



ADVANCED TIMING & CALCULATIONS - ALPINE

SEASON 2022

STUDY GUIDE

This Study Guide is intended as an educational and review aid for individuals interested in alpine officiating. Downloading, printing, and reading the Study Guide must not be substituted for actual attendance at an approved U.S. Ski & Snowboard Alpine Officials' Clinic or used as a replacement for actual instruction at any approved Clinic.

PLEASE NOTE: The Chief of Timing and Calculations is responsible for supervising, documenting, and enforcing the quality control of actual timing and results; the purpose of this Clinic is refinement of the skills required by the position.

With the exception of lower-level events where availability of personnel makes it necessary, the Chief of Timing and Calculations should not also be the individual operating the electronic timing equipment or the timing/race result software.

Training the use of timing equipment and/or timing/result software will result in higher qualified officials, so it should be included in the curriculum. In an effort to address this issue, materials have been made available for a Timing Operations Workshop that can be used to facilitate this option.

REFERENCE PUBLICATIONS:

1. U.S. Ski & Snowboard Alpine Competition Regulations (ACR)
2. ICR of the FIS, Online Edition
3. Rules for the FIS Points
4. U.S. Alpine Officials' Manual
5. FIS Timing Booklet

CERTIFICATION EXAMINATION:

Advanced Timing & Calculations (Level 3) Certification Examination will be available at approved U.S. Ski & Snowboard Alpine Officials' Clinics. Allowed time limit is 2.5 hours. The examination is open book, and it must be administered only at scheduled Clinics. It is NOT A TAKE-HOME EXAM. Allowing the use of computers for the calculation sections is not allowed. Completed examinations are to be retained by the Clinic examiners; they are not returned to the individuals taking them. Please refer to Region/Division publications for schedules. *The Study Guide is not intended as a replacement for taking notes or for use during an open-book examination at any Alpine Officials'-approved Clinic.*

If you have problems with this Study Guide or have suggestions for improvements, please contact the Chair of the Alpine Officials' Education Working Group: aoewgchair@gmail.com. Thank you.

U.S. SKI & SNOWBOARD

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PLEASE NOTE: Local health authority restrictions may require ski area management to implement procedures to protect the well-being of their employees and guests. These procedures may vary from venue to venue, county to county, and state to state. Procedures which impact your event operations and programs must be relayed to all event officials, Team Captains, and competitors. The procedures must – without question – be respected and observed.

U.S. Ski & Snowboard will continue to maintain a COVID-19 resource page with recommended protocols (usskiandsnowboard.org/covid-19).

There is much information available to us - no one can possibly know it all. What we **SHOULD** know is **WHERE** to find it. Some of the sections of this Study Guide may require research by the user. This research will aid in the ability to understand the layout of applicable rule books/publications and will reinforce their content.

NOTE: The U.S. Ski & Snowboard Schedule Agreement and ACR U203.2, require that the Chief of Timing & Calculations have a current U.S. Ski & Snowboard Officials membership, be appropriately certified for their position, and have attended a bi-seasonal Continuing Education Clinic (Update) prior to the event. The OC should appoint the most qualified individual available to serve as Chief of Timing & Calculations. *The Chief of Timing & Calculations for National Championship, Nor-Am Cup, and World Cup events **should** be certified as a Level 3 or higher Chief of Timing & Calculations.*

REFERENCE DOCUMENTS:

The following reference items can be found at the end of this Study Guide, in “Miscellaneous Study Guide Forms”, or on the FIS website. Document numbering is not sequential because it agrees with numbering in the “Master Packet of Forms” (MPF) as posted on the U.S. Ski & Snowboard website. All forms contained in the MPF have been reviewed and, when required, have been updated for season 2022. It is suggested that forms be printed for easy reference while using the Study Guide.

- 42. Timing Checklist
FIS List Cover Page (U.S./FIS websites)
- 39. FIS Penalty Calculation Form
FIS Timing Booklet
- 32. Replacement Manual (Hand) Time-of-Day (ToD) EET Worksheet

I. Focus of this Study Guide is primarily FIS-level events

- A. Regional FIS
- B. Nor-Am (Continental Cup)
- C. World Cup, World Championship, and Olympic Winter Games

II. Characteristics of Events

- A. Competitors are top level racers
 - B. Team Captains are highly astute and knowledgeable professionals
Depending on type and level of event, one or more Team Captains may be appointed to serve as Connection Coaches. Connection Coaches:
 - Serve as liaison between all Team Captains and the Jury
 - Serve as on-hill “Eyes of the Jury”
 - May supervise yellow flag zones in DH and SG
 - Have voice but no vote in Jury matters/decisionsDepending on the terrain and course set, Connection Coaches may also be appointed for other events, e.g., Giant Slalom, Slalom, Parallel, etc.
 - C. Organizing Committee (OC):
 - Is highly experienced and qualified
 - Is committed to a quality event
 - Is aware media exposure can make any off-the-cuff statement, “news”
 - Is aware of financial commitment and need for sponsors
 - Includes Technical Delegate as appointed by U.S. Ski & Snowboard or FIS Technical Delegate Working Group representative
 - Includes Referee, and Assistant Referee (speed events) as appointed by the Technical Delegate [601.2.3, 601.4]
 - Includes Forerunners as appointed by the OC
 - D. Race Jury
 - World Cup: FIS Chief Race Director and FIS Race Director serve as Referee and Assistant Referee for all events – both speed and technical [601.2.1]
 - World Championships and Olympic Winter Games: All Jury members, including Start and Finish Referee, are appointed by FIS and have voting rights [601.2.2, 601.4]
 - In all other races* the Technical Delegate appoints the Referee and for Downhill and Super G, the Assistant Referee [601.2.3]
 - By appointment, the above become members of the Organizing Committee [601.2.4]
- *Referee, Assistant Referee, and Course Setters are appointed by Nor-Am Cup Committee for Nor-Am Cup events. These officials may also be appointed by U.S. Ski & Snowboard for Championship events.
- E. Additional support officials, as required, have a high level of certification, knowledge, and experience
 - F. Professional Timing Company and Timing System Requirements [611]
 - G. FIS Computer Company

