



DGSV

Deutsche Gesellschaft für
Sterilgutversorgung e.V.

**LTC Ingo Berthelsen, DMD (DEU)
Commanding Officer 3./Kdo SES**

**An introduction into the
world of Air Mobile
Medical Facilities**

An introduction into the world of Air Mobile Medical Facilities¹ and the place and role of instrument sterilization modules therein.

A quick and eclectic tour concerning medical mission support and its significance from mythological antiquity via medieval proto-scientific approaches to today's variety of medical and health-oriented disciplines.

With a short summary of the combined and joint **tactics and logistics** of the Joint Medical Service of the Bundeswehr² from the perspective of the Medical Rapid Reaction Forces "Ostfriesland"³.

LtCol Ingo Berthelsen, DMD (DEU)
Commanding Officer 3./Kdo SES

¹ LBE, Luftverlegbare Sanitätseinrichtungen

² ZSanDstBw, Zentraler Sanitätsdienst der Bundeswehr

³ Kdo SES, Kommando Schnelle Einsatzkräfte des Sanitätsdienstes „Ostfriesland“

timeless necessities
knowledge
logistics
infrastructure
technology

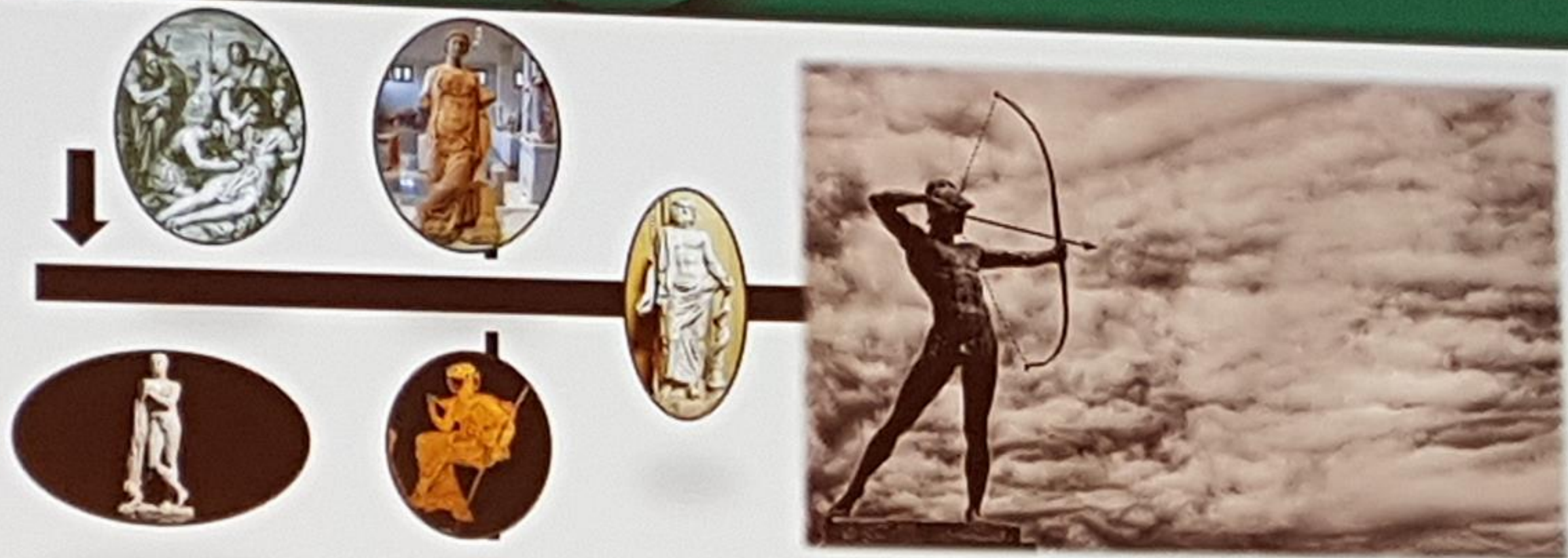
MEDICAL MISSION SUPPORT „IN NUCE“



MEDICAL MISSION SUPPORT THROUGH THE AGES

2017
18TH WORLD STERILIZATION CONGRESS

BONN | GERMANY | OCTOBER, 4-7, 2017



MEDICAL MISSION SUPPORT THROUGH THE AGES

2017
18TH WORLD STERILIZATION CONGRESS

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Feldbuch der Wundarznei



Einige
Anmerkungen
über die
Wundarznei
in
der
Wundarznei
in
der
Wundarznei



MEDICAL MISSION SUPPORT THROUGH THE AGES

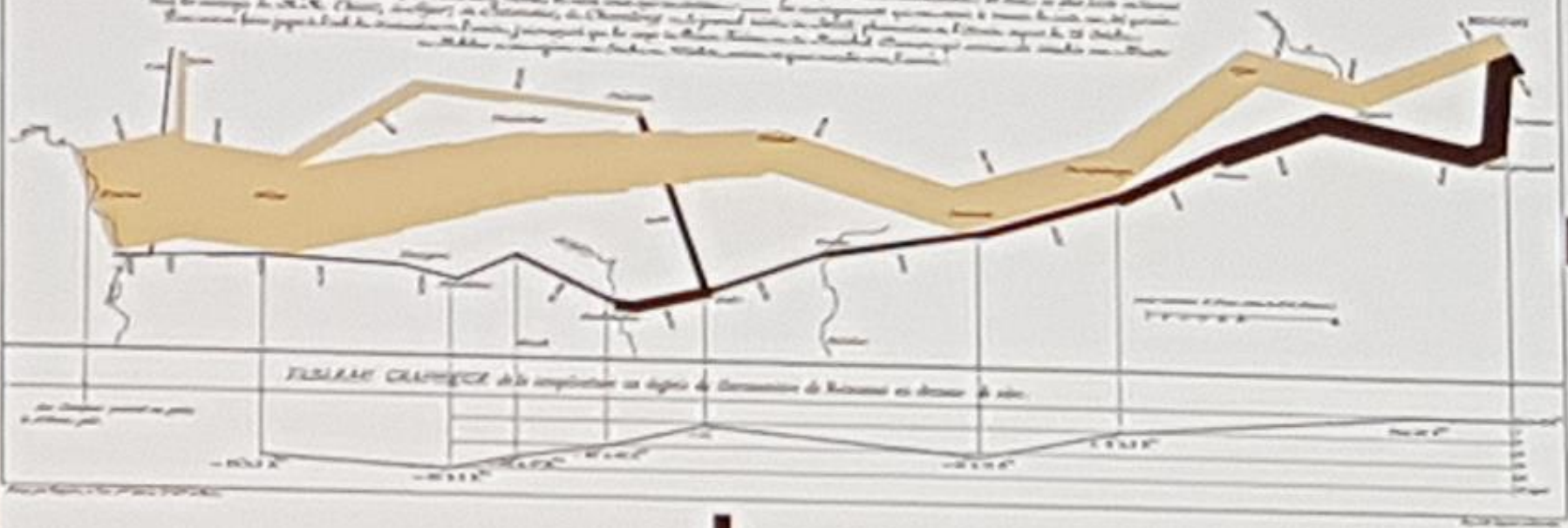
2017
18TH WORLD STERILIZATION CONGRESS

BONN | GERMANY | OCTOBER, 4-7, 2017

Cette Carte Rappré- sentera les possessions espagnoles en l'Occident Américain sous le commandement de Mexico, 1521-1535.

Les cartes et plans joints à cette Carte Rappré- senteront les possessions espagnoles en l'Occident Américain sous le commandement de Mexico, 1521-1535.

