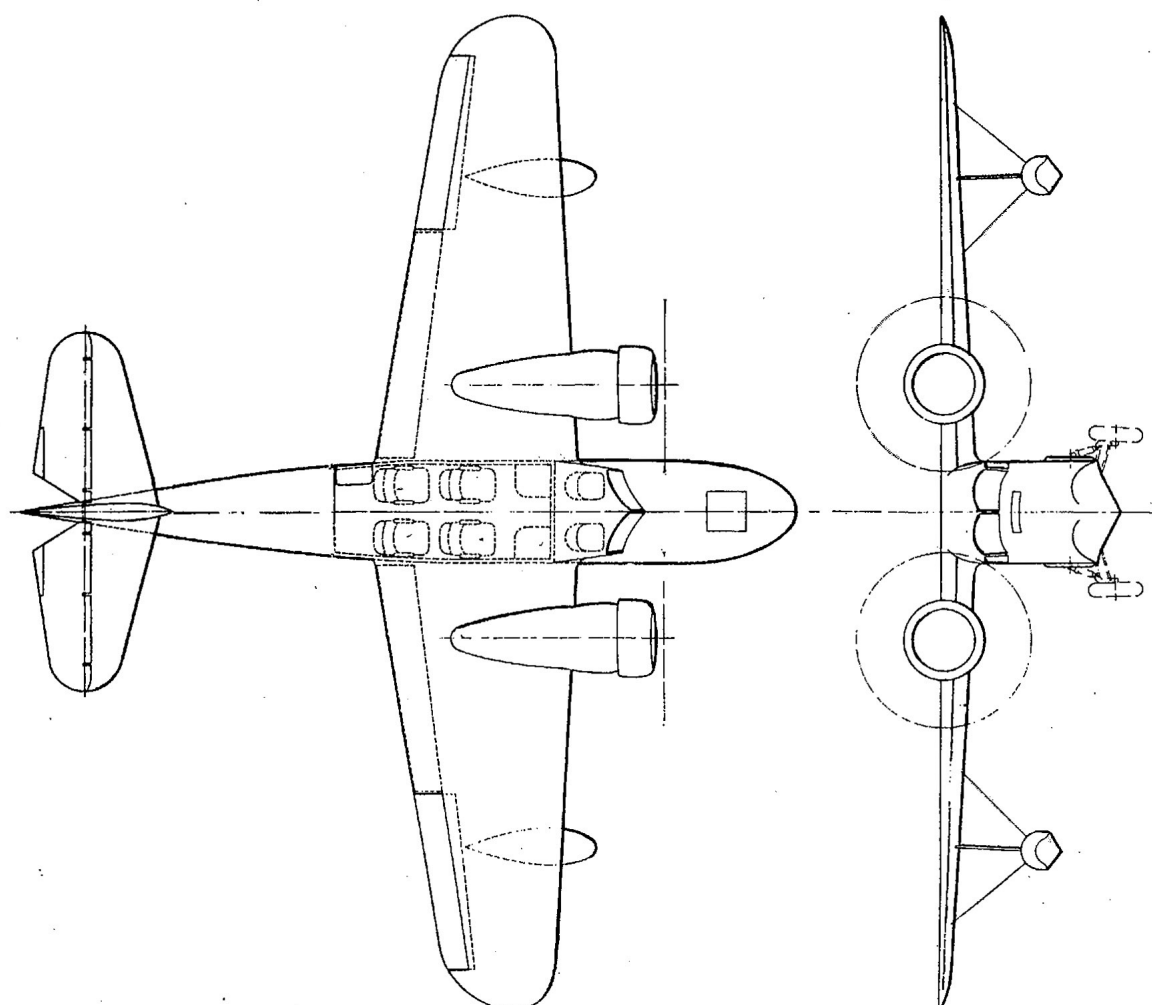