1. FIS Points
 - a. Validity [4.2.4 – the current season]
 - b. Rule Observance [1.1 – rules not observed; race not scored]
 - c. FIS List [5.1 – FIS List is only available electronically]
 - d. FIS Points may only be corrected by FIS Bureau. FIS Points marked “C” on FIS website version of FIS Points List are verified as being “confirmed”.
 - e. FIS Base Points are calculations based on prior season’s results, have not been adjusted for the next season (adders not yet applied), and are posted for informational purposes only. *FIS Base Points must not be used for event seeding or penalty calculation purposes.*
2. Nor-Am Cup Points are used for seeding of the first group of fifteen (15). They are updated after each event. * (Due to greater number of athletes qualified for Europa Cup, different procedures apply for Europa Cup, e.g.: 30 in first group.)
 - a. Entry to Nor-Am Cup events is quota controlled.
 - b. Overall **450-point holders from prior season** not included in first group are seeded at 16th position
 - c. Overall 450-point holders who were injured and unable to utilize special seeding during previous season may use it at the first 3 races of the following season. This is valid for a maximum of 3 starts irrespective of the events.
 - d. Overall 450-point holders are followed by entered competitors ranked within the top 30 of the FIS Points List for the respective event.
3. World Cup Points are used to seed first group of thirty (30); updated after each event. *
 - a. Overall 500-point holders from among top 30 WCSL present are seeded at 16th position
 - b. Overall 500-point holders from remainder of field are seeded no later than 31st position

*** Refer to current Continental Cup Rules and World Cup Rules if more detail is required.**

III. What is SCORING?

- A. Dimensions of scoring are:

To ensure that ALL scoring functions come together and function as a unit: Classic ICR descriptions are found as follows: Chief of Timing & Calculations [601.3.6]

 1. Chief Timekeeper [612.4]
 2. Assistant Timekeepers (Manual/Hand Timekeepers) [612.5]
 3. Finish Controller [612.6]
 4. Chief of Calculation [612.7] (When appointed.)
- B. Scoring interacts with:
 1. Timing Company
 2. Scoring Computer Company
 3. Announcer, Scoreboard and an Official Notice Board

Announcer should be available to announce competitors’ *unofficial* times. Announcer should also announce DSQ’s. When an announcer is announcing *unofficial* times, DSQ competitor data announcement may be used to replace actual posting of Report by the Referee. *Team Captains must be notified beforehand if announcement of DSQ information is going to replace actual posting.* [617.2.2]

The scoreboard as well as the Official Notice Board are usually located at or near the finish. However, the OC may advise participants that they choose to only use an online format for either or both of these items. In each case – actual or online – the rules are satisfied; *unofficial* results and other documents such as the Report by the Referee are made available for review. *Rules do not specify which system – acoustic, visual, or online – is preferred.*

4. Race Secretariat/Race Administrator
It is strongly recommended the Race Administrator not assume additional duties beyond those required for the position. Accurate event documentation is imperative for all events as these documents may be required in a legal review.
 5. Press Chief
 6. Technical Delegate
 - a. Verifies timely synchronization of timing equipment
 - b. Verifies accuracy of Official Results and Penalty
 - c. Verifies accuracy of data contained in “Timing & Data Technical Report Form” (TDTR) prior to its electronic transmission to FIS and U.S. Ski & Snowboard
 - d. Provides a signed PDF copy of TDTR for Race Administrator files (signed by both Chief of Timing & Calculations and Technical Delegate)
 7. Referee (Report by the Referee).
 - a. Chief of Timing or Assistant should track/enter NPS, DNS, and DNF bib numbers on the Report by the Referee
 - b. Chief of Timing should meet with Referee (and Assistant Referee for speed events) and assist with entering DSQ competitor data, e.g.: Name, team, name of Gate Judge, type of fault, and either gate # where fault occurred or rule number applicable to infraction.
 8. A competitor is “Not Permitted to Start” (NPS) [627] who:
 - a. Wears obscene names and/or symbols on clothing and equipment
 - b. Behaves in an unsportsmanlike manner in the start area
 - c. Violates the rules in regard to the competition equipment and commercial markings
 - d. Trains on a course closed for competitors
 - e. In training for Downhill has not participated in at least one timed training run
 - f. Does not wear a crash helmet that conforms to the Specifications for Competition Equipment [606.4]
 - g. Does not have ski brakes on their skis [606.3]
 - h. Does not wear or carry an official start number* according to the rules
- *An “official start number” refers to any bib issued by the local event organizer; this includes replacement bibs furnished by the Start Referee.***
9. Recording “NPS” Situation - U.S. and FIS Events
 - a. Due to rule(s) violation(s), athlete is not permitted to start; this could apply to either run of a 2-run event and must be noted on the Start Referee’s Report; Jury must be advised.
 - b. Software will include “NPS” designation
 - c. If the old Report by the Referee is being used, athletes who are not permitted to start (NPS) should be clearly noted on the Report by the Referee.

- d. If **new** Report by the Referee posted on the U.S. Ski & Snowboard website in the MPF is being used, the athlete's status is recorded in NPS section; bib #, name, club/nation and reason (in "Note" section).
- e. If the **new** Report by the Referee posted on the FIS website is being used, a section is only provided for documenting bib #'s for NPS athletes.
- f. Technical Delegate must verify accuracy of Official Results and Penalty posted on U.S. Ski & Snowboard/FIS websites.

NOTE: Due to *force majeure*, the Technical Delegate may prepare, sign, and post the Report by the Referee or may assign this duty to another official. A Report by the Referee signed by the Technical Delegate or designee is valid.