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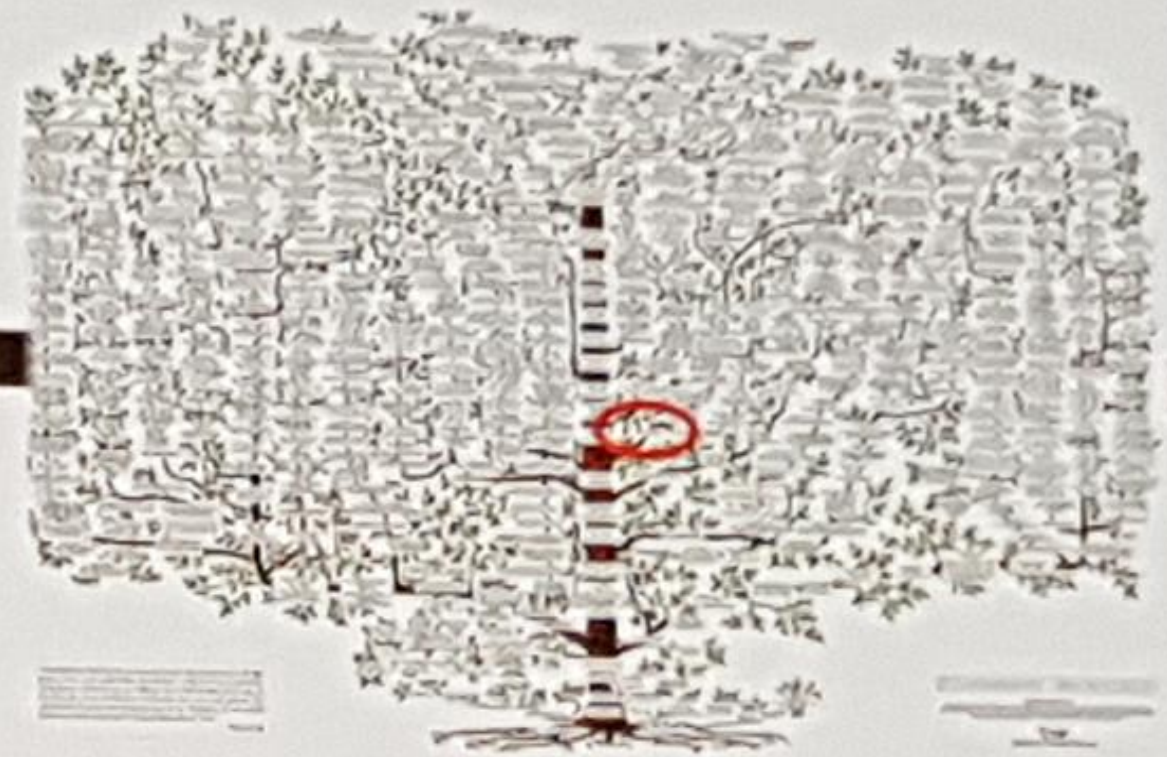
MEDICAL MISSION SUPPORT THROUGH THE AGES

A310 MEDEVAC
MEDICINISCHES TRANSPORTFLUGZEUG



- 44 Patientenbetten
- 6 Intensivpflegeplätze
- 16 Isotommedische Care Plätze
- 25 Ärzte und Pfleger

Die weltweit **größte** fliegende Intensivstation



MEDICAL MISSION SUPPORT THROUGH THE AGES

18TH WORLD STERILIZATION CONGRESS

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COL Dr. J. Backus, MD
Commanding Officer Kdo SES

The Kommando SES „Ostfriesland“

is the **specialized commando** of the joint medical service of the Bundeswehr for medical support with **rapid and air mobile** medical deployment forces, that operate in mission theaters of international stabilization, national and allied defense, humanitarian help and national risk and crisis management.

It especially supports **special operation forces** and **specialized forces**.



MEDICAL RAPID REACTION FORCES

Area Of Operation

Germany

The dictum of the Joint Medical Service of the Bundeswehr is the treatment of allied soldiers with an **outcome that matches the professional standard of german medical treatment.**



medical team



(air mobile)
primary care facility



(air mobile)
surgical hospital



deployed / mobile
surgical hospital



military hospital /
civil facility



Role 1

Role 2

Role 3

Role 4



MEDICAL RAPID REACTION FORCES

Air Mobile Surgical Hospital:

