

**Local contact information**

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**1. Opening Activities**

1.1 Opening Comments (Keaton)

1.2 Introduction of Participants/Roll Call

Aaron Ballman	Intel	USA	C++ Compatibility SG Chair
Alex Gilding	Perforce	USA	
Barry Hedquist	Perennial	USA	INCITS/C IR
Clive Pygott	LDRA Inc	USA	WG23 liaison
David Goldblatt	Facebook	USA	
David Keaton	Keaton Consulting	USA	Convener
David Vitek	Grammatech	USA	
Douglas Teeple	Plum Hall	USA	
Elizabeth Andrews	Intel	USA	
Fred Tydeman	Keaton Consulting	USA	INCITS/C Vice Chair
Freek Wiedijk	Plum Hall	USA	
Nick Dunn	NCC Group	USA	
Rajan Bhakta	IBM	USA	INCITS/C Chair
Robert Seacord	Woven Planet North America Inc	USA	Prospective
Aaron Bachmann	Austrian Standards	Austria	Austria NB
Dave Banham	BlackBerry QNX	UK	MISRA Liaison
Eskil Steenber	Quel Solaar	Sweden	Sweden NB
Jakub Lukasiwicz	Motorola Solutions Systems Polska	Poland	Poland NB
JeanHeyd Meneide	NEN	Netherlands	Netherlands NB
Jens Gustedt	NRIA	France	France NB
Joseph Myers	CodeSourcery / Siemens	UK	UK NB
Luigi Liquori	INRIA	France	Invited Guest
Martin Uecker	University of Goettingen	Germany	
Roberto Bagnara	BUGSENG	Italy	Italy NB, MISRA Liaison

1.3 Procedures for this Meeting (Keaton)

1.4 Required Reading

1.4.1 [ISO Code of Conduct](#)

1.4.2 [IEC Code of Conduct](#)

1.4.3 JTC 1 Summary of Key Points [[N 2613](#)]

1.4.4 [INCITS Code of Conduct](#)

1.5 Approval of Previous Minutes

1.5.1 Approval of Previous WG 14 Minutes [NXXXX] (WG 14 motion)

Minutes not available due to short time between meetings. Will approve at next meeting.

1.5.2 Approval of Previous INCITS/C Minutes [pl22.11-2022-XXXX] (INCITS/C motion)  
Minutes not available due to short time between meetings. Will approve at next meeting.

1.6 Review of Action Items and Resolutions

1.7 Approval of Agenda [N3093] (INCITS/C motion, WG 14 motion)  
Gilding moved, Bhakta seconded. Agenda unanimously approved.

1.8 Identify National Bodies Sending Experts:

- Austria
- Canada
- France
- Italy
- Poland
- Sweden
- The Netherlands
- UK
- US

1.9 INCITS [Antitrust Guidelines and Patent Policy](#)

1.10 INCITS official designated member/alternate information

1.11 INCITS Social Media Accounts

Links to follow INCITS social media accounts (LinkedIn, Twitter, Facebook):

- Click on the icons at the top of this agenda for links to the INCITS page on each corresponding social media platform  
AND/OR
- Scan this QR code with your Smart Phone, which will take you to a landing page with links to the INCITS page on all 3 social media platforms.

1.12 Note where we are in the current C23 Schedule

We are in the second and final of ballot resolution for CD1 9899. As soon as possible afterward, there will be a CD2, followed by a DIS.

## **2. Reports on Liaison Activities**

- No reports received this meeting.

2.1 ISO, IEC, JTC 1, SC 22

- Unicode consortium now members of SC22, so can attend future WG14 meeting
- ISO requires balloting for paragraph numbers for all documents

2.2 INCITS C/WG 14

2.3 INCITS C++/WG 21

WG21 requests feedback on

<https://www.open-std.org/jtc1/sc22/wg21/docs/papers/2023/p2723r1.html>

2.4 INCITS OTHER LANGUAGES

2.5 WG 23

2.6 MISRA C

2.7 Austin Group

2.8 Other Liaison Activities

### 3. Reports from Study Groups

No reports expected for this meeting.

A TS 6010 CD ballot is expected to be in progress at the time of the meeting.

3.1 C Floating Point Study Group

3.2 C Memory Object Model Study Group

3.3 C and C++ Compatibility Study Group

3.4 Undefined Behavior Study Group

### 4. Future Meetings

4.1 Future Meeting Schedule

Please note that in-person meetings may be converted to virtual meetings due to coronavirus considerations.

