For much of the last decade, significant parts of USAF’s airlift system had to go largely untended. The only new aircraft program in that period—the C-17—was delayed by technical and financial problems, as other aircraft became more obsolete. Unexpected C-17 cost growth (plus the expense of emergency fixes to the C-141 fleet) siphoned money away from less-visible yet important needs elsewhere in the system. Among them: upgrades to the C-5 airlifter to improve its reliability, procurement of new loaders to replace ancient cargo-handling equipment, replacement of the KC-135’s outdated avionics and electronics, and the purchase of global command-and-control systems and components for global air traffic management.
For the next decade, the C-5 Galaxy will be the “backbone” of strategic airlift, as the C-141 retires and the C-17 becomes the mainstay of the force. The Galaxy fleet needs improvements to stay current and become more reliable.

By John A. Tirpak, Senior Editor
Now that the C-17 program has turned around—with costs under control and DoD committed to buying a full fleet—a notion has spread that the airlift problem somehow has been “fixed.”

Not so. Those other, untended problems haven’t gone away, said Gen. Walter Kross, head of Air Mobility Command. In fact, he warned, Air Force procurement of the C-17 aircraft marks not the conclusion but the start of what will have to be a long renewal of AMC assets on many fronts. That will be required, said the General, if AMC is to remain highly capable in years to come.

Splitting Hairs

In an interview with Air Force Magazine, General Kross discussed the road ahead in modernizing AMC, a hairsplitting task of judging between priorities when everything is a priority and needed right away. He also discussed the recently completed Intratheater Lift Analysis, the status of the Civil Reserve Air Fleet (CRAF), and the recent repatriation of C-130s from Air Combat Command to AMC.

Governing the choices ahead are three themes, General Kross said. First is readiness, “supporting the warfighting CINC and his requirements.” The second is “to prepare now—the key word is ‘now’—to operate effectively in the twenty-first century,” because so many procurements require long lead times. Third, he said, “is continuous improvement of the critical processes associated with rapid global mobility.” The three themes all play together, but “they’re all very, very important.”

In the case of the C-17, “the expectations are way ahead of the numbers,” said the General. The C-17 has achieved some stunning successes and demonstrated excellent reliability. Even so, the program still is in its infancy.

Congress and many in the defense establishment, the General said, have formed the impression that “the C-17 is here, it is upon us, and we have enough tails to service the world. We don’t.” He noted that, in two years, AMC will have retired 47 more C-141 Starlifters but will have received only 11 more C-17s. Of the 34 C-17s in service in 1999, 14 will be dedicated to training, in depot, or in test, leaving only 20 or so airplanes available for day-to-day airlift operations. And, while the C-17 can carry more and larger items than a C-141 can, there will still be a lag in replacing the gross carrying capabilities of the retiring Starlifters.

During the transition from 256 C-141s to 120 C-17s as “the backbone of our fleet,” the 115 C-5 Galaxies—which the General described as “the least-reliable wide-body airplane built in America”—will have to fill the role of “backbone.” The last currently planned C-17 will reach the flight line in 2005, while the last active-unit C-141 will retire in 2003 and the last Air National Guard or Air Force Reserve C-141 in 2006.

The airlift force available for the next decade will be one that can handle “a single major regional contingency . . . with moderate to high risk,” General Kross said. The level of 120 C-17s now planned, along with rest of the inventory, will meet “the accepted characterization of risk,” he said, adding, “I was trying to avoid using the word ‘standard,’ because ‘moderate to high’ should never be a standard” of risk.

Airlift studies over the last two years have identified a need for as many as 140 C-17s, and new requirements are being added all the time. For example, no successor aircraft has been identified for some C-141s now filling a special operations mission. A study of intratheater airlift completed last year found a requirement for at least one squadron of C-17s in that role, as well—above and beyond its strategic airlift mission.

As the world changes, airlift requirements will also change, General Kross observed, and “the debate will still be on years from now” as to whether the nation should buy more than 120 C-17s.