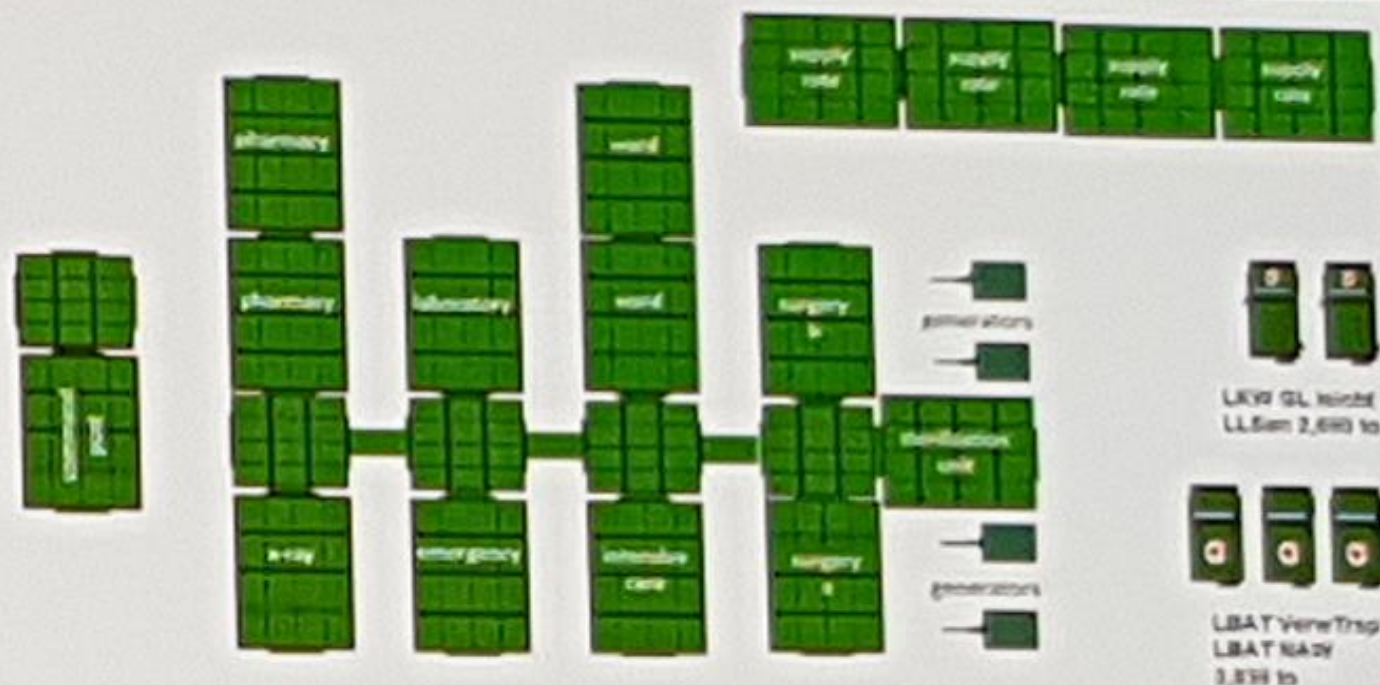
113,7 to
(144,5 to incl. vehicles + generators)

835 m³





333 boxes / pallets

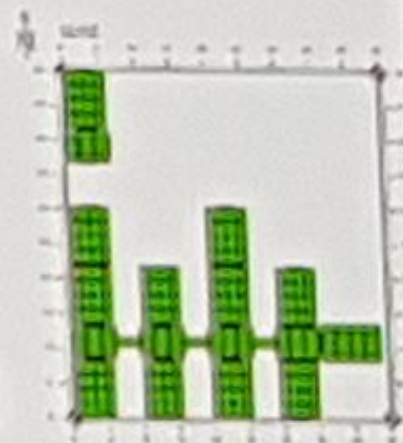
12 / 51 / 15 // 78

up to 7 days self-sustainable
holding capacity 10 routine
4 ICU
3 intubated

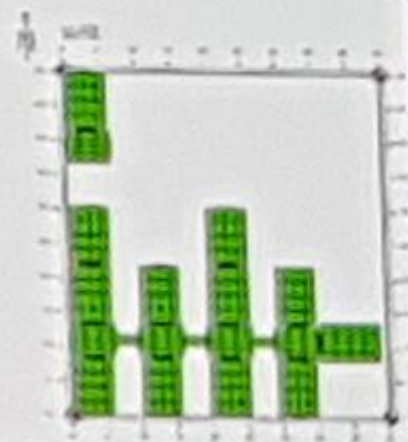


standard configuration

Aufnahmebereitschaft	Arbeitsbereitschaft	Einsatzbereitschaft	Durchlaufzeitpunkt
 1 Std	 2 Std	 4 - 8 Std	 7 Tage



ROLE 2 E AIR MOBILE SURGICAL HOSPITAL (LLRZ)



AIR MOBILE SURGICAL HOSPITAL (LLRZ)



