Forward
212.93 inches aft of datum (22.72% MAC) at 10,250 lbs.
203.75 inches aft of datum (10.40% MAC) at 7,500 lbs.
203.75 inches aft of datum (10.40% MAC) at 5,750 lbs.
Straight line variation between points.

Aft
218.70 inches aft of datum (30.47% MAC) at 10,250 lbs.
217.81 inches aft of datum (29.28% MAC) at 5,750 lbs.
Variation between points:
Inches aft of datum = 219.84 - (11653/Weight)

Datum

196 in. forward of wing leading edge at center section.

Leveling means

Longitudinal - top of fuselage on centerline aft of wing trailing edge.
Lateral - Transverse beam at front of rear baggage compartment floor.

XII - MODEL 690 (cont'd)

Maximum weight	Maximum takeoff 10,250 lbs. (ramp weight 10,300 lbs.) Maximum loading 9600 lbs. Zero fuel 8750 lbs.
Maximum operating altitude	25,000 feet
Maximum No. of seats	11 (Pilot + 10 passengers; pilot, co-pilot + 9 passengers)
Maximum baggage	600 lbs. (+260)
Fuel capacity	Total capacity 389.0 gal., usable fuel 384.0 gal. (see NOTE 1 for system fuel)
Oil capacity	Oil capacity per engine @ +188 AiResearch Tank No. 896062-1 6.25 qt. total 5.25 qt. usable AiResearch Tank No. 896417-1 6.00 qt. total 5.00 qt. usable (See NOTE 1 for system oil)

Control surface movements

Elevator	Up	30° + 1 0	Down	10° + 2 0
Elevator tab	Up	1/2° ± 1	Down	4° ± 1
Rudder	Right	0° ± 2 0	Left	0° ± 2 0
Rudder tab	Right	26° ± 2 0	Left	26° ± 2 0
Aileron	Up	23° ± 2	Down	15° ± 2
Flaps			Down	40° ± 2
Aileron tab	Up	17° ± 2.5°	Down	17° ± 2.5°

Serial Nos. eligible: Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to: Issue Airworthiness Certificate and approve design and production changes on airplane serial numbers 690-11001 through 11099. (See NOTES 15 and 22).

XIII - MODEL 685, 9 PCLM (Normal Category), Approved September 17, 1971

Engines	2 Continental Model GTSIO-520-F or GTSIO-520-K Turbosupercharged engines (See NOTE 14) (Rockwell P/N 610503)
Fuel	Aviation gasoline, 100/130 octane.
Oil	Teledyne Continental Specification MHS-24A.

Engine limits

	HP	R.P.M.	M.A.P.
Takeoff	435	3400	44.5 In.Hg
Maximum continuous	435	3400	44.5 In.Hg

Propeller and Propeller limits

2 Hartzell 3-bladed feathering propellers
Rockwell Drawing No. 610505

a. HC-H3YN-2 or HC-H3YN-2F Hubs with C8475+2, FC8475+2, or FC8475B+2 blades.
   Pitch settings at 30 in. Station: Low 18.1° ± 1.0°
   Feathered 83.5° ± 1.0°
   Diameter: 88 in., 1/2 in. reduction per blade allowed.
b. Spinner: 2 Hartzell D-3273-1
c. Governor: 2 Rockwell 610445-1, 610445-501, or 610445-503

XIII - MODEL 685 (cont'd)

Airspeed Limits	Maneuvering	156 m.p.h. (136K) CAS
	Never exceed	290 m.p.h. (252K) CAS
	Never exceed Mach	0.554
	Flaps extended - half	180 m.p.h. (156K) CAS
	Flaps extended - full	149 m.p.h. (130K) CAS
	Landing gear extended	230 m.p.h. (200K) CAS
	Max structural cruise	258 m.p.h. (224K)
	Max. structural cruise Mach	0.493

C.G.Range

Rear: 216.88 (28.0%) 9,000 lbs. (Gear down)
216.18 (27.1%) 5, 850 lbs. (Gear down)
Variation between points: inches = 218.15 - (11653/Weight)
Fwd: 208.67 (17.0%) 9,000 lbs. (Gear down)
203.45 (10.0%) 7,500 lbs. (Gear down)
203.45 (10.0%) 5,850 lbs. (Gear down)
Straight line variation between points given. Effect of retracting landing gear +11,653 in.-lb.

Datum

196 in. forward of wing leading edge at center section.

Leveling means

Longitudinal - Top of fuselage aft of wing trailing edge.
Lateral - Transverse beams at front of rear baggage compartment floor.

Maximum weight

Maximum takeoff 9000 lbs. (ramp weight 9050 lbs.)
Maximum landing 9000 lbs.

Maximum operating altitude

25,000 feet

Maximum number of seats

9 (Pilot + 8 passengers; pilot, co-pilot + 7 passengers)

Maximum baggage

600 lb. (+260)

Fuel capacity

Total capacity 261.0 gal., usable fuel 256.0 gal.
Auxiliary (option) 66.0 gal. total usable 322.0 gal.
Total undrainable 10.7 lbs. (without auxiliary option)
total undrainable 13.0 lbs. (with auxiliary option)

Oil capacity

24.0 qts. total (12.0 qts. each engine, 9.0 qts. usable - (See NOTE 1 for system oil) (+188)
Auxiliary with optional fuel 27.2 qts. total (13.6 qts. each engine, 10.6 qts. usable) (+188)

Control surface movements

Elevator	Up	30° ± 1 0	Down	10° ± 2 0
Elevator tab	Up	6 1/2° ± 1	Down	24° ± 1
Rudder	Right	20° ± 2 0	Left	20° ± 2 0
Rudder tab	Right	26° ± 2 0	Left	26° ± 2 0
Aileron	Up	23° ± 2	Down	15° ± 2
Flaps			Down	40° ± 2
Aileron tab	Up	17° ± 2.5°	Down	17° ± 2.5°

Serial Nos. eligible

Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to: Issue Airworthiness Certificates and approve design and production changes on airplane serial numbers 685-12000 through 12066. (See NOTES 15 and 22).

