

## Appendix A – Live data list

iRacing's telemetry comes in three variations, data written to an .ibt file 60 times a second, live data exposed to our telemetry API 60 times a second, and a session string in YAML format that contains more or less static information about the session. The YAML string is appended to the end of the .ibt file but only a small portion of that data is exposed to ATLAS. We will cover the YAML string in appendix B. Here is a list, as of 11/03/2015 of all the live and disk based telemetry parameters. Only the disk based parameters are available to ATLAS.

Name	Unit	Type	Disk	Live	Description
AirDensity	kg/m^3	float	1	1	Density of air at start/finish line
AirPressure	Hg	float	1	1	Pressure of air at start/finish line
AirTemp	C	float	1	1	Temperature of air at start/finish line
Alt	m	float	1	1	Altitude in meters
Brake	%	float	1	1	0=brake released to 1=max pedal force
BrakeRaw	%	float	1	1	Raw brake input 0=brake released to 1=max pedal force
CamCameraNumber		int	0	1	Active camera number
CamCameraState	irsdk_CameraState	bitfield	0	1	State of camera system
CamCarIdx		int	0	1	Active camera's focus car index
CamGroupNumber		int	0	1	Active camera group number
Clutch	%	float	1	1	0=disengaged to 1=fully engaged
CpuUsageBG	%	float	1	1	Percent of available time bg thread took with a 1 sec avg
DCDriversSoFar		int	0	1	Number of team drivers who have run a stint
DCLapStatus		int	0	1	Status of driver change lap requirements
DisplayUnits		int	0	1	Default units for the user interface 0 = english 1 = metric
DriverMarker		bool	1	1	Driver activated flag
EngineWarnings	irsdk_EngineWarnings	bitfield	1	1	Bitfield for warning lights
EnterExitReset		int	1	1	Indicate action the reset key will take 0 enter 1 exit 2 reset
FogLevel	%	float	1	1	Fog level
FrameRate	fps	float	1	1	Average frames per second
FuelLevel	l	float	1	1	Liters of fuel remaining
FuelLevelPct	%	float	1	1	Percent fuel remaining
FuelPress	bar	float	1	1	Engine fuel pressure
FuelUsePerHour	kg/h	float	1	1	Engine fuel used instantaneous

Name	Unit	Type	Disk	Live	Description
Gear		int	1	1	-1=reverse 0=neutral 1..n=current gear
IsDiskLoggingActive		bool	0	1	0=disk based telemetry file not being written 1=being written
IsDiskLoggingEnabled		bool	0	1	0=disk based telemetry turned off 1=turned on
IsInGarage		bool	0	1	1=Car in garage physics running
IsOnTrack		bool	1	1	1=Car on track physics running with player in car
IsOnTrackCar		bool	1	1	1=Car on track physics running
IsReplayPlaying		bool	0	1	0=replay not playing 1=replay playing
Lap		int	1	1	Lap count
LapBestLap		int	1	1	Players best lap number
LapBestLapTime	s	float	1	1	Players best lap time
LapBestNLapLap		int	1	1	Player last lap in best N average lap time
LapBestNLapTime	s	float	1	1	Player best N average lap time
LapCurrentLapTime	s	float	1	1	Estimate of players current lap time as shown in F3 box
LapDeltaToBestLap	s	float	1	1	Delta time for best lap
LapDeltaToBestLap_DD	s/s	float	1	1	Rate of change of delta time for best lap
LapDeltaToBestLap_OK		bool	1	1	Delta time for best lap is valid
LapDeltaToOptimalLap	s	float	1	1	Delta time for optimal lap
LapDeltaToOptimalLap_DD	s/s	float	1	1	Rate of change of delta time for optimal lap
LapDeltaToOptimalLap_OK		bool	1	1	Delta time for optimal lap is valid
LapDeltaToSessionBestLap	s	float	1	1	Delta time for session best lap
LapDeltaToSessionBestLap_DD	s/s	float	1	1	Rate of change of delta time for session best lap
LapDeltaToSessionBestLap_OK		bool	1	1	Delta time for session best lap is valid
LapDeltaToSessionLastLap	s	float	1	1	Delta time for session last lap
LapDeltaToSessionLastLap_DD	s/s	float	1	1	Rate of change of delta time for session last lap
LapDeltaToSessionLastLap_OK		bool	1	1	Delta time for session last lap is valid
LapDeltaToSessionOptimalLap	s	float	1	1	Delta time for session optimal lap
LapDeltaToSessionOptimalLap_DD	s/s	float	1	1	Rate of change of delta time for session optimal lap
LapDeltaToSessionOptimalLap_OK		bool	1	1	Delta time for session optimal lap is valid
LapDist	m	float	1	1	Meters traveled from S/F this lap
LapDistPct	%	float	1	1	Percentage distance around lap
LapLasNLapSeq		int	1	1	Player num consecutive clean laps completed for N average

