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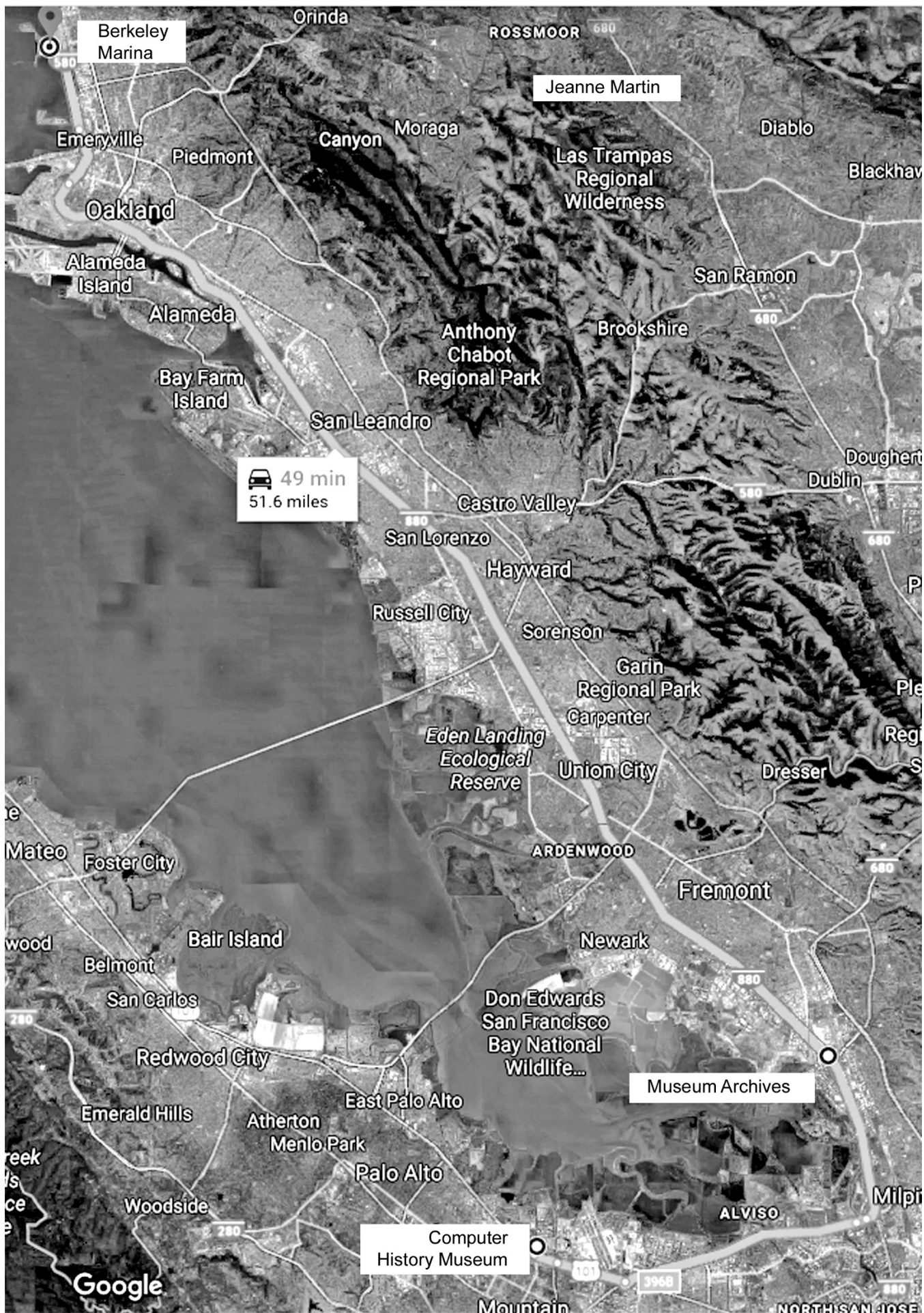
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Reunion Photos 2000 Nov 13

