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Reference for the Capabilities and Patient Loads of Aeromedical Evacuation Aircraft Used by U.S. and Allied Military Air Forces

By

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Modern warfare, military police and humanitarian actions, and special operations rely on the concept of joint/combined operations, between our sister services and our allies. Joint/combined operations include the aeromedical evacuation of the sick and injured. In peacetime, aeromedical evacuation planners develop joint/combined operation documents to standardize aeromedical evacuation procedures, policies, and equipment The planning process identified one deficiency as a result of Desert Storm operations in Southwest Asia in 1990/1991. The deficiency was the lack of a reference guide for informing aeromedical evacuation operators of the patient load capabilities of aeromedical evacuation aircraft. The U.S. Army Aeromedical Research Laboratory was tasked through the Air Standardization Coordinating Committee, Working Party 61/115, to develop this reference.

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Military relevance

Modern warfare, military police and humanitarian actions, and special operations rely on the concept of joint/combined operations, between our sister services and our allies. Joint/combined operations include the aeromedical evacuation of the sick and injured.

Joint/combined aeromedical evacuation missions are possible for several reasons. Aircraft cross lines of communication readily, covering great distances in a short period of time. One air force may have aeromedical evacuation responsibility for the combat zones of several air forces. Maneuvering friendly forces may intersect and/or cross over the combat zone lines of other friendly forces. Soldiers and fliers from several air forces may be combined under one commander, even at the battalion or squadron level. Joint/combined aeromedical evacuation centers may be placed in the rear echelons as transition points between tactical and strategic aeromedical evacuations.

In peacetime, aeromedical evacuation planners develop joint/combined operation documents to standardize aeromedical evacuation procedures, policies, and equipment The planning process identified one deficiency as a result of Desert Storm operations in Southwest Asia in 1990/1991. The deficiency was the lack of a reference guide for informing aeromedical evacuation operators of the patient load capabilities of aeromedical evacuation aircraft. The Aviation Epidemiology Data Register project officers, U.S. Army Aeromedical Research Laboratory, were tasked through the Air Standardization Coordinating Committee, Working Party 61/115, to develop the reference.

Method

Military aeromedical evacuation authorities from Australia, Canada, Germany, Great Britain, New Zealand, United States Air Force, United States Army, and United States Navy provided information on the aircraft used by their services for aeromedical evacuation. They detailed the aircraft manufacturer, model, and common name for each aircraft. They provided the aircraft type, maximum range and service ceiling, and maximum ambulatory and litter patient load capacity. The information was cross-referenced with other sources (Gunston, 1986a; Gunston, 1986b). The authorities were provided with an opportunity to edit the results.

Results

The results of the query were tabulated into eight reference tables. Tables 1 through Table 7 show the aircraft used by each ally and sister service participating in the study. As expected, many of the air forces buy aircraft from the same manufacturer, such as Bell, Lockheed, and Sikorsky. Table 8 summarizes the characterisitics of each individual aircraft.

Table 1.
Australian aircraft available for military aeromedical evacuation.

Manufacturer	Model	Common name
Aerospatiale	AS 350	Squirrel
Bell	UH-1	Iroquois
Bell	206B-1	Kiowa
Boeing	707-338C	
Dassault	900	Falcon
DeHavilland	CC-08	Caribou
Government A/C Factory	N22, N24	Nomad
Hawker Siddeley	HS748	
Lockheed	C-130	Hercules
Sikorsky	S70A	Black Hawk
Sikorsky	S70B2	Seahawk
Sikorsky	SH-3	Sea King

Table 2.
British aircraft available for military aeromedical evacuation.

Manufacturer	Model	Common name
Aerospatiale/Westland	SA.330	Puma
Boeing Vertol	CH-47	Chinook
British Aerospace	VC-10	Vickers
Lockheed	MK.1	Hercules
Lockheed	MK.3	Hercules
Westland	HU.5	Wessex

Table 3.
Canadian aircraft available for military aeromedical evacuation.

Manufacturer	Model	Common name
Airbus Industries	CC150	Airbus 310
Bell	212 (CH-135)	Twin Huey
Boeing	707 (CC-137)	
Canadair	CL-601 (CC-144B)	Challenger
Canadair	CL-66 (CC-109)	Cosmopolitan
Lockheed	C-130	Hercules

Table 4.
German aircraft available for military aeromedical evacuation.