Name	Unit	Type	Disk	Live	Description
LapLastLapTime	s	float	1	1	Players last lap time
LapLastNLapTime	s	float	1	1	Player last N average lap time
Lat	deg	double	1	1	Latitude in decimal degrees
LatAccel	m/s^2	float	1	1	Lateral acceleration (including gravity)
Lon	deg	double	1	1	Longitude in decimal degrees
LongAccel	m/s^2	float	1	1	Longitudinal acceleration (including gravity)
ManifoldPress	bar	float	1	1	Engine manifold pressure
OilLevel	l	float	1	1	Engine oil level
OilPress	bar	float	1	1	Engine oil pressure
OilTemp	C	float	1	1	Engine oil temperature
OnPitRoad		bool	1	1	Is the player car on pit road between the cones
Pitch	rad	float	1	1	Pitch orientation
PitchRate	rad/s	float	1	1	Pitch rate
PitOptRepairLeft	s	float	1	1	Time left for optional repairs if repairs are active
PitRepairLeft	s	float	1	1	Time left for mandatory pit repairs if repairs are active
PitSvFlags	irsdk_PitSvFlags	bitfield	1	1	Bitfield of pit service checkboxes
PitSvFuel	l	float	1	1	Pit service fuel add amount
PitSvLFP	kPa	float	1	1	Pit service left front tire pressure
PitSvLRP	kPa	float	1	1	Pit service left rear tire pressure
PitSvRFP	kPa	float	1	1	Pit service right front tire pressure
PitSvRRP	kPa	float	1	1	Pit service right rear tire pressure
PlayerCarClassPosition		int	1	1	Players class position in race
PlayerCarPosition		int	1	1	Players position in race
RaceLaps		int	0	1	Laps completed in race
RadioTransmitCarIdx		int	0	1	The car index of the current person speaking on the radio
RadioTransmitFrequencyIdx		int	0	1	The frequency index of the current person speaking on the raio
RadioTransmitRadiIdx		int	0	1	The radio index of the current person speaking on the radio
RelativeHumidity	%	float	1	1	Relative Humidity
ReplayFrameNum		int	0	1	Integer replay frame number (60 per second)
ReplayFrameNumEnd		int	0	1	Integer replay frame number from end of tape
ReplayPlaySlowMotion		bool	0	1	0=not slow motion 1=replay is in slow motion