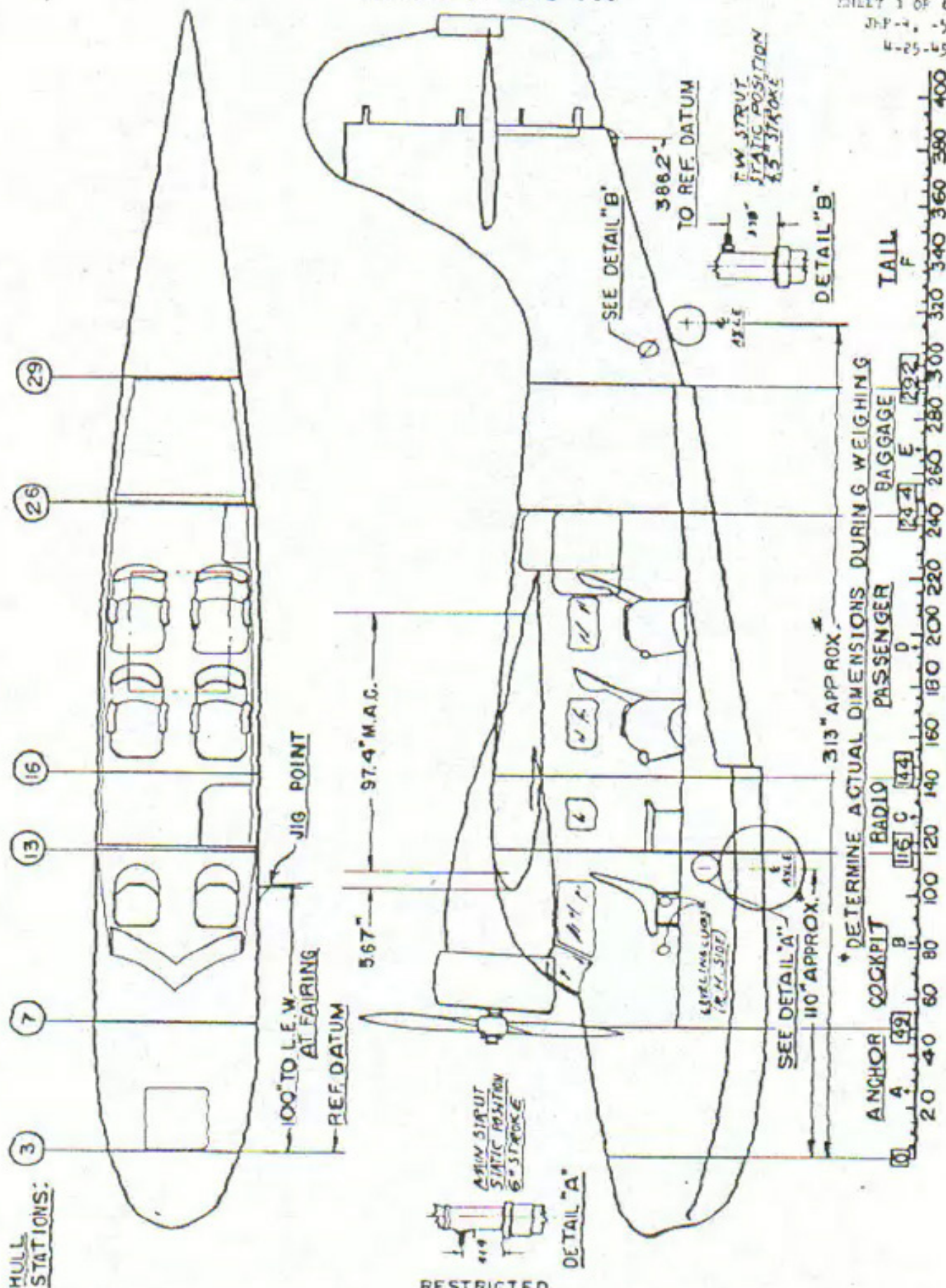


