Timing and Scoring Manual

Updated January 2006

FORWARD

The contents of this manual come from many sources. The first manual was the 1972 "Official SCCA Timing and Scoring Manual" compiled and written by Bob and Eleanor Perry of the Glen Region. The manual was revised and updated in 1983 by T&S National Administrator Wilma Dunias, and various Divisional and Regional T&S Administrators.

Much of this manual is based on the excellent 1994 Race Communications Association, Inc. "Timing and Scoring Manual," written by Marie Sheehe (Moldt) Heacox of the Glen Region, and edited by Patty McCabe. Rather than having to reinvent the wheel, Marie graciously agreed to let us adapt portions of her manual for SCCA.
Many thanks to all SCCA T&S officials who have contributed to this manual with their suggestions and help, but we would especially like to thank the T&S personnel of the Northeast and Central Divisions and the Runoffs T&S workers. It is a sign of great workers to be willing to devote their time and efforts to this project, which will (hopefully) help new T&S workers and administrators.

Although much has changed in timing and scoring since the writing of this manual we have left all of intact to teach and instruct the manual systems. Having a good understanding of manual timing and scoring is most beneficial and necessary to the event chiefs.

With the more accepted and trusted use of transponders there is a new section of this manual that relates to transponders. This is only the basics of transponders and not meant to train you on how to run a transponder system. There are files available on the SCCA website, Discussion Group, Workers then Timing and Scoring, for your use and training purposes. You also can call email Con Peplowski at times99@sbcglobal.net or you can call her at 1-440-442-4521 for files she has written on AMB software use and Rmonitor.

Table of Contents

Forward

Part I. Timing and Scoring – General

Introduction 5
General Description 5
Purpose 5
Timing and Scoring Terms 5
General Definitions in the GCR 6
Manual Timing 8
General Description 8
How to Operate a Stopwatch 8
Filling Out the Time Card 8
How to Calculate Lap Times 9
When Does Time Start? 9
Sample Time Cards 11
Electronic Timing 12
General Description 12
Taping 12
Sample Tape 13
Operating an Electronic Timer 14
Computer Operation 14
Auditing/Collating for the Electronic Timing Team 15
Sample Tapes - Before Auditing 16
Sample Tapes - After Auditing 16
Sample Tape and the Timer Printout - Before Auditing 17
Sample Tape and the Timer Printout - After Auditing 17
Scoring 18
General Description 18
Preparing the Lap Chart 18
Recording Lap Information 18
Recording the Results Information 19
Steps in Filling in the Lap Chart 19
Completed Lap Chart 21
Results 22
General Description 22
General Procedures 22
Post-Race mailing 23
Runners 24
Communications 24
General Description 24
Transponders 25

Part II. Personnel

Personnel 27
Licensing 27
Grades and Qualifications of Licenses 28
Regional Licenses 28
Divisional Licenses 28
National Licenses 29
Senior Licenses 29
Duties of the Timing and Scoring Personnel 29
Duties of the Regional Administrator of Timing and Scoring . . . 29
Duties of the Chief of Timing and Scoring 30
Duties of the Chief Timer 31
Duties of the Chief Scorer 32
Duties of the Chief of Results 32
Event Wrap-Up 32

The Timing & Scoring Team 33

Part III Transponders

Appendix 34

Part I. Timing and Scoring – General

Introduction

Welcome to the world of SCCA Timing & Scoring.

GENERAL DESCRIPTION

Funk & Wagnall's Standard Dictionary defines a race as "a contest to determine the relative speed of the contestants." Timing and Scoring's function is to report the race by recording each competitor's speed, scoring him/her according to the number of laps completed, the order in which he/she crosses the start/finish line, and by producing accurate results of this contest. This is accomplished by the five groups which make up Timing and Scoring - Manual Timing, Electronic Timing, Scoring, Communications, and Results.

Manual Timing refers to the use of stopwatches to measure each competitor's lap times. Each timer is assigned one or more cars, and records cumulative and lap times for each car on time cards. Scoring records the position of each car in the field by writing the car numbers on a lap chart in the order they cross the start/finish line. The lap chart is a visual record of the number of laps completed by each competitor and his/her position within the running order at any time in the race. Electronic Timing combines the lap times and field position. As each car crosses the start/finish line, tapers manually record its number, and a timing device electronically records the time. The car numbers and their times are then entered into a computer, which calculates lap speeds, the running order, and the number of laps completed. Communications keeps the timers and scorers informed of the status of cars that are missing, and whether or not they will be returning to the track. All this information is then passed to the Results team, which verifies the data and compiles the official qualifying and race results. These results are then distributed to the race officials, competitors, and the press.

Working in T&S can be a very rewarding job. You have first-hand knowledge of the running order, and are responsible for producing the official results. There is a special friendship among those in Timing and Scoring as they all work toward that common goal - to make a race a race.

PURPOSE

The purpose for providing this material is fourfold:

1. To provide the Regional Administrator and Timing & Scoring Chiefs with an outline of what is required of Timing & Scoring before, during, and after a race as specified in the GCR;
2. To assist the Regional Administrator and Chiefs of Timing and Scoring in the education of new personnel in the operation of the Timing & Scoring specialty;
3. To give you an overview of the Timing & Scoring (T&S) personnel required for each facet of the event and help you to organize your T&S team to perform their duties efficiently; and
4. To provide guidelines which may be customized for each region, track and event.

The manual is not intended as a mandate to standardize each region's Timing & Scoring specialty.

Timing & Scoring Terms

Although terms for activities differ from region to region, these are generally recognized in SCCA.

AUDITING	Checking tapes or time cards for accuracy
BRACKET	More than one car assigned to one time split. For the purposes of this manual, this term will be used throughout, although some regions use the term "double" or "overlap".)
CHECK OFF	A form used in practice sessions to record the number of laps for each car. May be done on the computer.
COLLATING	Combining audited tapes with the printed tape containing time splits from the electronic timer.
DOUBLE OR TRIPLE	One car, multiple time splits.
HIT OR SPLIT	Time recorded from timer (stopwatch or electronic timer)
MARK(S)	Is (are) used to start the timing devices, either watches or electronic timers
PADDOCK	Car has entered the paddock area as defined in the Supplemental Regulations
PIT	Designates car either entering or exiting pit road
"PIT NOW"	Phrase used by the timer operator to inform the tapers when to record pitting cars on their tapes.
PULL OR TEAR	Designates the beginning of a new tape or tear or continuity sheet
TAPE	Also called tear sheet or continuity sheet. A record of cars in the order that they crossed the Control Line
WORKING LAP	Car is racing on a lap number that will be completed when the Control Line is crossed

General Definitions

The following definitions used throughout this manual have been excerpted from the SCCA General Competition Rules. Since the GCR is updated each year, the section references may change. It is important that the Regional Administrator for Timing and Scoring and each Chief become familiar with the GCR and the supplementary regulations found on the entry form for each event.

1. ABORTED START (GCR 7.3.4.)
   Should an aborted start occur and additional pace laps be run, those additional laps will be cored as race laps and timing will start when the pole car crosses the timing control line unless otherwise specified by the Supplementary Regulations for the event.

2. CHECKERED FLAG (GCR 8.7.)
   The checkered flag shall be displayed first to the winner as he or she completes the prescribed distance of the course or crosses the finish line after completing the prescribed time, and then to the other finishers as they cross the finish line. If the checkered flag is displayed first to the wrong car, the race shall still finish when the actual winner crosses the finish line.

3. CLASSIFICATION OF CAR AS A STARTER (GCR 7.3.2.)
   To be considered a starter, a car shall receive the green flag at the start or, in the case of an aborted start, cross the control line. Cars that are on the course, not in the pits, when the green is displayed shall be considered starters. A car shall enter the race before the checkered glag is displayed in order to be classified as a starter.

4. CONTROL LINE (GCR 8.2.)
   A car crosses a control line when any portion of the car first intercepts the vertical plane of the control line, as observed by the officials assigned to record the passage, who may be aided by suitable automatic or semi-automatic equipment.

5. DEAD HEATS (GCR 8.3.)
   In case of a dead heat, the competitors concerned shall share the prizes allotted to their places in the Results. (See 16.2.4., Dead Heats, with respect to allocation of National Race points.)

6. FALSE START (GCR 7.3.3.)
   A false start shall occur when a driver under the Starter's orders moves forward from his or her prescribed position before the start. In the case of a rolling start, this movement shall refer to improving the driver's position in relation to the moving field by moving out of line or passing prior to the waving of the green flag. If the Chief Steward determines that a false start has occurred, and the race has been started, that driver or drivers may be black-flagged and held in the pits or at the start line for a period of up to one minute. Other penalties may also be imposed. (See 14.,Penalties)

7. FINISHERS (GCR 8.4.)
   A. In order to be considered a finisher, a car shall complete half the distance covered by the overall winner of the race. If the race length is an uneven number of laps, divide the overall winner's laps by two and round down to the nearest whole integer. A car has five (5) minutes after the checkered flag is displayed to complete his or her lap.

   B. A car may be considered a finisher if it is pushed across the Control Line or driven using on-board power (e.g. starter motor). This may only occur in the pit lane. Pushing a car on the racing surface is strictly forbidden.

8. INITIATION OF TIMING AND SCORING (GCR 8.1.4.)

   C. For the start of a qualifying session, the electronic timer (and/or stopwatches) shall be started simultaneously on a signal given by the Chief Timer.

   E. For the start of a race, the electronic timer (and/or stopwatches) shall be started simultaneously when the first car crosses the timing control line at the completion of the pace lap.

9. OFFICIAL TIMES (GCR 16.1.3.)
   A. At all National Championship events, grid positions shall be determined by official qualifying times certified by the Chief Timer. See 7.1.5., Starting Positions, and 7.1.6., Over Subscribed Classes.
   B. Any other method of determining starting position shall be described in the Supplementary Regulations and approved by SCCA.

10. PRACTICE/QUALIFYING (GCR 16.1.2.) (National Championship Racing)
There shall be a least forty-five (45) minutes in total of practice and/or qualifying time available to each class. All cars entered in the event shall practice and qualify by race group. Each competing driver/car combination shall qualify within a maximum of 120% of the qualifying time of the fastest qualifier in his or her class in order to be permitted to start the race unless waived by the Chief Steward. Each group shall have at least two (2) sessions. Qualifying shall be in race groups. National practice may be combined with Regional practice and qualifying. National qualifying shall not be combined with Regional practice and qualifying.

11. RESTARTS (GCR 7.7.)
When a race is restarted, each pace lap shall count as a race lap. In a timed race, the clock shall be restarted when the field is dispatched. No replenishment of or assistance to cars shall be allowed after a race is stopped and before it is restarted. However, any method of restarting the engine is permitted.

If a race is stopped, the Chief Steward may: (specify one of the following:)

1. Order a complete restart according to the original starting positions;
Note: A car which completes the pace lap for the first start is considered a starter.

2. Restart the cars in a single file in the overall order in which they completed their last completely scored lap; (See appendix for article from SportsCar Magazine which defines "last completely scored lap").

3. Restart from a scoring tape or a lap chart whichever best fits the conditions at hand.

12. SCCA STANDARD START (ROLLING START) (GCR 7.5.)
The following rolling start technique shall be known as the SCCA Standard Start and shall be utilized at all SCCA races, unless an alternate procedure has been approved by the Divisional Executive Steward and is set out in the Supplementary Regulations for the event.

13. SHORTENED RACES (GCR 8.5.)
1. If a race is stopped at less than fifty (50) percent of its scheduled time or distance and is not restarted, it shall be considered incomplete. Championship points shall not be awarded, and organizers shall not be required to distribute trophies or other awards.

2. A race that is stopped at fifty (50) percent or more of its scheduled time or distance, and not restarted, shall be scored as a complete race as of the end of the last completely scored lap (even if that lap is less than fifty (50) percent of the scheduled distance.)

14. SPLIT STARTS (GCR 7.6.)
A. Split starts are recommended where there is a large differential in speed or cornering ability between the classes or categories in a single race group. The procedures for a split start shall be set out in the Supplementary Regulations or explained at a Drivers' Meeting. The group containing the car with the fastest qualifying time shall start first.

B. The second group also should be led by a pace car, which should keep the first group in sight (on the longest straight). If the first group gets a green flag, then the second group's race will be considered to start no matter what flag the starter displays. This will allow the starter to display a yellow flag if warranted by an incident in the first group. Anyone jumping the start in the second group may be penalized.

C. A starting judge should be appointed for a split start.

15. STARTING LINE FOR TIMING AND SCORING (GCR 7.3.5.)
For a rolling start, the starting line shall be the control line on the crossing of which the timing commences unless otherwise provided in the Supplementary Regulations.

16. STARTING POSITIONS (GCR 7.1.5.)
A. Cars shall be positioned at the start in order of their official qualifying times without regard to engine displacement or class, with the fastest cars nearest the starting line, unless the Supplementary Regulations specify a different method.

B. In case of a tie in qualifying times, the second fastest lap, then the third fastest, etc., shall be used to break the tie.

C. It shall be the car/driver combination which qualifies for a starting position.

D. The fastest qualifier shall have the choice of the inside pole position (nearest the direction of the first turn) or the outside. Absent a choice, the pole position is assumed to be the inside. When outside position is chosen, the second qualifier will be inside, the third outside, the fourth inside, etc. Continue to alternate the entire grid.

E. Non-Qualifiers may be gridded behind qualifiers by the Chief Steward per GCR 16.1.2.

F. Cars not in position on the grid prior to the one (1) minute signal (7.5.1. and 7.5.2) shall relinquish their starting positions and shall start from the back of the field.

17. WINNER (GCR 8.6.)

The winner shall be the competitor who covers the prescribed distance of the competition in the least time, or the greatest distance within the prescribed time of the competition. If the race is shortened, the leader of the last completely scored lap is the winner, provided the race is completed. (See 8.5.1)

Manual Timing

GENERAL DESCRIPTION

Manual, or stopwatch, timing is basic to timing and scoring. It provides a record of a car's cumulative times, lap times, and fastest laps. When all watches are started properly, the time cards may be used to reconstruct a race if necessary (such as a power failure affecting electronic timing.) Time cards are also used by the results team to verify the data collected through electronic timing. For these reasons manual timing is one of the first skills all timers and scorers should learn.

Timers are assigned one or more cars to time, depending on their ability. Each car has its own time card on which to record the splits (the cumulative time that has elapsed since the beginning of the session), lap times, and any remarks, such as when the car enters the pits. Dual display watches are very helpful in that they display both the split and the lap time. Rookie or beginning timers are expected to time one car per watch. With experience, timers may time two or more cars per watch, and be able to calculate lap times by subtracting consecutive splits.

This section of the T&S Manual gives step by step instructions on how to operate a stopwatch, fill out a time card, figure lap times by subtraction, and when to take the first split. Included are sample time cards.

HOW TO OPERATE A STOPWATCH

These instructions refer to dual display stopwatches, and you will find that many brands and models operate in the same way.

Before a session the Timing Captain should review how to start the watches, record the split, and restart the display if necessary. He/she should make sure that all watches are set to record split times, not lap times. Any extra stopwatches should be started as backups.

1. To start the stopwatch, press the START/STOP button (SET/START/STOP on some watches). Once you start timing a session, be careful not to touch the START/STOP button again as this will stop the internal clock and zero out the watch.

2. To record a split, press the SPLIT button (SELECT/LAP/RESET on some watches). The time display will freeze until you press the SPLIT button again, however the internal clock will continue running. The lower time display is the split (the cumulative time that has elapsed since the watch was started). The upper display is the time that has elapsed since the last split was taken. This would be the lap time if the watch were being used to time only one car.

3. To restart the display, press the SPLIT button again. Be sure to restart the display after you have recorded both the split and lap times. (Note: If you have a 3rd display line that runs continuously, skip this step).

4. To stop the watch, press the START/STOP button, then press the SPLIT button twice until the time display reads 0:00.00.