„Golden Hour“:
Trauma Management
Primary Surgery

within first 2 hours:
Damage Control Surgery

Extended
Timelines



survival rate without
appropriate surgical care

MEDICAL RAPID REACTION FORCES

2017

18TH WORLD STERILIZATION CONGRESS

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implement treatment facilities where they rationally belong

logistics

infrastructure

accessability

mobility

**AIR MOBILE MEDICAL FACILITIES
AS PART OF FMB AND FOB**

Military Evacuation Operation →

MEvAkOp

LLOp

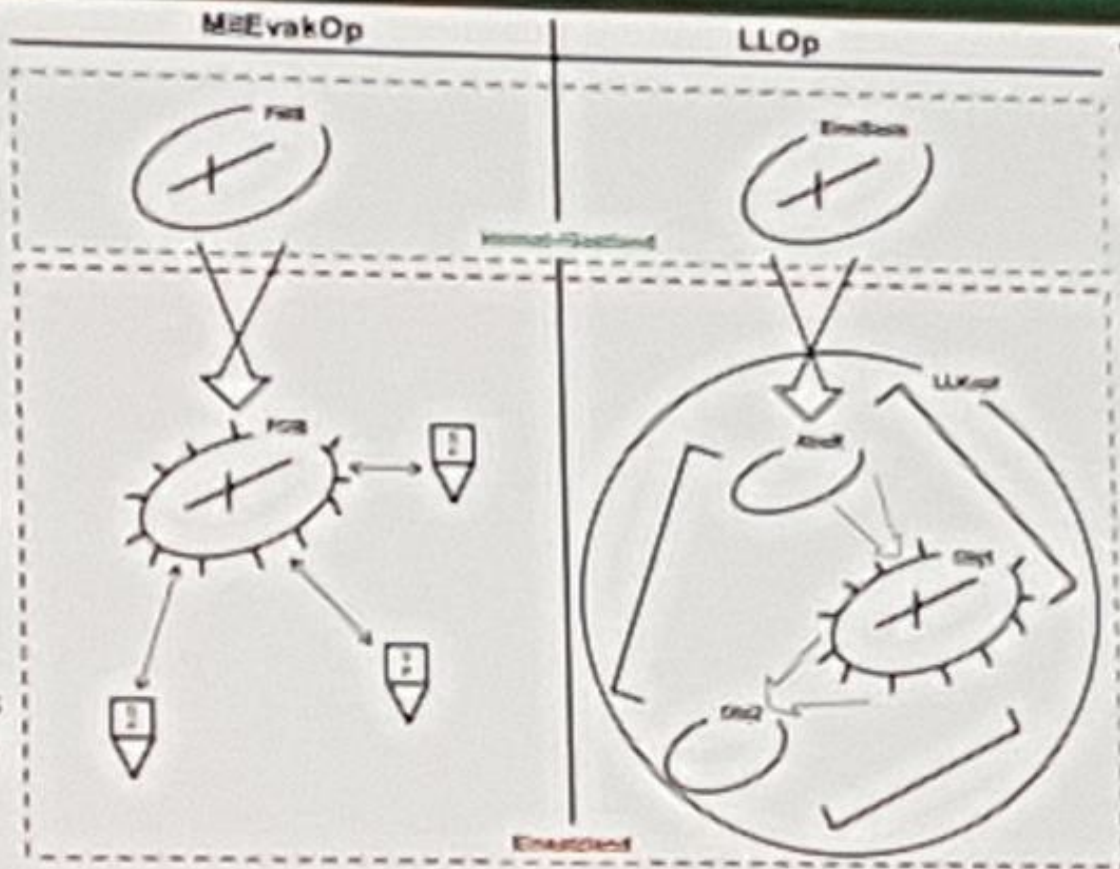
← Airborne Operations

Forward Mounting Base →

Air Transportation →

Forward Operating Base →
Forward Operations Base (SOF)