Manufacturer	Model	Common name
Bell	UH-1	Iroquois (Huey)
Boeing	707-320C	
Dornier	Do-28	Skyservant
Messerschmitt-Bölkow-Blohm	BO-105M	
Sikorsky	CH-53G	Stallion
Sikorsky	MK-41 (SH-3)	Sea King
Transporter Allianz	C-160	Transall

Table 5.
New Zealander aircraft available for military aeromedical evacuation.

Manufacturer	Model	Common name
Bell	UH-1	Iroquois (Huey)
Boeing	727-200	
British Aerospace	C.1	Andover
Lockheed	C-130	Hercules
Lockheed	P-3	Orion

Table 6.
U.S. Air Force aircraft available for military aeromedical evacuation.

Manufacturer	Model	Common name
Alenia	C-27A	
Beech	C-12	Huron
Bell	212 (UH-1N)	Twin Huey
Gates Learjet	C-21	
Lockheed	C-5	Galaxy
Lockheed	C-130	Hercules
Lockheed	C-141	Starlifter
McDonnell Douglas	C-9	Nightingale
Sikorsky	UH-60	Black Hawk
Sikorsky	HH-3	Jolly Green Giant
Sikorsky	HH-53	Super Jolly

Table 7.
U.S. Army aircraft available for military aeromedical evacuation.

Manufacturer	Model	Common name
Beech	C-12	Huron
Beech	U-8	Seminole
Bell	UH-1	Iroquois
Boeing Vertol	CH-47	Chinook
Sikorsky	UH-60	Black Hawk

Table 8.
U.S. Navy aircraft available for military aeromedical evacuation.

Manufacturer	Model	Common name
Beech	C-12	Huron
Bell	212 (UH-1N)	Twin Huey
Boeing Vertol	CH-46	Sea Knight
Grumman	C-2	Greyhound
Lockheed	C-130	Hercules
Lockheed	P-3	Orion
Kaman	SH-2	Seasprite
McDonnell Douglas	C-9	Skytrain II
Sikorsky	SH-60	Nighthawk
Sikorsky	SH-3	Sea King
Sikorsky	CH-53D	Sea Stallion
Sikorsky	CH-53E	Super Stallion

Table 9.
Characterisitics of military aeromedical evacuation aircraft.

Aircraft	Characterisitics
Aerospatiale AS 350 Squirrel	Type: unpressurized, observation, turboshaft, rotary-wing Performance: maximum range- 555 km (345 mi), service ceiling- 2,740 m (9,000 ft) Capacity: maximum ambulatory patients- 1, maximum litter patients- 1 (paraguard litter)
Aerospatiale/Westland SA.330 Puma	Type: unpressurized, utility, turboshaft, rotary-wing Performance: maximum range- 320 km (200 mi), service ceiling- 4,300 m (14,100 ft) Capacity: maximum ambulatory patients- 16, maximum litter patients- 6
Airbus Industries CC150 Airbus 310	Type: pressurized, transport, turbofan, fixed-wing Performance: maximum range- 8,700 km (5,470 mi), service ceiling- 11,890 m (39,000 ft) Capacity: maximum ambulatory patients- 243, maximum litter patients- 2
Alenia C-27A	Type: pressurized, cargo/transport, turboprop, fixed-wing Performance: maximum range- 2,400 km (1,500 mi), service ceiling- 7,620 m (25,000 ft) Capacity: maximum ambulatory patients- 44, maximum litter patients- 24
Beech C-12 Huron	Type: pressurized, utility / cargo, turboprop, fixed-wing Performance: maximum range- 2,935 km (1,824 mi), service ceiling- 9,450 m (31,000 ft) Capacity: maximum ambulatory patients- 6, maximum litter patients- 2
Beech U-8 Seminole	Type: unpressurized, utility / cargo, turboprop, fixed-wing Performance: maximum range- 1,794 km (1,115 mi), service ceiling- ? m (? ft) Capacity: maximum ambulatory patients- 6, maximum litter patients- 2
Bell UH-1 (1D, 1H, 1V) Iroquois (Huey)	Type: unpressurized, utility, turboshaft, rotary-wing Performance: maximum range- 530 km, (330 mi), service ceiling- 5,180 m (17,000 ft) Capacity: maximum ambulatory patients- 10, maximum litter patients- 6

Table 9 (Continued).
Characterisitics of military aeromedical evacuation aircraft.