FILLING OUT THE TIME CARD

Before Each Session

1. Sign out the stopwatch as directed by the Timing Captain.
2. Make sure your stopwatch is in the STOPWATCH MODE recording split times and is zeroed out.
3. Familiarize yourself with:
a. Your car's number and color and what session you are working (P1, Q1, R1, etc.),
b. When the mark will be given to start your watch,
c. When the first split is to be taken (see "When to Take the First Split"),
d. Whether or not the cars are to be timed into the pits.
4. Make sure you are using the correct side of the time card (Qualifying or Race).
5. If there is more than one session on the time card, skip a couple of lines above the previous session and draw a line. Number the laps for this new session, beginning with the word START.
6. Listen for instructions being given by the Chief of T&S or the Timing Captain. The Timing Captain may be asking who has a specific car and needs your attention for this roll call.

During Each Session

7. Start all the stopwatches that you have when the mark is given. If for any reason a watch does not start, ask for a backup watch.

8. Record splits when your car crosses the control line under CUMULATIVE TIME, and the subtracted lap times under LAP TIME: See GCR 8.2. Control Line. Times are recorded starting at the bottom of the imecard, with each consecutive split (and subtracted time) recorded above the previous one.

    a. If you didn't get the split, or missed the car, write MISS on the line for cumulative time. Don't fudge a time. Even experienced timers miss cars, and not marking a missed lap compounds the error and gives an incorrect lap count for that car.

b. If your watch zeroes out during a session, ask for a back-up watch.
c. Do not stop any watches during a session unless instructed to do so.

9. If directed by the Chief Timer, indicate on your time card:
   a. "Re-entered from paddock",
   b. PIT-when your car enters the pits,
   c. YF (Yellow Flag) or similar notation to indicate yellow flag lap times,
   d. GF (Green Flag), BFA (Black Flag All), or RF (Red Flag),
   e. New Watch or Diff. Timer, when you have changed watches or timers.

After Each Session

10. Indicate the checkered flag (CF):

    a. If your car took the checkered flag on track or in the pit lane write CF next to the lap your car took the checkered flag.
    b. If your car did not take the checkered flag, indicate CF on the line after your car's last lap.
    c If your car did not start the race write DNS (Did Not Start) in lap 1.
    d. If your car started the race, but did not complete any laps, write DNF (Did Not Finish) in lap 1.

11. Do not stop your watch until instructed to do so by the Timing Captain. Cars have five minutes after the checkered flag to complete their last lap, either on the track or in the pits (See GCR 8.4.1).
12. Indicate the fastest lap time as directed by the Timing Captain.
13. Sign your name next to the completed session.
14. Label the session as directed by the Timing Captain, P1, Q1, R1, etc.
15. Double check your subtraction and make sure the lap indicated was the fastest lap. Most cars will have consistent times, so if you see a difference of 5 or more seconds in the lap times, recheck your subtraction.
16. Hand your time card to the Timing Captain. Do not assume it will be picked up, make sure it is turned in.
17. Turn in your stopwatch as directed by the Timing Captain.

HOW TO CALCULATE LAP TIMES

Experienced timers can calculate lap times by subtracting the previous split from the split just recorded. This would allow you to time two or more cars during a session using one watch. You may, however, have to convert one minute to 60 seconds and add that to the seconds first. See the examples below:

```
Second split   14:22.68 = 13:82.68   (14 min + 22 sec = 13 min + 60 sec + 22 sec = 13 min + 82 sec)
First split    11:47.23 = 11:47.23
Lap time       2:35.45              (First split subtracted from second split)

Second split   29:06.65 = 28:66.65   (29 min + 6 sec = 28 min + 60 sec + 6 sec = 28 min + 66 sec)
First split    26:33.09 = 26:33.09
Lap time                   2:33.56   (First split subtracted from second split)
```

WHEN DOES TIME START?

Sanctioning bodies can differ on this point, and a description of the different methods will help you understand the different procedures.

Practice and Qualifying

The method most frequently used by SCCA is to give the mark to start the clocks sometime before the first car crosses the control line. This may be when the field first enters the course, or perhaps when they are coming off the last turn before the start/finish line. The first split is then taken when your car takes the green flag, or the first time you see your car cross the control line, and that split time is recorded in the START portion of the time card. The timers must be alert to locate their car and to record that initial split the first time they see their car cross the control line

Race Sessions

The procedure for giving the mark and taking the first split is the same for all race sessions. The mark is given when the first car crosses the control line. A START time of 0:00.00 is recorded on the time card. The Timing Captain will instruct you what to do if there is a no start or wave off. In SCCA racing, the extra pace lap will count as a race lap with all cars being given the same time for lap 1. A time split should be taken for all subsequent crossings of the control line.
Because of differences in track layout and the placement of the START/FINISH flag station, your car's first lap time may be longer or shorter than the remaining laps. It is usually not used in calculating the fastest lap.

Session No. _____
Timer's Initials _____
Watch No. _____

CAR NO. - CLASS _____
Course Class Record _____
Fastest Lap No. _____ Time _____
Make _____ Colors _____
Driver

0						
9						
8						
7						
6						
5						
4						
3						
2						
1						
0						
9						
8						
7						
6						
5						
4						
3						
2						
1						
0						
9						
8						
7						
6						
5						
4						
3						
2						
1						
Start						

RACE TIME	LAP TIME
Location	Date

Session No. _____
Timer's Initials _____
Watch No. _____

CAR NO. - CLASS _____
Course Class Record _____
Fastest Lap No. _____ Time _____
Make _____ Colors _____
Driver

0						
9						
8						
7						
6						
5						
4						
3						
2						
1						
0						
9						
8						
7						
6						
5						
4						
3						
2						
1						
0						
9						
8						
7						
6						
5						
4						
3						
2						
1						
Start						

RACE TIME	LAP TIME
Location	Date

Electronic Timing

GENERAL DESCRIPTION

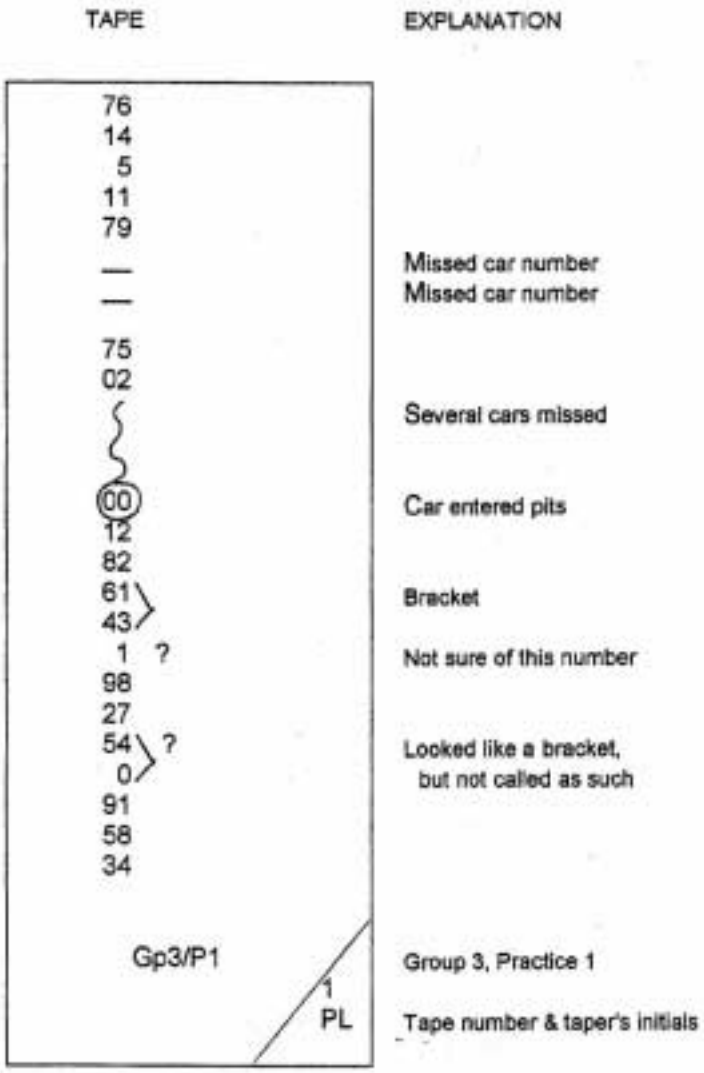
Electronic timing relies on equipment such as photocell pair used to trigger an electronic timing device, sending data to a computer and the manual input of car numbers by the computer operator. The software used produces both timing and scoring information (i.e. lap times and position within the field). Most regions use some type of electronic equipment to produce the results.

Tapers are responsible for continuity tapes, or listing the car numbers in the order in which they cross the control line. At least three tapers are needed along with an auditor (or auditors) who reviews the tapes and reconciles any differences. A photocell set at the control line sends a signal to an electronic timing device each time a car breaks the beam emitted by the source. This is called a "hit, or split." The electronic timer, accurate to .001 seconds, records the time of each hit. This data is then sent to the computer. The computer operator keys in car numbers associated with the incoming data from the electronic timer. The auditor collates the audited tapes to supply any missed or incorrect car numbers. The computer operator then uses these edited tapes to verify or enter the car number for each time sent to the computer by the timing device.

The timer operator, computer operator, and tapers must concentrate on all the cars and not just a few as manual timers do. While manual timers depend on their ability to recognize a few cars by their number, color, markings, and even shape, those in electronic timing must recognize all the cars. They generally do this by quickly scanning each car for its number, and then moving on to the next car. Legible numbers on all cars is a requirement for this kind of system to work well. The tapers and timer operator should work a practice or qualifying session for each group before the race sessions so that they are familiar with the numbers and cars.

TAPING

1. Prepare at least as many tapes as there are scheduled laps. Extra tapes may be needed for grid or pace laps and for cool-off laps. Number and initial the tapes as directed by the Timing Captain. Different colored tapes, pens or pencils may be used for different functions. Ex: Start-Finish line, Timer, Trackside Chart.
2. Write the group and session information at the bottom of every tape. EX: "Gp2/Q1" would mean group 2, qualifying session 1.
3. Write the car numbers down in a vertical column (one after the other) on the left side of the tape as they cross the control line. If you run out of room, continue the numbers in another column to the right of the first column. For practice and qualifying sessions, start taping when the first car crosses the control line. For race sessions, the cars should be in grid order the first time they go by, so just count the cars on the start so that you can tell if there are any cars missing, then start taping at the end of the first lap, or the second time by. (Depending on the track, it may be the third time by). Tapers may choose to tape the pace lap.
4. When the timer operator says, "PULL!" pass your tape to the auditor (or paper handler or runner) and start a new tape. During a race session, usually tapes will be pulled just before the leader, so that the leader will be the first car number on each tape. This is known as "Pulling on the Leader." If there is a large field, there may be "short pulls", or several pulls during a lap, and the leader will not be the first car number on each tape. Be prepared for lead changes.
5. If you are not sure of a number, write a question mark after it. If you miss a car, draw a horizontal line for each car you miss.
6. Circle the car numbers of cars entering or leaving the pits. The timer operator will say when to pit a car by calling out "Pit Now!" followed by the car number.
7. Note any bad or unreadable numbers with a question mark. Note duplicate numbers and notify your Chief Timer as soon as possible. (See Appendix for article by Rocky Entriken, "We've Got Your umber! Or, Red is a Dark Color!," SportsCar Magazine, February, 1992)
8. When the timer operator says "BRACKET!" it means that two or more cars crossed the Control Line so closely together that the beam of the electronic eye was broken only once. Write the car numbers, in the order that you saw them cross the line, with a bracket (>) next to them. Be sure the bracket encloses all the cars crossing the line at the same time. If you think it was a bracket but the timer operator does not call it as such, put the bracket next to the cars, but also put in a question mark (>?). Sometimes it is difficult for the timer operator to tell if the electronic beam was broken the correct number of times.
9. Do not copy from other tapers. Trust your own judgment. It is the auditor's job to settle any differences on the tapes, and you may be the only one who's correct!
10. Note any flag conditions which may affect Timing and Scoring, full course yellow, red flag, black flag all, checkered flag, and note them on your tapes as directed by the Chief Timer.



OPERATING AN ELECTRONIC TIMER

There are several different types and brands of electronic timers used in SCCA Club Racing. The Chronomix 737 and the Meca Timer are two of the most common, among others.

The electronic timer usually receives data from the photocell on track, but also has manual activation buttons which are used for cars crossing the control line in the pits, or in case of photocell failure. The electronic timer then passes this information to the computer through a data cable.

The timer operater should start each session by making sure the electronic timer is reset and that there is enough paper for the session. When the mark is given, start the electronic timer. Some electronic timers can be set to start automatically when the first car breaks the photocell beam (as in a race), and others must be started by pressing a button.

Most electronic timers have some way to print out the times being collected. If your electronic timer creates a printout, mark the top of the first printout with the Group and Session information. Mark each printout following with a sequential number that will match the tape that the tapers are writing on. You can annotate some of the times with car numbers only when you are absolutely sure of the car associated with a time. It is the collaters job to fill in the gaps, and the timer operater needs only to put in "benchmarks" which are certain.

When a car passes the control line in pit lane, press the pit (or manual) button. Announce your intention to the tapers by saying "Pit now" and the car number. While it is desirable to do this when the car is actually crossing the control line, the traffic on the track, and the times which are automatically being sent to the computer must be taken into consideration. Waiting for a small gap is a good idea, but do not let the pitting car get too far from the control line, especially if he is on his way back out onto the track.

When two or more cars cross the control line at the same time, creating only one time, announce "Bracket" followed by the car numbers (if you know them). You can check for a bracket by listening to the electronic timer's printer, or by checking the sequential number of the time. If you are not sure, do not mislead the tapers. Announce "Possible bracket" or say nothing. It is the tapers job to note brackets regardless of whether or not they are called.

Call "Pull" just before the leader crosses the control line (or during a lull in the action of a practice or qualifying session). Some electronic timers have a "pull" button to press marking the end of the tape. Tear off the printout after the pull and hand it to the auditors. Mark the top of the next printout with the next tape number.

At the end of each session, verify that the electronic timer is no longer needed for that session. Some electronic timers can "replay" the most recent session, until the moment they are reset. Reset the timer.

COMPUTER OPERATION

Operation of the computer depends on the timing software being used. A copy of the manual for the software being used should be on hand. Refer to the software manual for specifics.

Generally the software will receive a time from the electronic timer through a data cable, and the computer operator types the car number associated with it. It is a good idea to be "live", or current, during each session, but under some conditions this is not possible. Audited and collated tapes may be used either for original input, or to correct mistakes and verify information. Operating "live" enables the operater to see brackets or pit cars in real time, rather than depend on the tapers. However, a good taper should sit next tothe computer operator so that they can verify information quickly and stay current.

The software will keep track of and display the position of each car in the field, give each car's fastest time and number of laps completed by each car. It will usually ask for verification when a lap time does not make sense or when a car is not registered. The person setting up the software at the beginning of the weekend should make sure that the event information, track information, and lap records are entered and correct.

At the end of each session, you will usually save the data to a disk and give it to the Results Team.

AUDITING/COLLATING FOR THE ELECTRONIC TIMING TEAM

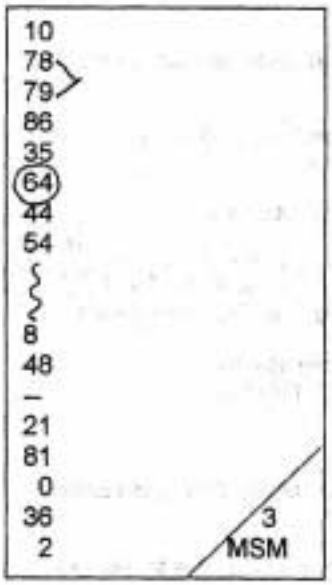
Auditing is one of the most important tasks in Timing and Scoring. Whether you are auditing time cards or tapes, you must be both quick and accurate. Experienced timers and tapers can quickly see errors when they occur and correct them for the use of the computer operator, scorers, or the Results Team.