10. Jury [601.4.6-601.4.7]
 - a. In cases of system malfunctions, e.g.: timing systems or absence of a gate, Jury allows reruns [623.1.2; 623.2.5]
 - b. In cases of doubt, Jury allows provisional reruns not based on system malfunctions
 - c. In cases of doubt, Jury allows provisional starts
 - d. Confirms validity of provisional starts and provisional reruns
 - e. Establishes start intervals for GS, SG, and DH and communicates the intervals (fixed/regular) to Chief of Timing or assistant.
 - f. In cooperation with Chief of Timing or assistant, establishes start intervals for Slalom (non-fixed/irregular)
 - g. In accordance with rules regarding minimum start intervals, establishes start intervals for Giant Slalom, Super G, Downhill Training and Downhill
 - h. Confirms start intervals for Giant Slalom, Super G, and Downhill and communicates any changes with Chief of Timing or assistant
 11. Provides instruction to manual/hand timekeeping crew in order to provide required manual timekeeping that is consistent and accurate
- C. QUALITY - Establish confidence in "Real Time" timing/scoring presentations
1. Familiarize yourself with available timing systems: Start, Finish, Net Time
 2. Verify scoreboard is available with: Bib #'s, Names, Unofficial Times
 3. Verify location of intermediate timing points
 4. Verify location and accuracy of video displays
 5. Furnish progress reports to media with respect for deadlines
 6. Document NPS, DNS, and DNF on Report by the Referee and be available to verify NPS and DSQ competitor data, e.g.: Bib, Name, Team, Rule #
 7. Aid in preparation of accurate official reports according to format

IV. Initial Actions of Scoring are:

- A. Establish presence with the following:
 1. Secretariat: Verify Race Administrator is using updated race result software, current/applicable Points List(s), and confirmed technical data, etc.

2. Timing Company: Verify use of homologated timing equipment
3. Scoring Computer Operations: Verify scoring software has been updated and is compatible with race result software
4. Chief of Manual/Hand Timing: Verify availability of supplies, equipment, and knowledge of procedures
5. Technical Delegate
 - a. Confirm timely synchronization of timekeeping equipment: electronic and manual
 - b. Prepare Timing & Data Technical Report (TDTR) for Technical Delegate's review/signature
 - c. Oversee electronic transmission of Timing & Data Technical Report, as required
 - d. Provide consistency and accuracy
 - e. Be available to verify all official times

B. Facilities and Schedules

1. Verify schedule for Team Captains' Meeting and plan on attending
2. Verify schedule for creating seed board
3. Verify location of Press Room and identify press room liaison personnel
4. Verify location and availability of results reproduction facilities
5. Inspect Finish Building and Finish Line/Finish Area [615.2]
 - a. Finish Photocells: Are they homologated?
 - b. Width between Finish Posts
 - 1.) DH and SG finish line dimensions – no less than 15 m*
 - 2.) SL and GS finish line dimensions – no less than 10 m*
 - 3.) Line is marked horizontally with a coloring substance so that it is clearly visible to the approaching competitor
 - 4.) Timing equipment/competitor security installation

*Distance is between finish posts/banners not length of finish line. Timing posts must be at least this far apart. The Jury may decrease this distance for technical reasons.
6. Start Area, Start Facilities and Start Gate/Area specifications [FIS Timing Booklet 2.58]
 - a. Homologated Start Gates
 - b. Dimensions
 - 1.) Width: Support posts should be 50 – 80 cm apart
 - 2.) Wand should be mounted approximately 35 – 50 cm from the snow
 - c. Start Wand Installation
 - 1.) Description: small diameter rod
 - 2.) Mounting
 - a.) Only one wand is permitted
 - b.) Wand cannot be so stiff that it could cause injury or not break, but must be stiff enough to eliminate false starts
 - c.) Wand must stay open once it is triggered; *auto return wands are not permitted*

- d.) Duplicate start wand must be on hand for replacement purposes
- e.) Mounted horizontally above the starting line and at an elevation that places it at or below a racer's knees
- f.) Mounted on a hinge. As the racer propels forward across the starting line, the wand is forced to swing forward and to the side by the racer's leg. Placement of start gate must be marked on the support posts.
- g.) Replacement must be with identical gate, at same position and with same rotation
- h.) If two start gates are used in concert, they must be solidly mounted on same physical bracket. Both mechanisms and box must be stiffly connected together.

NOTE: Refer to current FIS Timing Guide for information regarding angular range and accuracy of the start wand.

3.) Starting Gate

- a.) Minimum of 2 electrically isolated contacts activated by 1 wand.
- b.) Timing wires must be connected to separate start gate contacts using separate connections.
- c.) Wand must be installed so that starting is impossible without it opening.
- d.) Exact replacement gate must be available, if required due to failure

4.) Communication

- a.) Wiring between the start wand and the timekeeper's booth is generally available through another pair or wires or is piggybacked onto an existing pair – usually backup.
- b.) A headset may be plugged into a jack at the start so that the Starter can be in constant voice communication with the timing room

7. If possible, accompany Jury on course inspection and check for the following:

- a. Location of "yellow flag" zones and "blind" areas. Yellow flags as required for DH and SG. *Depending on terrain and/or course set, the Jury may also require them for GS*
- b. Staffing and location of Manual/Hand Timekeepers (Assistant Timekeepers)
- c. Staffing and location of intermediate timing positions, if available

V. Questions You Need to Ask:

- A. Are all entries in? Are all entries on the Board? *(This is important for Downhill Training where rules require that all qualified competitors be entered and drawn in all training runs.)*
- B. What computer-scoring program is being used and has it been updated? Is the operator familiar/comfortable with its use?
- C. Does it meet the requirements of 611.3.5, which requires that computer software that calculates net times must use precision of ToD as used in the timing device?
- D. Is the correct and current Points List available?
- E. Is the scoring computer up to date on entries?