Name	Unit	Type	Disk	Live	Description
ReplayPlaySpeed		int	0	1	Replay playback speed
ReplaySessionNum		int	0	1	Replay session number
ReplaySessionTime	s	double	0	1	Seconds since replay session start
Roll	rad	float	1	1	Roll orientation
RollRate	rad/s	float	1	1	Roll rate
RPM	revs/min	float	1	1	Engine rpm
SessionFlags	irsdk_Flags	bitfield	0	1	Session flags
SessionLapsRemain		int	1	1	Laps left till session ends
SessionNum		int	1	1	Session number
SessionState	irsdk_SessionState	int	1	1	Session state
SessionTime	s	double	1	1	Seconds since session start
SessionTimeRemain	s	double	1	1	Seconds left till session ends
SessionUniqueID		int	1	1	Session ID
ShiftGrindRPM	RPM	float	1	1	RPM of shifter grinding noise
ShiftIndicatorPct	%	float	1	1	DEPRECATED use DriverCarSLBlinkRPM instead
ShiftPowerPct	%	float	1	1	Friction torque applied to gears when shifting or grinding
Skies		int	1	1	Skies (0=clear/1=p cloudy/2=m cloudy/3=overcast)
Speed	m/s	float	1	1	GPS vehicle speed
SteeringWheelAngle	rad	float	1	1	Steering wheel angle
SteeringWheelAngleMax	rad	float	1	1	Steering wheel max angle
SteeringWheelPctDamper	%	float	1	1	Force feedback % max damping
SteeringWheelPctTorque	%	float	1	1	Force feedback % max torque on steering shaft unsigned
SteeringWheelPctTorqueSign	%	float	1	1	Force feedback % max torque on steering shaft signed
SteeringWheelPctTorqueSignStops	%	float	1	1	Force feedback % max torque on steering shaft signed stops
SteeringWheelPeakForceNm	N*m	float	0	1	Peak torque mapping to direct input units for FFB
SteeringWheelTorque	N*m	float	1	1	Output torque on steering shaft
Throttle	%	float	1	1	0=off throttle to 1=full throttle
ThrottleRaw	%	float	1	1	Raw throttle input 0=off throttle to 1=full throttle
TrackTemp	C	float	1	1	Temperature of track at start/finish line
TrackTempCrew	C	float	1	1	Temperature of track measured by crew around track
VelocityX	m/s	float	1	1	X velocity

Name	Unit	Type	Disk	Live	Description
VelocityY	m/s	float	1	1	Y velocity
VelocityZ	m/s	float	1	1	Z velocity
VertAccel	m/s^2	float	1	1	Vertical acceleration (including gravity)
Voltage	V	float	1	1	Engine voltage
WaterLevel	l	float	1	1	Engine coolant level
WaterTemp	C	float	1	1	Engine coolant temp
WeatherType		int	1	1	Weather type (0=constant 1=dynamic)
WindDir	rad	float	1	1	Wind direction at start/finish line
WindVel	m/s	float	1	1	Wind velocity at start/finish line
Yaw	rad	float	1	1	Yaw orientation
YawNorth	rad	float	1	1	Yaw orientation relative to north
YawRate	rad/s	float	1	1	Yaw rate

In addition to the above variables that are always available, there are several variables that only show up if a car implements that particular sensor type.

Name	Unit	Type	Disk	Live	Description
CFrideHeight	m	float	1	0	CF ride height
CFshockDefl	m	float	1	1	CF shock deflection
CFshockVel	m/s	float	1	1	CF shock velocity
CFSRideHeight	m	float	1	0	CFSR ride height
CRrideHeight	m	float	1	0	CR ride height
CRshockDefl	m	float	1	1	CR shock deflection
CRshockVel	m/s	float	1	1	CR shock velocity
dcABS		float	1	1	In car abs adjustment
dcAntiRollFront		float	1	1	In car front anti roll bar adjustment
dcAntiRollRear		float	1	1	In car rear anti roll bar adjustment
dcBoostLevel		float	1	1	In car boost level adjustment
dcBrakeBias		float	1	1	In car brake bias adjustment
dcBrakeBias		float	1	1	In car brake bias adjustment
dcDiffEntry		float	1	1	In car diff entry adjustment