- Sometime in the week 17<sup>th</sup>-21<sup>st</sup> April – length depends on the number of comments received
- October, 2023 (proposed, depending on DIS schedule) – DIS Ballot resolution meeting

4.2 Future Mailing Deadlines

Note: Please request document numbers by **one week before these dates**.

- Post-Virtual-202301/202302, Pre-Virtual-202304 – 17 March, 2023
- Post-Virtual-202304 – 12 May, 2023

### 5. Document Review -WG14 Business

The purpose of this meeting is to finish CD1 9899 ballot resolution.

Progress from the previous meeting is recorded in [\[N 3091\]](#)

Late addendum to ballot comments (unofficial standing) [\[N 3073\]](#), status [\[N 3092\]](#)

- CA-N3073-002 - no objections – accepted
- CA-N3073-003 - already accepted, as GB-016
- CA-N3073-004 - no objections – accepted

- CA-N3073-005 - already accepted with comments, as US:89-266

Other documents to which we may refer as needed:

Myers, Declaration contexts (C2x CD UK comment) [[N 3070](#)]

Myers, Conversions in constexpr initializers (C2x CD UK comment) [[N 3071](#)]

Gustedt, NB comments by AFNOR for ballot on ISO/IEC 9899:2023 [[N 3072](#)]

Gustedt, handle NB comments concerning constexpr [[N 3078](#)]

Unofficial spreadsheet version of CD1 9899 ballot comments [[N 3086](#)]

Plan:

For simplicity, proceed sequentially through N 3067 followed by N 3073 (but referring to N 3073 earlier if needed for N3067).

Upon reaching each editorial comment, the committee will be asked if there are any objections to adding it to a list to be mass-approved at the end. If there are objections, those editorial comments will be recorded with the outcome of the discussion of technical comments, below:

Resume processing at FR-131, where we left off at the previous meeting.

- GB-078 – ‘Does the committee agree to accept the changes proposed in N3103 as a resolution of GB-078’ with the additional modification “Change "implementation-defined behavior related to the char type" to 'implementation-defined behavior related to the char type of the elements of the string literal "\xFF'" Y-14 N-0 A-0 accepted as amended
- GB-089 – addressed in N3098 ‘Does the committee agree to accept N3098 as the resolution of GB-089’ Y-15 N-0 A-1 accepted
- US:30-115 – N3102 ‘Does the committee agree to accept the changes proposed in N3102 as a resolution of US:30-115 with “variable” replaced by “object”’ Y-14 N-0 A-1 accepted
- Fr-131 – N3072#5 ‘Does the committee agree to accept the change proposed in Fr-131’ Y-0 N-13 A-1 rejected
- GB-133 – Decision poll to accept GB-133 ‘Does the committee agree to accept the change proposed in GB-133’ Y-11 N-0 A-1 accepted
- US:37-142– Decision poll to accept GB-133 ‘Does the committee agree to accept the change proposed in US:37-142 to render the indicated text in non-italics’ Y-12 N-0 A-3 accepted
- CA:5-148 – Proposed disposition: Add a space before “NOTE” and change “do not agree” to “does not agree”. ‘Does the committee agree to accept the proposed disposition of CA:5-148’ Y-12 N-0 A-3 accepted
- Fr-158, Fr-217 & Fr-249 - N3072#15 addresses these three comments ‘Does the committee want something along the lines of N3072#15’ Y-5 N-2 A-8 accepted  
‘Does the committee agree to accept N3072#15 with <inttype.h> replaced by <inttypes.h> as the resolution of Fr-158, Fr-217 and Fr-249’ Y-10 N-1 A-4 accepted
- Fr-159 - N3072#14 ‘Does the committee agree to accept the change proposed in Fr-159 as modified in N3072#14’ Y-14 N-0 A-0 accepted
- US41:-167 - Proposed disposition: delete 7.12.7.4 para 3. ‘Does the committee agree to deletion of 7.12.7.4 para 3’ Y-12 N-0 A-1 accepted
- US:42-169 – proposed changes in n3105.pdf from CFP group. ‘Does the committee agree to accept the change proposed in US:42-169 as modified by N3105’ Y-12 N-0 A-2 accepted