here: 3 mission objectives
outside FOB →



FMB / FOB

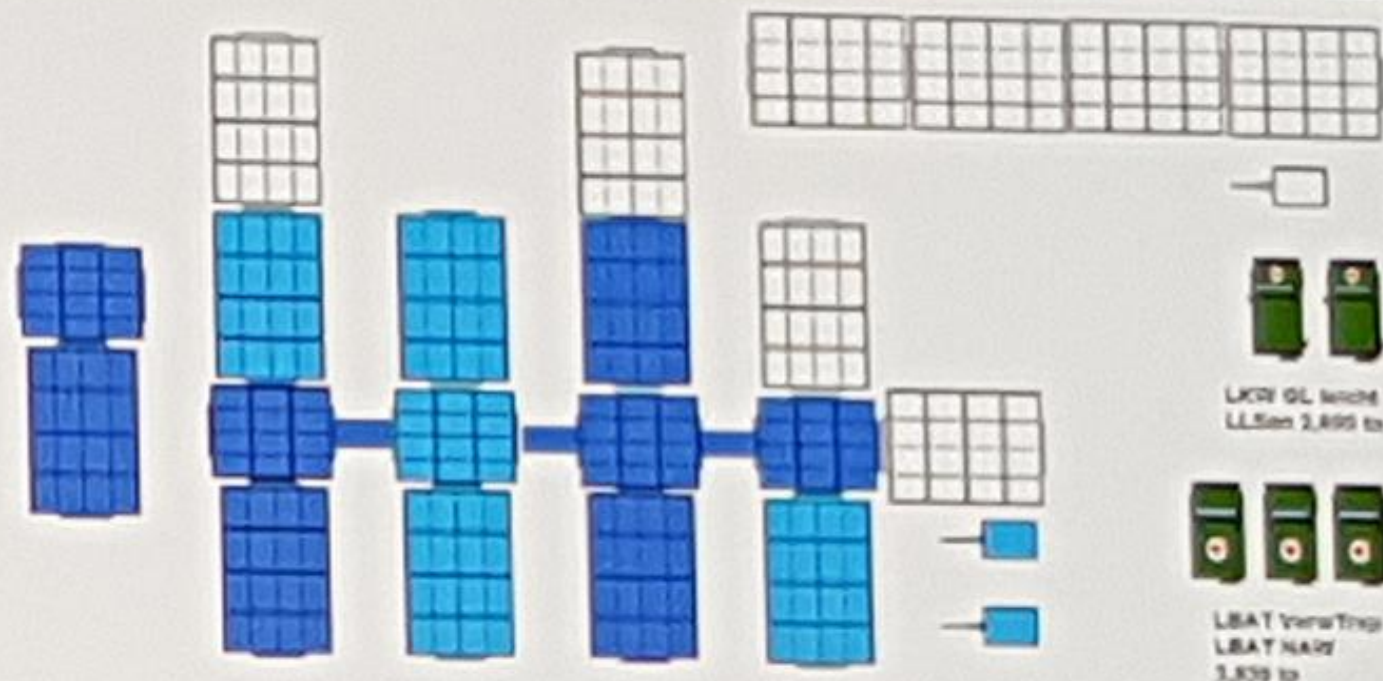
MILITARY EVACUATION OPS vs. AIRBORNE OPS

**Air Mobile Surgical Hospital,
MilEvacOp configuration**

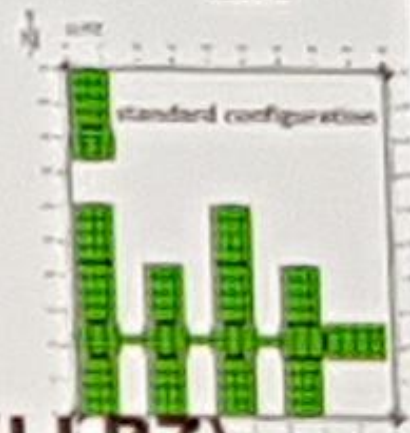
55 t
 ~110 boxes / pallets
 1 surgical unit
 disposable surgical instruments (?)
 short mission → less supply rates (?)

7 / 25 / 15 // 47
 holding capacity 8 routine
 3 icu
 3 intubated

Reduce weight by dividing the
 air mobile surgical hospital into
 IEF and MB/FOF
 and by defining subsequent
 waves of air transportation