Name	Unit	Type	Disk	Live	Description
dcDiffExit		float	1	1	In car diff exit adjustment
dcDiffMiddle		float	1	1	In car diff middle adjustment
dcEngineBraking		float	1	1	In car engine braking adjustment
dcEnginePower		float	1	1	In car engine power adjustment
dcFuelMixture		float	1	1	In car fuel mixture adjustment
dcRevLimiter		float	1	1	In car rev limiter adjustment
dcThrottleShape		float	1	1	In car throttle shape adjustment
dcTractionControl		float	1	1	In car traction control adjustment
dcTractionControl2		float	1	1	In car traction control 2 adjustment
dcTractionControlToggle		bool	1	1	In car traction control active
dcWeightJackerLeft		float	1	1	In car left weight jacker adjustment
dcWeightJackerRight		float	1	1	In car right weight jacker adjustment
dcWingFront		float	1	1	In car front wing adjustment
dcWingRear		float	1	1	In car rear wing adjustment
dpFNOMKnobSetting		float	1	1	Pitstop front flap adjustment
dpFUFangleIndex		float	1	1	Pitstop front upper flap adjustment
dpFWingAngle		float	1	1	Pitstop front wing adjustment
dpFWingIndex		float	1	1	Pitstop front wing adjustment
dpLrWedgeAdj		float	1	1	Pitstop lr spring offset adjustment
dpPSSetting		float	1	1	Pitstop power steering adjustment
dpQtape		float	1	1	Pitstop qtape adjustment
dpRBarSetting		float	1	1	Pitstop rear bar adjustment
dpRFTtruckarmP1Dz		float	1	1	Pitstop rftruckarmP1Dz adjustment
dpRRDamperPerchOffsetm		float	1	1	Pitstop right rear damper perch offset adjustment
dpRrPerchOffsetm		float	1	1	Pitstop right rear spring offset adjustment
dpRrWedgeAdj		float	1	1	Pitstop rr spring offset adjustment
dpRWingAngle		float	1	1	Pitstop rear wing adjustment
dpRWingIndex		float	1	1	Pitstop rear wing adjustment
dpRWingSetting		float	1	1	Pitstop rear wing adjustment
dpTruckarmP1Dz		float	1	1	Pitstop truckarmP1Dz adjustment
dpWedgeAdj		float	1	1	Pitstop wedge adjustment

Name	Unit	Type	Disk	Live	Description
LFbrakeLinePress	bar	float	1	1	LF brake line pressure
LFcoldPressure	kPa	float	1	1	LF tire cold pressure as set in the garage
LFpressure	kPa	float	1	0	LF tire pressure
LFrideHeight	m	float	1	0	LF ride height
LFshockDefl	m	float	1	1	LF shock deflection
LFshockVel	m/s	float	1	1	LF shock velocity
LFspeed	m/s	float	1	1	LF wheel speed
LFtempCL	C	float	1	1	LF tire left carcass temperature
LFtempCM	C	float	1	1	LF tire middle carcass temperature
LFtempCR	C	float	1	1	LF tire right carcass temperature
LFtempL	C	float	1	0	LF tire left surface temperature
LFtempM	C	float	1	0	LF tire middle surface temperature
LFtempR	C	float	1	0	LF tire right surface temperature
LFwearL	%	float	1	1	LF tire left percent tread remaining
LFwearM	%	float	1	1	LF tire middle percent tread remaining
LFwearR	%	float	1	1	LF tire right percent tread remaining
LRbrakeLinePress	bar	float	1	1	LR brake line pressure
LRcoldPressure	kPa	float	1	1	LR tire cold pressure as set in the garage
LRpressure	kPa	float	1	0	LR tire pressure
LRrideHeight	m	float	1	0	LR ride height
LRshockDefl	m	float	1	1	LR shock deflection
LRshockVel	m/s	float	1	1	LR shock velocity
LRspeed	m/s	float	1	1	LR wheel speed
LRtempCL	C	float	1	1	LR tire left carcass temperature
LRtempCM	C	float	1	1	LR tire middle carcass temperature
LRtempCR	C	float	1	1	LR tire right carcass temperature
LRtempL	C	float	1	0	LR tire left surface temperature
LRtempM	C	float	1	0	LR tire middle surface temperature
LRtempR	C	float	1	0	LR tire right surface temperature
LRwearL	%	float	1	1	LR tire left percent tread remaining
LRwearM	%	float	1	1	LR tire middle percent tread remaining