- F. Have all the preliminary reports been prepared?
- G. What is preparation status of timing facilities? (**Refer to MPF #42. Timing Checklist**)
- H. Has all of the required header data been entered in the race file?
- I. What timing equipment is being used? Is the operator familiar/comfortable with its use?
- J. What system will be used to transfer data between results computer and timing
 - 1. Transfer of race file which does not allow the Race Administrator to perform race data editing during race
 - 2. Transfer of timing file which involves only bib numbers, competitors' names and times does allow for race data editing
 - 3. Verify transfer process been established and tested: email, cloud, thumb drive, or runner
- K. What start gate is being used?
- L. What finish photocells are being used? Photo Finish timing has been approved for use at FIS events for *backup purposes only*. FIS has established criteria for photo finish systems, and they must be followed (see current edition of FIS Timing Booklet). *Due to the cost of the equipment, it will mostly be used only at OWG, WSC, WC levels.*
- M. Is all equipment: timing equipment, start gates, and finish photo cells on the current homologated lists? [611.2]

NOTE: All timekeeping equipment MUST meet stipulated standards. Use of equipment that does not meet standards will result in an event not being considered (scored).

- N. Are requirements for electronic data transmission of Official Results and Penalty – wireless or network – in place?

It may seem that we are delving into areas of responsibility belonging to other officials; however, it is necessary to verify all interfaces have been established, tested, and are functioning smoothly and efficiently. There is not enough time to try to establish or fix procedures while the competition is in progress. The Chief of Timing & Calculations or Scoring – in cooperation with other officials – should evaluate these interfaces and take whatever action is necessary to get the job done without sacrificing QUALITY!

VI. Quality Assurance Actions:

- A. Team Captains' Meeting, Seeding and the Draw. According to National and FIS rules, the draw must be conducted (or confirmed) at a Team Captains' Meeting. A Team Captains' Meeting, attended in person or online by Team Captains, Jury, and race officials is an inseparable and mandatory part of the competition and is important for communication of Jury instructions, support of the OC, as well as conveying OC requests and information. *It is also a critical element for risk management and liability-related matters.* [Refer to 621.8, 604.3]

With the approval of the Jury and at a time and place announced to all Team Captains, and where a computer-generated Draw* has been approved or is not required (e.g.: YSL where TRS by class and gender is used to determine the start order), an informational meeting is still required. The meeting may be held either immediately after the completion of a race for the next day's event or on the morning prior to a race.

1. Keep in close touch with Secretariat (RA)
2. Attend Team Captains' meetings
3. Review the Seed Board before and after Draw
 - a. Verify accuracy of the Board
 - b. Verify seed-point ties are identified
 - c. Verify correct seeding of competitors entitled to 16th/31st position, if applicable (U.S. "Golden Rule", FIS Nor-Am Cup, and FIS World Cup)
 - d. Verify grouping of competitors without points
 - e. Verify additional special seeding groups as authorized by the Jury
4. Verify correct application of rule regarding "Snow Seed"
5. Verify number of available Forerunners
6. Independently record the Draw
7. Recheck the Start or Training List against the Board
 - a. Verify header information against the appropriate source: Homologation file **
 - b. Verify accuracy of footer information

NOTE: USE OF ELECTRONIC SEED BOARDS: Electronic seed boards must have the capability to simultaneously and legibly display the entire competition field. Simultaneous display of all competitors allows all Team Captains and officials to verify the overall accuracy as well as additions and deletions to the starting order in "real time". *Using the race result software to display portions of the competition field is not acceptable.*

* It is important to remember that computer-generated Draws are governed by a random identifier and unless this identifier is changed prior to each Draw, results of a Draw involving the same competitors may only have minimal changes.

** **NOTE:** Homologation files are available for review on the following websites. Inasmuch as paper copy files in the club/ski area files may be outdated, these are the only valid sources for verification of a course homologation:

media.ussa.org/Public/Athletics/CompServices/Homologation/
 (Login is required: **User ID = homologation; Password = Allout2018!**)

fis-ski.com/DB/alpine-skiing/homologations.html
 (Maps, photos, reports, etc. not accessible at this site.)

A new inspection of an existing course (FIS or National) voids the previous homologation of an existing course.

B. Downhill Training

1. Verify all timing equipment and personnel will be in place for all training runs
2. Verify accuracy of Start List in scoring computer
3. Address intermediate timing considerations
 It is best to co-ordinate with the Technical Delegate and the Jury for placement of intermediate timing equipment. To avoid the cells being triggered by anyone other than the competitors, it is recommended that the person responsible for intermediate timing points use a push-button to arm the photocells when a competitor crosses the line.
 - a. Timing equipment operators

- b. Necessity of having on-hill operators
 - 4. Multiple Time Bases
 - a. Verify that scoreboard, either electronic or paper, is available to display competitors' times
 - b. Verify that forerunners' times will not be displayed
 - c. Verify accuracy of time-of-day printouts
 - d. Verify status of press room video displays, if available
 - e. Verify status of Announcer's display, if available
 - 5. Press Reports (UNOFFICIAL) Standard format not required
 - a. Establish contact with Chief of Press
 - b. Establish system for press report production and distribution
 - 1.) Verify accuracy of documents released to press
 - 2.) Keep copy of all documents released to press
 - 3.) Cooperate with electronic transmission to Press Room if no runner is available
 - 6. Other Reports
 - Accurately prepare all required reports in a timely manner
- C. Race Day - Be prepared for the unexpected.
- 1. First Run
 - a. If possible, attend Jury inspection
 - b. Verify schedule
 - 1.) A run or race that is rescheduled for a later time slot on the same day is **delayed**
 - 2.) A run or race that is rescheduled to a different date within the series is **postponed**
 - 3.) A run or race that is started but cannot be completed is **terminated**. *There is no set number that has to start or finish. If even one forerunner has started and the Jury determines that the event cannot continue, it is a "terminated" event.*
 - 4.) A run or race that cannot be rescheduled within the series is **canceled***; cancellation of an event vacates the U.S. Ski & Snowboard race code/FIS codex and invalidates the event liability insurance.
 - c. Verify amount of 2nd Run "Bibbo" [Reverse 15? 621.11.3]
 - d. Verify synchronization checks with TD; assist with compilation of "Timing & Data Technical Report"
 - 1.) Online filing of the TDTR XML file is required for all FIS events. *The required program is currently available at fis-ski.com/en/inside-fis/document-library/timing-data. It is available for Windows 8.1, 10, and MAC OSX 10.10+ and is updated as required. Software will alert when an updated version is available; please update to current version.*

A PDF paper copy of the TDTR, as well as any required Replacement Time (EET) calculations, must be made available for inclusion in required electronic or paper copy race result document packets as noted in "Distribution of Documents – FIS Events."