“There will always be a contractor” who will insist that the Air Force has to “make the decision right now, because of long lead, spare parts, and all those kinds of things,” General Kross said, “but, in fact, we have a number of years before we have to come to grips with that decision.”

In the meantime, there are other ways to “drive down” the amount of risk inherent in maintaining the airlift force at present levels, he said.

Additional sealift now entering the inventory will somewhat reduce the load that airlift will have to carry, General Kross—who is also head of US Transportation Command—pointed out. Moreover, better “global command and control, additional precision munitions,” and other adjustments to the overall force have narrowed the gap between lift capability and requirements. Precision weapons, for example, reduce the number of weapons that must be transported to a theater to conduct an air campaign because fewer bombs are needed per target. Better information exchange will make it easier to deliver cargo more precisely to where it is needed and away from where it isn’t.

Another “big driver” of reduced airlift
requirements is the increased amount of prepositioned equipment overseas. Although less has to be carried overall by sea or by air, “in the early phases” of an overseas contingency, “you have to carry more by air . . . to marry up with the [prepositioned equipment],” the General noted. In this respect, a large part of the burden can be carried by the C-17, a contingent of commercial carriers that commit their airplanes to military airlift in wartime or under commercial contract in peacetime.

Since the early phase operation “is largely a CRAF/passenger capability that’s required, we’re . . . playing to the strength of America’s aviation industry,” General Kross said.

After the Galaxy, What?

Because the C-17 issue appears largely settled for now, attention has shifted to the C-5’s expected retirement, slated to begin in 2006. Musings about a replacement—possibly even a “stretch” C-17—have already begun in aviation circles.

But General Kross dismisses talk of a C-5 replacement as premature, arguing that “this aircraft is not anywhere near the end of its service life . . . You don’t replace an airplane that hasn’t worn out—not in the airlift business . . . . It’s simply too expensive to replace.”

Instead, because the C-5 will have to be the “backbone” of the airlift fleet for a decade, a C-5 upgrade is boiling up near the top of AMC’s list of preferred investments.

“This nation should look very seriously at improving the reliability of the C-5 as the next major action in strategic mobility,” General Kross asserted.

Right now, the C-5’s reliability in takeoffs is about 87 percent—a number that sounds good until it is multiplied by four or five takeoffs and arrivals per day. After several legs of only 87 percent reliability, “you’re not managing flow anymore, you’re managing a series of problems,” General Kross noted. The commercial standard for takeoff reliability—both cargo and passenger—is 98 percent.

“Any advancement of the C-5 toward . . . dispatch reliability in the low- to mid-90s is a significant march forward for this nation, given the . . . tremendous capability of the C-5,” which can haul 36 pallets to the C-17’s limit of 18, he noted.

Over the past two years, thanks to aggressive exploitation of all available low-cost improvements and changes, the C-5’s departure reliability has been increased by seven percentage points, what General Kross called “very significant in a mature system.”

However, “we have now hit the wall. We have to expend significant amounts of money in order to advance these percentages very much further, in fits and starts.”

Those “fits and starts” could be funded separately, but the cost would still add up to the several billions necessary for a comprehensive Service Life Extension Program.

A SLEP proposal that could boost reliability to near-commercial standards “and also be in the low billions [of dollars in cost],” spread out over a five- to seven-year period, “is a . . . significantly interesting improvement to our strategic mobility,” General Kross said.

He noted that “the biggest drivers” of the C-5’s low reliability rate are the engines, autopilot, avionics, and hydraulics.

Lockheed Martin, prime contractor on the C-5, has offered USAF a proposal to do a “one-time” comprehensive update of the Galaxy fleet that would render it serviceable into the 2030s for under $35 million per airplane. The proposal involves reengining the fleet with leased powerplants that would increase thrust and improve efficiency. The proposal would entail...
Repatriation of C-130s

At their Corona meeting last October, top USAF leaders decided that the C-130 fleet—which had been given to Air Combat Command in the midst of the Air Force’s reorganization of the early 1990s—would return to Air Mobility Command.