XIV - MODEL 690A, 11 PCLM (Normal Category), Approved April 25, 1973

Engines	2 AiResearch Model TPE-331-5-251K Turboprop engines (Rockwell P/N 610495)
Fuel	Aviation turbine fuels ASTM designation D1655-68, Types Jet A, Jet B, and Jet A-1; and MIL-T-5624G(1), Grades JP-4 & JP-5. (See Rockwell Service Letter 170H) (See Mfg. Data Part V Approved F/M for List of Approved Fuels)
Oil	MIL-L-23699A and MIL-L-7808G. (See Mfg. Data Part V Approved F/M for List of Approved Lubricants)

Engine limits

	HP.	R.P.M.	I.T.T.
Takeoff	717.5	101%	923°C
Maximum continuous	717.5	101%	923°C

Propeller and Propeller Limits

2 Hartzell 3-bladed feathering and reversing propellers.
Rockwell Assembly No. 640053.

a. HC-B3TN-5FL Hubs with LT10282H-4 or LT10282H(B)+4 or LT10282+4 or LT10282(B)+4 or LT10282+4 or LT10282AB+4 blades

OR HC-B3TN-5DL or HC-B3TN-5NL hubs with LT10282A+4 or LT10282AB+4 blades.

Pitch settings at 30 in. Station: Low 13.5° ± 0.2°
Feather 90.0° ± 0.5°, Reverse -8.0° ± 0.5°
Start Locks +2.5° ± 0.2°
Diameter: 106 in, 1/2 in. reduction per blade allowed.
NOTE: Use AiResearch oil transfer tube No. 866533-3.
(See NOTE 16)

b. Spinner: 2 Hartzell 836-57P
c. Governor: 2 AiResearch 895490-1 or 895490-3

Airspeed Limits

Maneuvering	167 m.p.h. (145K) CAS
Maximum Operating	280 m.p.h. (243K) CAS .52 MACH
Flaps extended - half	207 m.p.h. (180K) CAS
Flaps extended - full	161 m.p.h. (140K) CAS
Landing gear extended	230 m.p.h. (200K) CAS

C.G. Range

Forward
212.93 inches aft of datum (22.72% MAC) at 10,250 lbs.
203.75 inches aft of datum (10.40% MAC) at 7,500 lbs.
203.75 inches aft of datum (10.40% MAC) at 6,749 lbs.
214.58 inches aft of datum (24.93% MAC) at 6,000 lbs.
Straight line variation between points
Aft
218.70 inches aft of datum (30.47% MAC) at 10,250 lbs.
217.98 inches aft of datum (29.50% MAC) at 6,278 lbs.
Variation between points:
Inches aft of datum = 219.84 - (11653/Weight)

Datum	196 in forward of wing leading edge at center section
Leveling means	Longitudinal - top of fuselage on centerline aft of wing trailing edge. Lateral - Transverse beams at front of rear baggage compartment floor.
Maximum weight	Maximum takeoff 10,250 lbs. (ramp weight 10,300 lbs.) Maximum landing 9600 lbs. Zero fuel 8750 lbs.
Maximum operating altitude	31,000 feet
Maximum No. of seats	11 (Pilot +10 passengers; pilot, co-pilot + 9 passengers)

XIV - MODEL 690A (cont'd)

Maximum baggage	600 lb. (+260)				
Fuel capacity	Total capacity 389.0 gal., usable fuel 384.0 gal. (See NOTE 1 for system fuel)				
Oil capacity	12.0 qts. total (6.0 qts. total each tank) (+188) 10.0 qts. usable (See NOTE 1 for system oil)				
Control surface movements	Elevator	Up	30° ± 1 0	Down	10° ± 2 0
	Elevator tab	Up	6 1/2° ± 1	Down	24° ± 1
	Rudder	Right	20° ± 2 0	Left	20° ± 2 0
	Rudder tab	Right	26° ± 2 0	Left	26° ± 2 0
	Aileron	Up	23° ± 2	Down	15° ± 2
	Flaps			Down	40° ± 2
	Aileron tab	Up	17° ± 2.5°	Down	17° ± 2.5°
Serial Nos. eligible	Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to: Issue Airworthiness Certificates and approve design and production changes on airplane serial numbers 690A-11100 through 11349. (See NOTES 15 and 22).				

XV - MODEL 690B, 10 PCLM (Normal Category), Approved October 5, 1976

Engines

2 AiResearch Model TPE-331-5-251K Turboprop engines (Rockwell P/N 610495), S/N 11350 through 11542
2 AiResearch Model TPE-331-5-252K Turboprop engines (Rockwell P/N 610495), S/N 11431, S/N 11543 and subs.

Fuel

Aviation turbine fuels ASTM designation D1655-68, Types Jet A, Jet B, and Jet A-1; and MIL-T-5624G(1), Grades JP-4 & JP-5. (See Rockwell Services Letter 170H) (See Mfg. Data Part V Approved F/M for List of Approved Fuels).

Oil

MIL-L-23699A and MIL-L-7808G (See Mfg. Data Part V Approved F/M for List of Approved Lubricants).

Engine limits

	HP.	R.P.M.	I.T.T.
Takeoff	717.5	101%	923°C
Maximum continuous	717.5	101%	923°C

Propeller and Propeller Limits

2 Hartzell 3-bladed feathering and reversing propellers.
Rockwell Assembly No. 640053.

a. HC-B3TN-5FL Hubs with LT10282H-4 or LT10282H(B)+4 or LT10282+4 or LT10282(B)+4 or LT10282+4 or LT10282AB+4 blades

OR HC-B3TN-5DL or HC-B3TN-5NL hubs with LT10282A+4 or LT10282AB+4 blades.

Pitch settings at 30 in. Station: Low 13.5° ± 0.2°
Feather 90.0° ± 0.5°, Reverse -8.0° ± 0.5°
Start Locks +2.5° ± 0.2°
Diameter: 106 in, 1/2 in. reduction per blade allowed.
NOTE: Use AiResearch oil transfer tube No. 866533-3.
(See NOTE 16)

b. Spinner: 2 Hartzell 836-57P

c. Governor: 2 AiResearch 895490-1 or 895490-3 (for aircraft with TPE 331-5-251K engines)
2 AiResearch 895490-5 (for aircraft with TPE 331-5-252K engines)

XV - MODEL 690B (cont'd)

Airspeed Limits	Maneuvering	171 m.p.h. (149K) CAS
	Maximum Operating	280 m.p.h. (243K) CAS .52 MACH
	Flaps extended - half	207 m.p.h. (180K) CAS
	Flaps extended - full	161 m.p.h. (140K) CAS
	Landing gear extended	230 m.p.h. (200K) CAS

C.G. Range

Forward
213.14 inches aft of datum (23.00% MAC) at 10,325 lbs.
203.75 inches aft of datum (10,40% MAC) at 7,500 lbs.
203.75 inches aft of datum (10.40% MAC) at 6,749 lbs.
214.58 inches aft of datum (24.93% MAC) at 6,000 lbs.
Straight line variation between points.
Aft
218.64 inches aft of datum (30.39% MAC) at 10,325 lbs.
217.85 inches aft of datum (29.33% MAC) at 6,267 lbs.
Variation between points.
Inches aft of datum = 219.84 - (12444/Weight)

Datum: 196 in. forward of wing leading edge at center section.