- 2.) The FIS TDTR software is also used for preparing and submitting a TDTR XML file for non-FIS events. The software will produce the required PDF paper copy report. The software will accept a “National Race Code” which is used for a U.S. Ski & Snowboard Race code number (alpha character + 4-digit number). “Race Codex” may require data, and either “CHI – Children,” “CIT – Citizen,” or “JUN – Junior” category must be selected. (Refer to current TDTR tutorials for additional information; TDTR PPT is available on the U.S. Ski & Snowboard website.)

The U.S. TDTR available in the MPF on the U.S. Ski & Snowboard website is intended to assist in gathering data required by the FIS TD software.

As with FIS events, a paper copy of the TDTR as well as any required Replacement Time (EET) calculations, must be made available for inclusion in the required Race Result Document Packet.

- e. Verify course and weather data for headers and communicate the information to Race Administration
- f. Follow preparations of timing and computer operations
- g. Verify instructions for manual/hand timekeeping crew
- h. Verify Downhill and/or Super G competition course length measurement has been accomplished by wheel, tape, or GPS
- i. Recheck start order in computer
- j. Plan press report production; follow plan
- k. Keep "Report by the Referee" up to date by noting bib #'s for NPS, DNS, and DNF competitors
- l. Observe timing company operations
 - 1.) Verify accuracy of time-of-day printout
 - 2.) Verify accuracy of interval timing reports prior to distribution
 - 3.) Make notes on Start List; especially important for documenting anomalies
 - 4.) If possible, track differential between main and backup timing
 - 5.) Identify five best (lowest) point holders who start race regardless of result
- m. Print unofficial listing immediately after last competitor finishes
- n. Meet Jury at finish with complete unofficial listing and “Report by the Referee”
 - 1.) Assist Referee/Assistant Referee with review of Gate Judge Cards
 - 2.) Provide a copy of unofficial competitors’ ranking for the Technical Delegate
 - 3.) Deliver DSQ list to announcer
- o. Publish Unofficial Results report
- p. After protest period has expired, verify appropriate action taken on DSQ's with computer operations and/or Race Administrator
- q. Print/verify 2nd Run Start List or 1st Run Results
- r. Verify Race Administrator has been made aware of any Jury decisions that may require documentation (Jury Minutes), e.g.: application of snow hardening agents, change in start

order, change in start times, change in announced start intervals for Giant Slalom, Super G, Downhill Training, and Downhill.

- s. Although not necessarily part of your responsibilities, notify Race Administrator of any incidents that may require filing of injury reports
2. For Second Run of Two-Run Events
 - a. Verify completion of “Timing & Data Technical Report”
 - b. Verify 2nd Run cutoffs
 - c. Verify accuracy of Second Run Start List. [6.21.11]
 - 1.) “Bibbo”; check for ties at last position of flipped group (30th or 15th)
 - 2.) Verify start order of ties outside of “bibbo”
 - 3.) For scored non-FIS events, verify if 1st Run NPS, DNF, DSQ competitors are included on 2nd Run Start List
 - a.) Suggested Procedure for Tracking 1st Run NPS (track in DNS section), DNF, DSQ athletes in 2nd Run:

The Chief of Timing & Calculations and the Race Administrator account for all competitors, and the U.S. Technical Delegate Report requires documentation of these calculations. For events where 1st Run NPS, DNF, and DSQ athletes are allowed to start in the 2nd Run, this can create a unique challenge.

It is important that the Chief of Timing & Calculations continue recording after all valid 2nd-run starters have completed their run. Not continuing to record 1st Run NPS, DNS, and DNF competitors who are being allowed to take a 2nd Run will result in an incomplete record of the event, so the following recording method is suggested:

- Start Referee notifies Timing when last classified 2nd-run starter has left the start
- Chief of Timing & Calculations (or assistant), makes appropriate notations in the DNS and DNF sections of the Report by the Referee

Report by the Referee will now concisely reflect how many actual 2nd Run DNS and DNF competitors are to be considered in the calculation of “Finishers/Total Ranked” on Official Results.

The following is suggested method. Chief of Timing or assistant may use recording method of their choice; e.g.: End 2nd Run, Run 1 Racers, etc.

Did not start (No.)/Pas au départ (No.)/Nicht am Start (Nr.)		4	27								
2nd Run complete	18	34	42								
Did not finish (No.)/Pas à l'arrivée (No.)/Nicht im Ziel (Nr.)		1	7	23	29	31	37	41	45	49	52
	65	72	77	81	82						
2nd Run complete	6	15	21	34							
Time published / Heure d'affichage / Anschlagzeit H:mm		Deadline / Délai / Ablauf H:mm			Date / Date / Datum m/dd/yy			Signature Referee Signature du juge arbitre Unterschrift des Schiedsrichter SI			

- d. Complete additional duties performed during 1st run
- e. If time permits, complete hand calculation of Penalty and include calculation draft when meeting with Technical Delegate after race.

VII. Miscellaneous and Timing Update and Review Items: Non-FIS and FIS

A. **Factors:** There has been no change for Season 2022.

B. **Age Classes:** U.S. Ski & Snowboard U19 age group has been realigned to U18.

C. **MINIMUM PENALTY: EVENT DOES NOT MEET MINIMUM VERTICAL DROP**
If a U.S. Ski & Snowboard event does not meet required minimum vertical drop (MVD), the greater of the calculated penalty or minimum penalty of 60.00, shall be applied.