When auditing:

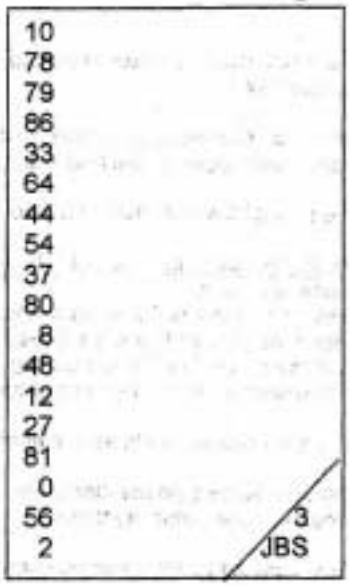
1. Use a pen or pencil that is a different color from what the tapers are using. Work as quickly and accurately as possible so that the computer operator may stay "live."
2. After each "pull," you will receive a set of tapes. Choose one to serve as the audited tape (you might choose the most legible tape, the one from the most experienced taper, or the tape with the most numbers on it).
3. When you audit a set of tapes, make sure they all have the same tape number on the bottom.
4. Compare the tapes. If they do not agree, the majority rules most of the time and use info available through the transponder system.
    a. If a car number is missing on a tape, write it in,
    b. If a car number is incorrect, draw a line through it and write the correct number next to it. (Draw only one line through it so that it is still readable,
    c. Make sure the audited tape has all the corrections on it, including the bracketed cars,
    d. Make sure numbers are legible by rewriting the number next to any illegible number.
5. To collate the tapes to the timer printout, count the numbers on the audited tape. Each bracket counts as one number.
6. Take the timer printout. Make sure it bears the same tape number as the continuity tapes.
7. Count the times on the timer printout. There should be the same number of times on the printout as there are car numbers on the audited tape.
    a. More times on the printout means an announced bracket was not a bracket. (If no brackets are marked on the tapes, it might mean that the timer made an extra hit, or all the tapers missed a car's number. Resolve this with the timer operator.
    b. Fewer times on the printout means that there was a bracket that was not announced. Check the tapes to see if anyone did mark a possible bracket.
    c. Remember that missed cars are represented by dashes, but keep in mind that the number of dashes may not necessarily correlate to the number of cars missed.
8. Use the audited tape to write the car numbers that the timer operator missed onto the printout. There may already be car numbers printed next to some of the times. Use these as benchmarks as you fill in the missing numbers. Each number will be written next to a time. Brackets will have two or more car numbers written next to one time. Extra hits from the electronic timer should be crossed out with a single line. Usually you will work from the top to the bottom of the printout, but occasionally you will have to work from the bottom up.
9. Although the car numbers on the timer printout are usually correct, you may find an incorrect car number. If so, draw a line through it (only one line so that it is still readable) and write the correct car number next to it.
10. Circle the cars that pitted (as on the tapes).
11. Staple the tapes and printout together with the timer printout on top, the audited tape next, and then the rest of the tapes. Set these aside or give to the computer operator.

SAMPLE TAPES—BEFORE AUDITING

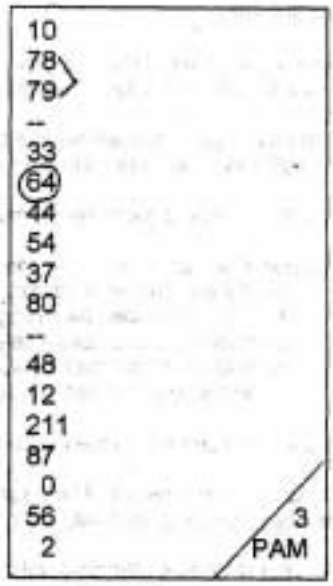
Taper #1



Taper #2

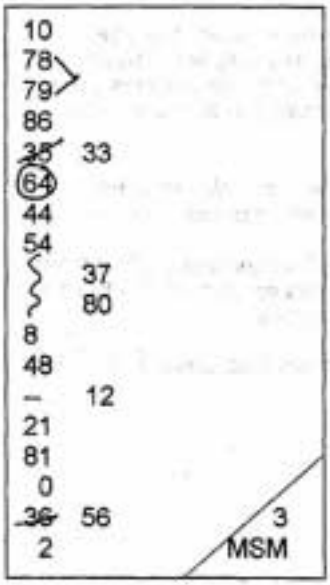


Taper #3

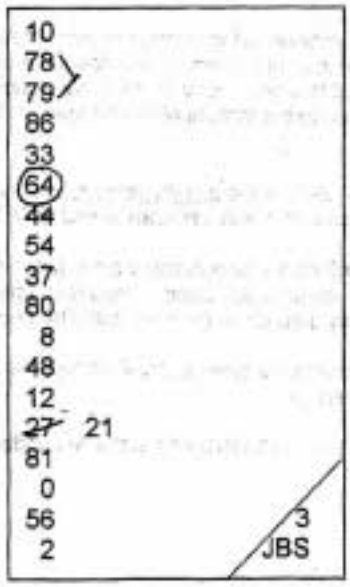


SAMPLE TAPES—AFTER AUDITING

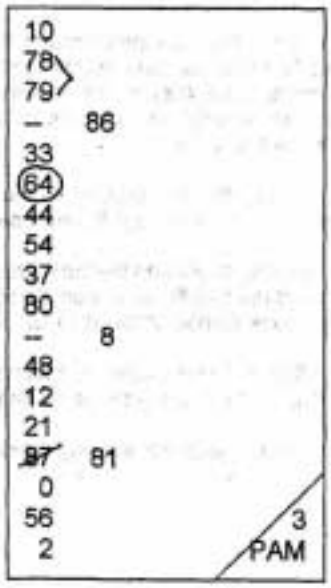
Taper #1



Taper #2

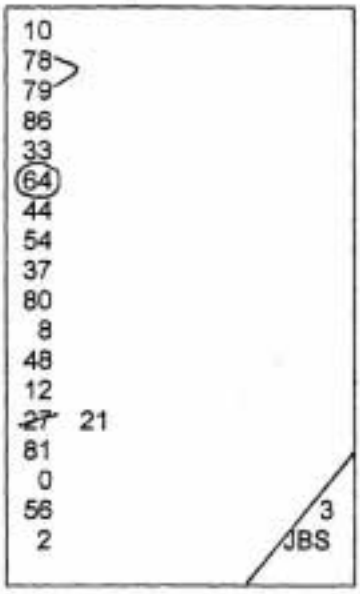


Taper #3



SAMPLE TAPE AND THE TIMER PRINTOUT – BEFORE AUDITING

Audited Tape

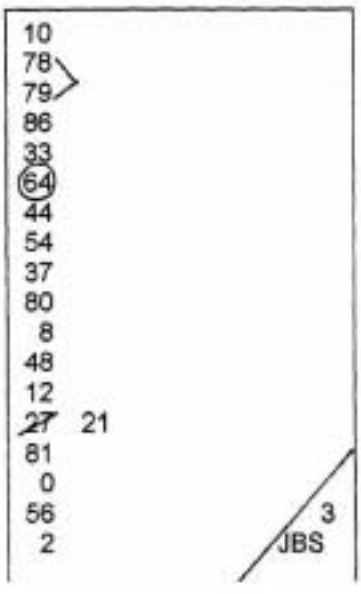


Timer Printout

	3	
1	0:07.991	
1	0:09.452	78
1	0:09.492	
1	0:09.525	
2	0:09.531	64
1	0:09.769	
1	0:09.781	54
1	0:09.790	
1	0:09.799	
1	0:09.805	
1	0:09.817	49
1	0:09.824	12
1	0:09.850	
1	0:10.241	
1	0:10.249	
1	0:10.256	
1	0:10.263	2

SAMPLE TAPE AND THE TIMER PRINTOUT – AFTER AUDITING

Audited Tape



Timer Printout

	3	
1	0:07.991	10
1	0:09.452	78/79
1	0:09.492	86
1	0:09.525	33
2	0:09.531	64
1	0:09.769	44
1	0:09.781	54
1	0:09.790	37
1	0:09.799	80
1	0:09.805	8
1	0:09.817	~~49~~ 48
1	0:09.824	12
1	0:09.850	21
1	0:10.241	81
1	0:10.249	0
1	0:10.256	56
1	0:10.263	2

Scoring

GENERAL DESCRIPTION

The scoring team prepares lap charts which show the position of each car within the field at any time during a race session (lap charts are not prepared for practice or qualifying). The team consists of charters who fill in the lap chart, tapers, and auditors. All members of the scoring team should be experienced tapers, timers, and auditors.

The charter fills in the lap chart by writing down the number of each car in the order that it completes the lap. There are three types of lap chart--live, from audited tapes, and computer-generated.

The live (or trackside) chart uses the tapes only for verification. For an audited lap chart the charter enters the car numbers from the scoring team's audited tapes. The computer-generated chart is a function of the electronic timing and scoring system as described previously.

The procedures for taping and auditing are generally the same as those used by the electronic scoring team, but three (3) audited tapes are prepared. At the end of the race the charter uses the information recorded to determine the overall finishing position of each car and its position within each group or class. The lap chart is then given to the Results Team.

SCCA National Races require the independent preparation of multiple lap charts so that they may be compared for discrepancies. These can come from the timing program and computer chart programs and/or be manually created. All members of the scoring team should have taped at least one practice or qualifying session for each group in order to be familiar with the car numbers and colors.

PREPARING THE LAP CHART

1. After the qualifying session becomes official, charts for each race are prepared by filling in the top of each lap chart with the date, track, name of the race, classes of cars, and number of laps.
2. The competitors' car numbers are written in qualifying or grid order in the number column. The class of each car is written in the class column.
3. Each charter should have a supply of black and colored pencils or pens. There are several schemes for using color to differentiate laps. Any scheme that allows for rapid auditing of the chart and quickly localizing errors is acceptable. A common method is to use red for lap numbers divisible by five and the last lap with the other laps written in black.

RECORDING LAP INFORMATION

1. Count the cars at the start of the race. If there are fewer cars than on the grid, check the incident or pit logs to see if any cars went off course on the pace lap.
2. As the cars complete each lap, write their numbers, in the order that they cross the start/finish line, in the appropriate lap column. The current leader will always be listed first in each column. Depending on the type of chart, you may record the car numbers live, or from the tapes.
3. Each time the leader approaches the start/finish line to complete a lap (or when you finish recording a tape), draw a heavy line under the last car in each previous lap column. This line (called the lap line) is used to show which cars are a lap or more down.
4. While recording each lap, scan the previous lap column to make sure each car has completed that lap. (The cars will usually be within two or three places of the position they were in on the previous lap). If you see a car that did not complete the previous lap, write its number below the lap line in that lap column, and not in the current lap column.
5. While recording each lap, do not list the same car twice in the same lap column. This would mean that it ran a particular lap twice! NOTE: The number of cars listed in each lap column will be the same as or less than the number of cars in the previous column. If you find that you have more cars in a lap column than there were in the previous column, you have either left a car out of a previous column, or listed a car twice under the same lap column.
6. Circle the number of any car that is circled on the tape. These are cars that have entered the pits, and this will make it easier to see why a certain car loses several positions in one lap. Brackets are not shown on the lap chart, but are listed in the order they are written on the tapes.
7. If you notice that a car is missing from the running order, write its number at the bottom of the chart under the lap column in which it first became missing. This will show what lap it should be recorded under when it does return to the race. This will also enable you to check the accuracy of your lap chart - the cars on the track plus the cars missing will always equal the number of cars that started the race. Checking off or dotting the car in the previous lap may be used to insure that the car is being entered in the correct lap.

RECORDING THE RESULTS INFORMATION

1. Transfer the car numbers from the last lap column directly across the chart to the Results section of the chart. Spaces in the "overall finish" column indicate cars that have dropped out during the race. Cars that were missing during the race will be listed according to the number of laps they completed, and cars that did not start the race will be listed last in the order that they qualified.
2. Write the number of laps completed by each car. This will be the number of the lap column that the car last appeared.
3. To be a finisher a car must complete one-half of the laps completed by the overall winner. If there is an uneven number of laps, half the total of the winner's completed laps is rounded down to determine how many laps need to be completed to be a finisher (e.g. 13 laps divided by 2 = 6.5. This would be rounded down to 6 laps, the number needed for a finish).
4. Use an asterisk or other symbol to indicate cars that were not running at the finish (not present for the checkered flag lap).
5. Complete the "finish by class" section of the chart.
6. In SCCA Club Racing, cars who are not finishers or starters are not awarded a class finish position.
7. Give the completed lap chart to the Results Team.

STEPS IN FILLING IN THE LAP CHART

CAR NO.	CLASS	GRID POS.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	O/A POS.	CAR NO.	CLASS	CL. POS.	LAPS COMP.
85	ITB	1													→				1				
10	ITB	2																	2				
39	ITE	3																	3				
16	ITB	4																	4				
81	ITB	5																	5				
47	ITE	6																	6				
01	SSC	7																	7				
2	SSC	8																	8				
56	ITE	9																	9				
9	SSB	10																	10				
27	ITE	11																	11				
		12																	12				
		13																					
		14																					

TAPES:

#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	#14CF
85	85	85	85	85	85	16	10	10	10	10	10	10	10
10	10	16	16	56	16	10	16	16	16	16	16	16	16
81	16	10	10	16	10	56	47	85	85	85	56	85	85
16	81	47	47	10	56	47	56	47	47	47	85	47	47
39	47	81	39	39	47	39	39	39	39	39	47	39	39
47	39	39	81	47	39	2	2	56	2	2	39	01	01
01	01	01	01	01	2	01	01	2	01	01	2	2	2
9	9	9	2	2	01	9	9	01	9	9	01	9	9
56	2	2	9	9	9	(85)		9	56		9	56	
2	56	56		81									

NOTE: The use of lap lines is optional, and may slow the charter unnecessarily when doing a trackside or "live" hand chart.

1. Use tape #1 to fill in column 1 in black pencil. Draw a lap line under the #2 car in column 1. (NOTE: Car #27 did not start the race. You may have been notified about this by the Grid or Race Control).
2. Use tape #2 to fill in column 2. Draw a lap line under the #56 car in column 2.

3. Use tape #3 to fill in column 3. Draw a lap line under the #56 car in column 3. (NOTE:

Brackets are not shown on the lap chart).

4. Use tape #4 to fill in column 4. Draw a lap line under the #9 car in column 4. (NOTE: Car #56 is missing. You may write it at the bottom of the lapchart in an inactive area, or wait another lap before writing it down).
5. Change to a red (or contrasting color) pencil and use tape #5 to fill in column 5. Car #56 has shown up. Remember, each car should appear only once in each column. Place each car in the lowest number column available. Although you are writing in column 5 (the leader's lap), car 56 has not yet appeared in column 4, so he is just completing lap 4 and is written under the lap line in column 4 in the same color as the lead car. Draw a lap line under both the #56 car in column 4, and the #81 car in column 5. Cross off car #56 at the bottom of the chart.
6. Change back to a black pencil. Use tape #6 to fill in column 6. Car #56 is written in column 5. Draw a lap line under the #56 car in column 5 and the #9 car in column 6. (NOTE: Car #81 is missing. You may write it at the bottom of the lapchart in an inactive area, or wait another lap before writing it down).
7. Use tape #7 to fill in column 7. Car #56 is written below the lap line in column 6. Car #85 should be circled. Car #81 is still missing and should be written at the bottom of column 6, the first lap that it missed. Draw a lap line under the #56 car in column 6 and under the #85 car in column 7. (NOTE: Ten cars started the race. Laps 1 through 5 have 10 cars shown on the track. Lap 6 shows 9 cars on the track and 1 car missing for a total of 10 cars, which equals the 10 cars that started the race).
8. Use tape #8 to fill in column 8. Car #56 is written in column 7. Draw a lap line under the #56 car in column 7 and under the #9 car in column 8. (NOTE: Car #85 is missing and is probably still in the pits. Car #81 is also still missing).
9. Use tape #9 to fill in column 9. Cars #85 and #56 are written below the lap line in column 8. Draw a lap line below the #56 in column 8 and the #9 car in column 9.
10. Change to a red (or colored) pencil. Use tape #10 to fill in column 10. Cars #85 and #56 are written below the lap line in column 9. Draw a lap line under the #56 car in column 8 and the #9 car in column 10.
11. Change back to a black pencil. Use tape #11 to fill in column 11. Car #85 is written below the lap line in column 10. Draw a lap line below the #85 car in column 10 and under the #9 car in column 11.
12. Use tape #12 to fill in column 12. Car #56 is now two laps down and is written below the lap line in column 10. Car #85 is written below the lap line in column 11. Draw lap lines under the #56 car in column 10, the #85 car in column 11, and the #9 car in column 12. (NOTE: Brackets are not shown on the lapchart).
13. Use tape #13 to fill in column 13. Car #56 is written below the lap line in column 11, and car #85 is written below the lap line in column 12. Draw lap lines below the #56 car in column 11, the #85 car in column 12, and the #9 car in column 13.
14. Checkered Flag Lap. Change to red (or colored) pencil for the last lap. Use tape #14 to fill in column 14. Car #85 is written in color below the lap line in column 13, but car #56 did not take the checkered flag. Draw lap lines below the #85 car in column 13 and below the #9 car in column 14.
15. Complete the chart by filling in the overall finishing position for each car, the finish by class information, the number of laps each car finished, the DNSs (Did Not Start), the DNFs (Did Not Finish). Use an asterisk or other symbol to indicate any cars which were finishers but were not running at the finish (not on the checkered flag lap) and note this on the chart. *Denotes cars not running at finish (not appearing on the last lap tape and are not otherwise noted as DNF.

