

**The Man Who Loves ULDs**  
**Urs Wiesendanger**  
[Click To View](#)

## Romancing The ULD



You might think we have gone a bit soft in the head to devote real estate in this highly professional publication to such a decidedly unglamorous article of airline lifecycle! It's kind of like the joke with the various body parts competing for primacy, and you'll never guess who wins ... right!

Then think again - we mark the launch of the first commercial 747 flights - the evolution of the ULD (unit load device) era-changing forever the way in which airfreight and baggage was handled. The first Pan Am Boeing 747 was put into service on January 15, 1970, although it seems the first flights regularly carrying fare-paying passengers only started on January 21.

Either way, we have had 40 years of ULDs as an essential part of commercial widebody air travel, truly the link in the air cargo supply chain that changed everything. We have come a long way in those four decades with ULDs becoming ever lighter and stronger, as well as becoming more versatile while specialized, indispensable for the proper handling of all types of cargo and baggage.

Many people have taken it for granted due to the ubiquitous nature of the lowly ULD. Yet, no ULDs, and the passengers' baggage ends up being left behind with predictable customer service failures or it is bulk loaded and unloaded, which negatively affects ground time and service. No ULD and that newly won hot account's first must-ride shipment is backlogged. And so this relatively insignificant piece of equipment all of a sudden gets much attention, but no love.



Above—lower deck ULDs.

Just to make sure we are on the same page – at the risk of stating a known fact, legally, ULDs are 'ship spares' subject to the very same aeronautical regulations as the aircraft itself. This extends to airworthiness and certified manufacturers and repair facilities. Although clearly critical from an operational perspective, in the big scheme of things, ULDs don't rate high in terms of executive attention and budget, unless – you got it - there is a service failure that stinks to heavens – think fish!

Airlines and the industry insist that safety is the first order of business, yet from aircraft manufacturers to airlines, money has been spent on passenger convenience items such as video screens in seatbacks, but nothing has been invested to have automatic identification readers onboard to confirm units are loaded according to the load plan, whether top side or in the lower deck on wide body aircraft.

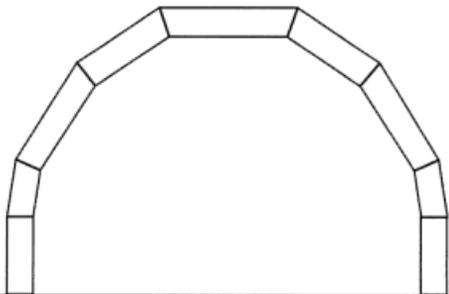
Leaving the development and implementation of such solutions to the after-market arena saddles any potential innovator with the enormous burden of obtaining certification for non-interference with avionics and the nightmare of available frequencies. Not an attractive proposition in the best of times and, needless to say, a very tall mountain to climb in a tough economic climate.

Cross-discipline standardization is perhaps the biggest cause of unmet potential simplification and its economic benefits.

Let's review briefly how it all evolved. Before the advent of wide body aircraft, all-cargo airlines used ULDs - from the ubiquitous set of aluminum pallets and nets to the igloos. First the B707, then the DC8-55F with 13 pallet positions in 1964, followed by the legendary DC8-63F stretched freighter in 1968, became the backbone of the cargo business, the latter carrying 90,000lbs of freight loaded in 18 pallet positions.

This facilitated a previously unprecedented degree of efficiency and economic viability in loading and unloading aircraft and ramp handling. The mainstay standard pallet has been the 88" X 125" type and cargo loaded using a template shaped as a cutout of the fuselage to ensure fit with the aircraft contour.

There is a wealth of information used by airlines and ground handling companies alike which contains detailed specifications and is a must have item – the IATA ULD Technical Manual.



This is the foundation of interoperability among airlines worldwide. The IATA operated Interline ULD Control User Group (IULDUG) with its roughly 60 member airlines and which – to quote IATA - "...was formed to facilitate the interline movements of ULDs, under standard procedures, and to track ULDs when they are outside the control of the ULD owner."

Setting up for loading 113 polo ponies on the main deck en-route to Bandar Seri Begawan (Brunei), Malaysia and the Philippines. Photos courtesy of Ted Braun.

Configured for a triple and a quad Instone horse stall across in each stick (left; right).

The military version of the pallet and net combo ended up as the 88 "X 108" "MAC" pallet, designed to handle pallets with a secondary function of airdrop. As CRAF (civil reserve air fleet) participating airlines have experienced for years, loading this type of pallet on commercial aircraft requires time consuming resetting of the entire floor locking mechanisms – vertical, lateral and side locks – before and after a mission.

As documented in Air University Review, July-August 1982, "A Uniform National Air Cargo System Do we need it?" by Paul D. Tuck which states "If unit-load devices were fully interchangeable between civil and military aircraft, the total number of ULDs required by the two airlift systems could be reduced". And "...The DC-8 productivity in cargo carried is increased about 11 percent when civil, rather than military, pallets are used."

Igloos came in all varieties – with doors, curtains and "GOH" – garments on hangers, enabling transportation of time-sensitive fashion merchandise by air. Livestock became another commodity to be commercialized, transporting efficiently by air breeding stock to countries, which were beginning to build up their infrastructure in the 80's, including Kuwait and Saudi Arabia, all under Irish agromanagement. The supply came mostly from the U.S., Australia, Germany and the Netherlands.

