Fifty Years of the FSG

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Interest in Fortran

There were many competing scientific languages in the late 1960s

The more elegant Algol-like languages tended to be preferred in Europe

It became clear that much useful applications software written in Fortran (both packages and subroutine libraries) was circulating in US universities

Moreover this was free of charge, usually freely available and relatively portable

A conference on Fortran at Edinburgh in 1969 attracted 160 participants from all over the UK and some from the continent

(UK) Scientific Computing in the late 1960s

- Public sector was generally required to buy British
- KDF9 at Edinburgh University offered only Algol and Imp
- Input was by 8-track paper tape and (for a few) punched cards
- Van collected input from and delivered listings to departments
- Fortran was available via overnight van service to NEL at East Kilbride (40 miles away)
- Computing staff rarely got more than two runs per project per day, plus one overnight
- Remote access via telephone line was at experimental stage

FSG - the beginning

- In 1966 USA Standard Fortran was the world's first programming language standard
- By 1970 it was due for its five-year renewal or revision
- In 1970 the FSG was formed to be a focus in the UK for developing Fortran standards and intended to work in association with national and international standardisation bodies.
- The ANSI committee had sole responsibility for producing the de facto world-wide Fortran standard. There was no formal international collaboration on programming language standards until 1978.

It always takes longer than planned

- By August 1971 X3J3 was in the midst of processing 153 proposals for extensions or revision (with still more to come)
- Yet in October 1971 the FSG chairman discussed future activity for the group saying "`now that much of the initial work related to the new ANSI Standard was drawing to a close`"
- Development work on the standard concluded in 1977; the ANSI standard was published in April 1978 and then issued as an ISO 'recommendation' (not formally a standard) in March 1980
- Reminder: Fortran 77 came with a subsidiary standard (Basic Fortran) and there was an intermediate standard: ECMA Fortran

It always takes longer than planned - 2

Similarly the FSG annual report for 1978-79 has

"This year has seen the long awaited completion and publication of the FORTRAN 77 language standard. It has seen too, the start of further revision for a proposed standard to be completed by 1982".

This became Fortran 8x, then Fortran 88, and finally Fortran 90.

Moving on from Fortran 66

- generalized subscript expressions
- mixed-mode arithmetic
- IF construct
- CHARACTER data type
- seven dimensions allowed instead of three
- some restrictions on DO loops relaxed
- expressions in output lists, including character expressions
- free format, namelist and direct-access I/O
- OPEN, CLOSE, END= etc

A move too far? - 1

Alternate RETURN

- Widely adopted by vendors in early 1970s
- FSG members were equivocal - some wanted it, others thought it unnecessary
- Approved by X3J3 in 1972
- Survived a vote to delete it (16-9) in X3J3 in1977
- Deemed ‘obsolescent’ in F90, F95, F03, F08, F18

A move too far? - 2

Real and double precision DO control variable and loop limits

- Copied from Algol, not generally available in vendors' Fortran in the early 1970s
- FSG members had a minority in favour, most against
- Deemed 'obsolescent' in F90, 'deleted' in F95, F03, F08, F18

A move too far? - 3

ENTRY statement

- Quite widely adopted by vendors in early 1970s
- FSG members had a minority in favour, most against
- Deemed ‘obsolescent’ in F08, F18

Proposed but not adopted

- Conditional compilation
- Macro facility
- Lower case alphabetics
- Complex format field descriptor
- Allow alphanumeric statement labels
- Names longer than six characters
- Dynamic storage allocation of arrays
- Do not require labeled common blocks to be same length
- Implied multiplication after a right parenthesis
- Execute DO loop once when m1>m2
- Negative I/O unit implies backward operation
- etc, etc, etc

FSG phases

1970 – 1975: working parties on language extensions
mini-computer Fortran
free format
diagnostics

1971 onwards: dialogue with X3J3 on development of Fortran 77 and then Fortran 90

1975 onwards: more emphasis on presentations on Fortran applications, compilers, libraries, tools, etc

