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3 April 1984

Jeffrey Richelson,
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4400 Massachusetts Avenue, N.W.
Washington, D.C. 20016

Dear Mr. Richelson,

Thank you for your letter of 14 March, which I found very interesting. Since writing the article on DSP manoeuvres I have re-examined the Titan 3C geosynchronous missions, and have concluded, like you, that there have been only 10 DSP flights. The confirmation in the Congressional testimony is reassuring, and I would be very pleased to see a copy of it. Unfortunately, Congressional testimony is one of two sources of data that I very rarely get to see, the other being the official USAF launch announcements.

You mention that 1982-19A was the 13th Titan 3C geosynchronous launch, but in fact it was the 14th; have you included 1975-55A in your count? When this launch was made it was originally given as an Atlas-Agena, but this was later amended to a Titan 3C, and I am pretty sure that this is what it was. This particular launch has been reported to be the first Argus mission, and I feel there is some link between Argus and Chalet.

I am enclosing a copy of an article which I recently produced, which is due to appear in JBIS, although it will be some months before it comes out, due to a backlog of pieces waiting for publication. In it I have outlined what I have been able to deduce about Argus and Chalet (not much!), and your comment that 1979-86A was a modified Chalet ties in very well with statements in Prados' book (p276) and Canan's book (p112) that following the loss of ELINT stations in Iran in early 1979 it was decided to modify a Chalet spacecraft as a partial replacement. Incidentally, as I understand it sigint is a NSA activity rather than a CIA one.

As to the earlier DSP flights, I have only piecemeal data. I started getting Two Line Orbital Elements in August 1980, but it wasn't until November 1982 that I started keeping all

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DSP element sets. Unfortunately, in June 1983 NORAD stopped issuing sets for DSP vehicles, along with photo recon, ELINT and ocean surveillance.

There are a couple of points worth bearing in mind when considering the DSP flight history. Firstly, the craft have very long lives, and tend to be moved around from time to time. Secondly, there were originally two operational stations, but at some point this was expanded to three. Lastly, there now appear to be two back-up stations as well. The actual stations are:

Prime: 69°E (Indian Ocean)
70°W (Western Atlantic)
134°W (Eastern Pacific)

Back-up: 75°E (Indian Ocean)
85°W (South America)

It is also worth remembering that these are the nominal stations; the satellites drift as much as 2° longitude either side of these during normal operations. As far as I can piece it together, this is the DSP "story":

Flight 1, 1970-93A, 6 Nov 70

This spacecraft failed to reach true synchronous orbit due to a launch vehicle failure, and was only used for system testing.

Flight 2, 1971-39A, 5 May 71

AWST (20 Sep 71) reported that this was believed to be over the Indian Ocean, at about 65°E. I have element sets for 8 Sep 80, 3 Nov 80, 30 Jun 81, 2 Mar 82 and full coverage from 1 Nov 82, all of which show it stationed at the back-up 75°E slot. On 19 Nov 82 it was manoeuvred to drift at 1.0°E/day, and then on 11 Jan 83 to drift at 7.7°W/day. My last set for it is for 2 Jun 83, which shows it still there. It was replaced at 75°E by 1976-59A, so I infer that it was retired in November 1982.

Flight 3, 1972-10A, 1 Mar 72

AWST (6 Mar 72) reported that this was expected to be stationed over Panama, while repeating that 1971-39A was over the Indian Ocean. However, 1972-10A was in a 0° inclination orbit, while Panama is about 9°N; I assume that AWST meant that the satellite was at the same longitude as

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Panama, i.e. about 80°W. I have an element set for 17 Aug 81 and continuous coverage from 2 Nov 82 to 13 Jun 83; all show 1972-10A drifting at 1.7°W/day, from which I infer that it was retired some time before August 1981.

Flight 4, 1973-40A, 12 Jun 73

Just before this launch, AWST (16 Apr 73) said that the USAF planned to expand the DSP network to three stations to extend coverage to further out into the Atlantic and Pacific. However, following the launch it said (18 Jun 73) that this satellite was expected to be positioned over the Indian Ocean to supplement 1971-39A, whose IR sensors were losing their sensitivity. Subsequently (2 Dec 74), it said that there were three satellites on station, one over the Indian Ocean, and two over the Western Hemisphere. On balance, therefore, it looks as if 1973-40A marked the expansion of the system to three stations, and by implication 1971-39A was still operable.