Leveling means: Longitudinal - Top of fuselage on centerline aft of wing trailing edge.
Lateral - Transverse beams at front of rear baggage compartment floor.

Maximum weight: Maximum takeoff 10,325 lbs. (ramp weight 10,375 lbs.)
Maximum landing 9675 lbs.
Zero fuel 8750 lbs.

Maximum operating altitude: 31,000 feet

Maximum No. of seats: 10 (Pilot + 9 passengers; pilot, co-pilot + 8 passengers)

Maximum baggage: 600 lb. (+260)

Fuel capacity: Total capacity 389.0 gal., usable fuel 384.0 gal.
(See NOTE 1 for systems fuel)

Oil capacity: 12.0 qts. total (6.0 qts. total each tank) (+188)
10.0 qts. usable (See NOTE 1 for system oil)

Control surface movements

Elevator	Up	30° ± 1	Down	10° ± 2
		0		0
Elevator tab	Up	6 1/2° ± 1	Down	24° ± 1
Rudder	Right	20° ± 2	Left	20° ± 2
		0		0
Rudder tab	Right	26° ± 2	Left	26° ± 2
		0		0
Aileron	Up	23° ± 2	Down	15° ± 2
Flaps			Down	40° ± 2
Aileron tab	Up	17° ± 2.5°	Down	17° ± 2.5°

Serial Nos. eligible: Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to: Issue Airworthiness Certificates and approve design and production changes on airplane serial numbers 690B-11350 through 11566. (See NOTES 15 and 22).

XVI - MODEL 690C, 11 PCLM (Normal Category), Approved September 7, 1979

Engines: 2 AiResearch Model TPE-331-5-254K Turboprop engines (Rockwell P/N 610495).

Fuel: Aviation turbine fuels ASTM designation D1655-68, Types Jet A, Jet A-1, and Jet B; MIL-T-5624G-1, Grades JP-4 and JP-5; MIL-T-83133, Grade JP-8 and MIL-F-46005A(MR)-1, Types I and II.

Oil: MIL-L-23699B Type II, MIL-L-7808G Type I (See Mfg. Data Part VIII Approved POH for List of Approved Lubricants).

Engine limits

	HP.	R.P.M.	I.T.T.
Takeoff	717.5	101%	923°C
Maximum continuous	717.5	101%	923°C

Propeller and Propeller Limits:
2 Dowty-Rotol Ltd. 3-bladed feathering and reversing propellers.
Rockwell Assembly No. 640080.

a. Dowty-Rotol Ltd. Type No. (C) R306/3-82-F/7-(c) VP2926 includes B. F. Goodrich propeller de-icing kit No. 65-330-1 or Dowty Rotol Ltd. Type No. (C) R306/3-82-F/7-(c) VP 3027 includes Dowty Rotol Drice Boots 660709275 as B. F. Goodrich De-Ice Boots 4E 2598-10. See NOTE 17.
Dowty-Rotol Propeller Blade Assembly P/N 660706330-XX
Pitch settings at .7 radius station:
Feather 83 10' ± 20", Reverse -13.75° ± 1.0°
Start Locks -1.25° ± 1.0°, Flight Idle 6.0° ± 0.5°
Diameter: 106 in., 1/2 in. reduction per blade allowed.
NOTE: Use AiResearch oil transfer tube No. 897458-2.
NOTE: All engine ground running for maintenance test purposes with the airplane stationary, must be done with the airplane headed into the wind.
b. Spinner: 2 Dowty-Rotol Ltd. Type No. (C)SB7/3/1
c. Governor: 2 AiResearch P/N 895490-5, 897410-2B, or 897410-4

Airspeed Limits

Maneuvering	158 m.p.h. (137K) CAS
Maximum Operating	280 m.p.h. (234K) CAS .52 MACH
Flaps extended - half	207 m.p.h. (180K) CAS (S/N 11600-11729)
	230 m.p.h. (200K) CAS (S/N 11730-11999)
Flaps extended - full	161 m.p.h. (140K) CAS (S/N 11600-11729)
	184 m.p.h. (160K) CAS (S/N 11730-11999)
Landing gear extended	230 m.p.h. (200K) CAS

C.G. Range
Forward
210.51 inches aft of datum (20.06% MAC) at 10,325 lbs.
204.70 inches aft of datum (12.03% MAC) at 7,500 lbs.
204.70 inches aft of datum (12.03% MAC) at 6,798 lbs.
215.10 inches aft of datum (26.42% MAC) at 6,240 lbs.
Straight line variation between points.
Aft
218.67 inches aft of datum (31.35% MAC) at 10,325 lbs.
217.88 inches aft of datum (30.25% MAC) at 6,332 lbs.
Variation between points:
Inches aft of datum = 219.93 - (13029/Weight)

Datum: 196 in. forward of wing leading edge at center section

Leveling means:
Longitudinal - Top of fuselage on centerline aft of wing trailing edge.
Lateral - Transverse beams at front of rear baggage compartment floor.

Maximum weight:
Maximum takeoff 10,325 lbs. (ramp weight 10,375 lbs.)
Maximum landing 9675 lbs.
Zero fuel 8800 lbs.

XVI - MODEL 690C (cont'd)

Maximum operating altitude	31,000 feet				
Maximum No. of seats	11 (Pilot + 10 passengers; pilot, co-pilot + 9 passengers)				
Maximum baggage	600 lb. (+260)				
Fuel capacity	Total standard capacity 430 gal., usable 425 gal. Total capacity with optional system 482 gal., usable 474 gal. (See NOTE 1 for systems fuel.)				
Oil capacity	12.0 qts. total (6.0 qts. total each tank) (+188) 10.0 qts. usable (See NOTE 1 for system oil)				
Control surface movements	Elevator	Up	30° ± 1 0	Down	10° ± 2 0
	Elevator tab	Up	3° ± 1	Down	24° ± 1
	Rudder	Right	20° ± 2 0	Left	20° ± 2 0
	Rudder tab	Right	20° ± 2 0	Left	20° ± 2 0
	Aileron	Up	23° ± 2	Down	15° ± 2
	Flaps			Down	40° ± 2
	Aileron tab	Up	17° ± 2.5°	Down	17° ± 2.5°
Serial Nos. eligible	Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to: Issue Airworthiness Certifictes and approve design and production changes on airplane serial numbers 11600 through 11735. (See NOTE 22)				