CAR NO.	CLASS	GRID POS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	O/A POS.	CAR NO.	CLASS	CL. POS.	LAPS COMP.
85	ITB	1	85	85	85	85	85	85	16	10	10	16	10	10	10	16			1	10	ITB	1	14
10	ITB	2	10	10	16	16	16	16	10	16	16	16	16	16	16	16			2	16	ITB	2	14
39	ITE	3	81	16	10	10	10	10	47	47	47	47	47	47	47	47			3	47	ITE	1	14
16	ITB	4	16	81	47	47	39	47	39	39	39	39	39	39	39	39			4	39	ITE	2	14
81	ITB	5	39	47	81	39	47	39	2	2	2	2	2	2	01	01			5	01	SSC	1	14
47	ITE	6	47	39	39	81	01	2	01	01	01	01	01	01	2	2			6	2	SSC	2	14
01	SSC	7	01	01	01	01	2	01	9	9	9	9	9	9	9	9			7	9	SSB	1	14
2	SSC	8	9	9	9	2	9	9	85	85	85	85	85	85	85				8	85	ITB	3	13
56	ITE	9	56	2	2	9	81	56	56	56	56	56	56						9	56*	ITE	3	11
9	SSB	10	2	56	56	56	56												10	81	ITB	5	DNF
27	ITE	11																	11	27	ITE	-	DNS
		12																	12				
		13																					
		14																					

*Denotes cars not running at finish (not appearing on the last lap tape and are not otherwise noted as DNF.

RESULTS

GENERAL DESCRIPTION

The Results Team uses the input from manual timing, electronic timing, and scoring to compile the official practice, qualifying, and race results. To work in results you should be an experienced computer operator and lap charter. This skill level means that you have had prior experience in stopwatch timing, taping, auditing, and operation of the electronic timer. You should also be familiar with data entry, editing of data, generation of reports, and understand all aspects of Timing & Scoring. This is normally a one-person job, but assistants may also be used. A runner may also be needed to distribute the results.

GENERAL PROCEDURES

The people compiling the results should be familiar with or have access to previous lap records for each class.

After each session, the disk containing the data collected by the computer operator is given to the Results Team. Data from all possible sources is compared, looking for inconsistencies, such as a car moving up several positions within one lap, or irregular lap times. The timecards, tapes, timer printout, and lap charts are used to verify or correct the data on the disk. Any discrepancies in registration information should be checked with Registration or Tech. Provisional results are generated after the data has been reviewed and verified. Provisional results should be posted and an announcement made of the posting time. The printout from AMB can be used as a provisional result and if you are running Orbits 1 or 2 these results can now be used as official results. A hand chart may be posted as provisional results if there is no computer output. If there are no changes (due to penalties assessed by the stewards, or protests from the competitors), these provisional results become final results after thirty (30) minutes. If there are changes, the Results Team makes them, and the revised provisional results are posted. These become the official results after 30 minutes unless protested.

Those generating the provisional and official results are often the first persons sought out by competitors when a question arises. The Results Team must be prepared to deal with the competitors in a professional manner, and to give clear and concise answers to their questions.

Equipment used by the Results Team includes a computer, printer, and the same software used by the electronic timing team. A copier should be available so that copies may be made of the provisional and official results that are then distributed to the stewards (or race control), competitors, and the press. The official qualifying results also need to be sent to the grid and start/finish line personnel, communicators, and to those preparing the lap charts. All results should be available to each competitor and anyone else requesting them at the event. This means that paper results should be available to all. Competitors should leave the track with a copy of the results in their possession. Remember all competitors and interested parties do not have internet capabilities.

If after results are posted official an error is noted the Chief of T&S needs to immediately inform the Chief Steward of the instance and request permission to revise the Official results. If this takes place after the event the Chief of T&S still needs to inform the Chief Steward of the situation and request permission to issue a revised Official result. All concerned parties on the result need to be notified by mail by letter with a copy of the result. The Chief Steward is normally the person that would compose the letter and send the result to each applicable party. All Revised Official results also need to be emailed or mailed, depending on the recipient’s choice, to all parties that are to receive Official Results.

The work of the Results Team does not begin until after each session is over. Also, after each race weekend, results must be sent to those specified in the GCR (3.12), Divisional staff, Regional staff, and to others who request copies of the results.

POST-RACE MAILING

(Addresses may be obtained at the track or from your Regional Executive, on your region website or the SCCA website)
Most all parties requesting results would like to have results in a digital/email format. SCCA would like a format as Word or Excel in order to publish to the website.

Divisional Executive	Steward Race Chairmen
Race Stewards	Regional Registrar
National Points keeper	Regional Newsletter Editor
Divisional Points keeper	Regional Competition Chairman

Regional Points keeper	Special Interest Groups such as Vintage Racing
SCCA Club Racing	Divisional/National Administrators of T&S
SportsCar Magazine	Promoters
Regional Executive	Press

OR

You may include a request form in the Steward's packet asking whether they would like to receive a post-race mailing and directing them to a distribution point for race-by-race information and results. See the example of the STEWARDS AND OFFICIALS letter in the Appendix.

Runners

Runners (or paper handlers) are used in a variety of jobs in T&S. They are used to pass the tapes from the tapers to the auditors with each pull. They can also be used to pass information from the T&S Communicator to the Timing Captain or Chief of Timing and Scoring. It requires the ability to move quickly, and the younger T&S workers are often the ideal people for this job.

While moving within T&S, the runner must be careful not to obstruct any other worker's view of the track, and must be ready to gather and deliver the tapes with each pull. Use of runners is optional and depends on the number of personnel available.

Runners are often needed to make copies of and distribute results and deliver information from T&S to other parts of the track. It requires the ability to move from one location to another quickly and responsibly. The runner must listen to and follow the directions given by the Chief of T&S in accomplishing the assignments.

Communications

GENERAL DESCRIPTION

Timing and Scoring's view of the track is sometimes limited depending on the track layout and the location of Timing and Scoring. This makes it difficult to know when a car fails to appear on the grid, when a car enters or leaves the pits or the status of a car during sessions. A method of communicating information to the T&S staff is necessary. Timing and Scoring communicators use two-way radios, telephones, or hard lines to keep in contact with other track specialties. From their information T&S can be kept aware of what is happening on the rest of the track. It is helpful to timers, tapers, and charters if they know the status of cars during sessions.

Before each session, the Communicator is informed of which cars are on the false grid or grid. They are also informed of cars that are not starting, and cars that will be late starters from the pits. This information is passed to the Timing Captain. The tapers also use this information to explain why the number of cars at the green flag is less than the number of cars listed on the grid for a race.

Cars entering the pits during a session will sometimes have a prolonged pit stop. This makes it difficult for the timers responsible for those cars. They are on constant alert for the return of their car to the track, and often wonder if they have missed their car. The communicator can find out the status of these cars and relay this information to the Timing Captain and thus to the timers. Charters and tapers also use this information to explain why a car number is missing from the tapes or lap chart.

Below are general procedures to be followed by each communicator.

1. Have paper, pencils or pens, incident reports, pit reports, and a stopwatch. If you have not been provided with the grid line-up for the race sessions, obtain one from the Results Team. Take your place in the area reserved for the communicators.
2. Report any information you receive from the pits regarding the grid to the Timing Captain, T&S Chief, and the tapers and charters.
3. Report any duplicate or hard to read numbers to the T&S Chief. (See the example in the Appendix of the Runoffs Number Modification Request or "Skibbegram" used by T&S at the National Runoffs).
4. Report any irregularities in the grid line-up for race sessions to the T&S Chief.
5. Relay any requests for information regarding cars missing on the track to the pit communicator or tower. Relay any information you receive from outside T&S to the Timing Captain or T&S Chief. Log cars entering or leaving the pits. (See the example of a PIT REPORT LOG in the Appendix).
6. Some regions also monitor the corner circuit and are able to record incident reports during a session. (See the example of an INCIDENT LOG in the Appendix).

Transponders

As the previous version of this manual was being completed, transponder systems were becoming more widely used in Club Racing. This wonderful technology can make Timing & Scoring so much easier! However, it must be stressed that transponders can never replace basic knowledge. For the same reason that Electronic Timing should not be run exclusively without a backup, neither should transponder systems be run alone. Adding transponders should augment, not replace, your current system. You may shuffle things around, possibly even dropping some of the bottom-of-the-line methods (such as watch timing). This doesn't mean that cars shouldn't have legible number (others beside Timing & Scoring use these numbers too). Timing & Scoring must still deal with Registration issues, process results, communicate with the rest of the world, and generally carry on business as usual. It will usually mean adding some people to your staff to help drivers with installation and problems, help Registration with transponder assignments, help the Results Team with processing the extra results, etc.

The SCCA recognized transponder system is the AMB TranX260. Company contact information for them is:
AMB i.t. US Inc.
3200 Highlands Parkway, Ste 104
Smyrna GA 30082
Tel 678 816 4000 or 1-877-4AMBitus (trust me it works)
Fax 678 816 4001
E-Mail support@amb-us.com

AMB/TRANSPONDER TERMS

Decoder	Box connected to the loop via coax cable which then received and transmits information to the AMB timing computer
Transponder	Personal timing identification device – each with its' own serial number that communicates with the loop
Run	A session
Group	Race Groups – List all classes in the group
Unrelated transponder	A transponder hit that has not been identified as one of the competitors
Unassigned Photo-cell	A photo-cell hit that may mean no transponder
Feed	Info that is transmitted from the loop to the decoder, the main AMB computer to various other computers for results monitors or iCard, tv etc
Refresh	F2 on the main timing computer to refresh the feed to results monitors
Rmonitor	Part of the AMB software that produces a results screen, can be set for qualifying or race mode – Very beneficial to race control and announcer

The complete TranX260 Identification and Timing system consists of four main components: Transponders, Detection Loop, Decoder and Software. The transponders enable each car to have a unique identification number. Each transponder sends out its unique number as it passes over a detection loop. The Detection Loop is embedded in the track surface and picks up each transponder as it passes and sends the information to the Decoder. The decoder combines each unique transponder signal with the exact passing time and sends the information to a computer running the Software. The Software program receives the data from the Decoder and displays the updated session information on the computer monitor. The Software can be interfaced with a scoreboard and send live scoring feeds to other results monitors around the track or television production as well as run. The Software can also produce numerous reports including laps of competitors, lap charts, race results. (Note: As of this writing, the race report generated should be GCR compliant). As with any other Timing & Scoring system, the transponder system operation must be monitored by a human. The main operator needs to wear the head set to make sure that all cars are producing a transponder beep, tells you there is a transponder on the car. The main operator should never leave the AMB computer while a session is in progress. Competitors can forget to turn on power to the transponder, the rechargeable transponder battery can become too weak to send a signal, the competitor vehicle may pass the outside the Detection Loop (in the grass), etc. Obviously in these situations, the system required human intervention to properly account for the competitor vehicle. A timing light should be used in coordination with the Detection Loop to provide backup in some situations. Ideally a taper should be assigned to work with the operator of the Transponder system to provide backup data. If necessary, the Transponder system can generate a "passings" report to assist in auditing information of the secondary (backup) T&S systems, or the secondary (backup) T&S system may be needed to provide missing passing information to the Transponder system. Scoring for the finish of a race MUST be a HUMAN VISUAL function. Various locations of the transponder on the vehicle (i.e. Car A locates transponder in front portion of vehicle, Car B locates transponder in rear portion) can score the cars out of the proper sequence. As with any computerized Timing & Scoring software system, the operators should be trained and familiar with all of the necessary facets of the systems setup and operation. The more personnel trained in the systems operation, the better the chance for personnel to rotate to other Timing & Scoring positions or (if the staffing level provides) being able to take a session off! The above applies to all positions within Timing & Scoring.

It is strongly recommended that you use a UPS (backup power supply) for your decoder. This will prevent you from loosing data during an event in the case of a power outage or computer crash. The Decoder does have the ability to retain passings in the event you lose power or your computer crashes. If this happens and you have a your decoder running through a UPS, you will see a window when you open your AMB software that says you have a session running and asks you if you would like to restore passings. Pick the passings you would like to restore and then you have a a session that has not lost any of the passings. This is truly invaluable.

As strong of a suggestion as the UPS is the running of timing lights to your decoder. The feed from a single set of timing lights can be split between your manual timing system and the decoder. If a car passes over the loop and no transponder is detected a pop up window will appear and ask you to identify the unassigned photo-cell entry. On every passing line of the AMB software you will see a photo-cell time as well as transponder time and time of day.

About two (2) weeks before your event make sure you check the AMB Support page for any and all updates to your decoder firmware and also for your Orbits system. Make sure you update your Orbits software

when you have an available phone line to be able to re-register the software. Do not delay in doing this.

When naming the event in your AMB software remember to put the region name or SCCA at the beginning of the name. Although the region name is at the bottom of the results form if this information is uploaded to Mylaps.com it is not seen. Most drivers and interested parties rarely remember the name of the event but know either the region or SCCA.

When naming your groups list the Classes in the Group. This information will appear on your printed AMB results and also will appear on Mylaps. If you don’t list the classes the output to Mylaps will just be group 1 etc. This is very helpful in the event that you need to edit the Mylaps output.

If a car has a weak hits or signal complete the transponder form and pass on to the Steward of the session to have the competitor told of the problem to correct just as you would for a bad car number. Work with the competitors on transponder placement.

At the end of your event if you are running the AMB Orbits software please upload to the AMB site, Mylaps.com. This will mean that you will have to modify the session of any changes that were made when you were compiling your official results. More drivers and interested parties are going to this site for information on our races.

Part II. Personnel

It is a good idea to have on hand a current copy of the General Competition Rules (GCR) available from the national SCCA office. Read the GCR, paying special attention to the portions that pertain specifically to Timing & Scoring.

For example, in the GCR 1998 edition section 14.0 refers to Officials and Their Duties. Section 14.17 refers specifically to the duties of the Chief Timer and Scorer.

Section 8.0 refers to Timing, Scoring, Finishes, and Winners; and is divided into the following subsections:
8.1 Timing and Scoring
8.2 The Control Line
8.3 Dead Heats
8.4 Finishers
8.5 Shortened Races
8.6 Winner
8.7 Checkered Flag
8.7.1 Late Checkered Flag
8.7.2 Winning Car Not Running
8.8 Lap Record
8.9 Results
8.9.1 Provisional Results
8.9.2 Final Results
8.10 Media.

Since the GCR is updated each year, you will have to order a new edition each year. You should also have on hand and read The Specialty Chief's Handbook available from the SCCA National Office. This is written specifically for the Regions' Specialty Chiefs and gives general information pertaining to all specialties.
Each region should develop a regional T&S handbook and training manual, which could be passed on from Chief to Chief and which would be specific to that region.

Personnel

Finding people who want to become Timing and Scoring workers is of prime importance to the successful operation of the Timing and Scoring specialty, and Timing and Scoring has some aspects which make it a good specialty to "sell."

For instance:

- There are many different jobs to be done in T&S, and many skill levels represented in these jobs.
- A novice T&S worker may be started taping or timing, and gradually work up to timing device or computer operation.
- At most race tracks, Timing & Scoring is one of the few specialties where minors may work. Remember if you have minors that work as part of your staff you make sure their parents are aware of the minor waivers necessary at registration.
- Most T&S facilities offer some type of shelter from the weather.
- T&S workers are the first to know who won the race.
- T&S workers may be scheduled for all or part of a racing day.
- On-the-job training is available.
- Reasonable hours are available for the late-risers.
- Family members and friends may be scheduled for the same hours.

