



ADVANCED TIMING & CALCULATIONS - ALPINE

SEASON 2021

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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2020-2120

PLEASE NOTE: The COVID-19 pandemic may require ski area management to implement procedures to protect the wellbeing 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.

In addition to ski area management procedures, all event operations must follow local health authority guidelines. During the pandemic, U.S. Ski & Snowboard will maintain a COVID-19 resource page with recommended protocols (usskiandsnowboard.org/covid-19). Alpine Officials' information is available in a separate education folder entitled "COVID-19 Best Practices Guidelines".

"COVID-19 Best Practices Guidelines" (PowerPoint presentation) must be reviewed at all U.S. Ski & Snowboard Alpine Officials' Clinics.

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. In addition, 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 2021. 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
- 31. 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/decisions

Depending on the terrain and course set, Connection Coaches may also be appointed for GS

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 are 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
 - a. Announcer should be available to announce competitors’ *unofficial* times.
 - b. Announcer should be available to 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]

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 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 score board, 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 Vista, 7, 8, 10, and MAC OSX 10.10; it will be updated as required. Software will alert when an updated version is available; please update to current version.*

A 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 preferred for preparing and submitting a TDTR XML file for non-FIS events. The software will produce the required 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” is left blank but either “CHI – Children,” “CIT – Citizen,” or “JUN – Junior” category must be selected.

If using the software is not an option, a paper copy U.S. TDTR for use at U.S. Ski & Snowboard non-FIS events is available in the MPF on the U.S. Ski & Snowboard website.

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. Update and Review Items Relevant to Timing & Calculations

A. **Factors:** There has been no change for Season 2021.

B. **Maximum Values & Minimum Penalties:** There have been no changes for Season 2021.

C. **Timing & Data Technical Report (TDTR) – non-FIS Events:**

A Timing Data Technical Report (TDTR) is required for all levels of competition. FIS TDTR software is preferred for preparing and submitting the report. The Chief of Timing & Calculations is responsible for submitting the report in XML format to tdtr@usskiandsnowboard.org. PDF copy must still be printed and signed as noted in instructions for preparing event document packets located in the Master Packet of Forms (MPF). *If an event requires calculation of a replacement time (EET), copies of all calculations must be included with the PDF copy.*

D. **FIS Email Addresses:** Communications with FIS Office, e.g.: Minutes of Protest, Sanctions, etc. are to be sent to alpine@fiski.com. *If an event requires calculation of a replacement time (EET), upon request from FIS Office, copies of all calculations must be sent to this address.*

E. **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.

In both instances, the procedure is to compare the System B start or finish time of day or manual/hand start or finish time of day to the corresponding System A time of day time for the 10 times prior to the missed time. The sum of the comparisons is divided by 10, the difference is rounded up or down (as required), and the resulting correction value is applied to the applicable

A replacement time (EET), when required, is an official time and is valid at all levels and types of competition. *Forerunners' times must not be used in the calculation of replacement times.*

The actual calculation(s) must be made available for the Technical Delegate's review and must be included with the Technical Data Timing Report submitted in the required Race Result Document Packet.

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.)

F. **Synchronization of Timekeeping Systems [611.2.1]:** Synchronization of the timing systems must occur *as close as possible to the 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 synchronization

accuracy on Systems A and B. The maximum allowed difference between system A and B is 0.001 seconds. Synchronization of all systems must be maintained, and systems *must not be re-synchronized for the second run*.

- G. **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.

- H. **FIS Base Points:** Base Points must not be used for seeding or penalty calculation purposes.
- I. **Parallel Events:** Rules have been approved for U.S. Ski & Snowboard Parallel non-FIS events; FIS Parallel rules are also available. Please refer to current editions of U.S. Ski & Snowboard ACR and/or FIS ICR and their Precisions. (Parallel Power Point presentation is available on the U.S. Ski & Snowboard website.)
- J. **FIS Points:** FIS Points are calculated to 999.00. U.S. Ski & Snowboard uses 999.99 to indicate an athlete has no earned National Points.
- K. **Results for Limited Finishes:** How many racers have to finish in order for an event to be scored?
1. **Non-FIS:** “Ghost” racers with maximum value points may be added to bring total of finishers to 5; no race penalty can be calculated when there are fewer than 3 finishers. [2020 Alpine Competition Guide: Rules for National Race Penalty Calculations - Fewer than Five Racers Finish.] *Penalty will have to be calculated manually; “ghost racers” must not be inserted into the race scoring software.*
 2. **FIS:** 5 must be classified; 3 must have FIS points. [4.4.4, Rules of the FIS Points]
- L. **FIS Penalty: (Refer to FIS List Cover Page and MPF #39. FIS Penalty Calculation Form)**
1. Understand procedure [4.4]
 - a. Identify event level
 - b. Select gender
 - c. Select event for Adder [4.4.7, 4.5]
 2. Understand procedure when current seed points are above maximum value or do not exist:
 - a. Maximum value is assigned to competitors who are ranked in the top 10 in time whose actual seed points are above the maximum value
 - b. Maximum value is also assigned to competitors who are ranked in the top 10 in time and have not earned FIS points
 3. Understand how to recognize and apply rules regarding ties in Penalty calculation
 - a. Tie 10th place in time: consider all ties to select best (lowest) 5 seed points
 - b. Tie 5th best (lowest) seed points - higher race points
 - c. If competitors to whom maximum value has been assigned are being considered among the 5th best (lowest), competitors who had “actual” FIS Points are chosen first

4. Penalty calculations - See **CURRENT RULES OF THE FIS POINTS**.
 - a. Minimum penalty - where found [4.5]
 - b. Best 5 who start [4.4.2]
 - c. Best 5 ***FIS Points*** [4.4.3]
 - d. Less than 5 with FIS Points – assignment of maximum value [4.4.4]
 - e. Negative penalty [4.5]
 - f. Rounding [4.4.8]
 - g. Alpine Combined [4.4.9]
5. Category Adders and Minimum Penalties [4.5]
The relevant category adder is added to the calculated penalty. If the calculated penalty is less than the minimum, the minimum is assigned as the penalty.
6. At least five racers have to finish and at least three of them must have actual FIS points or the race penalty cannot be calculated and the event cannot be scored.