XVII - MODEL 695, 11 PCLM (Normal Category), Approved November 1, 1979

Engines	2 AiResearch Model TPE-331-10-501K Turboprop Engines (Rockwell P/N 610653) or 2 Garrett Model TPE-331-10-511K Turboprop Engines (Gulfstream P/N 610653) See NOTE 19.			
Fuel	Aviation turbine fuel ASTM designation D1655-68, Types Jet A and Jet A-1, and Jet B; MIL-T-5624G-1, Grades JP-4 and JP-5; MIL-T-83133, Grade JP-8, MIL-F-46005A(MR)-1, Types I and II.			
Oil	MIL-L-23699B Type II, MIL-L-7808G Type I (See Mfg. Data Part VIII Approved POH for List of Approved Lubricants).			
Engine Limits		HP	R.P.M.	E.G.T.
	Takeoff	733	101%	650°C
	Maximum continuous	733	101%	650°C

Propeller and Propeller Limits

2 Dowty-Rotol Ltd. 3-bladed feathering and reversing propellers.
Rockwell Assembly No. 640080.

a. Dowty-Rotol Ltd. Type No. (C) R306/3-82-F/7-(c) VP2926 includes B. F. Goodrich propeller de-icing kit No. 65-330-1 or Dowty Rotol Ltd. Type No. (C) R306/3-82-F/7-(c) VP 3027 includes Dowty Rotol Deice Boots 660709275 as B. F. Goodrich De-Ice Boots 4E 2598-10. See NOTE 17.
Dowty-Rotol Propeller Blade Assembly P/N 660706330-XX
Pitch settings at .7 radius station:
Feather 83 10' ± 20', Reverse -13.75° ± 1.0°,
Start Locks -1.25° ± 1.0°, Flight Idle 6.0° ± 0.5°.
Diameter: 106 in., 1/2 in. reduction per blade allowed.
NOTE: Use AiResearch oil transfer tube Part No. 897458-2.
NOTE: Downwind ground operation above taxi power is prohibited when airplane is stationary.

XVII - MODEL 695 (cont'd)

Propeller and Propeller Limits (cont'd)	b. Spinner: 2 Dowty-Rotol Ltd. Type No. (C)SB7/3/1 c. Governor: 2 AiResearch P/N 897410-2B or 897410-4.

Airspeed Limits		
	Maneuvering	158 m.p.h. (137K) CAS
	Maximum Operating	280 m.p.h. (143K) CAS .52 MACH
	Flaps extended - half	207 m.p.h. (180K) CAS
	Flaps extended - full	161 m.p.h. (140k) CAS
	Landing gear extended	230 m.p.h. (200K) CAS

C.G. Range

Forward
210.51 inches aft of datum (20.06% MAC) at 10,325 lbs.
204.70 inches aft of datum (12.03% MAC) at 7,500 lbs.
204.70 inches aft of datum (12.03% MAC) at 6,798 lbs.
215.10 inches aft of datum (26.42% MAC) at 6,240 lbs.
Straight line variation between points.
Aft
218.67 inches aft of datum (31.35% MAC) at 10,325 lbs.
217.88 inches aft of datum (30.25% MAC) at 6,332 lbs.
Variation between points:
Inches aft of datum = 219.93 - (13029/Weight)

Datum: 196 in. forward of wing leading edge at center section

Leveling means: Longitudinal - Top of fuselage on centerline aft of wing trailing edge.
Lateral - Transverse beams at front of rear baggage compartment floor.

Maximum weight: Maximum takeoff 10,325 lbs. (ramp weight 10,375 lbs.)
Maximum landing 9,675 lbs.
Zero fuel 8,800 lbs.

Maximum operating altitude: 31,000 feet

Maximum No. of seats: 11 (Pilot + 10 passengers; pilot, co-pilot + 9 passengers)

Maximum baggage: 600 lb. (+260)

Fuel capacity: Total standard capacity 430 gal., usable 425 gal. (S/N 95000 thru 95040).
Total standard capacity 482 gal., usable 474 gal. (S/N 95041 thru 95999).
(See NOTE 1 for systems fuel.)

Oil capacity: 12.0 qts. total (6.0 qts. total each tank) (+188)
10.0 qts. usable (See NOTE 1 for system oil).

Control Surface movements					
	Elevator	Up	30° ± 1 0	Down	10° ± 2 0
	Elevator tab	Up	3° ± 1	Down	24° ± 1
	Rudder	Right	20° ± 2 0	Left	20° ± 2 0
	Rudder tab	Right	20° ± 2 0	Left	20° ± 2 0
	Aileron	Up	23° ± 2	Down	15° ± 2
	Flaps	Down	40° ± 2		
	Aileron tab	Up	17° ± 2.5°	Down	17° ± 2.5°

Serial Nos. eligible: Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to: Issue Airworthiness Certificates and approve design and production changes on airplane serial numbers 95000 through 95084. (See NOTE 22.)

XVIII - MODEL 695A, 11 PCLM (Normal Category), Approved April 30, 1981

Engines

2 AiResearch Model TPE-331-10-501K Turboprop Engines (Rockwell P/N 610653) or 2 Garrett Model TPE-331-10-511K Turboprop Engines (Gulfstream P/N 610653) See NOTE 19.

Fuel

Aviation turbine fuels ASTM designation D1655-68, Types Jet A, Jet A-1, and Jet B; MIL-T-5624G-1, Grades JP-4 and JP-5; MIL-T-83133, Grade JP-8, and MIL-F-46005A(MR)-1, Types I and II.

Oil

MIL-L-23699B Type II (See Mfg. Data Part VIII Approved POH for List of Approved Lubricants).

Engine Limits

	Torque	RPM	EGT
Takeoff and Maximum continuous	102.5%(820)	101.0%	650°C

Propeller and Propeller Limits

2 Dowty-Rotol Ltd. 3-bladed feathering and reversing propellers.
Rockwell Assembly No. 640080.

a. Dowty-Rotol Ltd. Type No. (C) R306/3-82-F/7-(c) VP2926 includes B. F. Goodrich propeller de-icing kit No. 65-330-1 or Dowty Rotol Ltd. Type No. (C) R306/3-82-F/7-(c) VP 3027 includes Dowty Rotol Deice Boots 660709275 as B. F. Goodrich De-Ice Boots 4E 2598-10. See NOTE 17.
   Dowty-Rotol Propeller Blade Assembly P/N 660706330-XX
   Pitch settings at .7 radius station:
   Feather 83 10' ± 20', Reverse -13.75° ± 1.0°,
   Start Locks -1.25° ± 1.0°, Flight Idle 6.0° ± 0.5°.
   Diameter: 106 in., 1/2in. reduction per blade allowed.
   NOTE: Use AiResearch oil transfer tube Part No. 897458-2.
   NOTE: Downwind ground operation above taxi power is prohibited when airplane is stationary, must be done with the airplane headed into the wind.
b. Spinner: 2 Dowty-Rotol Ltd. Type No. (C)SB7/3/1
c. Governor: 2 AiResearch P/N 897410-2B or 897410-4.