(22 photos at Lake Mead and Las Vegas)



EARLY FORTRAN STANDARDIZATION: 1962 to 1978

(Based on Martin Greenfield 1987 History)

In May 1962 the predecessors of ANSI and of CBEMA decided that programming languages were included in their standardization charge, and the initial meeting of Committee X3.4.3 was held in August 1962. Hardware vendors, user groups, software companies, and universities were represented. Martin Greenfield of Honeywell was the first chairman. The first two standards were approved in March 1966: “Basic Fortran” was based on IBM’s Fortran II; and Fortran 66 was based on IBM’s Fortran IV and officially denoted X3.9-1966, which became the first industry-standard Fortran.

Committee X3.4.3 was disbanded, but it was recalled late in 1967, primarily through the urging of the National Bureau of Standards. Betty Holberton was attempting to produce a Federal standard for Fortran. Her examination of the X3.9-1966 Fortran standard led her to submit a few dozen questions on interpretation. Other clarification inquiries were received from other sources. The Fortran group was revived as the only body that could authoritatively provide the clarifications. This process turned out to be more tedious and demanding than the standardization effort itself.

In 1968, Frank Engel was appointed to study whether the many extensions made in current implementations should be standardized. As a result, the Committee voted in January 1969 not to reaffirm X3.9-1966 when its review period came up, but to develop a new draft standard which they expected to complete in two years.

(Frank Engle became chairman in September 1970. He continued through the development of Fortran 77. He retired In October 1977 and Jeanne Adams was appointed to the chairmanship of the Committee.)

Criteria and goals were drawn up for what would become Fortran 77. Their gist was to evolve the language, keep it approximately the same “size,” and be sure that its efficiency features would not be impaired. Basic Fortran was to be discarded. Fortran 66 programs would remain “standard”, except that the Hollerith data type (based on punched-card input) was replaced by Character data type, and the zero trip DO loop interpretation was adjusted.

Six years of effort went into Fortran 77. That standard represented work on over two hundred technical proposals from all over the world. The cost of the effort was in excess of two million dollars. The text was almost six times the size of X3.9-1966. Emphasis was on clarity. Extensive editing, consistency checking, and rewriting; and distribution of interim drafts, required herculean efforts of the two editors, Lloyd Campbell and J. C. Noll.

The features of the draft standard were publicly presented by X3J3 members at the West Coast Fortran Forum held in Anaheim, California, in February 1976. The following month, the draft standard appeared in a special edition of SIGPLan Notices. An East Coast Fortran Forum was later held at the National Bureau of Standards in Gaithersburg, Maryland. Smaller groups of X3J3 members presented sessions on the

new language standard at meetings of professional societies, user groups, and at conferences. The public review was initiated and comments were solicited. Despite the earlier extensive checking by the committee, there were a number of changes and corrections incorporated because of the comments.

As measured by the volume of comments received, there was a clear requirement to add some facility in support of “structured programming.” Preprocessors had been developed that converted statements such as IF ... THEN ... ELSE, DO WHILE, DO UNTIL, and CASE into valid Fortran statements. The Committee felt that although some such facility should be added, there were many syntactic variations, and insufficient experience to select and standardize many of the constructs. They took an appropriately conservative action of adding only the BLOCK IF constructs. This addition, as specified by Walt Brainerd, provided most of the important capability requested.

The reaction of X3J3 to the structured programming requests is a good example of how a responsible committee should avoid an over-reaction that would prematurely add features that it would shortly regret. Unfortunately, there are counterexamples in Fortran 77 such as the ENTRY statement and the alternate RETURN that should not have been included.