Name	Unit	Type	Disk	Live	Description
LRwearR	%	float	1	1	LR tire right percent tread remaining
RFbrakeLinePress	bar	float	1	1	RF brake line pressure
RFcoldPressure	kPa	float	1	1	RF tire cold pressure as set in the garage
RFpressure	kPa	float	1	0	RF tire pressure
RFrideHeight	m	float	1	0	RF ride height
RFshockDefl	m	float	1	1	RF shock deflection
RFshockVel	m/s	float	1	1	RF shock velocity
RFspeed	m/s	float	1	1	RF wheel speed
RFtempCL	C	float	1	1	RF tire left carcass temperature
RFtempCM	C	float	1	1	RF tire middle carcass temperature
RFtempCR	C	float	1	1	RF tire right carcass temperature
RFtempL	C	float	1	0	RF tire left surface temperature
RFtempM	C	float	1	0	RF tire middle surface temperature
RFtempR	C	float	1	0	RF tire right surface temperature
RFwearL	%	float	1	1	RF tire left percent tread remaining
RFwearM	%	float	1	1	RF tire middle percent tread remaining
RFwearR	%	float	1	1	RF tire right percent tread remaining
RRbrakeLinePress	bar	float	1	1	R brake line pressure
RRcoldPressure	kPa	float	1	1	RR tire cold pressure as set in the garage
RRpressure	kPa	float	1	0	RR tire pressure
RRrideHeight	m	float	1	0	RR ride height
RRshockDefl	m	float	1	1	RR shock deflection
RRshockVel	m/s	float	1	1	RR shock velocity
RRspeed	m/s	float	1	1	RR wheel speed
RRtempCL	C	float	1	1	RR tire left carcass temperature
RRtempCM	C	float	1	1	RR tire middle carcass temperature
RRtempCR	C	float	1	1	RR tire right carcass temperature
RRtempL	C	float	1	0	RR tire left surface temperature
RRtempM	C	float	1	0	RR tire middle surface temperature
RRtempR	C	float	1	0	RR tire right surface temperature
RRwearL	%	float	1	1	RR tire left percent tread remaining



Name	Unit	Type	Disk	Live	Description
RRwearM	%	float	1	1	RR tire middle percent tread remaining
RRwearR	%	float	1	1	RR tire right percent tread remaining

In addition there is a series of variables that are only ever output live (not available in ATLAS) that show up in an array format with one entry for each car in the race, up to 64 entries.

Name	Unit	Type	Disk	Live	Description
CarIdxClassPosition		int	0	1	Cars class position in race by car index
CarIdxEstTime	s	float	0	1	Estimated time to reach current location on track
CarIdxF2Time	s	float	0	1	Race time behind leader or fastest lap time otherwise
CarIdxGear		int	0	1	-1=reverse 0=neutral 1..n=current gear by car index
CarIdxLap		int	0	1	Lap count by car index
CarIdxLapDistPct	%	float	0	1	Percentage distance around lap by car index
CarIdxOnPitRoad		bool	0	1	On pit road between the cones by car index
CarIdxPosition		int	0	1	Cars position in race by car index
CarIdxRPM	revs/min	float	0	1	Engine rpm by car index
CarIdxSteer	rad	float	0	1	Steering wheel angle by car index
CarIdxTrackSurface	irsdk_TrkLoc	int	0	1	Track surface type by car index

Each variable has an associated type, the types are as follows:

- bool – 8 bit int that can be set to 1 (true) or 0 (false)
- int – 32 bit signed integer
- float – 32 bit signed floating point number
- double – 64 bit signed floating point number
- bitfield – 32 bit unsigned integer with each bit representing a different state or value.

Here is a description of each of the 4 bitfield types:

irsdk_EngineWarnings	
irsdk_waterTempWarning	0x0001
irsdk_fuelPressureWarning	0x0002
irsdk_oilPressureWarning	0x0004
irsdk_engineStalled	0x0008
irsdk_pitSpeedLimiter	0x0010
irsdk_revLimiterActive	0x0020

irsdk_Flags	
irsdk_checkered	0x00000001
irsdk_white	0x00000002
irsdk_green	0x00000004
irsdk_yellow	0x00000008
irsdk_red	0x00000010
irsdk_blue	0x00000020
irsdk_debris	0x00000040
irsdk_crossed	0x00000080
irsdk_yellowWaving	0x00000100
irsdk_oneLapToGreen	0x00000200
irsdk_greenHeld	0x00000400
irsdk_tenToGo	0x00000800
irsdk_fiveToGo	0x00001000
irsdk_randomWaving	0x00002000
irsdk_caution	0x00004000
irsdk_cautionWaving	0x00008000
irsdk_black	0x00010000
irsdk_disqualify	0x00020000
irsdk_servicable	0x00040000
irsdk_furled	0x00080000
irsdk_repair	0x00100000
irsdk_startHidden	0x10000000
irsdk_startReady	0x20000000
irsdk_startSet	0x40000000