I have element sets for 1973-40A on 24 Mar 81 and 24 Aug 82, and continuous coverage from 21 Nov 82 to 14 May 83; all show it drifting at 1.6°W/day, implying that it had been retired by March 1981.

Flight 5, 1975-118A, 14 Dec 75

AWST (26 Jan 76) said that this satellite was to replace one already on station (1971-39A?), implying that the three station configuration was in existence at that time. However, it was damaged at separation from its launcher, and was never usable. I have element sets for it on 2 Feb 81 and 22 Aug 82, and continuous coverage from 20 Nov 82 to 12 Jun 83, all showing it drifting at 0.8°E/day.

Flight 6, 1976-59A, 26 Jun 76

AWST (28 Jun 76) said that this was the back-up for 1975-118A, and on 12 Jul 76 it said that the existing network consisted of three satellites. I have element sets for it on 20 Aug 80, 5 Feb 81, 15 Mar 81 and 28 Apr 81, all showing stationed at various positions between 65°W and 69°W. At some point it was moved from this position, and it arrived at the 75°E slot on 2 Dec 82, taking over from 1971-39A. I have continuous coverage from that point until 7 Jun 83, during which it remained at this station.

Flight 7, 1977-07A, 6 Feb 77

Just after this launch, Flight International (19 Feb 77) said that it was to be positioned over the Indian Ocean. I have element sets for it on 19 Aug 80 and 27 Apr 81, and continuous coverage from 22 Aug 82 to 7 Jun 83, all showing it stationed at the 69°E Indian Ocean slot.

Flight 8, 1979-53A, 10 Jun 79

I have sets for 1979-53A on 20 Aug 80, 18 Oct 80, 4 Feb 81, 27 Apr 81, 23 Jul 81, 8 Nov 81 and 21 Dec 81, and continuous coverage from 21 Feb 82 to 8 Jun 83. These show it stationed at the 134°W Eastern Pacific slot until 12 Apr 82, when it was moved to the 85°W back-up slot, which it reached on 12 May 82. All subsequent sets show it at this station.

Flight 9, 1981-25A, 16 Mar 81

I have full Two Line coverage for this mission, up to 8 Jun 83. It reached the 70°W Western Atlantic slot on 22 Mar 81, and remained there until 7 Mar 82. Between that date and 13 Apr 82 it was moved to the 134°W Eastern Pacific slot, taking over from 1979-53A. All subsequent sets show it at this station.

Flight 10, 1982-19A, 6 Mar 82

I have full Two Line coverage for this mission, up to 10 Jun 83. It reached the 70°W slot on 6 Apr 82, taking over from 1981-25A. The comment in the Congressional testimony that this flight replaced Flight 8 is true in the sense that following this launch Flight 8 was retired to back-up service; it did not take over its station.

As you probably know, there has been a launch this January (1984-09A) which has been reported as a Titan 3C geosynchronous mission, but due to NORAD's new release (or rather, non-release!) policy, no element sets have been issued, and I have seen no reports in the press about it. Based on the use of the Titan 3C it could be a DSP or a Chalet, but at the moment I have no way of deciding. Have you seen anything about it?

I'm not sure where you got my address from, but I'm afraid it's out of date - I moved last year, to the address at the top of the letter.

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I would, of course, be very interested to see a copy of your paper when it is complete, and if there is any other help I can give you, please let me know. I have, by the way, published two previous articles on the general subject of reconnaissance satellites, both of which contain sections on early warning satellites. The first covered the period up to the end of 1976, and was published in the July 1978 issue of Spaceflight. The second covered the years 1977 through 1980, and was published in the January 1982 issue of JBIS. I'd be happy to send you copies if you haven't seen them.

Yours sincerely,

A handwritten signature in dark ink, appearing to read 'A. Kenden', with a long horizontal flourish extending to the right.

Anthony Kenden

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KH-11 MANOEUVRES , 14 JUNE 1983

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