D. **TEAM CAPTAINS' MEETINGS: NON-FIS and FIS EVENTS**

Team Captains' Meetings for all U.S. Ski & Snowboard events are to be held either in person or online. Regardless of the format, an attendance list and minutes of the meeting must be generated. **[604.3]**

- Verify availability of internet connectivity with sufficient bandwidth
- Choose an online meeting platform and test its functions; e.g., sharing screen
- Include platform, URL, time, and date in Race Announcement
- Follow up with log-in information for registered clubs/Team Captains
- Establish procedure for posting required documents; e.g., Medical Plan, Program, etc.

E. **DOCUMENTS & SIGNATURES**

The list of documents that must be submitted to U.S. Ski & Snowboard and the FIS Office has been reduced, but rules still require signatures on many documents including, but not limited to TD Report, TDTR, Jury Minutes, Team Captains' Meeting Minutes, Report by the Referee, Protests. Signatures confirm that rules and procedures were followed, and original, signed documents may be required in a legal review.

If the Technical Delegate agrees to the use of electronic signatures on certain documents, s/he must verify availability of legally-acceptable document signing software, e.g., DocuSign, eSign, etc., which certify signatures with time and date, etc. *Copying and pasting a facsimile of a signature is not legally acceptable.*

F. **SCOREBOARD & OFFICIAL NOTICE BOARD**

The scoreboard as well as the Official Notice Board are usually located at or near the finish. However, the OC may opt to only use an online format for either or both of these items. In addition, an Announcer may be announcing DSQ's. In each case, the rules are satisfied, and unofficial results and other documents such as the Report by the Referee are made available for review. *Rules do not specify which system – acoustic, physical, or online – is preferred.*

G. **CALCULATION OF SEASON 2022 NATIONAL BASE POINTS**

National points for Season 2022 will be based on an athlete's best two results from Seasons 2020 and 2021.

H. **LESS THAN FIVE COMPETITORS: MAXIMUM VALUE: FIS Events Only**

If there are less than five competitors with FIS points among the first ten of the result list, or there are not five competitors who started with FIS points, then those competitors without FIS points will receive the maximum value as noted in Rules of the FIS Points.

If less than three competitors with FIS points are ranked within the five or at least three competitors without FIS points are classified, the competition will be considered for FIS points with a double of the maximum value (of the respective event) as minimum penalty. **[4.4.4 Rules of the FIS Points]**

I. **TIMING & DATA TECHNICAL REPORT (TDTR)**

A Timing Data Technical Report (TDTR) is required for all levels of competition, and the FIS TDTR software is to be used for its preparation and submittal. For non-FIS events, the Chief of Timing & Calculations is responsible for submitting the report in XML format to tdtr@usskiandsnowboard.org. For FIS events, the XML report is sent to alpine@fisski.com.

The PDF report must still be printed and signed as noted in instructions for preparing event document packets located in the Master Packet of Forms (MPF).

The U.S. TDTR in the MPF is intended for making note of items required by the FIS software. *If an event requires calculation of a replacement time (EET), copies of all calculations must be included with the PDF copy.*

J. **REPLACEMENT TIME (EQUIVALENT ELECTRONIC TIME – EET)**

When a System A (primary) time is missing, calculation of a replacement time utilizing a comparison of System A (primary) time-of-day start or finish impulse to (System B (secondary/backup) time-of-day start or finish impulse is required. *It is not permitted to substitute time-of-day times from System B for use with System A for the purpose of net time calculations.*

If both System A and System B timing systems fail, calculation of a replacement time utilizing a comparison of electronic time-of-day start or finish impulse to manual/hand time-of-day start or finish impulse is required.

IMPORTANT CLARIFICATION: If both the Start impulse and the Finish impulse from system A are missed, replacement ToD's must be calculated for each impulse as outlined in ICR 611.3.2.1. Net time is then calculated, verified, and applied. (Use one form for Start ToD and one form for Finish ToD.)

K. **CLINIC ATTENDANCE**

In addition to applicable certification and current U.S. Ski & Snowboard membership, an official must have attended a bi-seasonal Continuing Education Clinic prior to serving as a Course Setter, Chief of Course, Chief of Race, Referee, **Assistant Referee**, Jury Advisor (Start or Finish Referee), Chief of Timing & Calculations, or Race Administrator at U.S. Ski & Snowboard sanctioned events.

L. **COURSE HOMOLOGATION DATA VERIFICATION**

Paper copies of homologations located in ski area/club files may be outdated. The only accurate sources for course homologation data verification are the U.S. Ski & Snowboard and FIS websites.

U650.1.2 A new inspection of an existing course (FIS or National) voids the previous homologation of an existing course.

M. COURSE SETTING SPECIFICATIONS: MULTIPLE AGE CLASS COMPETITIONS

For multiple age class competitions, course setting specifications for Super G, Giant Slalom, and Slalom events are based on one class older than the youngest age class competing, e.g., U16, U14, U12, and U10 events will follow U12 specifications. Downhill event course setting is based on the youngest age class competing.

U8, although recognized by U.S. Ski & Snowboard, as well as additional classes for younger competitors are established for the purpose of awards and are subject to U10 course setting specifications.

These specifications only apply to course setting specifications; they do not apply to maximum vertical drop. Unless an athlete is competing with a “Ski Up Agreement”, they are not permitted to compete in events where the vertical drop exceeds the allowance for their chronological age group. Example: GS field consists of U16, U14, U12, and U10 athletes, U12 course setting specification will apply, but the maximum vertical drop of 200m for U10 athletes must be respected.

N. KOMBI RULES

- Kombi events must be set using appropriately homologated hills. Slalom/Giant Slalom format (technical orientation) using a hill homologated for Giant Slalom; Giant Slalom/Super G format (speed orientation) using a hill homologated for Super G
- Rules are those that apply to the faster of the events: e.g., Slalom/Giant Slalom events are governed by Giant Slalom rules; e.g., Start commands and start intervals; helmets

U1259.10 clarifies In Kombi competitions, athletes must use the helmets designed for GS, SG, or DH. Athletes U14 and older must use helmets that meet the FIS standards.

O. PARALLEL

Rules for Parallel events continue to evolve. Events are referred to only as “Parallel”. Please refer to current editions of ACR/ICR and their precisions.