**Core Module configuration
 MilEvacOp configuration**
 ± Initial Entry Forces



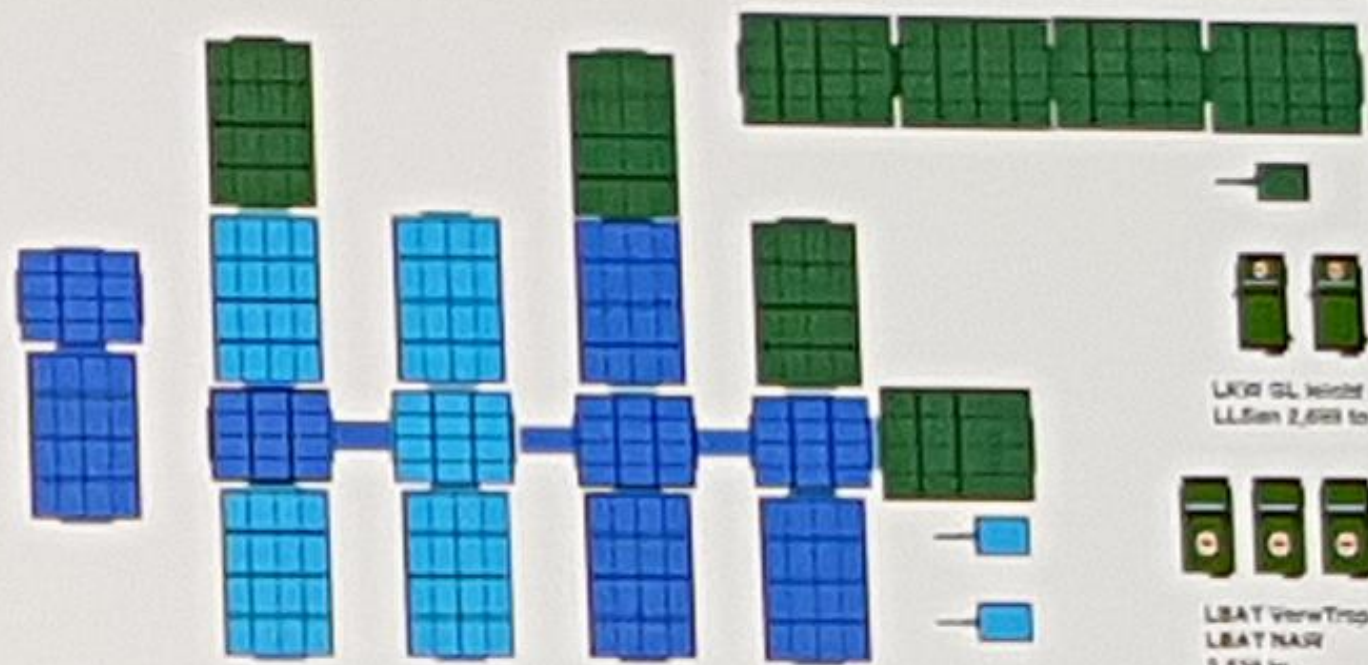
**FMB
 ROLE 2 E**

**FORWARD MOUNTING BASE
 → AIR MOBILE SURGICAL HOSPITAL (LLRZ)**

Air Mobile Surgical Hospital: Main Body configuration

61,1 to
233 boxes / pallets
1 to 2 surgical unit
disposable surgical instruments
+ sterilization module
+ ward module
standard number of supply rates

up to 7 days self-sustainable
holding capacity 16 routine
4 icu
3 intubated



Main Body configuration
= standard configuration



FMB
ROLE 2 E

FORWARD MOUNTING BASE
→ MAIN BODY / FOLLOW ON FORCES



Personell

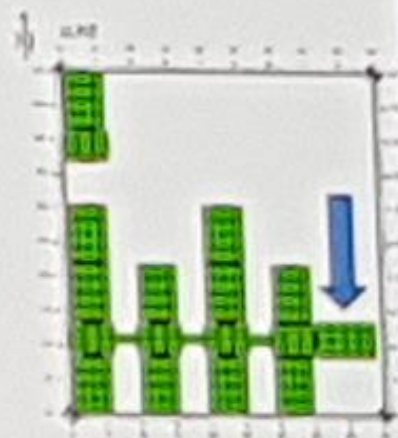
2 NCO (sterilization assistants)
2 enlisted (medic)