irsdk_startGo	0x80000000
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irsdk_CameraState	
irsdk_IsSessionScreen	0x0001
irsdk_IsScenicActive	0x0002
irsdk_CamToolActive	0x0004
irsdk_UIHidden	0x0008
irsdk_UseAutoShotSelection	0x0010
irsdk_UseTemporaryEdits	0x0020
irsdk_UseKeyAcceleration	0x0040
irsdk_UseKey10xAcceleration	0x0080
irsdk_UseMouseAimMode	0x0100

irsdk_PitSvFlags	
irsdk_LFTireChange	0x0001
irsdk_RFTireChange	0x0002
irsdk_LRTireChange	0x0004
irsdk_RRTireChange	0x0008
irsdk_FuelFill	0x0010
irsdk_WindshieldTearoff	0x0020
irsdk_FastRepair	0x0040

While the following is not actually a bitfield, each value has a specific meaning as outlined in the table below

irsdk_TrkLoc	
irsdk_NotInWorld	-1
irsdk_OffTrack	0
irsdk_InPitStall	1
irsdk_AproachingPits	2
irsdk_OnTrack	3

irsdk_SessionState	
irsdk_StateInvalid	0
irsdk_StateGetInCar	1
irsdk_StateWarmup	2
irsdk_StateParadeLaps	3
irsdk_StateRacing	4
irsdk_StateCheckered	5
irsdk_StateCoolDown	6

## Appendix B – Session String

The session string represents all the details about the current state of iRacing and its current session that don't need to be updated 60 times a second. For the most part this is a static string that does not change, however it is not guaranteed to be static and in fact will change as drivers register for the session and as the race results are posted. The string is formatted using the YAML format, a nested data format like XML but one that is easily read by a human. The key to this format is that indentation matters, and `` denotes the start of an array entry.

The ATLAS .ibt importer pulls some data from the session string and makes it available to ATLAS, however to see the vast majority of this information you will need to use one of the various telemetry tools to gain access to the data.

Here is a mockup of a session string with every possible entry filled in and some pseudo code to indicate the format of the data and an indication of what each array represents. The data is indicated using standard printf() notation, %s is a string, %d is an integer, and %0.xf is a floating point number where x represents the number of decimal places to display.

```
---
WeekendInfo:
  TrackName: %s
  TrackID: %d
  TrackLength: %0.2f km
  TrackDisplayName: %s
  TrackDisplayShortName: %s
  TrackConfigName: %s
  TrackCity: %s
  TrackCountry: %s
  TrackAltitude: %0.2f m
  TrackLatitude: %0.6f m
  TrackLongitude: %0.6f m
  TrackNorthOffset: %0.4f rad
  TrackNumTurns: %d
  TrackPitSpeedLimit: %0.2f kph
  TrackType: %s
  TrackWeatherType: %s
  TrackSkies: %s
  TrackSurfaceTemp: %0.2f C
  TrackAirTemp: %0.2f C
  TrackAirPressure: %0.2f Hg
  TrackWindVel: %0.2f m/s
  TrackWindDir: %0.2f rad
  TrackRelativeHumidity: %d %
  TrackFogLevel: %d %
  TrackCleanup: %d
  TrackDynamicTrack: %d
SeriesID: %d
SeasonID: %d
SessionID: %d
SubSessionID: %d
LeagueID: %d
Official: %d
RaceWeek: %d
EventType: %s
Category: %s
SimMode: %s
TeamRacing: %d
```

```
MinDrivers: %d
MaxDrivers: %d
DCRuleSet: %s
QualifierMustStartRace: %d
NumCarClasses: %d
NumCarTypes: %d
WeekendOptions:
  NumStarters: %d
  StartingGrid: %s
  QualifyScoring: %s
  CourseCautions: %s
  StandingStart: %d
  Restarts: %s
  WeatherType: %s
  Skies: %s
  WindDirection: %s
  WindSpeed: %0.2f km/h
  WeatherTemp: %0.2f C
  RelativeHumidity: %d %
  FogLevel: %d %
  Unofficial: %d
  CommercialMode: %s
  NightMode: %d
  IsFixedSetup: %d
  StrictLapsChecking: %s
  HasOpenRegistration: %d
  HardcoreLevel: %d
TelemetryOptions:
  TelemetryDiskFile: "%s"
```