Airspeed Limits

Maneuvering	162 m.p.h. (141K) CAS
Maximum Operating	290 m.p.h. (252K) CAS .60 MACH
Flaps extended - half	207 m.p.h. (180K) CAS (S/N 96000-96055)
	230 m.p.h. (200K) CAS (S/N 96056-96999)
Flaps extended- full	161 m.p.h. (140K) CAS (S/N 96000-96055)
	184 m.p.h. (160K) CAS (S/N 96056-96999)
Landing gear extended	230 m.p.h. (200K) CAS

C.G. Range

Forward
209.78 inches aft of datum (19.1% MAC) at 11,200 lbs.
204.34 inches aft of datum (11.5% MAC) at 8,500 lbs.
204.34 inches aft of datum (11.5% MAC) at 7,010 lbs.
214.18 inches aft of datum (25.1% MAC) at 6,466 lbs.
Straight line variation between points
Aft
218.77 inches aft of datum (31.5% MAC) at 11,200 lbs.
217.95 inches aft of datum (30.4% MAC) at 6,582 lbs.
Variation between points:
Inches aft of datum = 219.93 - (13029/Weight)

Datum

196 in forwad of wing leading edge at center section.

Leveling means

Longitudinal - Top of fuselage on centerline aft of wing trailing edge.
Lateral - Transverse beams at front of rear baggage compartment floor.

XVIII - MODEL 695A (cont'd)

Maximum weight	Maximum takeoff	11,200 lbs. (ramp weight 11,250 lbs.)			
	Maximum landing	10,550 lbs.			
	Zero fuel	9,500 lbs.			
Maximum operating altitude	35,000 feet				
Maximum No. of seats	11 (Pilot + 10 passengers; pilot, co-pilot + 9 passengers)				
Maximum baggage	600 lb. (+290) Non pressurized compartment (See NOTE 18) 100 lb. (+245) Pressurized compartment				
Fuel capacity	Total standard capacity 482 gal., usable 474 gal. (See Note 1 for systems fuel)				
Oil capacity	12.0 qts. total (6.0 qts. total each tank) (+188) 10.0 qts. usable (See Note 1 for system oil)				
Control Surface movements	Elevator	Up	30° ± 1 0	Down	10° ± 2 0
	Elevator tab	Up	3° ± 1	Down	24° ± 1
	Rudder	Right	20° ± 2 0	Left	20° ± 2 0
	Rudder tab	Right	20° ± 2 0	Left	20° ± 2 0
	Aileron	Up	23° ± 2	Down	15° ± 2
	Flaps			Down	40° ± 2
	Aileron tab	Up	17° ± 2.5°	Down	17° ± 2.5°
Serial Nos. eligible	Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to: Issue Airworthiness Certificates and approve design and production changes on airplane serial numbers 96000 through 96100. (See Note 21 and 22)				

XIX - MODEL 690D, 11 PCLM (Normal Category) Approved December 2, 1981

Engines	2 AiResearch Model TPE 331-5-254K Turboprop Engines (Gulfstream P/N 610495).			
Fuel	Aviation turbine fuels ASTM designation D1655-68, types Jet A, Jet A-1 and Jet B; MIL-T-5624G-1, Grades JP-4 and JP-5; MIL-T-83133, Grade JP-8 and MIL-F-46005A(MR)-1, Types I and II.			
Oil	MIL-L-23699B Type II or MIL-L-7808G type I (See Mfg. Data Part VIII Approved POH for List of Approved Lubricants).			
Engine limits		HP	R.P.M.	ITT
	Takeoff and Maximum continuous	748	101.0%	923°
Propeller and Propeller Limits	2 Dowty-Rotol Ltd. 3-bladed feathering and reversing propellers. Rockwell Assembly No. 640080. a. Dowty-Rotol Ltd. Type No. (C) R306/3-82-F/7-(c) VP2926 includes B. F. Goodrich propeller de-icing kit No. 65-330-1 or Dowty Rotol Ltd. Type No. (C) R306/3-82-F/7-(c) VP 3027 includes Dowty Rotol Deice Boots 660709275 as B. F. Goodrich De-Ice Boots 4E 2598-10. See NOTE 17. Dowty-Rotol Propeller Blade Assembly P/N 660706330-XX Pitch settings at .7 radius station:			

XIX - MODEL 690D (cont'd)

Propeller and Propeller Limits (cont'd)	Feather 83° 10' ± 20', Reverse -13.75° ± 1.0° Start Locks -1.25° ± 1.0°, Flight Idle 6.0° ± 0.5°. Diameter: 106 in., 1/2in. reduction per blade allowed. NOTE: Use AiResearch oil transfer tube Part No. 897458-2. NOTE: All engine ground running for maintenance test purposes, with the airplane stationary, must be done with the airplane head into the wind. b. Spinner: 2 Dowty-Rotol Ltd. Type No. (C)SB7/3/1 c. Governor: 2 AiResearch P/N 897410-2B or -4.

Airspeed Limits		
	Maneuvering	160 m.p.h. (139K) CAS
	Maximum Operating	290 m.p.h. (252K) CAS .60 MACH
	Flaps extended - half	207 m.p.h. (180K) CAS (S/N 15000-15024)
		230 m.p.h. (200K) CAS (S/N 15025-15999)
	Flaps extended - full	161 m.p.h. (140K) CAS (S/N 15000-15024)
		184 m.p.h. (160K) CAS (S/N 15025-15999)
	landing gear extended	230 m.p.h. (200K) CAS

C.G. Range

Forward
208.77 inches aft of datum (17.7% MAC) at 10,700 lbs.
204.34 inches aft of datum (11.5% MAC) at 8,500 lbs.
204.34 inches aft of datum (11.5% MAC) at 7,010 lbs.
214.18 inches aft of datum (25.1% MAC) at 6,466 lbs.
Straight line variation between points.
Aft
218.72 inches aft of datum (31.4% MAC) at 10,700 lbs.
217.94 inches aft of datum (30.4% MAC) at 6,582 lbs.
Variation between points
Inches aft of datum = 219.93 - (13029/Weight)

Datum: 196 in. forward of wing leading edge at center section

Leveling means: Longitudinal - Top of fuselage on centerline aft of wing trailing edge.
Lateral - Transverse beams at front of rear baggage compartment floor.