The GRUMMAN "G-21A" AMPHIBIAN



GRUMMAN AIRCRAFT ENGINEERING CORP.
BETHPAGE, LONG ISLAND



CREW MOVEMENT

TABLE OF MOMENTS

STATION	COCKPIT	RADIO	FRONT PASSENGER	REAR PASSENGER
Baggage	311	248	189	118
Rear Passenger	193	130	71	
Front Passenger	122	59		
Radio	63			

Change In moment for one 180 pound man - Unit of moment - 100 inch pounds

Movement of crew member aft: Plus (+) sign (Add)

Movement of crew member fwd.: minus (-) sign (Subtract)

COMPARTMENT LOADING TABLE

COMPARTMENT	A. ANCHOR	C. RADIO	D. PASSENGER	E. BAGGAGE
Structural Capacity Lbs.	260	350	1350	400
Max. Floor Loading (l./ft. ²)	21.8	32.7	35.1	22.6
Floor Area (ft. ²)	11.9	10.7	37.4	17.7
Fore & Aft Limits (Inches)	0 to 49	116 to 144	114 to 244	244 to 292
Cubic Capacity (ft. ³)	32.1	59.7	198.2	53.1
Door Size (Inches)	22.5 x 22.5	30.4 x 25.4	30.4 x 25.4	18 x 33
Door Size (Auxiliary) (Inches)	-	24 x 29.3	24 x 29.3	-
Largest Package Dimension (Inches)	22 x 22	30 x 25	30 x 25	18 x 15
Centroid	25	130	194	268

SPECIFICATIONS

THE GRUMMAN "G-21A" AMPHIBIAN

AIRPLANE DATA

Airplane Type 8 Place Amphibian Monoplane
 Number of Engines Two
 Controllable Pitch Propellers Hamilton - Standard
 Landing Gear Retractable Mechanically
 Wing Flaps Vacuum - Two Position
 Soundproofing Sperry
 Hull and Body Structure All Metal
 Wing Structure All Metal
 Empennage Structure All Metal
 Shock Absorber Units Bendix

ENGINE DATA

Engines (2) Wasp Jr. "S.B." Pratt & Whitney
 Type Radial Air Cooled - 9 Cylinders
 Horsepower and RPM - Take-Off 450 at 2300 with 87 Octane
 400 at 2200 with 80 Octane
 Maximum Horsepower for Continuous 400 at 2200 (Up to 5000 ft.
 Operation Critical Altitude)
 Cruising Horsepower (Recommended) 300 at 2000 r. p. m.

AIRPLANE DIMENSIONS

Length	38' 4"	11.70 M.
Span	49' 0"	14.95 M.
Height (On three wheels)	12' 0"	3.66 M.
Wheel Tread	7' 6"	2.28 M.
Wing Area	375 Sq. Ft.	34.80 Sq. M.

AIRPLANE WEIGHT DATA

Gross Weight	8000 Lbs.	3630 Kgs.
Empty Weight	5475 "	2470 "
Useful Load (Standard Equipment)	2525 "	1155 "
Maximum Oil Capacity (15 U. S. Gals.)	112 "	51 "
Normal Fuel Capacity (175 U. S. Gals.)	1050 "	476 "
Maximum Fuel Capacity (220 U. S. Gals.)		
Wing Loading	21.3 lbs. per Sq. Ft.	103.8 Kgs. per Sq. M.
Power Loading (Take-off Power)	8.9 lbs. per HP.	4.02 Kgs. per HP.

AIRPLANE PERFORMANCE (8000 lbs.)

Maximum Speed at 5000 ft. (1525 M)	201 M. P. H.	324 Km. P. H.
Maximum Speed at Sea Level	191 "	307 "
Cruising Speed at 9600 ft. (2930 M) (600 H. P.)	190 "	306 "
Cruising Speed at 5000 ft. (1525 M) (600 H. P.)	180 "	289 "
Cruising Speed at 5000 ft. (1525 M) (500 H. P.)	170 "	273 "
Cruising Speed at Sea Level (600 H. P.)	171 "	274 "
Maximum Rate of Climb at Sea Level	1,300 Ft. per Min.	396 M per min.
Climb to 5000 ft. (1525 M)	4.5 Min.	4.5 Min.
Climb to 9600 ft. (2930 M)	10.0 Min.	10.0 Min.
Service Ceiling	22,000 Ft.	6700 M
Absolute Ceiling	24,000 Ft.	7320 M
Ceiling with One Engine (8000 lbs.) (3630 Kgs.)	6,000 Ft.	1825 M
Take-off Run at Sea Level	820 Ft.	250 M
Take-off Time at Sea Level	12 Secs.	12 Secs.
Take-off Time as Seaplane (Calm, glassy)	19 Secs.	19 Secs.
Landing Speed at Sea Level (Flaps Down)	62 M. P. H.	100 Km. P. H.
Fuel Consumption at 600 H. P.	51 U. S. Gals. per Hr.	
Fuel Consumption at 500 H. P.	40 U. S. Gals. per Hr.	
Fuel Consumption at 400 H. P.	32 U. S. Gals. per Hr.	