U614.2.3 Competitors may step back (hike) in qualification round(s) only; stepping back (hiking) is not allowed in bracket round(s). FIS rules do not allow for stepping back (hiking) in any portion of Parallel events.

P. VALID / FALSE STARTS [613.7, 805.4] AND DELAYED STARTS [613.6, 805.3.1]

- Early/late start violation occurs when a competitor is in the start gate and does not start within the required period with respect to the start command – “GO”!
- Course workers and officials must have a reasonable expectation of when a competitor may be approaching their position. Competitors who either start early or late can minimize this expectation and potentially create an environment that is not secure. For these reasons, early/late start violations require DSQ. [613.7, 805.4]
- A “delayed” competitor is one who is not present in the start area or who is not ready to start when called [613.6, 805.3.1]

- A provisional start may be allowed by the Start Referee (*force majeure*) or the Jury (in case of doubt)
- Athletes who are given provisional starts are subject to SANCTION, which *may or may not* include DSQ

Q. START STOP

- ANY Jury member
- ANY Eyes of the Jury (Connection Coach, Chief of Course)
- ANY Jury Advisor (Start Referee or Finish Referee)

May call a “Start Stop” when necessary to address critical situations; no other official is authorized to call a “Start Stop”. Failure to comply may result in a “radio walk-over”, impairing the Start Referee’s ability to receive the transmission.

R. OTHER NECESSARY AND PLANNED INTERRUPTIONS

- **Course Maintenance:** Most course maintenance issues do not require a “**Start Stop**”. Depending on the type and level of event, a Jury may schedule course holds at regular intervals, e.g.: after first seed or set number of starts. An exception is if a broken gate or other material poses an interference for competitors on the course. Otherwise, experienced race crew members can operate within the start interval.
- **Timing Hold:** If required, a radio request for a timing hold is communicated by the Chief of Timing & Calculations to the Jury and the Start Referee. It is further communicated by radio to Jury positions along the course and by voice communication to those in the start area.
- **Start Interval:** The designated start interval for “fixed interval” events GS/SG/DH is the time planned between competitors’ consecutive starts. The start interval duration must be listed on the program as it is critical for course workers and officials to know when it is clear to work or communicate between competitors. Changes to the start interval **MUST** be communicated over the jury channel by the Start Referee or Timing.
- **Finish Interval:** A finish interval is a decision to start one racer after the completion of the run by the previous racer. The use of a finish interval, though not required, for the last few remaining athletes on the start list may help eliminate unnecessary delays by minimizing the interference of an athlete due to issues that may occur on the course prior to their start.

S. SYNCHRONIZATION OF ALL TIMEKEEPING SYSTEMS [611.2.1]

Synchronization of timing systems must occur *as close as possible to scheduled start for the first run*. The synchronization impulse for all timers must come from one single source (one contact) for all timing devices. *After synchronization is done, a new impulse must be sent by the same source to check the synchronization accuracy on Systems A and B*. Synchronization of all systems must be maintained and *must not be re-synchronized for the second run*.

T. MANUAL/HAND TIMING [611.2.2]

Stopwatches or hand operated battery powered timers installed at both the Start and the Finish and capable of expressing the time of day to at least 1/100th (0.01) precision qualify as proper hand timing devices. They must be synchronized prior to the start of the first run with the same time of day as System A and System B. *U611.2.2 states hand timing devices should “preferably” be synchronized with the same time of day as System A and System B.*

U. **FIS POINTS**

- Base Points must not be used for seeding or penalty calculation purposes.
- FIS Points are calculated to 999.00. U.S. Ski & Snowboard uses 999.99 to indicate an athlete has no earned National Points.

VIII. Miscellaneous FIS Race Penalty Information:

FIS-level Chiefs of Timing & Calculation must be aware of minimum/maximum Penalties that apply to the race being scored. The minimum is the lowest Penalty at which the event will be entered into the Points List. If the calculated Penalty is lower than the minimum, the minimum figure must be used. If the calculated Penalty is greater than the minimum, the calculated figure is used. Maximum/minimum Penalties can be found on the cover of the FIS Points List.

Category Adder and Minimum Penalty: The relevant adder - competition level, gender, and event specific - is added to the calculated Penalty. If the calculated Penalty is less than the minimum, then the minimum Penalty is applied.

IX. FIS Timing Requirements: Refer to most current edition of FIS Timing Booklet available in the Timing & Data section of FIS website.



TIMING CHECKLIST

- Interconnects 1. Is there wire? Does it work? Are you sure?
- Equipment 2. Is the equipment on the current list of timing equipment homologated by the FIS Timing Working Group?
(fis-ski.com/en/inside-fis/document-library/timing-data)
- Setup 3. Are the Time-of-Day times immediately and automatically sequentially recorded on printing strips at the maximum precision of the timing device according to the requirements for homologation?
- Software 4. If timing software is used to calculate times, is it calculating net times using the precision of ToD as used in the timing device?
- Hand Timing 5. Is hand timing that records to 1/100th (.01) precision available?
- Quality 6. Is the timing crew aware that hand times, even if not used, should be within acceptable limits?
- Start Gate 7. Does the Start Gate meet the following requirements?
a. Does the start have 2 separate electronically isolated switch contacts for triggering the start inputs from both System A and System B?
b. One wand?
c. Installed at proper height?
d. Are identical Start Gate mechanism & Wand available for replacement?
e. Is the placement marked on the Start Posts?
f. Are the Start Posts solidly installed?
- Finish Eyes 8. Do the Finish Photocells meet the following requirements?
a. Are 2 sets available?
b. Are 4 posts with a maximum diameter of 6cm available for mounting photocells? (2 are acceptable; replacements must be available)
c. Is the vertical separation between the beams no greater than 20cm?
- Synchronization 9. Have system A and System B been synchronized as close as possible to the scheduled start time for the first run of the day?
10. Has the synchronization been performed from one single contact switch for all timing devices?
- Systems 11. If System A fails, is the timing crew aware of the requirement to use System B times to calculate a replacement time (EET) for the missing impulse?
12. Is the timing crew aware that manual timekeeping is not used to calculate a replacement time (EET) impulse unless both System A and System B fail?