SessionInfo:

NumSessions: %d

Sessions:

for each session

{

```
- SessionNum: %d
  SessionLaps: %d
  SessionTime: %0.2f sec
  SessionNumLapsToAvg: %d
  SessionType: %s
  SessionTrackRubberState: %s
  ResultsPositions:
```

for each car in position order

{

```
- Position: %d
  ClassPosition: %d
  CarIdx: %d
  Lap: %d
  Time: %.3f
  FastestLap: %d
  FastestTime: %.3f
  LastTime: %.3f
  LapsLed: %d
  LapsComplete: %d
  LapsDriven: %.3f
  Incidents: %d
  ReasonOutId: %d
  ReasonOutStr: %s
```

}

```
ResultsFastestLap:
- CarIdx: %d
  FastestLap: %d
  FastestTime: %.3f
ResultsAverageLapTime: %.3f
ResultsNumCautionFlags: %d
ResultsNumCautionLaps: %d
ResultsNumLeadChanges: %d
ResultsLapsComplete: %d
ResultsOfficial: %d
}
```

QualifyResultsInfo:  
Results:

```
for each car
{
- Position: %d
  ClassPosition: %d
  CarIdx: %d
  FastestLap: %d
  FastestTime: %.3f
}
```

CameraInfo:  
Groups:

```
for each camera group
{
- GroupNum: %d
  GroupName: %s
  IsScenic: true
  Cameras:

  for each camera in group
  {
- CameraNum: %d
  CameraName: %s
  }
}
```

RadioInfo:  
SelectedRadioNum: %d  
Radios:

```
for each radio
{
- RadioNum: %d
  HopCount: %d
  NumFrequencies: %d
  TunedToFrequencyNum: %d
  ScanningIsOn: %d
  Frequencies:

  for each frequency in radio
  {
- FrequencyNum: %d
  FrequencyName: "%s"
  Priority: %d
  CarIdx: %d
  EntryIdx: %d
  }
```

```
ClubID: %d
CanScan: %d
CanSquawk: %d
Muted: %d
IsMutable: %d
IsDeletable: %d
}
}
```

#### DriverInfo:

```
DriverCarIdx: %d
DriverHeadPosX: %.3f
DriverHeadPosY: %.3f
DriverHeadPosZ: %.3f
DriverCarIdleRPM: %.3f
DriverCarRedLine: %.3f
DriverCarFuelKgPerLtr: %.3f
DriverCarFuelMaxLtr: %.3f
DriverCarMaxFuelPct: %.3f
DriverCarSLFirstRPM: %.3f
DriverCarSLShiftRPM: %.3f
DriverCarSLLastRPM: %.3f
DriverCarSLBlinkRPM: %.3f
DriverPitTrkPct: %.3f
DriverCarEstLapTime: %.3f
DriverSetupName: %s
DriverSetupIsModified: %d
DriverSetupLoadTypeName: %s
DriverSetupPassedTech: %d
Drivers:
```

for each car

```
{
- CarIdx: %d
  UserName: %s
  AbbrevName: %s
  Initials: %s
  UserID: %d
  TeamID: %d
  TeamName: %s
  CarNumber: "%s"
  CarNumberRaw: %d
  CarPath: %s
  CarClassID: %d
  CarID: %d
  CarScreenName: %s
  CarScreenNameShort: %s
  CarClassShortName: %s
  CarClassRelSpeed: %d
  CarClassLicenseLevel: %d
  CarClassMaxFuelPct: %.3f %
  CarClassWeightPenalty: %.3f kg
  CarClassColor: 0x%02x%02x%02x
  IRating: %d
  LicLevel: %d
  LicSubLevel: %d
  LicString: %s
  LicColor: 0x%s
  IsSpectator: %d
  CarDesignStr: %s
  HelmetDesignStr: %s
```



```
SuitDesignStr: %s
CarNumberDesignStr: %s
CarSponsor_1: %d
CarSponsor_2: %d
ClubName: %s
DivisionName: %s
}

SplitTimeInfo:
Sectors:

for each sector
{
- SectorNum: %d
  SectorStartPct: %.3f
}
...
```