By the time Lufthansa, as launch customer for the B747-200F started flying them, and with both Seaboard World Airlines and Flying Tigers introducing them to service in 1974, yours truly witnessed the mind boggling 29 upper deck and 9 lower deck positions loaded with 200,000 plus pounds of freight for simultaneous nose and side door loading and unloading!

My jaw dropped when I saw the first Seaboard LODEP in Frankfurt!

The Seaboard version was named the "Containership" and pioneered the use of 20-foot equipment, which also enabled the famed "sea-air" cargo intermodal concept. Initially marine containers were used which carried a very hefty tare weight and were loaded on 20 foot pallets. Air containers made of aluminum soon followed. This equipment could be taken off-airport to either the freight forwarders' or the customer's distribution center for loading and breakdown anchored on trucks with ISO corner fittings. 10-foot containers or "cans" followed.

There are approximately 60 companies worldwide engaged in ULD manufacturing and repairs based on the IATA compatibility codes.

From the utilitarian, ULDs have progressed to a plethora of special purpose devices – main and lower deck, forkliftable and non-forkliftable containers, animal units (cattle, horses, goats, and sheep), ULD for aircraft engine transport, automobile transport (single and twin car racks) and a variety of thermal containers.

While looking at the utilization of ULDs in cargo, the passenger business has deployed containers throughout the world for as many years, using an ever increasing 'making-your-head-spin' variety of ULDs for baggage; here is a quick overview of some of the more frequently used lower deck containers:



Designation	Width (in)	Height (in)	Depth (in)	Base (In)	Max load (lb)	Max load (kg)	Shape
LD-1	92.0	64.0	60.4	61.5	3500	~1588	Type A
LD-2	61.5	64.0	47.0	61.5	2700	~1225	Type A
LD-3	79.0	64.0	60.4	61.5	3500	~1588	Type A
LD-4	96.0	64.0	60.4	n/a	5400	~2449	Rectangular
LD-5	125.0	64.0	60.4	n/a	7000	~3175	Rectangular
LD-6	160.0	64.0	60.4	125.0	7000	~3175	Type B
LD-7	125.0	64.0	80.0	n/a	13300	~6033	Rect. or Contoured
LD-8	125.0	64.0	60.4	96.0	5400	~2449	Type B
LD-9	125.0	64.0	80.0	n/a	13300	~6033	Rect. or Contoured
LD-10	125.0	64.0	60.4	n/a	7000	~3175	Contoured
LD-11	125.0	64.0	60.4	n/a	7000	~3175	Rectangular
LD-29	186.0	64.0	88.0	125.0	13300	~6033	Type B

Source: Wikipedia

In the wake of the downing of Pan Am flight 103 over Lockerbie in 1988, initial government reactions prompted efforts to explore “bomb-proof” containers. Trials produced equipment alleged to withstand an explosion of the magnitude suffered by the Pan Am aircraft using various techniques, whether in material or construction. The ‘Q’ series represents certified hardened aircraft containers.

Aluminum ended up sharing the space with composite materials, which made it more economical to repair damage but weigh more. Indeed the pursuit of lightweight materials continues to this day, well after Lexan, which is lightweight, clear and weather resistant. I am waiting to see something, which is forklift resistant....

The quest for innovation and for the “perfect” ULD marches on; last year Lufthansa Cargo together with Jettainer, its ULD pooling and management provider (partially owned by LH), tested about 1,000 composite containers made of materials that are 15% lighter than aluminum. Additionally, their repair is alleged to be less costly while also enhancing safety during handling. The main ingredient which delivers these advantages is Dyneema®, whose manufacturer, DSM, claims it’s the world’s strongest fiber which has a unique combination of strength and softness.

As fuel and “green” are perennial economic drivers, at times in parallel, at other times interchangeably, this seems to be one of the more promising alternatives because the fiber has been in production for almost 20 years.

Temperature controlled ULDs have revolutionized air cargo; from humble beginnings and primitive controls with minimal ranges in the aircraft, nowadays high yield pharmaceuticals and sensitive electronics travel first class, ensconced in plush, dedicated equipment with digital readings and in-flight transmission capability on demand. All kinds of perishables, from fresh cut flowers, to chilled seafood, bull semen, plasma – the list is endless, have evolved into a specialized niche of cargo products with more and more sophisticated supply chains and shorter door-to-door transportation time.

Some of the key players in the supply end of temperature controlled ULDs include Envirotainer and Unitpool, two of the best known and established global players and newbies such as Skycooler (2006), the UK-based temperature controlled container leasing company. The latter’s management team includes Jorgen Veslov as CEO, a former Unitpool AG manager and Philip Hill as Chairman, formerly Unitpool’s managing director.

Considering the bi-directional imbalance inherent in the airline business in both passenger and cargo loads, combined with the location of certified repair stations, securing the required stock levels throughout an airline’s network poses a significant logistical challenge. And ULDs go off-airport to forwarders, distribution warehouses, shippers and customers, all factors, which add to the magnitude of the availability and serviceability predicament.

Anecdotal evidence has revealed over the years that containers were spotted as unconventional housing substitute in various developing countries throughout the globe. Not necessarily the intended use, to the chagrin of the airlines’, which regularly conduct sweeps to locate missing equipment.

So there you have it – give the ULD some respect!  
Ted Braun