Gen. Walter Kross, AMC commander, said the move was made not because there was “anything broken . . . [or that] really needed to be fixed” but because theater airlift forces will work better if they are re-integrated with other mobility forces, for purposes “of training, . . . exercises, for doctrinal air mobility development, for integrated tactics.” The change means a theater commander won’t have to “go to two commands” to get theater lift, he added.

AMC “has the core competency for the entire range of rapid global mobility,” he said. The move is expected to smooth out professional development and personnel issues as well.

A squadron of C-130s will remain in each theater under PACAF and USAFE to do work deemed necessary by each theater’s air component commander, and “plenty of work” will keep them busy, the General said. Their role will be analogous to that of tankers deployed overseas to support fighter refueling, he added.

The change will be “as close to no-cost as we could make it,” he said, mostly “base signage and letterhead stationery,” and the move will likely be “transparent to the customer.”

“glass cockpit” improvements borrowed from the company’s C-130J effort, structural enhancements, and other changes. [See February 1997 “Aerospace World,” p. 15.]

The company claims the upgrade can reduce operating costs by up to 45 percent per ton-mile.

Not a Crisis

However, because the C-5’s status is not a near-term crisis, neither a replacement nor a SLEP appears on AMC’s list of top acquisition priorities.

Because the C-17 fleet is still only a couple of squadrons strong, it will remain the command’s top modernization priority almost through program completion.

Next on the list is something much more mundane but altogether as critical: loading equipment.

“The moral equivalent of trucks for the Army are our materiel-handling equipment that we use to load our planes,” General Kross said.

The existing MHE fleet “is old [and] very disparate . . . a lot of different models,” the General noted. More important than the lack of uniformity is the MHE fleet’s rapidly decreasing reliability, with a mean-time-between-failure rate of 10 hours. “We need loaders that are tenfold that,” he said.

The MHE procurement will be in a high-low mix. At the high end is the “60K,” a machine able to carry and hoist 60,000 pounds into any airplane in the fleet, soon to go into operational test. At the low end is the next-generation small loader, an off-the-shelf commercial loader with 20,000 to 25,000 pounds of capability, now out for bid.

However, when the MHE procurement is completed in 10 years, it still won’t have replaced the entire MHE fleet, General Kross noted.

“It will just provide us with a modernized, highly reliable—very deployable—core set of equipment,” he said.

Third on the list of priorities is “what we call global command and control,” General Kross said. This system will give AMC the same kind of “in-transit visibility”—the ability to find a piece of cargo wherever it is in the pipeline and route it as required—that the major commercial cargo companies like Federal Express Corp., United Parcel Service, or CSX Corp. already have.

“We . . . place more emphasis on the rapid movement of timely information than . . . taxiing the aircraft to takeoff,” General Kross asserted. “Our global mobility system absolutely requires it. . . . The information’s got to get there before the airplane does.”

He added that “to have a plane show up . . . unannounced, and nobody knows what the cargo is on the inside, is a failure.”

The “global transportation network” is now “up and running” on the World Wide Web, and AMC also has access to it through other servers, as well.

Besides the need to “stay the course on procuring this system,” General Kross emphasized that it must tie easily to the commercial carriers, as well, since “so much of our stuff moves on the commercial [carriers].”

Other aspects of the command-and-control system involve electronic interfaces with the other services, which will tie all US military transportation data together. This system, called Transportation Coordinators’ Automated Information for Movement System II (TC AIMS II), “is actually an Army program. We’ve got to make sure the Army keeps their money on that program. And we’ve got to make sure the Air Force supports the Army in doing so.”

Fourth on AMC’s procurement pri-
ority list is a “basketful” of relatively small but vital system improvements that will allow AMC aircraft to continue operating under rapidly shifting international rules and standards for air safety.