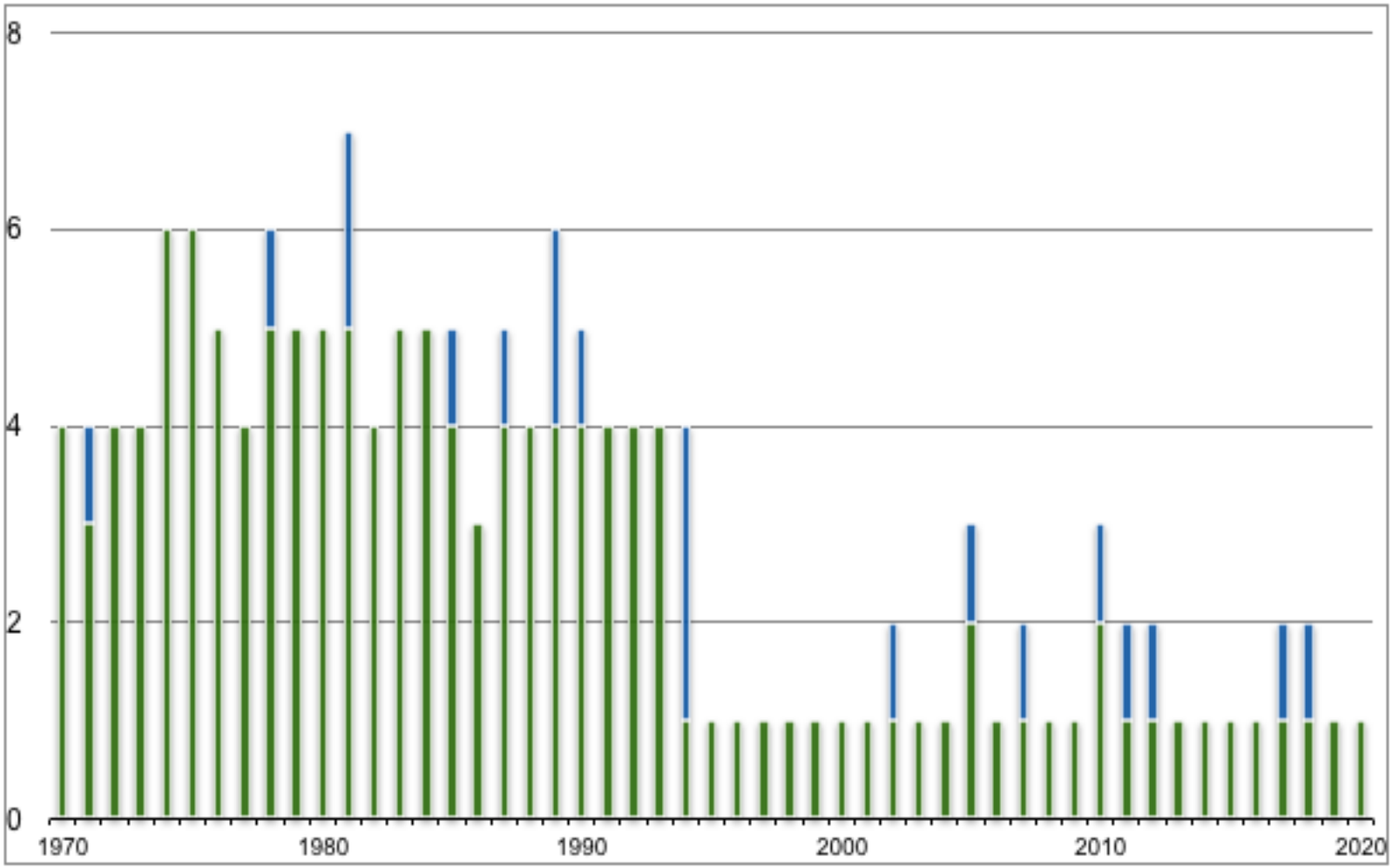
1978 - 1993

- With the establishment of an ISO Fortran working group primary attention moved from developing the next standard to promoting Fortran and discussing Fortran-related matters
- Several members of the FSG joined the ISO group and a few also joined the US committee
- Meetings continued to be held, with typically four per year, with regular reports on developments in language standards
- Fortran Forums were held in 1978, 1981, 1985, 1987, 1989 (5 in London, 2 in Edinburgh) with audiences of up to 150

