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27 Nov 74

Bud:

Here is the Frog/Kønnen installment of the NRO History and General Allen's comments for your review and comment. Please comment ASAP by message, so we can get on with it. Sorry it took so long.

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COMMENTS OF NATIONAL RECONNAISSANCE HISTORY
BY LT GENERAL LEWIS ALLEN

The history is very interesting and, perhaps of necessity, is based on the exchange of memoranda and written documents pertinent to the time. However, in that process some undue attention may be given to bureaucratic squabbling at the expense of some perspective. For what it is worth, here is a personal, subjective view of some of that interesting period. There are perhaps three major factors of photo-recce to be considered: (a) quality-resolution mainly, not color, stereo, shadow detail, etc.; (b) quantity-meaning broad area coverage; and (c) timeliness. There can be developed a logical description of requirements, as it relates to each factor, but in truth (as Katz would say) the developments have been driven by the "technological imperative" and the requirement here caught up later. (cont?)

For instance, MOL was decided upon when DYNASOAR was cancelled, because it was felt one shouldn't cancel something without allowing some alternate program; and many felt it was essential that DOD have some kind of man-in-space effort if the national commitment to Apollo was really going to generate a new era of manned space flight. Having decided on MOL, it took some time to decide what to do with it; and when nothing else made sense, the DORIAN mission was, in some sense, forced. The DORIAN camera specifications were actually

optimized to make maximum use of man's contribution and were substantially off-optimum for an unmanned application (e.g. focal length too long). Once DORIAN was essentially a fact, it was judged by some (Land Panel) that if one were to have such a high-quality, manned system one must have an automated version for operation, in the event that man proved difficult. This led to unmanned MOL, a contradiction in terms and I think, in this case, the Land Panel led the Government down an atrocious, illogical path based on irrefutable, scientific logic and no practical judgment. The unmanned version added greatly to the cost and complexity of MOL and, thus, to its cancellation. When cancellation of MOL began to be seriously considered, design studies were undertaken of an optimized unmanned "VHR" system (you called it Hexador). This system was much less expensive than MOL, performed better and its potential was used as a basis for MOL termination. In fact, the argument had gone full circle. On intelligence needs alone one had difficulty justifying the approximately \$500 million for "Hexador," yet \$1 billion had been judged all right for MOL as a Lab and \$2 billion for MOL/DORIAN, but not \$3 billion for the complex program that evolved and included the automated version. In other words, the true basis of the justification was the man. If it had not been for that "imperative," it is likely that the course of action selected for factor (a) would have been

evolutionary improvement of GAMBIT, as indeed we ultimately pursued anyway.

With regard to factor (b) you have that history about right, but it is useful to point-out that weighing a number of factors: (factors which have been sort of constant for 10 years and will remain so about 10 more) -- the size of Asia; the desire for about 3' resolution to identify vehicles; the fact that film is the only way; the size of big boosters (Titan III) - one reached a system description which was, and is, about "ultimate." Its success has left factor (b) unfruitful for further dreams.

Now (c) -- you describe all of the early attempts, but recall the base of technology and the understanding of space recce was at a relatively very low level, so conclusion can't be too profound. Still, (c) is a factor to inspire dreams. Many ideas were promoted; some simple, like several Corona on alert for rapid launch and call down - implemented but never used - others complex and technically doubtful. However, as the enormous value of overhead recce became more appreciated, it was always the strategic concept which dominated - technological advancement of Soviet weaponry - SALT - order of battle, etc. "C" was a factor to be worked on, but not worth much.

The thing that changed was the development of the solid state array. SP had looked at similar approaches, but had been frightened off by the low-image plane resolution - CIA was not quite so leery,

but their original system thoughts were modest -- I believe to a very major degree that it was Land personally who made the big leap. Remember, at the time he was investing several hundred million of (effectively) his personal fortune in the SX70 -- a device no one felt would work -- a device which took his remarkable inventions in film and used a very ambitious system of micro-electronics - plus bold optics and generated pictures in near real time. He had seen and made a major personal commitment to a camera, which capitalized on several major new technological achievements to do the "impossible." It was in that frame of mind that he challenged Les Dirks and said the elements are here:

- solid state array
- integrated circuits for complex data processing
- large, fast optics - 100" f/2
- gigabit/sec data link
- long-lived satellites
- communications satellites

In his view those elements were the quantum leap - the challenge was to design the system to use them - the need would appear. From that point on, all arguments for alternate systems were basically irrelevant. The need was never really there, in a sense, -- the "technological imperative" was the thing. As in VHR where the worth was apparently

never quite 500 million, but the man was the thing. A readout system really wasn't worth much, unless it had the elements above. I had the cynical view during much of this period (not really shared by McLucus or Schlesinger, I must say) that our work^K on FROG or was for the purpose of showing that it was not mandatory to proceed with "K" -- I felt if "K" were ended, FROG would not be far behind; and, of course, the concern with "K" was quantitative - cost, schedule, risk -- was it really worth all that? Many felt not, but felt obliged to generate alternatives, rather than only be negative. Since the argument is quantitative, I have sometimes felt that in the absence of Government measures of merit, a test of Land's judgment on the matter could be the profitability of the SX70 -- so far that has got to be considered questionable.

Although I supported FROG and institutionally, my heart wasn't in it -- they should not have gone forward. I had a conservative view of K, and still do, a remarkable technical vision, but one it is possible the country could do without. In a profit-loss environment it wouldn't make it -- like an SST - but that's conservation I guess.

The view of history may not even be right, but it's very personal and like few things in one's life has shaped my views of many other things.

P. S. A remarkable aspect of "K" history is the awesome effectiveness with which CIA and the Land Panel dedicated themselves to supporting "K" once Land made his basic commitment. The only parallel in history is the unified dedication of the Romans to the destruction of all Carthage.