Where do these people come from? Some suggestions are:
- Family members and friends of drivers and crew members.
- Family members and friends of officials.
- Family members and friends of current T&S workers.
- Members from other aspects of the club, such as Solo and Rally.
- Newcomers who want to "try out" the organization before they become members.
- Members of other racing organizations such as Vintage Racing or Marquee Clubs.

By offering a T&S seminar for crew members at a Driver's School, some new workers may be recruited. It is the prerogative of the Timing and Scoring Chief to set age limits for workers. Timing and Scoring should not be thought of as a baby-sitting service where children might be dropped off for the day. Encouraging parents to work with their child until the child is experienced enough or old enough to be on their own is recommended. A younger person may be just the person you need and want as they may have a better understanding of computers and networking equipment. Treat ALL workers as you would want to be treated. Make every person on your team know that their job is of utmost importance to you as a chief.

Once you have recruited the workers, it is up to the Timing and Scoring Chief (or a deputy) to train them. Entry-level skills should be established, and a natural progression to higher-level tasks should follow. For instance, novice Timers and Scorers could be started as tapers or timers, and then progress to the auditing of tapes or time cards. This would give the newcomer time to get used to the speeds at which the cars run, the system used to tape or time, and a chance to become comfortable with a variety of tasks. Each new worker should attain a comfort level in his/her skill before going on to a new skill. Cross training in t&s is important. If a person has trouble with one skill there are plenty of skills that they may shine at, this includes all of our younger workers. Do not disclude anyone because of age, etc. Remember to include the transponder system in the rotation of training. Training should also include the back-room, results. You want to make your volunteers all feel that they are appreciated and welcomed, and that everyone is on the same playing field.

By making sure that all timers and scorers have information about upcoming events, and a way to let you know whether they will be attending an event, you can keep up their interest in Timing and Scoring. Make sure that each person knows the "when, what, and where" of each event, any equipment or supplies needed, how to dress for the weather, social events at the track, and anything else to keep up their interest and build enthusiasm for the specialty. Encouraging T&S team members to polish their skills, and learn new jobs, will keep them from getting bored with the specialty. Be on the lookout for those workers who will want to go on to administrative positions in T&S. Remember a thank you goes a long way.

Licensing

Keep in mind that Timing & Scoring is one specialty that does not require a license, or even SCCA membership, in order to participate. Licensing serves as a way for individuals to measure their skills and move up the ladder of T&S leadership. Licensing is required in order to Chief any event.
The National Office supplied the following information

GCR 6.2 - Race Official Licenses

It is required that all Officials under SCCA control at all SCCA sanctioned events shall either be licensed in the specialty or hold a logbook in the specialty, except physicians and nurses. These licenses are to be checked at Registration (preferred) or by the Chief of the Specialty at each event.

GCR 6.2.2 - Minimum Grades of Licenses
At the following event grades, the listed minimum license grades are mandatory for the Chiefs of Specialty:

A. National Championship Events - National License for Chief Starter, Chief Timer and Scorer, Chief of Flagging and Communications, Chief Scrutineer, Chief of grid, Chief of Pits and Chief of Emergency Services
B. Regional Events - Divisional License for all specialties listed in section 6.2.2.A.
C. Driver Schools - National License for all above Chiefs of Specialty, except Timing and Scoring.

GRADES AND QUALIFICATIONS OF LICENSES

Licenses are renewed on the membership anniversary date. (GCR 5.2). A worker may hold a license in more than one specialty. Only one license upgrade, per specialty, will be issued to any one worker during the membership year if approved by the Divisional Administrator (DA). ANY SCCA speed event worked shall count as participation for a license upgrade or renewal (i.e., National PRO Rallies, SCCA Pro Racing events, Mini Grand Prixs, etc.) NON-SCCA EVENTS SHALL NOT BE USED TO OBTAIN AN SCCA LICENSE.

Regional Licenses

Regional licenses are issued only to SCCA members by a region. This license is for persons new to the specialty or to new members. Regions may submit names of members for issuance of regional licenses in any form they choose, as long as the member number, name and specialty are included. It is not necessary to send the applications to the DA. A pre-carbonized application form is also available from the National Office. Regional licenses have no participation requirements for renewal.

Divisional Licenses

Divisional licenses are issued only to SCCA members by the DA if they approve the recommendation made by the applicant's home region. Active participation as a member of the specialty, rather than the actual nature of the performance should be the qualifying characteristic. For all new divisional license applications, the applicant's regional license showing a minimum of four (6) events must be included. For all licenses being renewed, a photocopy of the participation log card showing at least four (6) events worked and showing the Chief's signature, must be mailed with the application. Any application for upgrade from a regional license must be approved and signed by both the Regional Administrator (RA) and the Divisional Administrator.

National Licenses
National licenses are issued by the DA upon recommendation of the member's home region to those who have performed as a Divisional license holder over an extended period of time and have attained a high level of proficiency in the specialty. Renewals are issued after the applicants have properly filled out the application. A photocopy of the participation log card showing the Chief's signature must accompany the application.

The requirements for upgrading to a national license are a minimum of eight (8) events worked in a year plus approval or waiver by the DA. National licenses shall not be issued as a reward for tenure, but must be earned. Each division may have different requirements because of a different number of events that are available to be worked in each division. A good mix, to gain or retain a national license, would be national events, regional events, and a driver's school. To retain a national license, one should work more than just the "Cream of the Crop." The National License holder should work some out-of-region events and demonstrate proficiency in all areas of Timing and Scoring. In some divisions, people have the opportunity to work 20-30 events; in other divisions, workers do not have the opportunity to work as many. Any application for upgrade from a divisional license must be signed by the Regional Administrator and the DA for approval.

Senior Licenses
A senior grade specialty license shall be nominated by the DA of the specialty and approved by the Executive Steward of the division.

To be awarded a senior license, an individual shall have:
1. Demonstrated a long-term commitment to an individual specialty and the Club.
2. Possess outstanding knowledge of and operational skill in the specialty.

When awarded, a senior grade specialty license shall have the same rights, responsibilities and privileges as a Divisional grade license in that specialty. A senior grade license may not chief a National level race.

Renewal of a senior grade specialty license shall be every three (3) years upon recommendation of the DA and approval of the Executive Steward. There shall be no minimum participation requirements for a senior grade specialty license. This license grade is not considered "above" a National license, but rather is given to National license holders who are no longer active enough to meet the minimum number of events requirement.

Duties of the Timing & Scoring Personnel

Duties of the Regional Administrator

In some regions Timing & Scoring Regional Administrators are appointed. Their responsibilities are more general than a Chief of Timing & Scoring. The Regional Administrator (RA) might not ever "chief" a race, but is responsible for appointing those who are the chiefs for an event. Chiefs may stay the same throughout the season or may be appointed for each event. This is not to say that the RA can't "chief" a race. A job description should be available and should spell out what is expected.

The RA oversees the current and prospective members working in this specialty. The RA's duties include compiling lists of volunteers to be given to Registration, assigning workers to various jobs, ordering and distributing supplies, attending meetings, and being able to listen and respond to the questions and concerns of the workers. It is important that the RA be familiar with those working in T&S and what their abilities and skill levels are.

The RA also acts as an assistant to a visiting sanctioning body's Chief of Timing and Scoring. This includes finding out what the needs of the sanctioning body are, informing them of what workers, skills, and supplies are available, providing those workers and supplies.

The duties of the RA are varied, and some of the specific responsibilities are listed in the following sections. In general, the RA of Timing and Scoring must be able to listen, observe, assist, and direct the operations within their specialty.
1. Compile lists of workers for each race weekend. Use the input from the mailings or volunteer sign-up sheets. Before each race weekend, information should be sent to each prospective worker. The best time to send these may vary from region to region, but three weeks prior to the event should be the latest. Consider sending information about all of the season's events in one mailing, a great saving in time and money. Include the following information:
   a. Date of race weekend(s),
   b. Schedule of events,
   c. Reporting times for the team members,
   d. Registration information, especially where and when,
   e. Any special details about the weekend, maybe include a copy of the supplementary regulations, motel and camping accommodations, etc.,
   f. A self-addressed postcard for the member's answer,
   g. The deadline for responding, if this is an issue,
   h. Type of Timing & Scoring facilities,
   i. Food available at the track.
2. Send the list of workers for each event to the Registrar by the deadline set by them.
3. Prepare the sign-in lists to be used in the T&S area. Check to see that everyone present has
4. If possible, check the lists of the T&S personnel who signed in at Registration. Make sure that each person who received credentials did show up and work in T&S. Contact those who received credentials but did not work to find out why. If they do not have a legitimate reason, give them a warning.
5. Respond to the questions and concerns of workers, race officials, or competitors. If you

cannot answer a question or satisfy a concern, direct it to the appropriate personnel.
6. Maintain and requisition the necessary supplies for Timing and Scoring. (See Supplies in Appendix)
7. Keep notes on each race weekend. Include workers, the job performed by each of them, any problems that occurred, and any techniques that were particularly successful. This journal will help to plan future events and/or training sessions by noting successful techniques, possible problems, and in which skills each worker has had experience.
8. Keep a list of timing and scoring workers, including names, addresses, events worked, and experience in each skill.
9. Attend meetings, or appoint someone to represent Timing and Scoring at each meeting. The concerns of our specialty can be brought up, and responses and general information can then be reported back to you.
10. Participate in the planning and execution of training sessions.
11. Be prepared to make recommendations regarding any T&S worker's licensing. Your recommendations may be based on the number of days worked, their skill levels, and adherence to the T&S procedures.
12. Sign participation cards.

A copy of the new Duties, Responsibilities and Expectations of Divisional and Regional Administrators of T&S can be found in the Appendix.

Duties of the Chief of Timing & Scoring

If the Regional Administrator of T&S appoints a Chief of Timing and Scoring, the appointee serves as the overall Chief of T&S at the track during that race weekend. Although there may be some duplication of effort, the Chief of Timing and Scoring may be thought of as serving a managerial role, while the RA acts in an administrative capacity. Often the RA will serve as Chief of Timing and Scoring.

1. Using the response cards, fill out the assignment sheet. This sheet can be made up for each day of the race weekend, or for each individual session. The sheet can be a preprinted form that needs only names to be complete. It should be posted near the entrance to the Timing and Scoring area. Some latitude should be given in filling the jobs.

    a. Keep the workers experience and proficiency in mind in making assignments. Check with the individuals; they might have preferences.
    b. In instances where a Chief is unsure of who the workers are, consider letting workers sign up for assignments and allow them to set up their own rotation of work areas. Many workers like to do a variety of tasks during the race weekend. Self-empowerment is a wonderful thing. Ownership of a task usually produces amazing results.
    c. When possible, schedule time off for workers. This is especially important for endurance races. Try to schedule friends or family members together.
    d. Be as reasonable as possible, but remember that you can't please all the people all the time.
    e. In order to insure an adequate supply of workers, "over schedule" workers so that there are always enough workers on hand to get the job done. You can always let people go on break, but it's hard to get them back once they've left.

2. Training of team members is a major responsibility of the Chief of Timing and Scoring. If group captains are available, their assistance is invaluable. Training can be divided into two areas: the teaching of new people and the upgrading of current workers. Training can take place in Timing and Scoring seminars, or be a form of on-the-job training. A Drivers' School is an excellent time to hold a seminar, with the added advantage of having cars on the course with which to practice.

3. New people should first be trained in the basic skills of timing and scoring: taping and watch timing. Once they are experienced and comfortable with these, they are ready to move on to more challenging tasks such as auditing and charting. This does not follow for the person that has a specific skill level that you need, ie, AMB operator or networking or equipment person. Train those people in that position to ensure that they have a place. Training in other can come later.

4. Supervise the current and prospective members working in timing and scoring. Familiarize yourself with the names, faces, and skills of your workers. Assign them to a job suited to their skills and skill level, and observe who is working and who is not. Try to rotate assignments so workers may learn and become experienced in new skills. Also, make sure that they are aware of and follow the correct procedures and rules, and that they sign in each day they work. Make sure your workers are enjoying and are happy with what they are doing and who they are working with. Make sure new volunteers are welcomed and included in all activities for the weekend.
5. For experienced workers, all aspects of Timing and Scoring should be covered: Duties of Captains and Chiefs, etc. Seminars offer the Chief an opportunity to introduce changes in procedure, organization, or in the GCR, allowing team members to become familiar with them before major events.
6. On-the-job training may be done effectively by using the "buddy" system. Assign a new worker to an experienced one who can give assistance as needed.

Duties of the Chief Timer

An experienced timer may act as Chief Timer to supervise the timers. The Chief Timer oversees the preparation, distribution, and collection of time cards, checks on missing cars, and assists timers. Assistants may be assigned to help the Chief Timer by collecting or distributing time cards, announcing the time of day (TOD), or distributing stopwatches. The Chief Timer is directly responsible to the Chief of Timing and Scoring.

If a sufficient number of timers are not available to provide adequate backup to the electronic timing system, a timing team, composed of a timer using a printing stopwatch and one or more tapers, works well. Printing stopwatches with triggers are available and provide some relief to the timer who must time every car. The tapes and stopwatch time printout may be collated and be available should they be needed.

Pre-Event Responsibilities

1. Familiarize yourself with:
a. The practice, qualifying and race schedules,
b. Classes of cars within each group session, and
c. Number of timers you have available.
2. Get time cards from T&S Chief.
a. Fill out time cards for each car in each group.
b. Put time cards in numerical order within each group.
3. Confer with T&S Chief:
a. If there are NOT enough timers for each car, ask which cars need to be timed.
b. If there are enough timers for each car, ask which cars should have back-up timers and prepare extra time cards for those cars.
c. Decide when the mark should be given for practice, qualifying and races.
d. Decide who should give the mark to start stopwatches.
e. For practice or qualifying decide when the first split should be taken.
f. Decide how to deal with cars pitting during practice, qualifying, and races.
4. Assign and describe duties to assistants.

Before the First Session of the Day

5. Set up the electronic timing equipment: timer, lights, computer, cabling, etc.

Before Each Session

6. Pass out time cards and stopwatches. If a timer has more than one car, the cars should be separated in the field. Make sure that rookies are sitting near experienced timers.
7. Check with Communications to find out which cars are actually on the grid, and make sure time cards have been distributed for those cars. Check the status of cars not on the grid.
8. Announce to timers:
a. What session they will be working (P1, P2, Q1, Race, etc.).
b. Which side of the time card to use, Qualifying or Race.
c. When the mark will be given.
d. When to record the first split (first time they see their car, or at the end of their car's first complete lap).
e. Zero out all stopwatches, make sure they are in the correct mode and reset them, if necessary.
f. Start all available stopwatches when given the mark - no matter what. (If it is a wave-off, the watch can be stopped and restarted when instructed to do so.)
g. Whether or not their cars are to be timed into the pits.
h. Keep all stopwatches running NO MATTER WHAT until five minutes after the end of the session.

During Each Session

9. Give the mark. ("3 - 2 - 1 - MARK!") Give the Time of Day of the green flag.
10. See if any watches did not start, and pass out back-up watches if needed.
11. Help anyone who needs assistance. Check on the status of cars that are late or missing, and inform timers if their car is out of the race or will be returning to the track.
12. Announce checkered flag and give the Time of Day. Remind timers whether or not cars are to be timed into the pits.
13. Remind timers to:
    a. Sign their time cards.
    b. Label which session it is (P1, P2, Q1, etc...)
    c. Circle their fastest lap time (circle both the split and the lap time)

After Each Session

14. Collect time cards. Check each card for a signature, session identification, and whether the fastest lap has been circled.
15. Calculate lap times on cards that do not have them.
16. Put time cards in numerical order and return them to the appropriate person, usually a member of the Results Team.
17. If timers are leaving the T&S area, remind them:
    a. To return stopwatches and any other equipment.
    b. To clean up their work area.
    c. What time to report back to the T&S area for the next session.

Duties of the Chief Scorer

An experienced and skilled scorer may be appointed as Chief Scorer. The Chief Scorer oversees the preparations for the scoring of each race session and answers directly to the Chief of Timing and Scoring. The Chief Scorer may assist the Chief Timer in the setting up of the electronic timing and scoring equipment.