Alpine Skiing

2021/2022

1st FIS points list 2021/2022

Valid from 01-07-2021 to 04-08-2021

Category/Catégorie/Kategorie	Race level	Minimum penalty	Maximum penalty
OWG,WC,WSC	0	0.00	0.00
COM,WQUA	0	0.00	4.00
ANC,EC,ECOM,FEC,NAC,SAC,UVS,WJC	1	15.00	999.00
EQUA	1	23.00	999.00
NC	2	20.00	999.00
AWG,CISM,CIT,CITWC,CORP,EYOF,FIS,FQUA,JUN,NJC,NJR,UNI,YOG	3	23.00	999.00
ENL	4	60.00	999.00

MEN						GENERAL			WOMEN						
ADDER					Z-Value	Men/Women		ADDER					Z-Value		
Disc.	Level 0	Level 1	Level 2	Level 3	Level 4		F Value	Max points	Disc.	Level 0	Level 1	Level 2	Level 3	Level 4	
DH	0	0	2	3	13	0.00	1250.00	330.00	DH	0	0	2	3	13	0.00
SL	0	0	2	3	13	0.00	730.00	165.00	SL	0	0	2	3	13	0.00
GS	0	0	2	3	13	0.00	1010.00	220.00	GS	0	0	2	3	13	0.00
SG	0	0	2	3	13	0.00	1190.00	270.00	SG	0	0	2	3	13	0.00
AC	0	0	2	3	13	0.00	1360.00	270.00	AC	0	0	2	3	13	0.00

FÉDÉRATION INTERNATIONALE DE SKI
INTERNATIONAL SKI FEDERATION
INTERNATIONALER SKI VERBAND



PENALTY CALCULATION
CALCUL DE LA PENALITE
PUNKTEZUSCHLAGSBERECHNUNG

Name of Event <i>Nom l'événement</i> Name der Veranstaltung		
Date <i>Date</i> Datum	Event <i>Événement</i> Veranstaltung	Name of the TD <i>Nom du DT</i> Name des TDs

The best 10 at finish / 10 meilleurs à l'arrivée / Die besten 10 im Ziel

Result <i>Résultat</i> Resultat	Number <i>Dossard</i> Nummer	Name <i>Nom</i> Name	Nat <i>Nat</i> Nat	Time <i>Temps</i> Zeit	FIS-Points <i>Points FIS</i> FIS-Punkte	Best 5 <i>5 meilleurs</i> 5 besten	Race points <i>Pts de course</i> Rennpunkte

The best 5 at start / 5 meilleurs points FIS au départ / Die 5 besten FIS-Punkte am Start

TOTALS / TOTALS / SUMMEN

- (B) FIS Points of best 5 at start
Points FIS des 5 meilleurs au départ
 Die 5 besten FIS-Punkte am Start
- (A) FIS Points of best 5 to finish in top 10
Points FIS des 5 meilleurs dans les premiers 10
 Die 5 besten FIS-Punkte aus den ersten 10
- (C) Race Points of corresponding competitors
Points compétition de ces concurrents
 Rennpunkte der entsprechenden Wettkämpfer

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Calculated penalty / *Pénalité calculée* / Berechneter Zuschlag

A + B - C = : 10 =

Category Adder / *Additif de catégorie* / Kategorie-Adder

Penalty applied / *Pénalité appliquée* / Angewandter Punktezuschlag

Signature TD / Signature du DT / Unterschrift des TDs	Nr/No/Nr
--	-----------------

TIME-of-DAY (ToD) / MANUAL (ToD) REPLACEMENT TIME (E.E.T.) WORKSHEET

DATE: _____ EVENT: _____ MEN _____ WOMEN _____ RUN _____ CHIEF CALCULATIONS: _____

TIME-of-DAY (ToD) MISSING: _____ START or _____ FINISH

*Precision of time-of-day as used by timing device; minimum of 1/1000 precision required.

RACER BIB #	START/FINISH	START/FINISH	COLUMN A	COLUMN B
	SYSTEM B ToD* (or MANUAL ToD*)	SYSTEM A ToD* (or MANUAL ToD*)	SYS.B/MANUAL TIME SHORTER (+)	SYS.B/MANUAL TIME LONGER (-)
_____	____:____.____	____:____.____	____.____	____.____
_____	____:____.____	____:____.____	____.____	____.____
_____	____:____.____	____:____.____	____.____	____.____
_____	____:____.____	____:____.____	____.____	____.____
_____	____:____.____	____:____.____	____.____	____.____
_____	____:____.____	____:____.____	____.____	____.____
_____	____:____.____	____:____.____	____.____	____.____
_____	____:____.____	____:____.____	____.____	____.____
_____	____:____.____	____:____.____	____.____	____.____
_____	____:____.____	____:____.____	____.____	____.____

COLUMN A TOTAL + _____

COLUMN B TOTAL - _____

DIFFERENCE = (+) or (-) _____

DIVIDED BY 10 = (+) or (-) _____ = CORRECTION _____

BIB #	TIME OF DAY	(+) or (-)	REPLACEMENT TIME OF DAY
_____	____:____:____.____	____.____	____:____:____.____
_____	____:____:____.____	____.____	____:____:____.____

PROCEDURE TO BE FOLLOWED WHEN BOTH START & FINISH SYSTEM A TIMES ARE MISSED.

****If both Start and Finish ToD impulses are missed, replacement ToD's must be calculated for each ToD impulse as outlined in ICR 611.3.2.1.**

Net time is then calculated and verified.

(Use 1 form for Start ToD replacement calculation and 1 form for Finish ToD replacement calculation; complete net time assignment on Finish ToD calculation form.) ALL CALCULATIONS MUST BE SUBMITTED WITH TDR!

Bib # _____

Fn. ToD _____:_____:____.____

St. ToD _____:_____:____.____

Net Time: _____