Bell 206B-1 Kiowa	Type: unpressurized, utility, turboshaft, rotary-wing Performance: maximum range- 444 km (275 mi), with fuel cells- 574 km (360 mi); service ceiling- 3,048 m (10,000 ft) Capacity: maximum ambulatory patients- 3 (without attendant), maximum litter patients- 2
Bell 212 (CH-135, UH-1N) Twin Huey	Type: unpressurized, utility, turboshaft, rotary-wing Performance: maximum range- 420 km (260 mi), service ceiling- 4,330 m (14,200 ft) Capacity: maximum ambulatory patients- 12, maximum litter patients- 6
Boeing 707 (CC-137, 320C, 338C)	Type: pressurized, transport, turbofan, fixed-wing Performance: maximum range- 12,250 km (7,600 mi), service ceiling- 12,810 m (42,000 ft) Capacity: maximum ambulatory patients- 155 to 189, maximum litter patients- 7 to 88
Boeing 727-200	Type: pressurized, transport, turbofan, fixed-wing Performance: maximum range- 4,818 km (2,994 mi), service ceiling- 2,800 m (42,000 ft) Capacity: maximum ambulatory patients- 189, maximum litter patients- 1 (litter kit)
Boeing Vertol CH-47 Chinook	Type: unpressurized, cargo / lift, turboshaft, rotary-wing Performance: maximum range- 400 km (250 mi), service ceiling- 4,570 m (15,000 ft) Capacity: maximum ambulatory patients- 44, maximum litter patients- 24
Boeing Vertol CH-46 Sea Knight	Type: unpressurized, cargo / lift, turboshaft, rotary-wing Performance: maximum range- 385 km (240 mi), service ceiling- 5,180 m (17,000 ft) Capacity: maximum ambulatory patients- 25, maximum litter patients- 15
British Aerospace C.1 Andover	Type: unpressurized, cargo / transport, turboprop, fixed-wing Performance: maximum range- 1,440 km (900 mi), service ceiling- 7,620 m (25,000 ft) Capacity: maximum ambulatory patients- 44, maximum litter patients- 18

Table 9 (Continued).
Characterisitics of military aeromedical evacuation aircraft.

British Aerospace VC-10 Vickers	Type: pressurized, transport, turbofan, fixed-wing Performance: maximum range- 4,800 km (3,000 mi), service ceiling- 13,110 m (43,000 ft) Capacity: maximum ambulatory patients- 137, maximum litter patients- 66
Canadair CL-601 (CC-144B) Challenger	Type: pressurized, transport, turbofan, fixed-wing Performance: maximum range- 6,370 km (3,960 mi), service ceiling- 12,500 m (41,000 ft) Capacity: maximum ambulatory patients- 15 to 17, maximum litter patients- 4
Canadair CL-66 (CC-109) Cosmopolitan	Type: pressurized, transport, turboprop, fixed-wing Performance: maximum range- 2,000 km (1,240 mi), service ceiling- 7,010 m (23,000 ft) Capacity: maximum ambulatory patients- 40, maximum litter patients- 15
Dassault 900 Falcon	Type: pressurized, transport, turbofan, fixed-wing Performance: maximum range- 6,600 km (4,000 mi), service ceiling- 12,810 m (42,000 ft) Capacity: maximum ambulatory patients- 12 to 14, maximum litter patients- 1 to 2
DeHavilland CC-08 Caribou	Type: unpressurized, cargo / transport, radial piston, fixed-wing Performance: maximum range- 1,580 km (980 mi), service ceiling- 5,790 m (19,000 ft) Capacity: maximum ambulatory patients- 30, maximum litter patients- 20
Dornier Do-28D Skyservant	Type: pressurized, cargo / transport, turboprop, fixed-wing STOL Performance: maximum range- 800 km (500 mi), service ceiling- 7,300 m (24,000 ft) Capacity: maximum ambulatory patients- 9, maximum litter patients- 3
Gates Learjet C-21	Type: pressurized, cargo / transport, turbofan, fixed-wing Performance: maximum range- 4,482 km (2,785 mi), service ceiling- 12,960 m (42,500 ft) Capacity: maximum ambulatory patients- 7, maximum litter patients- 2

Table 9 (Continued).
Characterisitics of military aeromedical evacuation aircraft.