- GB-232 – ‘Does the committee agree to accept the changes proposed in N3107 to resolve GB-232’ Y-16 N-0 A-0 accepted
- GB-286 – proposed changes in n3105.pdf from CFP group. ‘Does the committee agree to accept the change proposed in GB-286 as modified by N3105’ Y-13 N-0 A-2 accepted
- GB-287 – proposed changes in n3105.pdf from CFP group. ‘Does the committee agree to accept the change proposed in GB-287 as modified by N3105’ Y-14 N-0 A-0 accepted
- US:45-174 - ‘Does the committee agree to accept the change proposed in GB-175 as a solution US:45-174’ Y-17 N-0 A-0 accepted
- GB-175 - Decision poll to accept GB-175 ‘Does the committee agree to accept the change proposed in GB-175’ Y-14 N-0 A-2 accepted
- GB-188 - ‘Does the committee agree to accept the change proposed in GB-188 to remove the version macro’ Y-6 N-6 A-5 no consensus to make a change
- GB-191 – see N3078#5 ‘Does the committee agree to accept GB-191’ Y-13 N-1 A-3 accepted
- Fr-192 & NL:6-193 - see N3072#17 ‘Does the committee agree to accept N3072#17 as the resolution of GB-192 and NL:6-193 – using the ‘alternative suggestion’ from France as the normative text and the Netherland’s text as the recommended practice’ Y-15 N-0 A-3 accepted
- NEN/NL:6-193 – see Fr-192
- GB-195 - ‘Does the committee agree to resolve GB-195 by adding "Conversions to atomic\_bool behave the same as conversions to bool." after the first sentence of 7.17.6#1? Y-11 N-0 A-3 accepted
- GB-196 – ‘Does the committee agree to accept the change proposed in GB-196’ Y-2 N-5 A-8 rejected A paper requested to address this issue for C2Y - Meneide suggested this already exists as N2389
- GB-197 – ‘Does the committee agree to accept the changes proposed in GB-197’ Y-7 N-0 A-3 accepted Note one of the changes depends on GB-195
- GB-198 – ‘Does the committee agree with resolving GB-198 by removing note 1’ Y-8 N-0 A-3 accepted
- NEN/NL:7-200 – ‘Does the committee agree to accept the changes proposed in NEN/NL:7-200’ Y-11 N-0 A-3 accepted
- NEN/NL:3-201 – ‘Does the committee agree to accept the changes proposed in NEN/NL:3-201’ Y-0 N-5 A-7 rejected
- NEN/NL:2-202 – N3104 ‘Does WG14 accept NEN/NL-202, with wording from N3104, with "32" changed to "24" in the footnotes, "3" removed in "N.3" and "unsigned\_BitInt(sizeof(value) \* CHAR\_BIT)" changed to "unsigned\_BitInt(N)" in both places?’ Y-5 N-4 A-4 rejected with comments, to be brought C2Y
- US:58-203 – ‘Does the committee agree to accept the changes proposed in US:58-203’ Y-5 N-2 A-3 accepted
- NEN/NL:4-204 – ‘Does the committee agree to accept the changes proposed in NEN/NL:4-204’ Y-10 N-0 A-3 accepted
- US:59-206 – ‘Does the committee agree to accept the changes proposed in US:59-206’ Y-0 N-7 A-5 rejected
- GB-210 – ‘Does the committee agree to accept the change proposed in GB-210’ Y-4 N-4 A-5 no consensus - David Banham asked to bring this suggestion up for C2Y
- Fr-217 – see Fr-158
- GB-218 - ‘Does the committee agree to accept the change proposed in GB-218’ Y-3 N-7 A-4 rejected
- GB-224 - ‘Does the committee agree to accept the first change proposed in GB-224’