The International Civil Aviation Organization and International Air Transport Association have been establishing new equipment standards that will help organize and deconflict airspace, which is increasingly congested, and AMC simply must keep up, General Kross asserted.

The new regulations dictate “whatever equipment you must have to fly a transoceanic route . . . or to land at an airport like Heathrow, [UK], or to fly over France, or to be able to talk on the radio, or . . . to get preferential routing over the Pacific.”

All these requirements have been “swept into a basket we call GATM,” or Global Air Traffic Management, the General said. It is a critical program, since without it, AMC may be barred from flying at certain altitudes or along the most efficient routes.

“We will incur delays, we will have to fly around,” and such limits would then invoke “penalties” that would affect the ability to carry out requirements for a major regional conflict.

**Key to Global Reach**

Collectively, GATM will continue to “guarantee unrestricted global reach,” General Kross asserted.

Putting these modifications—like replumbing the KC-135’s pitot-static system so it can fly at higher altitudes—into the collective GATM basket “has raised the consciousness level” of the Joint Chiefs of Staff and other decision-makers that these projects are linchpins of airlift that must be funded, the General said. And, time will not allow interminable delay.

“The first one of these [new equipment regulations] kicks off” on March 27, 1997, he observed, and more will come into force every year for the next three years or more. “I can’t work that into the 1999 [program objective memorandum] or the Pentagon five-year budget plan. The regulation governs vertical separation on major North Atlantic air routes, so it can’t be ignored.

In order to fund these projects, “we’re . . . slipping other things in order to get in front of this requirement, biting it off in chunks. But it will eventually become an overall, overarching Air Force requirement, and it will be something that everyone gets behind.”

The fifth and last of AMC’s top modernization priorities is the long-postponed update of the KC-135. Powerful and capable as the Stratotanker is, “if you go in the cockpit of that plane, it looks like a museum piece,” the General observed. Though the reengining program from KC-135E to KC-135R has substantially enhanced the fleet, “the time has come . . . to modernize the electronics, the avionics, the brains of the plane,” he said. The program “overlaps a little with GATM.”

The General went on to say that the Air Force “has never stepped up to capitalizing the KC-135 properly . . . because there are so many planes. Even if you want to change the intercom . . . it’s a $50 [million to] $60 million bill. And so we haven’t done any of these things.”

The Pacer CRAG (Compass, Radar, and Global Positioning System) program, as the update is called, will give the KC-135 a glass cockpit, color radar, GPS capability, and other improvements.

“We need to stay the course on that, do the whole fleet to one single standard: active, Guard, and Reserve,” General Kross said.

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**CRAF Development**

Gen. Walter Kross said that Air Mobility Command will “seek to mitigate” the level of risk in current airlift by adding as much capability as possible through the Civil Reserve Air Fleet program.

The Air Force is attempting to get “as much leverage as we can get in our annual CRAF contracts as well as other contracts, . . . such as [General Services Administration] small-package contracts, all of which [now] have clauses requiring various commitments to the CRAF by those who participate or who are award-winners,” General Kross noted.

There has been a “modest” increase in CRAF participation over the last three years, chiefly because of steps taken after Operation Desert Storm, he pointed out. After the Persian Gulf War, some carriers pulled out because they had lost market share.

To bring them back, more government cargo business was made available to participants. It’s an attractive piece of business, worth some $700 million a year, but to compete for it, airlines must commit at least 15 percent of their aircraft to CRAF.

In the case of the GSA small-package contracts, it’s 30 percent.

General Kross noted these “very satisfied” with the current level of participation in CRAF and pointed out that in 1997, for the first time, the program will meet its requirements for aeromedical evacuation-equipped aircraft.

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Photo by Randy Jolly

General Kross calls the KC-135 cockpit a “museum piece” and argues for updates to put the Stratotanker on a par with international air traffic standards coming into force. Roping all of the “little” upgrades into one program increases their visibility.