Before Each Session

1. Decide where each scoring function will take place.
a. Taping
b. Auditing
c. Charting
2. Set up pencils, scratch pads, tapes, clipboards, colored pencils and lap charts.
3. Obtain grid sheets for the lap charts when they become available.
4. Prepare the lap charts for the race, by filling in the event information.
5. Fill in the car/driver information from the grid sheet.

During Each Race Session

6. Help count cars on pace laps.
7. Be available to answer any questions from the scoring team.
8. Assist when needed in resolving problems that may arise.

After Each Race Session

10. Supply the Impound area and trophy chair with any information they need.

Duties of the Chief of Results

The person appointed as Chief of Results should be a very experienced worker, comfortable with all aspects of timing and scoring. The Chief of Results reports directly to the Chief of Timing and Scoring. As the information that is generated by the electronic timing and scoring system, the manual timers, the tapers, and the charters, is completed, it is brought to the Chief of Results, who must issue accurate results in a timely manner.

Before The Race Sessions

1. Sets up the equipment and supplies needed for the "backroom" operations.
2. Have on hand results from previous race events and track records.

After Each Race Session

3. Prepare results from information gathered by the various T&S teams.
4. Check for new track records and record new records. Make sure these records are passed to the Chiefs for future events.

Event Wrap-Up

After each event, it is the responsibility of the Chief of Timing and Scoring for that event to oversee the final wrap-up.

Make arrangements to get the track records to the T&S Chief of the next group racing at the track.

Make provisions for storage of T&S equipment and supplies.

Have a post-race checklist to go through, for example:

1. Have the results of all competitions been reported? If there have been protests involving tear-downs, some of the results may remain provisional.
2. Provide results to all those who have requested them.
3. Mail results to those specified in the GCR.
4. Clean the T&S facilities.
5. Inventory supplies and equipment.
6. Prepare expense recap and submit it to the Race Chair.
7. Send "Thank You" note to workers as convenient.
8. Review necessary improvements and changes.
9. Process T&S worker licenses and license upgrades.
10. Plan for worker training sessions.

11. Identify and train your successor!

Be prepared to answer questions from officials, competitors, the media, and other interested parties!

The Timing & Scoring Team

In T&S probably more than any other specialty, the effect of teamwork can be seen in the results produced. In order to produce accurate and speedy results, each sub-specialty of Timing & Scoring must work with other sub-specialties to effectively and efficiently provide the information needed. This interlocking of duties within the specialty creates a close-knit team. This is not a closed group, but one that should be willing to share their knowledge with a new volunteer or welcome a worker from another region.

Every T&S worker should be familiar with the part they play in the preparation of the official results. Workers are first trained in manual timing or taping and can then be trained in other areas after they have attained the level of experienced timer, taper, and auditor. The goal is to have each worker trained in several skills so that they may fill the gaps when worker shortages occur. Together, manual timing, electronic timing, and scoring are actually a system of checks and balances. The software used by electronic timing can produce both lap times and position in the field, but it is dependent on an uninterrupted power supply, and power failures happen. Manual timing and scoring has saved the day on many occasions, and no job is less important than another in arriving at accurate results.

Before leaving the personnel area, a word about "esprit de corps" is certainly in order. Attitude is everything! A well-trained, motivated team, run with authority and reasonableness will develop this spirit themselves. Anything the Chief Timer and Scorer can do to let the team know that they are interested and enthusiastic will help develop camaraderie. Ensure that the team feels the spirit of success and achievement that doing a job well brings. Always remember that a sincere “THANK YOU!” is extremely effective.

Appendix

"We've Got Your Number! Or, Red is a Dark Color!"
by Rocky Entriken. SportsCar Magazine,
March 1992, pp 56-58+. 35
Runoffs Number Modification Request or "Skibbegram" 38
Charting Practice 39
Manual Timing Subtraction Practice 42
Equipment and Supplies List 44
Sample Stewards and Officials Letter 45
Chronomix Information 46
Suggested Region Abbreviations 47
Non-Working Transponder Notification Form 49
Official Race Result Info 51
T&S Posting Log 52
Sample Incident Log 53
Sample Pit Report 54
Sample Timing and Scoring Assignment Sheet 55
Sample Worker List for Registration 56
AMB Loop Diagram 57
Divisional Administrator Duties & Responsibilities 59
Regional Administrator Duties & Responsibilities 60

As if this Corvette driver weren't already in enough trouble, how will the observers at that corner identify the car in their crash report if the black on red number can't be read?

WE'VE GOT YOUR NUMBER!

Or, Red Is A Dark Color!

By Rocky Entriken

GCR 12.5.1 Numbers
"Numbers shall be placed on the front and both sides of the car so that they are legible...."

GCR 12.5.2 Size of Numbers
"Numbers shall be at least 8 inches high, with a 1.5-inch stroke on a contrasting background. Metallic numbers are prohibited. The distance between two numbers shall be at least as wide as the stroke of the numbers...."

RACE CENTRAL

This is a story about numbers on race cars, but if you get no farther than this first sentence, we want to impart one message above all others: **Red is a dark color.**

Actually, this is a story about bad car numbers, the kind that drive timers and scorers up the wall. If there is one problem that crops up more than any other, it is people who think red contrasts with black, or midnight blue, or other dark shades. So they put a red number on a black car (or vice versa) and think they are in compliance with GCR 12.5.2.

What happens when a car comes by with a lousy number? Usually that car will get a time, or get marked on the scoring tape, but it is the cars behind it that suffer.

Consider the job of timers and scorers. A timer must find his or her assigned car, punch a watch, write down the time, and subtract it from the previous lap to get the lap time. Some hotshot timers may be handling five or six cars, and inevitably there is some point in a session when two or three come through together.

A scorer has an even tougher job in this respect—this official is, in effect handling all the cars on the track. He or she must write down the number of every car as it passes, doing all that on a number approaching at funny angles or going by at 140mph. When that car with the lousy number appears, the timer and scorer spend a few seconds hunting for the number, or trying to figure out what it is. In those few seconds the approaching car is now departing, and behind it several other cars are departing also—cars that did not get timed or scored because the official was busy trying to figure out a bad number.

The geublem is exacerbated when the number of timers or scorers is not what it should be to do a good job. Then these officials are piled with heavier loads—and bad numbers loom as an even larger problem. Consider a 30-car race group and six people in the tower to time them. That's five cars for each timer—assuming all six are National-caliber individuals capable of handling five. Make a couple of those six novices, or children shanghaied into driving a stopwatch, and a couple of the "experts" have to pick up the slack with seven or eight cars.

If that busy worker cannot pick your car out in a flash, the result is bad times or no times.

Why A Number?

The purpose of having a number on a race car is so that it can be scored. It is not decoration. It is not supposed to be a clever element in graphic design. It is not intended as a statement of personality or a reflection of creative ability. It is there for one reason and one reason only—so those watching the race (both officials and spectators) know who you are!

Therefore, the number must be able to be seen clearly in virtually all conditions of viewpoint and weather. People watch from all angles. They may be on a low

grassy knoll or in a high grandstand. They may be corner workers behind an guardrail 30 feet from trackside or scorers in a tower 300 yards away. There may be bright sunshine, low clouds or incessant rain. In all conditions, the number must be legible for it to do its job.

Contrast

Once again: Red is a dark color. The GCR speaks of "contrasting background" so let's discuss what is contrasting and what is not. Basically it comes down to two elements: dark and light.

The only trick then is to figure out what is dark and what is light. Not such an easy thing, considering the numbers that often appear on cars.

Red is often perceived as a light color. This is probably because of things called "bright red." However bright it may be, red is not light in color. The best example of how dark red is occurs in offset printing. To print a picture, the printer must make a "window" on the photographic negative from which the printing plate is made. Through this window the photo will be shown. Some printers make this window with a square of red paper, rather than black, because it has been found that in a black-and-white negative, red photographs "blacker than black."

Actually, there are relatively few light colors and entirely too many dark ones. So, to get contrast, you need one of these light colors: White, of course, Yellow, Orange, Pink, Tan, Silver. Or very light shades of gray or blue.

Contrast also means the two colors have to be from different areas of the spectrum. So it is not contrasting to put pink or orange on red, tan or yellow on brown, light blue on dark blue, any light color on silver (or bare metal) bodywork.

Some drivers think a pinstripe border on the number (even as much as half an inch) creates the needed contrast. Usually it does not, the pinstripe simply is too thin to be seen at speed or from distance.

Sometimes, lookalike team cars cause problems, even when numbers are otherwise good. A trick is to do something graphically to differentiate one from the other. A broad-brush approach is to paint the cars opposite—if one is white with blue accent, the other is blue with white accent. A more subtle approach is to give each car, otherwise identical, its own accent splash. Note the Andrettis in CART, who match right down to helmet design. The cars are basically black and white, but Mario has a red numeral and rollbar while Michael's numeral is black, his rollbar white. Another trick is a simple nose stripe of differing color on otherwise identical cars.

Few scorers should have any trouble finding this highly contrasted number sitting squarely between the wheels.

Placement

Where the number is placed is equally as important as the color contrast, but it seems drivers begrudge having to put a number on their car because it takes up billboard space (Especially in F1. —*Ed*).

One of the truly disconcerting things to timers and scorers is having to go on some protracted number hunt. The first place the official looks for a number is on the side of the car between the wheels.

Ever notice numbers in NASCAR? Great, huge things always located on the door panel (also on the roof). Nothing goes there but the number. The primary sponsor's name goes on the back fender, all the little sticker sponsors go on the front fender, but that door is reserved solely for the number.

You don't see Dale Earnhardt's 3 crammed between the Unocal and Winston decals, or Kyle Petty's 42 tucked under the Mello Yello sunrise. No, siree, they are BIG, bold, blocky, and spang in the middle of the door. And these guys could just about go out with no numbers at all, they're so well-known.

SCCA club racers, however, who usually are not household names like Petty and Earnhardt, seem to try to make up in graphic cleverness what they suffer in anonymity. Unfortunately, the result is that their number is as anonymous as their name.

A timer/scorer needs to see the number as the car approaches, or pick it up in a flash as it passes. Numbers have been found (after considerable search) back on the extreme tail of the car, way up on the front fender, high on a formula car cowling or on a wing plate. Sometimes on formula cars they are tucked behind a front wheel, where they cannot be seen until the car has passed.

Consider a string of Spec Racers, all with numbers between the wheels except for one yokel who puts his on the tail. These cars often run in packs. The timers and scorers take four times as long finding that oddball tail number as all the other numbers. As a result, several cars in the pack may not get scored—usually the ones behind the oddball.

Nose numbers often are laid on the flat part of the hood. Numbers on the nose allow a car to be identified as it approaches, but a number flat on the hood often cannot be seen. Bring it down, forward, as vertical as possible.

Although the GCR does not mandate a tail number, they are a good idea. The same vertical-surface concept applies. Sedans often like to put numbers on windows. This works well, but consider the window as black. It looks into the car's dark interior. Thus, numbers placed on windows should be light in color.

Not only is this Spec Racer's number on the tail section, but it has minimal contrast to the color of the bodywork.

Size, Stroke and Graphics

The GCR wants an 8-inch number with a 1.5in stroke. That's only a minimum. Bigger is better (but even that can be overdone). A good number is big and blocky, and while it can be graphically pleasing, its purpose is not to demonstrate graphic or artistic cleverness. A zero that has a stroke pinstripe-narrow at the top and bottom widening out to two inches at the sides tends to look like an 11 at speed. Fancy curlicues usually obscure what the numeral really is; a 6 with curlicues off

the top may appear to be an 8. A 1 with a fancy flag ends up scored as a 7. A 5 with skinny vertical strokes appears to be a 3.

That 1.5in stroke should be constant all the way around the number. Also, spacing should be the same as the stroke. An 8 drawn that way would not only have a 1.5in wide stroke all the way around its curves, but the spaces inside would also be at least 1.5in wide.

This is a good place for war stories:

• I once saw a car with a little stubby black 1 inside a large white number ball. The number ball was square with rounded-off corners. The number looked more like a fat zero.

• A guy racing a Japanese car decided to make his numbers look like Oriental characters. At speed, all that could be seen were some random slashes of color, but nothing that looked like numerals.

• A Formula Continental driver crammed both his double-digit number and his class letters onto a very small wing plate. The number style was an "old west" type of skinny numeral. From a distance, at speed, the graphic elements clumped on top of each other so tightly that no number could be discerned.

• One Formula Atlantic car had a numeral that looked like an overinflated balloon. While the stroke was very broad, the space within the number was almost nonexistent. What timers saw at 140mph was a shapeless blob.

• An IT car was painted with a white top and dark bottom, with its very nice, blocky, red number half on the white part and half on the dark part. All the timers could see was some funky design sticking up out of the dark part.

• A GT driver who apparently had a big-bucks sponsor decided to devote the entire side of his car to his sponsor's name. Then he tucked his car number, at bare minimum size, into a little leftover area by the front fender. The size of the lettering of the sponsor's name so overwhelmed the tiny number that timers spent several laps hunting for it.

• A racer in a good ole American Corvette decided to do his number in patriotic colors—the bottom red, the middle white, the top blue with white stars. Timers saw the red, white and blue all right, but all the multi-color graphic cleverness made it look like a stars and stripes decoration, not a number.

• A Formula Ford racer came out with a white car, with nicely blocky red numbers across a "scribble" of blue behind it. Motionless on the grid, it was very pretty. At 100mph, the blue effectively scribbled out the numeral and it looked like some kindergartener had gotten to the car with his tempera paints.

• The driver of a fast GT1 car decided to make his numerals merely by outlining the number in half-inch white pinstripe. Thus, the number was the same color as the car. And from a distance, at speed, the pinstripe could not be discerned.

• A sports racer had a smallish number back on his tail, clear enough but unobtrusive. The car had two vertical air scoops in front of the rear wheel. For several laps timers saw the scoops as numbers and timed 11 because the shadows of the scoops were so much more prominent than the numeral.

Changing Numbers

No matter how good your numbers are, there will come a time when you'll have to change it. Your group got merged with another, or you are at an out-of-division track and someone else has that permanent number there. Or maybe, you are fortunate enough to qualify for the Runoffs and you are one of four cars in your class with that number.

Changing a number is an art unto itself. The trick is to make the revision look as solid and legible as the original. So many drivers change numbers badly. My favorite old war story on changing numbers is the driver of car 27 that had to change to a 21, so he covered the tail of the 7 with a piece of paper that was not quite the same color as his car (instead of covering the whole number and creating a new 1). Well, covered or not, a novice timer still saw that car as 27 and timed it for several laps of practice. Then after it exited, the real 27 came on track and the same novice picked it up and resumed timing it (never minding that one was blue, the other white, and not even in the same class!). Meanwhile, the timer who was assigned to 21 never saw his car. For once, two wrongs made a right—the confused novice ended up with times on both 21 and 27 and both cars were gridded for the race.

It would be good if every driver, in designing a car number, makes the design with a plan in reserve on how to change it. Know, when you make that zero that someday it may have to become an 8 or a 6 or a 9. Know how you will make the change—not just a line across the middle to turn the zero into an 8, but perhaps a couple of nips at the sides also.

Carry contact paper or plastic tape in the color of your car number, just for the purpose of making changes. Have a pair of scissors in the tool box.

Your number may be complex enough a change is best done by covering it entirely with contact paper the color of your car and sticking a new number on that. Always remember that the GCR stroke rule still applies. Don't change 4 to 14 by putting one thin strip of half-inch electrical tape in front of the numeral. If you have a single-digit number, leave space for another numeral. Another trick is to leave space beside double numerals, so that 28 could become 85 by covering one number and adding another.

Plan ahead.

Nothing's Perfect

No matter how good your numbers are, no matter how easily they can be seen, no matter how conscientious you were in making them, the day will come when they probably just won't work.

At Heartland Park Topeka, the timers and scorers view the cars from the north and thus are almost always looking at the shady side of the cars. Once, on a dark and threatening morning, the light was so dim many otherwise excellent car numbers simply could not be seen in the gloom. Several drivers were asked to re-do their numbers in white, which solved the problem.