M. U. S. Ski & Snowboard Penalty – NON-FIS EVENTS

1. Minimum Penalties for scored events
 - a. The minimum penalty for a non-FIS race that meets minimum vertical drop requirements is 40.00. If the calculated penalty is lower than 40.00, the applied penalty shall be 40.00. If the minimum vertical drop requirement is met, the minimum winning time requirement does not apply.
 - b. The minimum penalty for a non-FIS race that does not meet minimum vertical drop requirement but does meet minimum winning time requirement as published in the 2020 Alpine Competition Guide is 75.00. If the calculated penalty is lower than 75.00, the applied penalty shall be 75.00.
 - c. If both of the published standards – the minimum vertical drop requirement and the minimum winning time requirement are not met, then the greater of the calculated penalty plus an additional penalty as published in the 2020 Alpine Competition Guide, or the minimum penalty of 75.00 shall be applied.
2. Calculation of a non-FIS Penalty under particular circumstances
 - a. Race fails to meet Vertical Drop, Minimum Time Requirements

MINIMUM VERTICAL DROP PER RUN:

ALTERNATE MINIMUM TIME STANDARDS AND ADDITIONAL PENALTY:

<u>EVENT</u>	<u>MIN VD</u>	<u>ALT MIN TIME</u>	<u>ADDITIONAL PENALTY</u>
DH*	400 m	60 seconds combined/max 2 runs	26.00
SL	100 m	50 seconds combined for 2 runs	12.00
GS	200 m	50 seconds combined for 2 runs	17.00
SG	300 m	40 seconds for 1 run	21.00
P	60 m	40 seconds combined for 2 runs	10.00

NOTE: DH “combined/max 2 runs” does not eliminate 60-second minimum time for a 1-run DH.

- b. Fewer than ten racers finish, a minimum race penalty shall be applied regardless of the calculated penalty, as follows:
 - 1.) DH – 180
 - 2.) SG – 135

- 3.) GS – 110
 - 4.) SL – 100
 - 5.) AC – 125
- c. When at least five racers with valid National points finish, but one or more has points over the maximum value, assign points at the maximum value as follows, prior to completing the calculation:
- 1.) DH – 820
 - 2.) SG – 660
 - 3.) GS – 530
 - 4.) SL – 360
 - 5.) AC – 660
 - 6.) P – 445
- d. When fewer than five racers in the first 10 have valid National Points
- 1.) Assign maximum value in order to bring the total of racers with points to five
 - 2.) Remember maximum value is also assigned to any of the best five whose actual National Points are above the maximum level
- e. When fewer than five racers finish, penalty must be calculated manually:
- 1.) Insert “ghost” racers in order to reach a total of five
 - 2.) Assign maximum National Points to each “ghost”
 - 3.) Assign race points equal to those of the lowest ranked (slowest time) finisher
 - 4.) Calculate penalty according to the form.

RACE PENALTY CANNOT BE CALCULATED WITH FEWER THAN THREE FINISHERS!

N. “Start Stop” - When necessary to address critical situations:

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

MAY call a “Start Stop”; no other official is authorized to call a “Start Stop”. Failure to comply may result in a “radio walk-over”, effectively canceling the Start Referee’s ability to receive the transmission.

Other Necessary and Planned Interruptions

1. **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.

When it is necessary to have a hold for an extended period of time for course maintenance, the Chief of Course or another Jury member can inform the Start Referee to interrupt the race to complete the task. On fixed interval events, it is common to indicate requested amount of time in terms of intervals - “We will need a 4 interval hold for maintenance.”

2. **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.

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

2020/2021

1ère LISTE DES POINTS FIS - 1st FIS POINTS LIST - 1. FIS PUNKTELISTE

Valid from 7/2/2020 to 8/5/2020

Category/Catégorie/Kategorie	Race level	Minimum penalty	Maximum penalty
OWG WSC WC		0	0
COM WQUA		0	4
WJC ANC EC FEC NAC SAC ECOM EQUA	1	15	999
NC	2	20	999
YOG FIS FQUA AWG JUN NJC NJR CIT	3	23	999
ENL	4	60	999

MEN					GENERAL		LADIES						
ADDER				Z-Value	Men/Ladies		ADDER				Z-Value		
Dis.	Level 1	Level 2	Level 3	Level 4		F Value	Max points	Dis.	Level 1	Level 2	Level 3	Level 4	
DH	0	2	3	13	0.00	1250	330	DH	0				
SL	0	2	3	13	0.00	730	165	SL	0				
GS	0	2	3	13	0.00	1010	220	GS	0				
SG	0	2	3	13	0.00	1190	270	SG	0				
SC						0	0	SC	0				

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

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

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

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 / <i>Signature du DT</i> / 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: _____