Government A/C Factory N22, N24 Nomad	Type: unpressurized, transport, turboprop, fixed-wing Performance: maximum range- 830 km (520 mi), service ceiling- 2,740 m (9,000 ft) Capacity: maximum ambulatory patients- 16, maximum litter patients- 1 to 3
Grumman C-2 Greyhound	Type: pressurized, cargo / transport, turboprop, fixed-wing Performance: maximum range- 1,930 km (1,200 mi), service ceiling- 10,210 m (33,500 ft) Capacity: maximum ambulatory patients- 28, maximum litter patients- 12 or catapault launch- 4
Hawker Siddeley HS748	Type: pressurized, transport, turboprop, fixed-wing Performance: maximum range- 2,590 km (1,610 mi), service ceiling- 7,625 m (25,000 ft) Capacity: maximum ambulatory patients- 30, maximum litter patients- 6
Kaman SH-2 Seasprite	Type: unpressurized, utility, turboshaft, rotary-wing Performance: maximum range- 710 km (440 mi), service ceiling- 6,800 m (22,300 ft) Capacity: maximum ambulatory patients- 4, maximum litter patients- 2
Lockheed C-5 Galaxy	Type: pressurized, cargo / transport, turbofan, fixed-wing Performance: maximum range- 5,310 km (3,300 mi), service ceiling- 10,900 m (35,750 ft) Capacity: maximum ambulatory patients- 70, maximum litter patients- 0
Lockheed C-130 / MK1 / MK3 Hercules	Type: pressurized, cargo / transport, turboprop, fixed-wing Performance: maximum range- 4,820 km (3,000 mi), service ceiling- 11,890 m (39,000 ft) Capacity: maximum ambulatory patients- 78 to 128, maximum litter patients- 74 to 97
Lockheed P-3 Orion	Type: pressurized, patrol /attack, turboprop, fixed-wing Performance: maximum range- 3,830 km (2,380 mi), service ceiling- 9,150 m (30,000 ft) Capacity: maximum ambulatory patients- 16, maximum litter patients- 2 to 4

Table 9 (Continued).
Characterisitics of military aeromedical evacuation aircraft.

Lockheed C-141 Starlifter	Type: pressurized, cargo / transport, turbofan, fixed-wing Performance: maximum range- 6,450 km (4,000 mi), service ceiling- 15,250 m (50,000 ft) Capacity: maximum ambulatory patients- 200, maximum litter patients- 103
Messerschmitt-Bölkow-Blohm BO-105M	Type: unpressurized, utility, turboshaft, rotary-wing Performance: maximum range- 388 km (625 mi), service ceiling- 3,048 m (10,000 ft) Capacity: maximum ambulatory patients- 4, maximum litter patients- 2
McDonnell Douglas C-9 Nightingale	Type: pressurized, medical evacuation, turbofan, fixed-wing Performance: maximum range- 4,700 km (2,900 mi), service ceiling- 10,670 m (35,000 ft) Capacity: maximum ambulatory patients- 40, maximum litter patients- 40
Sikorsky UH-60, UH-60Q, S70A, SH-60, S70B2 Black Hawk, Nighthawk, Seahawk	Type: unpressurized, utility, turboshaft, rotary-wing Performance: maximum range- 600 km (373 mi), service ceiling- 5,790 m (19,000 ft) Capacity: maximum ambulatory patients- 6 to 10, maximum litter patients- 2 to 6
Sikorsky HH-3, SH-3 Jolly Green Giant, Sea King	Type: unpressurized, search-rescue, turboshaft, rotary-wing Performance: maximum range- 750 km (470 mi), service ceiling- 4,480 m (14,700 ft) Capacity: maximum ambulatory patients- 15, maximum litter patients- 4
Sikorsky HH-53, CH-53D, CH-53E* Super Jolly, Sea Stallion, Super Stallion	Type: unpressurized, transport, turboshaft, rotary-wing Performance: maximum range- 870 km (540 mi), service ceiling- 6,400 m (21,000 ft), 5,608 m* (18,400 ft) Capacity: maximum ambulatory patients- 37 to 55, maximum litter patients- 24

Table 9 (Continued).
Characterisitics of military aeromedical evacuation aircraft.

Transporter Allianz C-160 Transall	Type: pressurized, cargo / transport, turboprop, fixed-wing Performance: maximum range- 4,800 km (2,980 mi), service ceiling- 7,770 m (25,500 ft) Capacity: maximum ambulatory patients- 89, maximum litter patients- 62
Westland HU.5 Wessex	Type: unpressurized, utility, turboshaft, rotary-wing Performance: maximum range- 290 km (180 mi), service ceiling- 3,050 m (10,000 ft) Capacity: maximum ambulatory patients- 14, maximum litter patients- 8

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