Approval of the Fortran 77 standard came in April 1978. The official designation is American National Standard programming language Fortran X3.9-1978. In March 1980, an International Standards Organization Fortran, based upon the ANSI standard and known as ISO 1539-1980, was approved by twenty-one countries. This document is essentially a cover that references ANS X3.9-1978 for the English text and the French standard NF Z65-110 for the French text. In September 1980, the US Federal Standard for Fortran (FIPS PUB 69), incorporating by reference X3.9-1978, was approved.

[Note: I joined X3J3 Committee in February 1976. – Loren Meissner]

To: Fortran Forum, BCS, NAG, etc. From: **John Reid**

Date: 6th December 1988

Subject: ISO/WG5 meeting in Paris, and X3J3 meeting [no. 110] in Boston.

Note: This is a personal note on the meetings and in no sense does it constitute an official record of them.

1. Introduction

My usual practice is to construct a 'public' report by applying a very small number of mechanical changes to the trip report that I make to my organisation (removing such things as the date of the next meeting of our group). This time, I am proceeding a little differently. The deadlock in X3J3 is over. This would probably not have happened without the influence of the ISO/WG5 meeting in Paris. Therefore this report is constructed from two of my private trip reports.

2. Summary of the WG5 meeting [Paris France, Sep 1988]

WG5 expressed great dissatisfaction with the deadlock in X3J3. It wanted a single compromise plan leading to the appearance of a fresh draft standard soon. The plans of Weaver, Philips, Reid/Smith, and Brainerd, *et al.* were presented by Dick Weaver, Ivor Philips, Andy Johnson, and Lawrie Schonfelder, respectively. It was decided quite quickly that neither the Weaver plan nor the Philips plan was suitable. They were seen as too large a departure from the draft and likely to result in many “no” votes in a second ISO ballot. The authors of the remaining plans met to discuss how a compromise plan might be constructed that met the objectives of both plans and was likely to be acceptable to WG5. This left several decisions open, so straw votes of WG5 were taken before a final plan was proposed. This was modified slightly by WG5 and was adopted on the final day with a vote of 30-2-5 by individuals (Dick Weaver and Ivor Philips voting “no”) and 8-0-1 by countries (USA abstaining). The resolution (P2) is reproduced here as an appendix.

WG5 also adopted a resolution (P5) expressing its belief that the timely revision of the Fortran standard is critical and adopting a set of milestones leading to the completion of a second ISO ballot before the next WG5 meeting (10-14 July 1989). This was passed with a vote of 24-4-9 by individuals (Weaver, Philips, Johnson, and Warren (IBM, Canada) voting “no”) and 6-0-3 by countries (Japan, Sweden, and USA abstaining).

3. Summary of the X3J3 meeting [Boston MA, Nov 1988: Meeting No 110]

A draft standard implementing the WG5 plan (P2) was distributed to members in time for the 2-week rule. X3 directed X3J3 that the US support a single Fortran standard. Early in the Boston meeting it was decided (24-9) to accept a plan based, in general, on the P2 resolution and during the meeting most of the P2 changes were adopted.

[... More in Crisis folder on flash drive.]

The Fortran Story Retold

Selected Reprints 1968-2011

Compiled by Loren Meissner, 2016

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What You Won't See at the Museum

Loren Meissner 2018

In April 2016 I wanted to clean out some old computer-oriented books on my shelves, and documents in my files (at my home in San Jose), and I thought of the Computer History Museum. I contacted them, and I was referred to Paul McJones who is a volunteer at the Museum. He is quite familiar with Fortran, and he created a *software preservation project* with “materials concerning the original IBM 704 FORTRAN/FORTRAN II compiler”

When I sorted my books and documents, I sent out a call on the “COMP-FORTRAN” email line for some missing items. Van Snyder replied, telling me that he knew Jeanne Martin had a large collection at Alamo, about 25 miles east of Berkeley. Paul and I visited

her a few times, and from more than 20 linear feet of documents (mostly in binders) she gave us Fortran meeting reports and other relevant materials that she had kept, including some that she got from Frank Engel. Van Snyder also shipped a box of documents to me.