Your number that works fine at Laguna Seca may be illegible at Texas World, or one easily seen from the close, ground-level proximity of Hallett may be impossible from the heights of the tower at Watkins Glen. At some tracks, the timers and scorers see a car coming for 20 seconds before it is in range to read the number, at others they suddenly appear before the workers' eyes and are gone from view just as quickly.

So when some official approaches asking you to fix your number, don't throw a fit. They are, after all, just trying to make sure you got what you came for—a weekend of fun playing cars.■

While most readers know Rocky Entriken primarily as SportsCar's Solo expert, he is also a Nationally licensed timer.

Here's an excellent example of a well-placed, well-contrasted number that has plenty of room for future expansion.

VALVOLINE RUNOFFS
NUMBER MODIFICATION REQUEST

❑ 1ST NOTICE	❑ 3RD NOTICE - times disallowed
❑ 2ND NOTICE	Chief Steward Initials _____

Date: _____

To: Driver/Crew of car # _____ Class _____

From: Chief of Timing and Scoring

According to the GCR, all numbers on cars must be clear and readable from Timing & Scoring and are subject to the approval of the Chief of Timing & Scoring.

Please keep in mind that T&S is located in a different spot at each track. We must deal with all variations of distance, angle, height and light. Just because your number can be seen clearly at another track does NOT mean that it can be clearly seen here.

Therefore, your number does not meet our approval because:

_____

_____

_____

Our suggestions for improving your number are:

_____

_____

_____

If your number is not improved for the next track appearance, we cannot guarantee that you will be timed. If you have any questions, please come to Timing & Scoring to see us.

Thanks for your help!

Chief of Timing & Scoring _____

White–Driver / Yellow–Steward/Tech / Pink–Timing & Scoring

Tapes and a blank chart for practicing charting

1. Make sure that the novice charter has the materials needed to complete the chart: black pencils, colored pencils, eraser, etc.
2. Go over the principles of charting found in the Scoring Section of Part I.
3. Use the tapes on the sheet to fill in the chart.
4. Remind the novice that every 5th lap is entered in colored pencil, usually red.
5. The final lap is entered in colored pencil.
6. "Read" or check the chart with another charter every 5th lap if possible.
7. Checking off cars on the previous lap will help in placing the car in the correct lap. A car must have appeared in each of the previous laps before it may be entered in the current lap.
8. Have the novice charter complete the chart including the class finish portion of the chart.
9. Compare the completed chart with the "key" chart found in the appendix.

Use these tapes to complete the sample chart. When you have finished the chart, check your results with the completed sample chart.

TAPE #1	TAPE #2	TAPE #3	TAPE #4	TAPE #5	TAPE #6	TAPE #7
17	17	17	17	58	58	58
58	58	58	58	17	88	53
53	53	53	53	67	39	63
66	66	60	60	53	53	9
60	60	66	66	60	17	60
65	65	65	27	65	60	88
27	27	27	65	66	65	65
16	16	16	16	27	27	39
6	6	6	34	16	66	66
21	21	21	6	34	67	27
45	34	34	21	21	16	16
34	74	45	45	6	34	67
15	45	15	15	45	6	21
74	15	74	74	15	21	34
35	35	35	35	74	45	6
5	81	81	49	35	35	35
81	5	49	81	49	15	45
49	49	5	5	5	74	15
31	31	31	31	81	49	74
63	63	9	63	31	81	49
9	9	63	9	63	5	5
88	39	88	39	9	31	81
39	88	39	88			
67	67	67				

TAPE #8	TAPE #9	TAPE #10	TAPE #11	TAPE #12
58	58	58	58	58
53	53	67	35	63
31	31	53	15	9
60	60	81	45	34
65	65	5	74	21
66	66	60	49	6
27	27	65	53	39
63	16	66	81	53
9	9	31	5	35
88	63	27	60	45
39	88	16	65	15
16	39	63	67	49
21	17	9	66	74
34	34	17	27	88
6	21	39	31	5
67	6	88	16	60
45	15	21		65
15	45	34		81
35	35	6		66
74	74			27
49	49			67
81				16
5				31

COMPLETED PRACTICE CHART

CAR		GRID																	CAR	O/A		CL.	LAPS
NO.	CLASS	POS.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		NO.	POS.	CLASS	POS.	COMP.
60	FF	1	17	17	17	17	58	58	58	58	58	58	58	58					58	1	FA	1	12
58	FA	2	58	58	58	58	17	53	53	53	53	53	53	53					53	2	FC	1	12
53	FC	3	53	53	53	53	53	17	60	60	60	60	60	60					60	3	FF	1	12
65	FF	4	66	66	60	60	60	60	65	65	65	65	65	65					65	4	FF	2	12
81	FF	5	60	60	66	66	66	65	66	66	66	66	60	66					66	5	FC	2	12
27	FF	6	65	65	65	27	66	27	27	27	27	27	27	27					27	6	FF	3	12
16	FF	7	27	27	27	65	27	66	16	16	16	16	16	16					16	7	FF	4	12
66	FC	8	16	16	16	16	16	16	21	21	34	21	34						34	8	CFF	1	11
6	CFF	9	6	6	6	34	34	34	34	34	21	34	21						21	9	CFF	2	11
34	CFF	10	21	21	21	6	21	21	6	6	6	6	6						6	10	CFF	3	11
39	FV	11	45	34	34	21	6	6	45	45	15	39	39						39	11	FF	5	11
21	CFF	12	34	74	45	45	45	45	15	15	45	15	45						45	12	FF	6	11
45	FC	13	15	45	15	15	15	15	39	39	39	45	15						15	13	CFF	4	11
15	CFF	14	74	15	74	74	74	39	74	74	74	74	49						49	14	FC	3	11
49	FF	15	39	39	39	39	39	74	49	49	49	49	74						74	15	CFF	5	11
74	CFF	16	5	81	81	49	49	49	81	81	81	81	5						5	16	FF	7	11
5	FF	17	81	5	49	81	5	81	5	5	6	5	81						81	17	FF	8	11
31	FV	18	49	49	5	5	81	5	31	31	31	31	31						31	18	CFF	6	11
63	FV	19	31	31	31	31	31	31	63	9	63	63							63	19	FV	1	10
9	FV	20	63	63	9	63	63	63	9	63	9	9							9	20	FV	2	10
88	FV	21	9	9	63	9	9	9	88	88	39	39							39	21	FV	3	10
67	FV	22	88	39	88	39	88	88	39	39	88	88							88	22	FV	4	10
17	FA	23	39	88	39	88	39	39	67	67	67	67							67	23	FV	5	10
59	FC	24	67	67	67	67	67	67	17	17									*17	24	FA	2	8
8	FA	25																	8	25	FA		DNS
35	FF	26																	59	26	FC		DNS
		27	59						17		17									27			
		28	8																	28			
		29																		29			
		30																		30			

Time cards for practicing subtraction of times for manual (stopwatch) timing.

1. The times to be subtracted are on the left side of the sheet.
2. The key to each set of times is on the right side of the sheet.
3. Fold the time cards in half along the center line.
4. Have the novice timer practice subtracting the lap times on the left side of the card.
6. Check the novice timer's card against the key card on the right.

Session No. _____
Timer's Initials _____
Watch No. _____

CAR NO. - CLASS _____
Course Class Record _____
Fastest Lap No. _____ Time _____
Make _____ Colors _____
Driver

0						
9						
8						
7						
6						
5						
4						
3						
2						
1						
0						
9						
8						
7						
6						
5						
4						
3						
2	20	40	228			
1	18	55	878			
0	17	12	940			
9	15	30	019			
8	13	46	333			
7	12	02	696			
6	10	19	811			
5	8	34	687			
4	6	50	800			
3	5	07	561			
2	3	21	578			
1	1	37	880			
Start	0	00	000			

RACE TIME | LAP TIME

Location | Date

Session No. _____
Timer's Initials _____
Watch No. _____

CAR NO. - CLASS _____
Course Class Record _____
Fastest Lap No. _____ Time _____
Make _____ Colors _____
Driver

0						
9						
8						
7						
6						
5						
4						
3						
2						
1						
0						
9						
8						
7						
6						
5						
4						
3						
2	20	40	228	1	44	350
1	18	55	878	1	42	938
0	17	12	940	1	42	921
9	15	30	019	1	43	686
8	13	46	333	1	43	637
7	12	02	696	1	42	885
6	10	19	811	1	45	124
5	8	34	687	1	43	887
4	6	50	800	1	43	239
3	5	07	561	1	45	983
2	3	21	578	1	43	698
1	1	37	880	1	37	880
Start	0	00	000			

RACE TIME | LAP TIME

Location | Date

EQUIPMENT AND SUPPLIES

Equipment Basics

o Backup timer o Power surge strips
o Batteries/charger o Printers
o Cables o Printing stop watch
o Chronomix or similar electronic timer o Shelter
o Clock o Spare connectors
o Computers o Stackable letter trays
o Copier or ditto machine o Supply cabinet
o Electric pencil sharpener o Surge protector
o Files o Tables/chairs
o GCR o 3-hole punch
o Manual stop watches/batteries o Timing lights/tripods/photocells
o Paper cutter o Typewriter
o Phones/radio/fax o Waste baskets

Basic supplies

o Carbon Paper o Pens
o Clip boards o Plain envelopes
o Copy paper o Printer paper
o Discs/labels o Push pins
o Erasers o Ribbons for printer and timer
o Extension cords o Rubber bands
o Fax paper o Scissors
o Labels o Screwdriver/hammer/basic tools
o Large envelopes for mailings o Spindles
o Markers o Staplers, tabletop & gun
o Padlock o Staple remover
o Page protectors o Staples
o Paper/timer o Stencils
o Paper clips o Tape - Scotch, masking, racers, electrical
o Paper weights o Taping paper
o Pencil sharpeners o Trash bags
o Pencils-black, red, other o White out

Forms

o Bad number notification form o Late entry form
o Charts o Pit reports
o Check-off sheets o Schedules
o Current lap records o Sign in sheets
o Forms for recording times of posting, etc. o Incident logs
o Time cards

Miscellaneous

o Bug spray o Soap
o Cleaning supplies o Tissues
o Coffee pot and supplies o Contact paper - white and black
o Collator
o First aid kit
o Fly swatter o Toilet paper
o Paper towels o Wet wipes

ATTENTION

Stewards and Officials If you wish to have a complete set of results mailed to you after the event, please fill out the form below and return it to Timing & Scoring or give it to one of the Race Chairs in the tower.

Name_____
Address_____
City/State/Zip_____
Email _____
Note: Results from individual races are available at Driver Information in the tower. Thanks.

Your friendly and cooperative T&S Staff

Chronomix Information

For repairs or information on the Chronomix 737 timer, contact
Chronomix Corporation
650F Vaqueros Ave.
Sunnyvale, CA 94085
Phone: 1-800-538-1548
Fax: 408-737-0160
Website: www.chronomix.com
The Chronomix 737 takes 2-3/4" adding machine roll paper.

SUGGESTED REGION ABBREVIATIONS

REGION #	REGION NAME	DIVISION	COMMON ABBR	OFFICIAL ABBR
1	Alabama	SE	ALA/AL	Ala
2	Arizona	SP	AZ/ARIZ	Ariz
3	Atlanta	SE	ATL	Atl
4	Central Illinois	CD	CIL	ClIl
5	Central New York	NE	CNY	CeNY
6	Western Michigan	CD	WMR	WMch
7	Chicago	CD	CHI	Chi
8	Colorado	RM	COL	Colo
9	Delta	SW	DELT	Delt
10	Detroit	CD	DET	Det
11	Florida	SE	FL/FLA	Fla
12	Gulf Coast	SE	GC	GuCo
13	Indianapolis	CD	INDY	Indy
14	Iowa	CD	IA	Iowa
15	Kansas	MD	KS	Kan
16	Kansas City	MD	KCTY	KC
17	Kentucky	CD	KY	Ky
18	Land O'Lakes	CD	LOL	LOL
19	California Sports Car Club	SP	CSCC	CSCC
20	Milwaukee	CD	MIL(W)	Milw
21	Saint Louis	MD	STL	StL
22	New England	NE	NER	NEng
23	New York	NE	NY	NYR
24	Neohio	CD	NEO	Neoh
25	Northeastern Pennsylvania	NE	NEPA	NePa
26	Northern New Jersey	NE	NNJ	NNJ
27	Northwest	NP	NW	Nwst
28	Northwestern Ohio	CD	NOW	NwOh
29	Ohio Valley	CD	OVR	OhV
30	Oklahoma	MD	OKLA	Okla
31	Philadelphia	NW	PHILA	Phil
32	Houston	SW	HOUS	Hous
33	San Francisco	NP	SFR	SanF
34	Buccaneer	SE	BUC	Bucc
35	South Bend	CD	SBR	SBnd
36	Southern Indiana	CD	SINR	SInd
37	Southern New York	NE	SNY	SNY
38	Big Sky	NP	BSR	BSky
39	Steel Cities	NE	STCT	StCt
40	Tennessee	SE	TN	Tnn
41	Texas	SW	TEX	Tex
42	Washington DC	NE	DC	WDC
43	Western New York	NE	WNY	WNY
44	Southwest Louisiana	SE	SWLA	SwLa
45	Wiregrass	SE	WGR	Wire
46	Hawaii	SP	HI	Haii
47	Southern West Virginia	CD	SWV	SwVa
48	Nebraska	MD	NEBR	Neb
49	Alamo	SW	ALMO	Almo
50	Utah	RM	UTAH	Utah
51	River Cities	CD	RCR	RvCt
52	Northeast Iowa-**Merged with Iowa Region*******NO LONGER AVAILABLE*****			
53	Rio Grande	RM	RIOG	RioG
54	Northeast Oklahoma	MD	NEOK	NeOk
55	North Carolina	SE	NCR	NCar
56	Lake Superior	CD	LSUP/LKSP	LSup
57	San Diego	SP	SD	SanD
58	Southern Illinois	MD	SILL	SIll
59	Central Pennsylvania	NE	CEPA	CPa
60	Central Louisiana	SW	CLA	CnLa
61	Central Carolina	SE	CCR	CCar
62	Finger Lakes	NE	FLR	Fing
63	Old Dominion	SE	OD	ODom
64	Columbus Sports Car Club	CD	COLU(M)	Colm
65	Mohawk-Hudson	NE	MOHU	MoHu
66	Mid-South	MD	MS	MidS
67	Arctic-Alaska	NP	ARC	Arct
68	Eastern Tennessee	SE	ETN	ETnn
69	South Texas Border	SW	STBR	STxB
70	Cincinnati	CD	CIN/CINCY	Cinc
71	Glen	NE	GLEN	Glen
72	Las Vegas	SP	LV	LasV
73	Mississippi	SW	MISS	Miss
74	Central Kentucky	CD	CKY	CKy
75	Indiana Northwest	CD	INR	InNw
76	Des Moines Valley	MD	DMV	DMV
77	Arkansas	MD	ARK	Ark
78	Red River	SW	RDRV	RdRv
79	South Carolina	SE	SCR	SCar
80	Mahoning Valley	NE	MAHV	MahV
81	Pan American	SW	PNAM	PnAm
82	Blackhawk Valley	CD	BVR/BHV	BhV

83	Central Florida	SE	CFR	CFla
84	South Jersey	NE	SJY	SHy
85	Fort Wayne	CD	TW	FtWn
86	Western Ohio	CD	WOR	WOh
87	West Texas	SW	WTEX	WTex
88	Arizona Border	SP	AZBDR	ArzB
89	Northern Ohio Valley	CD	NOVR	NOhV
90	Wichita	MD	WIC	Wich
91	Middle Georgia	SE	MGA	MGA
92	Susquehanna	NE	SUSQ	Susq
93	Tennessee Valley	SE	TVR	TnnV
94	Chattanooga	SE	CHT	Chat
95	Dixie	SE	DX	Dix
96	Oregon	NP	OR	Ore
97	Blue Mountain	NE	BMT	BlMt
98	Lone Star	SW	LNST	LnSt
99	Great River	CD	GRR	GtRv
100	Saginaw Valley	CD	SAGV/SAG	SagV
101	Reno	NP	RE	Reno
102	Badlands	CD	BLR	Badl
103	Blue Ridge	SE	BR	BlRg
104	Misery Bay	NE	MISB	MisB
105	Montana	NP	MON	Mont
106	Snake River	NP	SRR	SnRv
107	Ozark Mountains	MD	OZM	OzMt
108	Yellowstone	RM	YEL	YlSt
109	Continental Divid	RM	CDR	Cont
110	Salina	MD	SAL	Sal

Non-Working Transponder Notification Form

Car # _____ Class _____ Color _____ Session_____ Timing & Scoring has found a problem with your Transponder (TX). This notice is for your information, and you need to take action to make sure your TX is operating properly. The problem is indicated below. Tech can help in proper placement of your TX.