RANGE — PAYLOAD TABLE

Horsepower	Altitude	Fuel	Speed	Payload (With 1 Crew)	Range
75%	9600	175	190	1205	610
75%	5000	175	180	1205	580
62½%	9600	175	180	1205	740
62½%	5000	175	170	1205	700
50%	5000	220	150	920	1000

These Figures Allow 10 Gallons for
Warm-up and Climb to Altitude

Guaranteed within 3%:—

Weight Empty

Guaranteed within 5%:—

Max. Speed at Sea Level
Service Ceiling

MODELS: Grumman G-21 and G-21A (Army OA-9, Navy JRF-1, JRF-2, JRF-3, JRF-4, JRF-5 and JRF-6B - See NOTE 8), 8 PCL-AM-FcM (Approved 9/29/37 and 2/5/38 respectively)

T.C. NUMBER: 654

(For difference between G-21 and G-21A, see NOTE 5)

Engines	2 P&W Wasps Jr. SB or SB-2 with one 4-1/2N and one 9N damper (See also Item 111)
Fuel	80 minimum octane aviation gasoline (for 400 hp rating), 87 minimum octane aviation gasoline (for 450 hp takeoff rating)
Engine limits	Maximum, except takeoff (Sea level) 34.5 in. Hg., 2200 rpm (400 hp) (Straight line manifold pressure variation with altitude to 5000 ft.) 33.5 in. Hg., 2200 rpm (400 hp) Takeoff (one minute) (With 80 octane fuel) 33.5 in. Hg., 2200 rpm (400 hp) (With 87 octane fuel) 36.5 in. Hg., 2300 rpm (450 hp)
Airspeed limits (T.I.A.S.)	Level flight or climb - 194 mph (169 knots) Glide or dive - 225 mph (195 knots) Flaps extended - 110 mph (96 knots)
Propeller limits	Item 109, 228 or 302 must be installed
Ceilings	(a) Without de-icers; 5000 ft. absolute (density alt.) either engine inoperative (b) With de-icers: Zero ft. (usable in standard air at 8048 lbs. with either engine inoperative and the inoperative propeller idling in high pitch)
C.G. range	(+20.5) (15.2 percent MAC) to (+33.0) (28.0 percent MAC)
Datum	Wing leading edge at fuselage
MAC	97.4 in. L.E. of MAC (+5.7)
Leveling means	Lugs on right side and aft bulkhead of pilot's compartment
Maximum weight	Model G-21A: 8000 lbs. (See NOTE 7) Model G-21: 7500 lbs. (See NOTES 5 and 7)
No. seats	8 (2 at -5, 2 at +24, 2 at +62, 2 at +102)
Baggage	700 lbs. maximum (300 lbs. in front compartment (-65), 400 lbs. in rear compartment (+169)) (See NOTES 2 and 3)
Fuel capacity	200 gallons (one 110 gallon tank in each center

Oil capacity	section) (+30) 15 gallons (one 7-1/2 gallon tank in each nacelle) (+8)
Control surface movements	Not available
Serial Nos. eligible	1001 and up and B-1 and up
Required equipment	Items 101 (See NOTE 5), 102, 103, 104, 105, 106(a), 107, 108, 109 and 110

Specifications Pertinent to All Models:

Certification basis	Type Certificate No. 654 (Aero. Bulletin 7A)
Production basis	Production Certificate No. 23
Export eligibility	Eligible for export except as follows, subject to provisions of MOP 2-4: (a) Canada - Landplane, Amphibian and Flying boat eligible. - Skiplane not eligible.

EQUIPMENT:

Propellers and Propeller Accessories (except de-icing equipment)

109.	Two controllable metal (Hamilton Standard hubs 2D30, blades 6095A-12)	303 lbs.	(-52)
201.	Constant speed propeller controls	13 lbs.	(-23)
228.	Two constant speed full feathering hydromatic (Grumman Drawings 13709A and 13710) (Hamilton Standard hubs 22D30, blades 6181A-12, 6183A-18, or 6381A-12)	+67 lbs.	(-38)
302.	Two controllable metal (Hamilton Standard hubs 2D30, blades 6167A-12 or 6101A-18) (for interchangeable blade models see Prop Spec. No. 206) (NOTE 6)	No weight change	