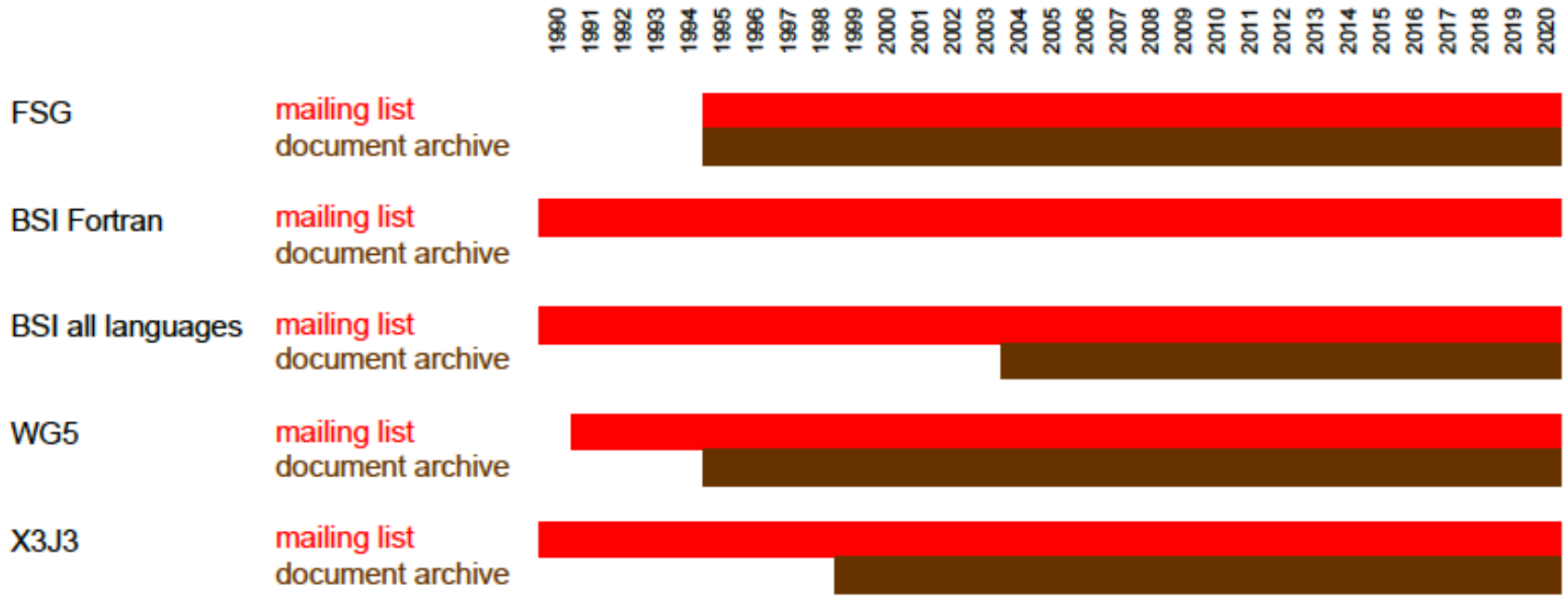
FSG meeting locations

From 1980 onwards, occasional meetings have been held outside London - at Brimpton, Coventry, Edinburgh, Glasgow (Scottish subgroup), Jodrell Bank, Oxford, Reading, Rutherford, and Salford

The effect of the internet:
Ordinary meetings and special events 1970 - 2020



The effect of the internet: Fortran mail discussion lists and on-line document archives



FSG documents were distributed on paper by BCS HQ up to the 1997 AGM, typically costing around £250-350 p.a. They acted as a sort of newsletter on Fortran matters.

1994 - 2020

From 1994 it was decided to change to have only an annual meeting (AGM) with presentations, plus special events:

1994 Forums in Edinburgh, Liverpool, London, Oxford
1996 **Fortran Futures 96, Heathrow (NAG in association with the FSG)**
1998 **Fortran Futures 98, Heathrow (NAG in association with the FSG)**
2002 Forum in London
2005 Special meeting on requirements for Fortran 2008
2007 **Fortran Jubilee meeting**
2010 Fortieth anniversary meeting
2010 Joint meeting with BCS Advanced Programming SG
2011 Joint meeting with BCS Leicester branch
2017 Joint meeting with Computational Physics Group of the Institute of Physics
2018 Joint meeting with BCS Open Source Specialist Group

Development Project - 2002

- In 2002 the Specialist Groups Executive Committee invited bids “to provide support to SGs wanting to undertake specific activities outside of their own resources”.
- The FSG was awarded funds “to support the continued UK contribution to the development of the ISO Fortran standard, Fortran 2000, and to allow the ISO project to be completed to schedule”.
- This involved financial support for three UK Fortran experts to attend ISO Fortran Working Group meetings and one to attend BSI Programming Languages Committee meetings.
- Support has continued, subject to re-application year by year

References

- Fortran Specialist Group - The First Two Decades
  https://fortran.bcs.org/1990/min900510.html#appc
- Forty years of FSG and Fortran Standards
  https://fortran.bcs.org/2010/FSG40.pdf
- Archive of Fortran Specialist Group Events 1970 - 1993
  https://fortran.bcs.org/archive.php
- Fortran Specialist Group Past Events 1994 – 2019
  https://fortran.bcs.org/pastevents.php

Thanks

Many people have contributed to the work of the Fortran Specialist Group. Thanks are due to all the officers over the years, particularly to John Gatehouse, founder and first chairman, and to Peter Crouch, the longest serving and most innovative chairman; also to Paul Samet who invited a member of X3J3 to an IBM users' conference in Italy in 1971 specifically to initiate communication between X3J3 and FSG members.