(1) [ ] The transponder is located above metal, and is not sending a clear signal. There are times when the car may not be sensed by the loop in the track, making your car "invisible" to the transponder system. There needs to be a clear, wide (inverted cone shape) area between your transponder & the track surface. The transponder should be moved to be clear of metal. (You may be using a transponder other than a TRANX-260 [red]) See reverse side.

(2) [ ] There is metal in front of or behind the transponder. The metal is blocking the signal from reaching the timing loop in the track. The transponder needs to be moved. There are times when your car may become "invisible" to the transponder system. See reverse side.

(3) [ ] There are times when your transponder is not sensed by the timing loop. When your car is sensed, the placement appears to be good. You may have a wiring problem.

(4) [ ] Your transponder stopped being sensed by the timing loop. If it is a rechargeable unit, it may not be stable. If it is hard wired, the wiring may need to be corrected.

(5) [ ] There was no transponder sensed during this session.

(6) [ ] Your rechargeable transponder needs to be recharged.

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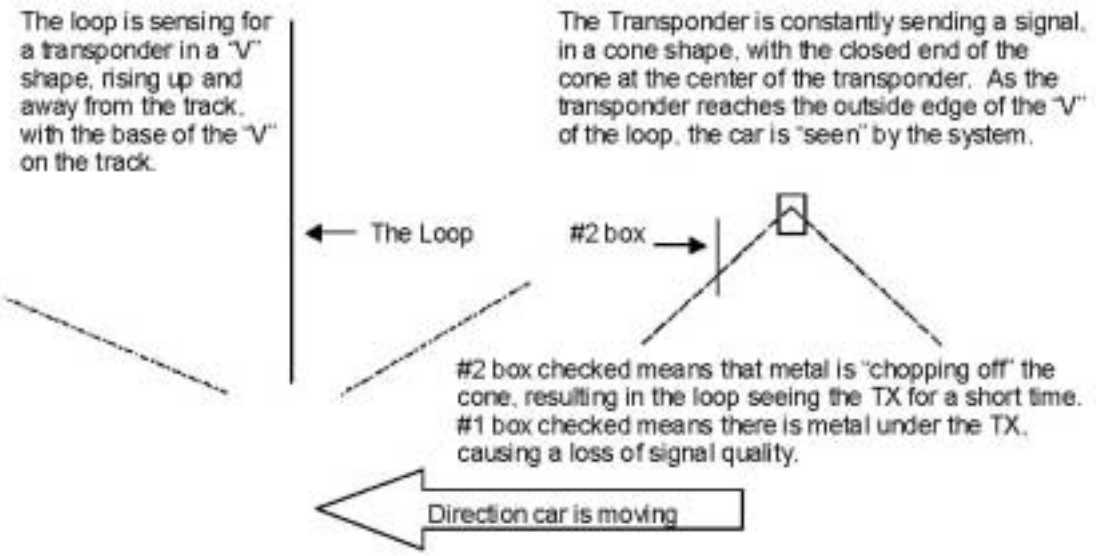
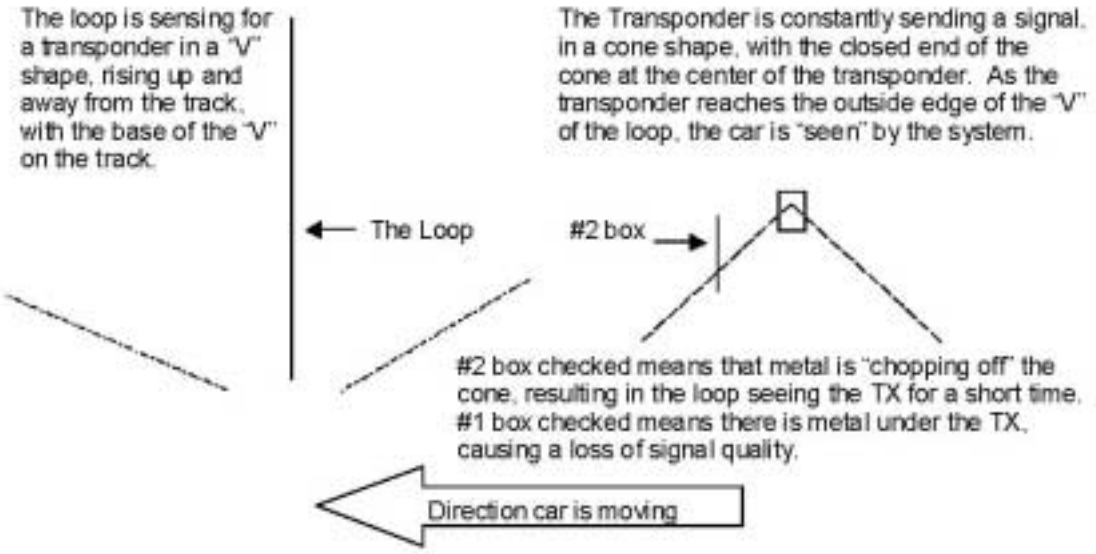

The loop is sensing for a transponder in a "V" shape, rising up and away from the track, with the base of the "V" on the track.
The Transponder is constantly sending a signal, in a cone shape, with the closed end of the cone at the center of the transponder. As the transponder reaches the outside edge of the "V" of the loop, the car is "seen" by the system.
The Loop
#2 box
#2 box checked means that metal is "chopping off" the cone, resulting in the loop seeing the TX for a short time.
#1 box checked means there is metal under the TX, causing a loss of signal quality.
Direction car is moving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OFFICIAL RACE RESULTS

Summary of Required Information

Description of the event:

- **Location of the event**
- **Date**
- **Sanction Number**
- **Name of Conducting Region**
- **Length of Track**
- **Duration of Race (laps or miles)**

Timing & Scoring Information:

- **Total number of entries, including DNF's and DNS's**
- **Overall and Class finishing positions for all starters**
- **Number of laps completed for all starters**
- **Overall Time of the race**
- **Winner's Margin of Victory**
- **Winners Average Speed**
- **Fastest lap times for all starters**
- **Any new track records**

Driver Information

- **Driver's full name**
- **Driver's hometown & State**
- **Driver's Region of Record**
- **Car Number**
- **Car Make and Model**
- **Car year as required by the GCR (T1, T2. SSB, SSC)**
- **Driver's Competition License Number**

Optional Information:

- **Overall time and average speed for each class winner**
- **Pit Stop Information,**
- **Accident Reports**
- **Sponsorship**
-

If the results do not contain all the necessary required data a supplementary report (such as an entry list) may be included with the "Official Race Results", and submitted to the national office and other officials.

Disqualifications, Exclusions, or Withdrawals:

When a car is disqualified, exclude, or withdrawn, the results should list the car(s) in the original finishing order, indicating the car(s) which have been affected. Results should show adjusted final overall and class positions for all finishers. A footnote should indicate for each disqualified car that "Car number (X) is disqualified (excluded, withdrawn); all subsequent cars moved up".

T&S POSTING LOG

Date & Event:_____

Group	Posted Provisional	Posted Official	Steward Notes	Who Released & Time	Notes	Copies
1						
2						
3						
4						
5						
6						
7						
8						
9						

INCIDENT LOG

Race No. _____ Classes _____

Date _____ Location _____ Recorder _____

Car No.	Time (RACE TIME)			Location	What Happened?
	Hour	Minute	Second		

PIT REPORT

RACE NUMBER: _____ DATE: _____ LOCATION: _____

CLASSES: _____ NUMBER OF CARS ENTERED: _____

RECORDER: _____ NUMBER OF CARS ON GRID: _____

TIME OF DAY - START OF RACE: _____ SCRATCHES: _____

NOTES: _____

OFF TRACK					ON TRACK				PADDOCK
CAR #	RACE TIME			WHAT HAPPENED?	CAR #	RACE TIME			
	HR.	MIN.	SEC.			HR.	MIN.	SEC.	

pitreprt.wk4

TIMING & SCORING ASSIGNMENTS

SCHEDULE FOR RACE_____

CHIEF SCORER_____ **CHIEF TIMER**_____

CHRONOMIX TEAM

OPERATOR_____

KEYPAD_____

COMPUTER_____

TAPER_____

TAPER_____

TAPER_____

AUDIT_____

STOP WATCHES

STOP WATCH_____

TAPER_____

STOP WATCH_____

TAPER_____

CHARTING

TRACKSIDE_____

TAPER_____

COMPUTER_____

BACKROOM_____

BACKROOM_____

RESULTS

COMPUTER_____

COMMUNICATIONS

WHITE ONE_____

INCIDENT REPORTS_____

Orbits Computer:_____

Orbits Taper: _____

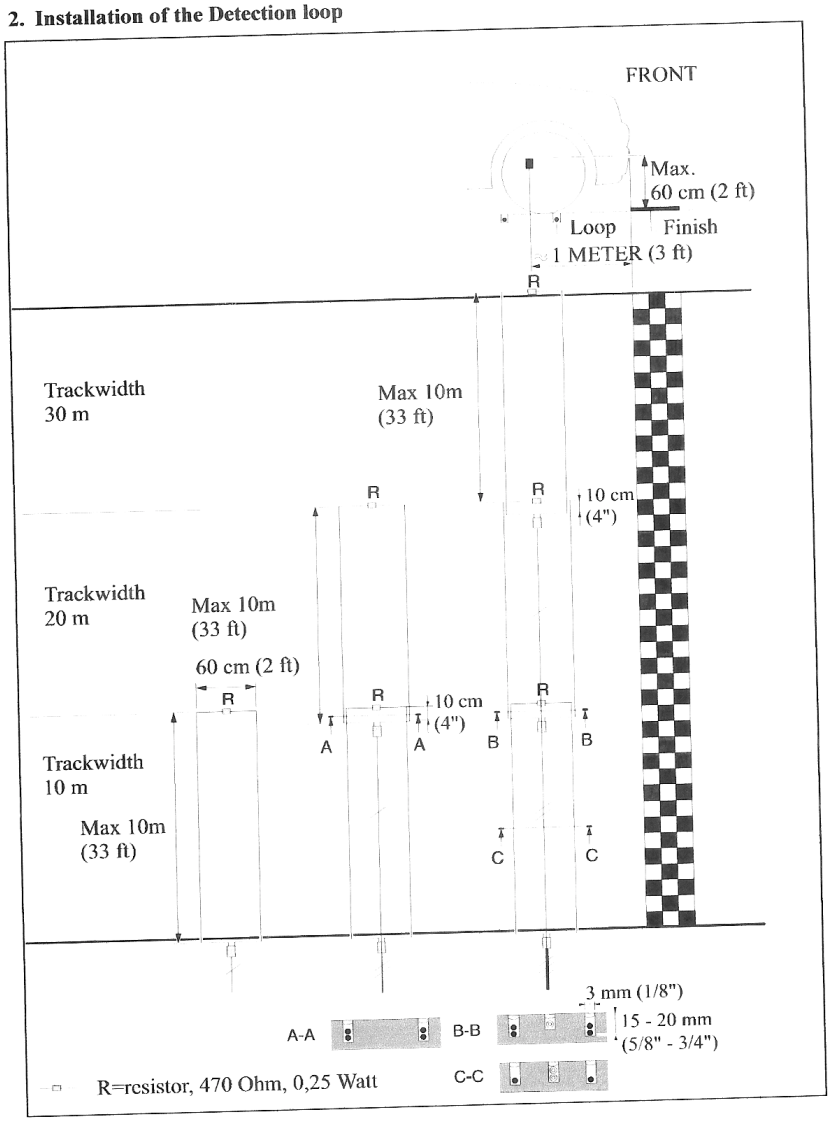
:VENT_____ Special Instructions_____

:PECIALITY_____ _____

'age ____ of ____

WORKER	In	Ni	Ti	Ti	Member No.	Exp	Guest	Ass	Guest	As

2. Installation of the Detection loop



1. The detection loop must be positioned in such a way that the transponder is in the middle above the detection loop when the front of the car or motorcycle is above the finish line.

2. One separate loop is applicable to a track width of max. 10 m. For wider tracks use 2 or 3 (max.) loops. Cut the slots in the track maximum 2 cm / 3/4" deep and 60 cm / 2 ft apart. Put the wires of the detection loop in the slots and cut the excess length of the detection loop wires. Make sure vehicles can not pass outside the detection loop. Extend the detection loop outside the track if necessary.

3. Put the heat shrinkage sleeves over a detection loop wire end. Then solder the 470 Ohm resistor (R) between the two ends of the detection loop wire. Put both the shrinkage sleeves over the resistor and hold it over a heat source.

4. Widen the slot with a chisel where the small connection box of the loop is to be installed. Put the connection box vertically in the slot.

5. Fill the slot with silicon. Make sure the silicon is fully under the surface of the track, otherwise the vehicles may pull out the silicone.

6. The detection loop is sensitive to interference, possibly emitted by nearby cables. When possible keep all cables 5 m / 15 ft away. Also make sure cars or motorcycles on other parts of the track will not get closer than 5 m / 15 ft to the detection loop, to avoid false inputs.

7. All wiring of the loop must be installed according to the drawing in order to avoid a serious degradation in performance.

DIVISIONAL ADMINISTRATOR OF TIMING & SCORING DUTIES AND RESPONSIBILITIES

JOB SUMMARY:

Work and communicate with the Regional Administrators of T&S as well as the Executive Steward and National Administrator of T&S in regards to the execution of T&S policies and practices.

ESSENTIAL DUTIES & RESPONSIBILITES:

- Supervise the Regional Administrators of T&S within your Division.
- Communicate with Regional Administrators information regarding T&S changes per GCR.
- Ensure operational consistency of T&S across the Division.
- Travel, when possible, to tracks within the Division to monitor T&S and provide training and assistance at events.
- Develop and have training materials and T&S manual available to all Regions T&S administrators, as well as all T&S workers within the Division.
- Hold a divisional T&S seminar at the Division's meetings.
- Keep apprised if all T&S advances as well as upgrades to software and hardware available.
- Resolve all licensing issues and if unable forward to the National Administrator.
- Review, approve or reject all license upgrades. If rejected inform the Regional Administrator as well as the applicant on the reason and set a plan to be able to upgrade.
- Help Region's without a Chief of T&S secure a chief for their events when necessary. Stress the importance of the Region having their own Chief and T&S workers.
- Attend Divisional meetings.
- Attend the Runoffs, when possible.
- Establish open communications with all T&S workers within the Division and the Division leadership.

Divisional Administrator Reports To:

The Executive Steward of the Division
Division Leadership
National Administrator of T&S

Term:

2 years. Appointment

2005

Regional Administrator of T&S Duties and Responsibilities

Job Summary:

Work with the region's race chairs and event stewards to promote T&S and its' proper practices and policies.

Essential Duties & Responsibilities:

- Supervise the Regional Administration of T & S
- Consult with the Regional Executive on the appointment of the Region's Chief of T & S.
- Maintain all region T&S equipment in good working condition. Update all software on a regular and necessary basis.
- Keep abreast of all advances T&S, as well as all GCR changes relating to T&S.
- Maintain a listing of regional T&S workers, along with workers outside of the region that participate in your regions events.
- Promote growth and cross training in T&S. Develop T&S training within region.
- Communicate your expectations to your T&S staff.
- Ensure results are per the GCR.
- Keep a set of results of all region races.
- Review and approve license renewals and upgrades and forward on to the appropriate parties. Keep copies for your records. Work with the Stewards and Exec. Steward.
- Responsible for all intervention of Region's problems concerning T&S and their resolution.
- Promote region T&S workers traveling to other tracks.
- Attend Divisional meetings.
- Promote camaraderie and friendship.

Who do you answer to:

Regional Executive
Your Division's Executive Steward
Your Divisional Administrator of T&S

2005