Engines and Engine Accessories - Fuel and Oil System

101.	Two engine ring cowls	56 lbs.	(-36)
102.	Two oil radiators (UAP No. U3160)	26 lbs.	(0)
103.	Two starters (Eclipse E-160)	77 lbs.	(-12)
108.	Pressure fire extinguisher (Lux type A-1)	21 lbs.	(-33)
111.	Engines (must have one 4-1/2 N and one 9N damper)	Use actual weight increase	
	(a) P&W Wasps Jr. SB-3 (limits same as SB)		
	(b) P&W Wasps Jr. T1B2 (limits as follows:)		
	Maximum continuous		
	(Sea level) 35 in. Hg., 2200 rpm (400 hp)		
	(Straight line manifold pressure variation with alt. to 3800 ft.) 34 in. Hg., 2200 rpm (400 hp)		
	Takeoff (one minute)		
	35 in. Hg., 2200 rpm (400 hp)		
	37.5 in. Hg., 2300 rpm (450 hp)		
	(c) P&W Wasps Jr. T1B3 (limits same as T1B2, Item 111(b) above)		
	(d) Military R-985-AN-4 (limits same as SB)		
	(e) Military R-985-AN-6 or -AN-6B (limits same as SB)		
	(f) Military R-985-AN-12 or -AN-12B (limits same as SB)		
	(g) Military R-985-AN-14B (limits same as SB)		
	(h) Military R-985-25 (limits same as T1B2, Item 111(b) above)		
	(i) Military R-985-AN-1 or AN-3 (limits same as T1B2, Item 111(b) above)		
202.	Starters		
	(a) Two cartridge, Federal type (one standard battery may be omitted)	62 lbs.	(-5)
	(b) Two electric, Eclipse F-141	62 lbs.	(-12)
218.	Engine tool kit	13 lbs.	(+161)
221.	Engine work shelf	9 lbs.	(+189)
222.	Auxiliary fuel tank (60 gallons) (Drawings 12855 and 12854)	40 lbs.	(+27)

Landing Gear and Floats

106. Two main wheel-brake assemblies,
30x7, Type II, with 32x8 6-ply
rating tires
(a) Bendix type B
(b) Goodrich (formerly Hayes) Model
3070A
Wheel assembly G-3-56A
Brake assembly H-2-102
107. 13.25 in. streamline tail wheel with
Goodrich 6-ply special H.D. tire
110. Wing tip floats (Edo W-760) (See
NOTE 6) 87 lbs.
229. Electrically or manually controlled
landing gear retracting mechanism per
"Instruction Report No. G-21-11" for
kit installation, by Clifford W. Bryan,
6620 Aldea, Van Nuys, CA) +43 lbs. (-5)
301. Wing tip floats (Grumman Drawing 13000) No weight change
304. Skis Use actual weight change
- (a) Federal SA-12
305. 12.50 in. smooth contour tail wheel
with Goodrich 6-ply special H.D. tire

Electrical and Radio Equipment

104. Generator - 24 amp. (Eclipse D-1) 26 lbs. (-23)
105. Two batteries - 38 amp. hr. (Exide
6TS-13-1) 75 lbs. (-7)
203. Extra generator
(a) 25 amp. (Eclipse D-1) 26 lbs. (-23)
(b) 15 amp. (Eclipse G-1) 21 lbs. (-23)
(c) 50 amp. (Eclipse E-5) +17 lbs. (-23)
204. Battery
(a) 65 amp. hr. (Exide 6TX-19-1) 75 lbs. (-48)
(b) 38 amp. hr. (Reading 6ARL-11) 38 lbs. (-48)
(c) (Exide 6-TAS-9-1) 80 lbs. (-7)
207. Miscellaneous radio installations
(a) Bow compartment including shelves Maximum 150 lbs. (-60)
(b) Rear compartment Maximum 150 lbs. (+151)
215. One or two landing lights (Grimes
ST-1000) 8 lbs. each (+60)