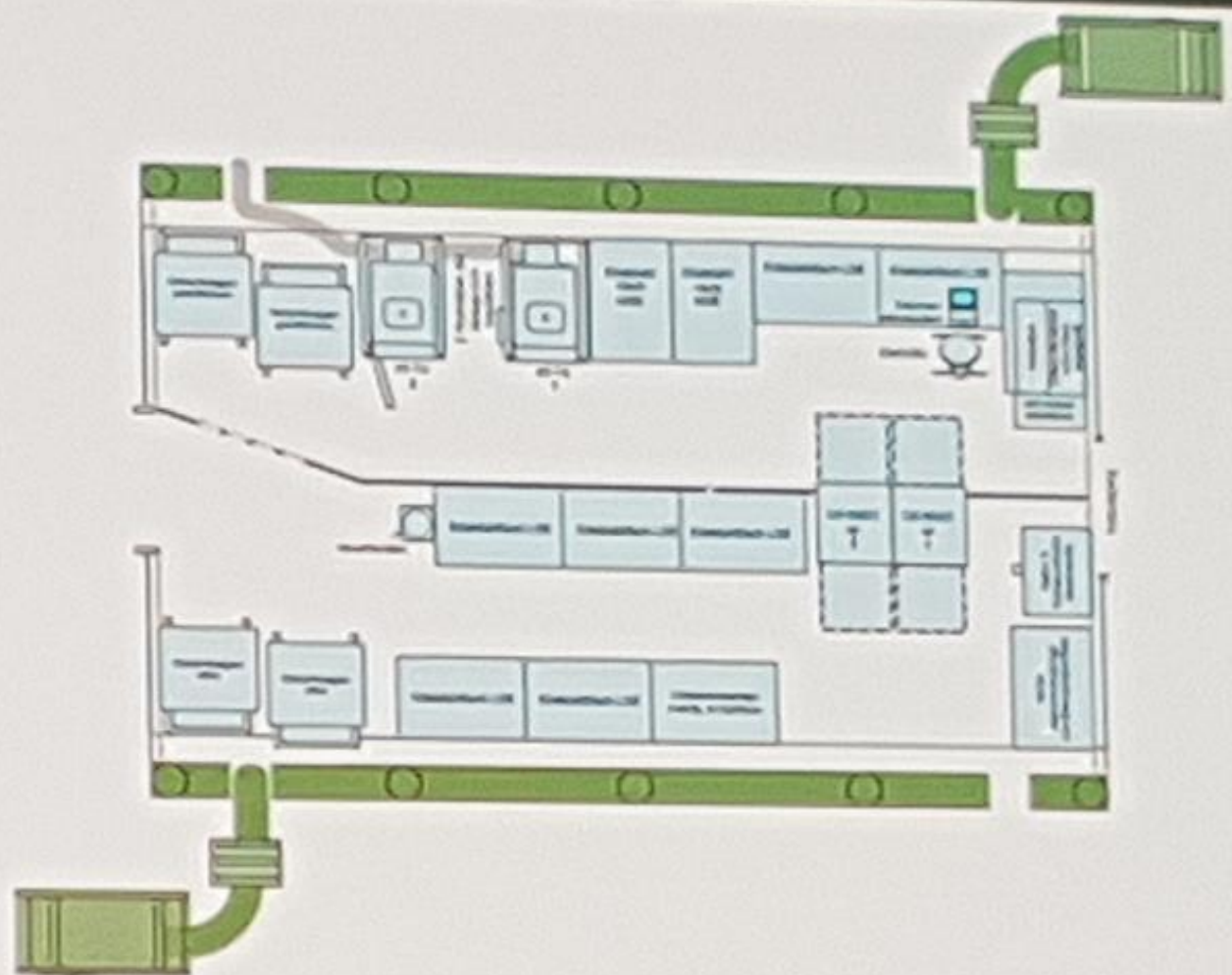
Tasks:

- sterilization / cleaning of medical instruments and devices
- quality management and documentation

FMB

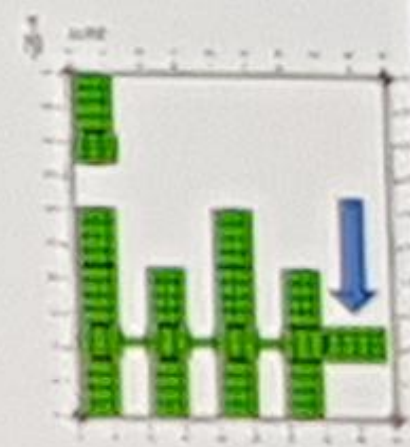
FOF / MAIN BODY
→ STERILIZATION UNIT





FMB

FOF / MAIN BODY
→ STERILIZATION UNIT



limitations of the air mobile sterilization module

infrastructure

water

temperature

humidity

limitations of the air mobile sterilization module

infrastructure

water

temperature

humidity

transportation → ground / sea / air:

ground / sea:

container systems for vehicles / vessels

no air mobility → extended timelines

air:

C-160 → airport or similar infrastructure

CH 53 → weight limitation → number of flights +++

limitations of the air mobile sterilization module

infrastructure

water

temperature

humidity

water dependency:

ion exchanger → 2 utilized, 2 stored

reverse osmosis module → prefiltration for ion exchanger → <5% capacity after breakdown

→ maintenance / resupply are vital for holding capability

limitations of the air mobile sterilization module

infrastructure

water

temperature

humidity

climatic limitations:

temperature range: + 5°C to + 40°C

humidity range: < 80% (+ 31°C) to < 50% (+ 40°C)

→ mean values ok ; extreme weather situations?