My study was full of Fortran document boxes for a few weeks, while I re-organized the materials and then took them to the Archives building in Fremont, about 13 miles east of the Museum. Boxes 1 to 11 were from Jeanne Martin, and Box 12 was from Van Snyder.

In May 2017 during early discussion of Geezers Meeting plans with Jerry Wagener, I suggested that we might visit the Archives building. But they are not staffed on Sundays, and anyway we decided that most of what we'd see can be shown by photos.

I made an appointment to visit the archives and take photos in January 2018. When I got there, the Archives staff had brought out the twelve boxes of documents and positioned them on a table for me. You can see that I'm not a great photographer.

Contents of the Booklet

= Street view, Museum Archives bldg. (48431 Milmont Dr, Fremont); Photo of "Infinity".

Jeanne Martin donation:

= Box1 – The beginning of US Fortran standardization, 1962 to 1977:

> Martin Greenfield was chairman of meetings 1 (Aug 1962) to 18 (Jul 1970) as recorded in the first two binders. No record of Meetings 1 to 7 was kept; Meeting 13 record (if any) is missing.

> Frank Engle was chairman of meetings 19 (Sep 1970) to 59 (May 1977) recorded in the rest of this box.

> Last binder includes F77 draft and Frank Engle "valedictory" (summary of progress to date).

= Boxes 2 to 8 – US standardization through 2003:

> Includes minutes and documents, from an "ad hoc" meeting to get organized, and from meetings 60 to 164. (At first Jeanne Adams was chairman and I was secretary.)

= Boxes 9 and 10 – *International* standardization, 1977 to 1994, Jeanne Martin chairman;

= Box 11:

> International standardization, 1995 to 1999, Jeanne Martin chairman

> IBM Fortran manuals 1957-1988.

Van Snyder donation:

= Box 12 – Fortran standards CRISIS during transition from Fortran 77 to Fortran 90 (April 1978 to May 1991) with Aug 1988 Compromise.

> Includes copies of official F77 and F90 standards.

The Van Snyder Donation (CHM A2016.5316) consists of drafts prepared for Fortran standardization by US committee ANSI X3J3 and by International committee ISO WG5 in the process of upgrading Fortran 77 to Fortran 90. This was perhaps the most important upgrade in Fortran language history.

= The "theme" of the Van Snyder Donation collection is the SURVIVAL of the development process for Fortran 90, in spite of a CRISIS that was resolved at a meeting of the International committee WG5 in Paris, SEP 1988.

(One committee member wrote to me): “1988 was the key year in which IBM & Co. switched from obstruction to cooperation (probably realising that that was what the market was demanding) ...”

WG5 prepared a draft called “Fortran 88” for X3J3 to use in continuing development toward the final Fortran 90 standard.

This “Fortran 88” document was distributed to X3J3 as a “pre-meeting” document for X3J3 meeting 110 in NOV 1988.

Fortran Forum (Vol 8, No 1, Serial No 20, Jan 1989) published a transcription of an “informal report” by John Reid concerning the SEP 1888 WG5 meeting (in Paris) and the X3J3 response at its NOV 1988 meeting.

= Some of the documents in this donation were “internal” drafts for use by X3J3 and WG5. Four of them were public (external to the two committees). These are:

- 1: Fortran 77 Standard (from 1978: “ANSI x3.9-1978 and ISO 1539-1980”);
- 2 and 3: X3J3 Documents 104 and 112, released as the first and second Draft Standards for public comment in JUN 1987 and JUN 1989 – I have bound these together, along with a “Summary of Changes” from 104 to 112 (prepared by X3J3), and an excerpt from Michael Metcalf’s summary of the CRISIS and its SOLUTION;
- 4: The “final” document (labeled as ANSI X3J3 Doc 118 and ISO WG5 Doc 692) submitted in for final processing by ANSI and ISO, and approved (possibly with minor edits) in May 1991 as Fortran 90.