Maximum weight	
Maximum takeoff	10,700 lbs. (ramp weight 10,775 lbs.)
Maximum landing	10,550 lbs.
Zero fuel	9,500 lbs.

Maximum operating altitude: 31,000 feet (see note 23 for modification to increase to 35,000 feet)

Maximum No. of seats: 11 (Pilot + 10 passengers; pilot, co-pilot + 9 passengers)

Maximum baggage: 600 lb. (+290) Non pressurized compartment
100 lb. (+245) Pressurized compartment

Fuel capacity: Total standard capacity 430 gal., usable fuel 425.0 gal.
Total capacity with optional system 482 gal., usable 474 gal.
(See NOTE 1 for systems fuel).

Oil capacity: 12.0 qts. total (6.0 qts. total each tank) (+188)
10.0 qts. usable (See NOTE 1 for system oil)

XIX - MODEL 690D (cont'd)

Control Surface movements	Elevator	Up	30° + 1 0	Down	10° + 2 0
	Elevator tab	Up	3° ± 1	Down	24° ± 1
	Rudder	Right	20° + 2 0	Left	20° + 2 0
	Rudder tab	Right	20° + 2 0	Left	20° + 2 0
	Aileron	Up	23° ± 2	Down	15° ± 2
	Flaps			Down	40° ± 2
	Aileron tab	Up	17° ± 2.5°	Down	17° ± 2.5°

Serial Nos. eligible: Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to: Issue Airworthiness Certificates and approve design and production changes on airplane serial numbers 15000 through 15042. (See Notes 21 and 22.)

XX - MODEL 695B, 11 PCLM (Normal Category), Approved February 15, 1984

Engines: 2 Garrett Model TPE 331-10-511K Turboprop engines (Gulfstream P/N 610653).

Fuel: Aviation Turbine fuels ASTM designation D1655-68, types Jet A, Jet A-1, and Jet B; MIL-T-5624G-1, Grades JP-4 and JP-5; MIL-T-83133, Grade JP-8; and MIL-F-46005A(MR)-1, Types I and II; British D.ENG.R.D. 2486 Issue 2; British D.ENG.R.D. 2494 Issue 4; and NATO Equivalents.

Oil: MIL-L-23699B type II (See Mfg. Data Part VIII Approved POH for List of approved lubricants.)

Engine Limits

	Torque (HP)	RPM	EGT
Takeoff and Maximum Continuous	102.5% (820)	101.0%	650°C

Propeller and Propeller Limits:
2 Dowty-Rotol Ltd. 3-bladed feathering and reversing propellers.
Gulfstream Assembly No. 640080

a. Dowty-Rotol Ltd. Type No. (C) R306/3-82-F/7-(c) VP 3027 includes
Dowty-Rotol Deice Boots 660709275 or B. F. Goodrich De-ice Boots 4E2498-10.
Dowty-Rotol Propeller Blade Assembly P/N 660706330-XX
Pitch settings at .7 radius stations:
Feather 83° 10'± 20', Reverse -13.75° ± 1.0°
Start Locks -1.25° ± 1.0°, Flight Idle 6.0° ± 0.5°
Diameter: 106 In., 1/2 in. reduction per blade allowed.
NOTE: Use Garrett oil transfer tube Part No. 897458-2.
NOTE: All engine ground running for maintenance and test purposes, with the airplane stationary, must be done with the airplane headed into the wind.
b. Spinner: 2 Dowty-Rotol Ltd. Type No. (C) SB7/3/1
c. Governor: 2 Garrett P/N 897410-4

Airspeed Limits

Maneuvering	182 m.p.h. (158K) CAS
Maximum Operating	290 m.p.h. (252K) CAS .60 MACH
Flaps extended - half	230 m.p.h. (200K) CAS
Flaps extended - full	184 m.p.h. (160K) CAS
Landing gear extemded	230 m.p.h. (200K) CAS

XX - MODEL 695B (cont'd)

C.G. Range

Forward
210.91 inches aft of datum (20.6% MAC) at 11,750 lbs.
204.34 inches aft of datum (11.5% MAC) at 8,500 lbs.
204.34 inches aft of datum (11.5% MAC) at 6,836 lbs.
211.56 inches aft of datum (21.5% MAC) at 6,410 lbs.
Straight line variation between points.
Aft
217.03 inches aft of datum (29.1% MAC) at 11,750 lbs.
218.71 inches aft of datum (31.4% MAC) at 11,628 lbs.
217.85 inches aft of datum (30.2% MAC) at 6,639 lbs.
Straight line variation except between 11,628 lbs. and 6,639 lbs.
Inches aft of datum = 219.87 - (13402/weight)

Datum

196 In. forward of wing leading edge at center section

Leveling means

Longitudinal - Top of fuselage on centerline aft of wing trailing edge.
Lateral - Transverse beams at front of rear baggage compartment floor.

Maximum Weight

Maximum takeoff 11,750 lbs. (Maximum Ramp 11,800 lbs.)
Maximum landing 11,000 lbs.
Zero Fuel 9,800 lbs.

Maximum operating altitude

35,000 feet

Maximum No. of seats

11 (Pilot + 10 passengers; pilot, co-pilot + 9 passengers)

Maximum baggage

750 lb. (+290) Nonpressurized compartment
100 lb. (+245) Pressurized compartment

Fuel capacity

Total standard capacity 482 gal., usable 474 gal.
(See NOTE 1 for systems fuel).

Oil capacity

12.0 qts. total (6.0 qts. total each tank) (+188)
10.0 qts. usable (See NOTE 1 for system oil).

Control Surface movements

Elevator	Up	30° ± 1 0	Down	10° ± 2 0
Elevator tab	Up	3° ± 1	Down	24° ± 1
Rudder	Right	20° ± 2 0	Left	20° ± 2 0
Rudder tab	Right	20° ± 2 0	Left	20° ± 2 0
Aileron	Up	23° ± 2	Down	15° ± 2
Flaps			Down	40° ± 2
Aileron tab	Up	17° ± 2.5°	Down	17° ± 2.5°

Serial Nos. eligible

Under the Delegation Option Provisions of Part 21 of the Federal Aviation Regulations, Delegaton Option Manufacturer No. SW-2 is authorized to: Issue Airworthiness Certificates and approve design and production changes on airplane Serial Numbers 96201 thru 96208 (See NOTES 20 and 22).