Y-11 N-0 A-2 accepted editorial issue – needs adding to Annex J

- GB-227 - 'Does the committee agree to accept the change proposed in GB-227, with "five types and several functions" changed to "several types and functions"' Y-12 N-0 A-0 accepted
- Fr-228 – N3072#16 'Does the committee agree to accept the changes proposed in N3072#16 as a resolution to Fr-228' rejected (without vote – withdrawn by proposer)
- GB-235 - 'Does the committee agree to add a footnote in 7.24.3.1 paragraph 2 after "whose alignment is specified by alignment," "The alignment requirements from 7.24.3 also apply even if the requested alignment is less strict." to resolve GB-235?' Y-13 N-0 A-2 accepted
- FR-241 & GB-242: N3072#9 'Does the committee agree to accept the changes proposed in N3072#9 to resolve Fr-241 & GB-242?' Y-14 N-0 A-1 accepted
- GB-242 – see Fr-241
- GB-248 - 'Does the committee agree to accept the change proposed in GB-248 – with font choice left to the editor' Y-14 N-0 A-0 accepted
- Fr-249 – see Fr-158
- US:1-254 – 'Does the committee agree to resolve US:1-254 by changing page vi bullet "Missing macros were added to from <float.h> and <limits.h>" to "Missing macros were added to <float.h> and <limits.h>' Y-12 N-0 A-0 accepted
- GB-265 - 'Does the committee agree to accept the change proposed in GB-265 – with the choice left to the editor' Y-12 N-0 A-0 accepted
- US:89-266 – 'Does the committee agree for the editor to change the footer to "index" on page 672 and later to resolve US:89-266' Y-12 N-0 A-0 accepted with comments
- See GB-271 (in previous minutes)
- US:82-295 - 'Does the committee agree that the change proposed in US:82-295 is not required' Y-10 N-0 A-2 accepted
- US:83-296 - 'Does the committee agree to the change proposed in US:83-296' Y-2 N-5 A-6 rejected
- US:73-304 - 'Does the committee agree to the changes proposed in US:73-304' Y-13 N-0 A-1 accepted
- US:86-318 - 'Does the committee agree to the changes proposed in US:86-318' Y-0 N-12 A-1 rejected
- NEN/NL:9-333 - 'Does the committee agree to the changes proposed in NEN/NL:9-333 incorporating N3095 instead on N3031' Y-1 N-7 A-6 rejected
- Fr-334 - 'Does the committee agree to the changes proposed in Fr-334 with the comment "Font representations will be made consistent; details to be found in other accepted comments"' Y-12 N-1 A-1 accepted with comment
- Fr-335 – 'Does the committee want to accept Fr-335 with comment by changing the value returned by \_\_has\_c\_attribute to 202311L for all attributes?' Y-10 N-6 A-0 accepted as noted
- Fr-336 - 'Does the committee want to accept N3072#12 as a resolution of Fr-336, i.e. keep the colour as used in N3054 in the final draft' Y-6 N-5 A-5 no consensus rejected, to be considered again for C2Y

As a follow-on to the Fr-335 decision poll, there was a discussion on how to avoid the same issue in the future, this led to the following opinion poll 'If an attribute does not change between two versions of the standard should the \_\_has\_c\_attribute return number change' Y-1 N-14 A-2 Clear sentiment for not changing the \_\_has\_c\_attribute returned value if the attribute hasn't changed.

The following items were considered for mass approval and no objections were raised

GB-132	GB-134	GB-135	GB-136	GB-137	GB-138
GB-139	GB-140	GB-141	GB-143	GB-144	GB-145
GB-146	US:38-150	GB-154	GB-160	GB-161	GB-162
GB-165	GB-168	GB-171	US:44-172	US:46-176	US:47-177
US:48-178	GB-179	US:49-180	US:50-181	US:51-182	US:52-183
US:53-184	US:54-185	US:55-186		GB-194	GB-199
GB-205	GB-207	GB-208	US:62-215	GB-219	GB-221
GB-222	GB-223	GB-225	GB-226	GB-231	GB-233
GB-234	GB-236	GB-237	GB-243	GB-244	GB-246
US:64-247	US:65-250	US:66-251	GB-252	GB-253	GB-255
Fr-256	GB-257	Fr-258	GB-259	GB-260	GB-261
GB-262	GB-263	GB-264	US:69-272	GB-273	US:70-274
GB-277	US:72-280	GB-281	GB-282	US:75-283	US:76-284
GB-285	US:77-289	US:80-290	US:81-291	GB-292	GB-293
GB-294		US:84-297	GB-298	GB-299	GB-300
US:85-301	GB-302	US:74-303	GB-305	GB-306	US:93-307
US:92-308	US:91-309	US:90-310	GB-311	Fr-312	GB-313
GB-314	GB-315	GB-316	GB-317	GB-319	GB-320
GB-321	GB-322	GB-323	GB-324	GB-325	US:88-328
GB-329	GB-330	GB-331	GB-332	US:2-337	GB-338

Decision poll 'Does the committee agree to accept all the proposals listed above'

Y-16 N-0 A-0 all accepted

Seacord presented a paper N3106 as a proposed solution to GB-012 (rejected at the last meeting). To be considered before CD2.

## 6. Clarification Requests - WG14 Business

The previous queue of clarification requests has been processed.

## 7. Any Other Business

No other business raised.

## 8. Resolutions and Decisions reached - WG14 Business

### 8.1 Review of Decisions Reached

- All decision recorded in N3108

### 8.2 Review of Action Items

- JTC/1 accessibility group to be invited to a future WG14 meeting to discuss use of color

## 9. PL22.11 Business (INCITS/C Minutes Only)

### 10. Thanks to Host

10.1 Thanks to ISO for supplying Zoom capabilities

### 11. Adjournment (INCITS/C motion)

11.1 Ballman proposed, Seacord seconded – no objection