Interior Equipment

205. Miscellaneous cabin furnishings
(a) Leather chair upholstery +40 lbs. (+77)
(b) Lounge, replacing two chairs
(Gillies No. 1203) 53 lbs. (+102)
(c) Bed, replacing two chairs
(Gillies No. 1201) 100 lbs. (+102)
(d) Folding bench, replacing two
chairs (Gillies No. 1205) 35 lbs. (+102)
(e) Buffet, replacing one chair and
one auxiliary seat (Gillies No.
1214) 32 lbs. (+25)
(f) Writing table (Gillies No. 1215) 19 lbs. (+54)
(g) Locker (Gillies No. 1215) 12 lbs. (+20)
(h) Wash basin with 5 quarts water 16 lbs. (+151)
(i) Auxiliary seat 10 lbs. (+24)
(j) Special folding bench (replacing
two chairs) 28 lbs. (+92)
(k) Four sets quick detachable chair
leg locks (Drawing 13272) 12 lbs. (+77) and
4 lbs. (+118)
6 lbs. (+184)
206. Toilet (See NOTE 2a) 6 lbs.
209. Camera installation (Zeiss RMK 20/3030)
(Drawing 12840) 305 lbs. (+93)
213. Flares (I.F.S. MK. I pistol with 3 -
1 minute) 14 lbs. (+17)
214. Very's pistol and 12 rounds ammunition 4 lbs.
219. Parachutes 20 lbs. each
220. Life saving equipment
(a) Life raft (7 man) 75 lbs. (+161)
(b) Life preservers (8) (Air
Associates E-1) 10 lbs.
(c) Life preservers (Air Associates C) 3 lbs. each
(d) Life preservers (approved Kapok) 3 lbs. each (+169)
224. Automatic pilot installations
(a) Sperry servo unit model No. C4-S1-C 34 lbs. (-40)
Provision for installation 15 lbs. (-13)
(b) Sperry servo unit model No.
C6-D3-B Total 131 lbs. (-22)

	Consisting of gyro unit	39 lbs.	(-32)
	Controls and cables	52 lbs.	(-40)
	Accessories and tubing	40 lbs.	(+12)
(c)	Lear Model L-2B automatic pilot installation in accordance with Lear Drawing 91400	50 lbs.	(+107)
	Placards required near the auto-pilot controller:		
	"Do not use autopilot in cruise configuration below 450 feet above terrain."		
	"Do not use autopilot in the approach configuration below 150 feet above terrain."		
	"Do not manually overpower autopilot to increase angle of bank or angle of pitch."		
	Servo stall torque measured at the servo on the ground:		
	Aileron 25 in. lbs., elevator 75 in. lbs., rudder 100 in. lbs.		
225.	Cabin heater manifold	9 lbs.	
303.	Flare installation (wing) per Drawings 12436 and 13810	49 lbs.	
De-Icing Equipment			
227.	De-icer installation (See NOTE 7)	125 lbs.	
	(a) Fixed portion (includes 62 lbs. (+17) piping, gages, valves, pump, tank, spinners, slinger rings, etc.)		
	(b) Removable portion		
	Wing boots	26 lbs.	(+9)
	Tail boots	18 lbs.	(+255)
	De-icer fluid	19 lbs.	(+146)
Miscellaneous (not listed above)			
208.	Airline windshield (3/8 inch, 5-ply)	+20 lbs.	(-28)
210.	Window in emergency exit	1 lb.	
217.	Miscellaneous seaplane equipment		
	(a) Anchor (Northill 12 lbs. and 100 ft. Manila line 1-3/4 in.)	19 lbs.	(-98)
	(b) Bilge pump, boat hook, fog horn and chart board	7 lbs.	
223.	Emergency exit (pilots' compartment) (Drawing 12149)	7 lbs.	(-7)
226.	Enlarged right hand cabin door (Drawing 13265)	+2 lbs.	(+118)

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

NOTE 2.

- (a) When item 206 is installed, the maximum allowable rear compartment baggage must be reduced 176 lbs.
- (b) When items of optional equipment are installed in the baggage compartment, the compartments must be placarded for reduced capacities accordingly. Pertinent agent's report should indicate items so installed.

C.G. check is required.

NOTE 7. Maximum weight may be increased 48 lbs. when complete de-icer is installed.

NOTE 8. Prior to certification as civil airplanes, the following should be accomplished:

- (a) If uncertificated position lights are installed, they should be removed or replaced with certificated lights.
- (b) Remove the Navy MK IV-1 flares or modify the installation to accommodate approved flares in the Navy JRF airplanes.
- (c) If uncertificated flares are installed in Army OA-9 airplanes, they should be removed or replaced with certificated flares.
- (d) If plexiglass blisters are installed on the JRF-6B, they should be replaced with a regular window or the opening covered in a suitable manner.
- (e) If mixture control operation in reverse direction from standard civil practice is present in JRF-5 or JRF-5B airplanes, it should be changed to give a "forward" movement for full rich position. This may be accomplished by rotating the position of the mixture control bellcranks 180 degrees on the carburetors and reversing the toothed segments of the cockpit control end for end. The cockpit control placard should be revised accordingly.