Specifications Pertinent to All Models

Certification basis Type Certificate No. 2A4

Models 680, 680E:	**CAR 3** effective Nov. 1, 1949, through Amdt. 3-12 dated May 18, 1954.
Model 720:	**CAR 3** effective Nov. 1, 1949, through Amdt. 3-12 dated May 18, 1954, and 3.197, 3.395, 3.396 of Amdt. 3-2 dated August 12, 1957.
Models 560, 680F, 680FL:	**CAR 3** effective May 15, 1956, including Amdts. 3-3 dated May 17, 1958, and 3-4 dated October 6, 1958.
Models 680F (Pressurized) 680 FL (Pressurized):	**CAR 3** effective May 15, 1956, including 3.197, 3.395, 3.396 of Amd. 3-2 dated Aug.12, 1957, and Amdt. 3-3 dated May 17, 1958, and 3-4 dated October 6, 1958.
Model 680T:	**CAR 3** effective May 15, 1956, including 3.197, 3.395, 3.396 of Amdt. 3-2 dated August 12, 1957, and Amdts. 3-3 dated May 17, 1958, 3-4 dated Oct. 6, 1958, Amdt. 3-6 dated Sept.13, 1961, plus Special Conditions dated April 1, 1965.
Models 680V, 680W, 681:	**CAR 3** effective May 15, 1956, including 3.197, 3.270, 3.395, 3.396 of Amdt. 3-2 dated August 12, 1957, and Amdts. 3-3 dated May 17, 1958, 3-4 dated Oct.6, 1958, Amdt. 3-6 dated Sept.13, 1961, plus Special Conditions dated April 1, 1965.
Models 690, 690A, 690B	**CAR 3** dated May 15, 1956, including Pars. 3.197, 3.270, 3.395, and 3.396 of Amdt. 3-2 dated Aug.12, 1957, and Amdt. 3-3 dated May 17, 1958, 3-4 dated Oct.6, 1958, 3-6 dated Sept.13, 1961, Par. 23.473, 23.479, 23.481, and 23.483 of FAR 23, Amdt. 23-7 dated Sept.14, 1969, plus Special Conditions dated April 1, 1965, and August 12, 1970; Docket #10506
Model 685:	**CAR 3** dated May 15, 1956, including Pars. 3.197, 3.270, 3.395, and 3.396 of Amdt. 3-2 dated August 12, 1957, and Amdt. 3-3 dated May 17, 1958, 3-4 dated Oct.6, 1958, 3-6 dated Sept. 13, 1961.
Models 690C, 695	**CAR 3** dated May 15, 1956, including Pars. 3.197, 3.270, 3.395, and 3.396 of Amdt. 3-2 dated August 12, 1957, and Amdt. 3-3 dated May 17, 1958, 3-4 dated Oct.6, 1958, 3-6 dated Sept. 13, 1961, Pars. 23.473, 23.479, 23.481, and 23.483 of FAR 23, Amdt. 23-7 dated Sept. 14, 1969, plus Special Conditions dated April 1, 1965, and Aug.12, 1970; Docket #10506, and FAR 36 dated Dec.1, 1969, through Amdt. 36-6 dated Jan.24, 1977.
Model 695A, 690D	**CAR 3** dated May 15, 1956, including Pars. 3.197, 3.270, 3.395, and 3.396 of Amdt. 3-2 dated August 12, 1957, and Amdt. 3-3 dated May 1, 1958, 3-4 dated Oct. 6, 1958, 3-6 dated Sept. 13, 1961, Pars. 23.253, 23.335(b)(4), 23.473, 23.479, 23.481, 23.483, 23.571(a), 23.572(a)(1), and 23.1505(c) of FAR 23, Amdt. 23-7 dated Sept. 14, 1969, FAR 23.1303(e)(2) of Amdt. 23-17 dated Feb. 1, 1977, plus special Conditions dated April 1, 1965, and August 12, 1970, Docket No. 10506, and FAR 36 dated December 1, 1969, through Amdt. 36-6 dated Jan.24, 1977.
Model 695B	**CAR 3** dated May 15, 1956, including Pars. 3.395 and 3.396 of Amdt.3-2 dated August 12, 1957, and Amdt. 3-3 dated May 1, 1958, 3-4 dated Oct. 6, 1958, 3-6 dated Sept.13, 1961, except for Subpart C, plus Pars. 23.253, 23.1303(e)(2), and 23.1505(c), and Subpart C of FAR 23 as amended thru Change 17 dated Sept.13, 1982, plus Special Conditions dated April 1, 1965, and Aug.12, 1970, Docket No. 10506 and FAR 36 dated December 1, 1969, through Amdt. 36-6 dated January 24, 1977.

Production basis Production Certificate No. 203

Equipment

The basic required equipment as prescribed in the applicable airworthiness regulations (see Certification Basis) must be installed in the aircraft for certification. This equipment must include a current Airplane Flight Manual except for Models 690B, 690C, 690D, 695, 695A, and 695B which require a current Pilot's Operating Handbook.

In addition, the following item(s) are required:

1. Stall warning system:
   Models 560F, 680F, 680F(P), 680FL, 680FLP, 680T, 680W, 681, 690, 685, 690A (throuogh S/N 11268 except 11249) - Gulfstream Dwgs. 850016 and 850195.
   Models 690A (11249, 11269 through 11349), 690B - Gulfstream Dwgs. 850016 and 8000644
   Model 690C, 690D and 695 - Gulfstream Dwgs. 200036 and 800644.
   Model 695A and 695B - Gulfstream Dwgs. 200036, 800644 and 800746.

2. Outside Air Temperature Thermometer
   Models 680T, 680V, 680W, 681 - Gulfstream Dwg. 850295
   Models 690, 690A, 690B, 690C, 690D, 695, 695A, and 695B - Gulfstream Dwg. 850478.

3. EGT System
   Model 685 (with Service Letter 300 installed) Gulfstream Dwg. 890412.

NOTE 1: Current weight and balance report, including list of equipment, included in certificated empty weight and loading instructions must be in each aircraft at the time of original airworthiness certification and at all times thereafter (except in the case of air carrier operators having an approved weight control system.)

The certificated empty weight and corresponding center of gravity location must include unusable fuel (included in total fuel capacity and undrainable oil (included in total oil capacity) as follows:

Model	680	680-E	720	680-F & 680-F Press	680-FL & 680-FL(P)
Fuel	15.5 lb.(+187)	15.5 lb.(+187)	15.5 lb.(+187)	15.5 lb.(+187)	15.5 lb.(+231)
Oil	15.0 lb.(+191)	15.0 lb.(+191)	15.0 lb.(+191)	17.4 lb.(+150)	17.4 lb.(+194)

Model	560-F	680W, 681 680T, 680V	690, 690A 690B	685
Fuel	15.5 lb.(+187)	13 lb. (+231)	31 lb.(+231)	27 lb.(+231)
Oil	17.4 lb.(+191)	6.5 lb.(+188)	4 lb.(+188)	0 lb.(+188)

Model	690C, 690D		695		695A, 695B
	Standard	Std + Optional	(SN 95000-95040)	(95041-95999)	
Fuel	33.5 lb.(+230)	53.6 lb.(+230)	33.6 lb.(+230)	53.6 lb.(+230)	53.6 lb.(+230)
Oil	4.0 lb.(+188)	4.0 lb.(+188)	4.0 lb.(+188)	4.0 lb.(+188)	4.0 lb.(+188)

NOTE 2: The placards specified in the Airplane Flight Manual must be displayed in front of and in clear view of the pilots.

NOTE 3: Serial Numbers 466, 471, 529, and 530 of Military RL-26-D as defined by Aero Commander Dwg. 6100012-A are eligible as Model 680 airplanes.

NOTE 4: When Lycoming GSO-480-B1A6 engines are installed, the following pertains: The oil cooler outlet gills must be relocated in accordance with Service Letter No. 62 and oil temperature gage markings changed per Service Letter No. 63. Engines must be operated in accordance with Airplane Flight Manual.

NOTE 5: An optional pressurized version of the Model 680-F designated "680-F (Pressurized)" was approved June 29, 1962. This model is a standard 680-F incorporating a factory modification per Aero Commander Dwg. 610021. Note the special required equipment list and the special equipment column for this modified 680-F in Revision No. 24 or Service Information SI-118.

NOTE 6: Model 680FL S/N 1471 and up are manufactured as 8500 lb. gross weight aircraft. Serial Numbers 1261 through 1470 are manufactured as 8000 lb. gross weight aircraft and become 8500 lb. aircraft when modified per Aero Commander Dwg. 6100028. Serial Number 1441through 1470 were modified per Rockwell Dwg. 6100028 at the factory.

NOTE 7: The Model 680 is eligible as a Model 680E when modified in accordance with Aero Commander Report G10-163.

NOTE 8: All Model 680T aircraft are to be modified or manufactured per Aero Commander Report G10-227 and are to be 8950 lb. gross weight aircraft.

NOTE 9: The Model 680T is eligible as a Model 680V when modified in accordance with Aero Commander Dwg. 6100034.

NOTE 10: Icing Approval:

a. The Models 680T, 680V, 680W, and 681 may be flown through known icing conditions when equipped in accordance with Aero Caommander Service Letter No. 196.
b. The Model 690 may be flown through known icing conditions when equipped in accordance with Aero Commander Service Letter No. 241A or Drawing 890338. Flight Manual Supplement 4 dated 6/10/71 is required.
c. Models 690A and 690B are fully equipped and approved for flight into known icing. See Flight Manual (Pilots Operating Handbook) for list of required operable equipment. Safe Flight P/N C-01426 and C-01427 required to provide stall warning.
d. Model 690C Serial Numbers 11600 thru 11619 approved for flight into known icing after compliance with Rockwell Service Letter No. 329. Serial Numbers 11620 and Subs are fully equipped for flight into known icing. See Pilots Operating Handbook for list of required operable equipment.
e. Model 695, 695A, 695B and690D are fully equipped for flight into known icing. See Pilots Operating Handbook for list of required operable equipment.

NOTE 11: The Models 680T and 680V may have the AiResearch engines TPE-331-43A installed as a product improvement item and in accordance with Aero Commander Service Letter No. 208.

NOTE 12: The Models 680T, 680V, 680W, and 681 may have auxiliary fuel tanks installed in accordance with Aero Commander Drawing 890326. These provide 25.5 usable gals. each side. (51 gal. total) Unusable added is negligible.

NOTE 13: The Model 685 may be approved for flight into known icing coorditions when equipped in accordance with Aero Commander Service Letter No. 241 or Drawing No. 890338. Flight Manual Supplement 5 dated April 15, 1972, is required.

NOTE 14: With GTS10-520-K engine installed, 2 Alcor turbine inlet temperature indicators must be installed per Rockwell Service Letter 300. Flight Manual Revision No. 5.

NOTE 15: In some cases, the serial number contains the basic number plus a dash followed by a second set of numbers. This second number is a model unit number and the basic serial number applies with or without the second number. Example as follows: 680FL-1779-148 can be referred to as S/N 1779-148 or by S/N 1779.

NOTE 16: If blades LT10673 or LT10673B are installed per STC SA546GL, propeller blade angles at the 42 inch station are: Reverse 14.0° ± .5°, Start Locks -8.7° ± .5°; Low 6.0° ± .5°, and Feather 77.9° ± .5°.

NOTE 17: Airframe electrical modifications per 800 788 required when installing Dowty Rotol boots 660709275 or B. F. Goodrich boots 4E2498-10 in place of previously installed B. F. Goodrich de-ice Kit 65-330-1.

NOTE 18: Maximum Baggage Weight increased to 750 pounds for Model 695A Serial Numbers 96063, 96069, 96075, 96078, and 96085.

NOTE 19: TPE 331-10-501K effective on Models 695 S/N 95000 through 95084, 695A S/N 96001through 96071 except those complying with Service Information Letter 189. TPE 331-1Q-511K effective on Models 695 S/N 95087 and Subs. 695A S/N 96000, 96072 and Subs. plus those complying with Service Information Letter 189. It is acceptable to have one each -501K and -511K engine installed.

NOTE 20: Model 695A Serial Numbers 96062, 96063, 96069, 96075, and 96078, and 96085 are eligible as a Model 695B when modified in accordance with Gulfstream Aerospace Drawing 100062 Rework EO No. 3 except that the maximum value of zero fuel weights is limited to 9500 pounds.

NOTE 21: Model 690D airplanes, Serial Numbers 15000 through 15042, are eligible for conversion to Model 695A when modified in accordance with Gulfstream Drawing 100068.

NOTE 22: Delegation Option Authorization No. SW-2 expired July 17, 1986.

NOTE 23: Model 690D maximum operating altitude may be increased to 35,000 feet through the installation of Twin Commander Aircraft Corporation Custom Kit No. 149.

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