TIC v6 and CTL v6.xx Data Release Notes

This is an older version of the TESS Input Catalog. It is only available for bulk downloads. The TIC Version 8.2 is the current version, please consult that documentation.

Last Updated 2018-05-23

The data release notes are updated by the TESS Stellar Parameter Working Group as issues are found.

This delivery contains the sixth version of the TESS Input Catalog (TIC) produced entirely by the Target Selection Working Group (TSWG), and was finalized and prepared for delivery to the TESS Science Office (TSO) on 2017 December 22. The second version of the candidates target list (CTL-6.2) was prepared for delivery on 2018 March 12.

The delivery has a number of minor issues (see below) which have not been fixed in this version due to time constraints during preparation. Specific details of the method of production and the contents of this TIC will be described in the full TIC-6 Documentation can currently be found on the arXiv at (https://arxiv.org/abs/1706.00495).

The design is the same as TIC-5, in that the columns and their format are the same, but there have been significant changes compared to TIC deliveries prior to TIC-6. TIC IDs have not been changed and all future deliveries of the TIC will use the same IDs for specific objects. New objects added to the TIC will always receive new IDs. Objects may be removed from the TIC, if they are found to be spurious, but TIC IDs will always be unique and a new TIC object will never receive the ID of an old TIC object.

Changes compared to TIC-5

This delivery contains major changes in computed quantities compared to TIC-5. It should be noted that the methods used to estimate a variety of stellar parameters are still under active development and can be affected by poor catalog photometry when there is no acceptable alternative photometry for a given star. The major changes compared to previous versions are:

1. All stars with matches between 2MASS and Gaia now have their coordinates given in the epoch 2015 Gaia system. Stars that did not have matches to the Gaia catalog have their coordinates given in the original 2MASS system. Entries where multiple Gaia stars match to one 2MASS star will have a single entry in TIC-6, but are flagged as Gaia multiples in the TIC. The position is re-computed as the flux-weighted position of the Gaia stars, and the associated Gaia magnitude is derived from the added flux of the components. The Source-ID of the brightest Gaia star is given as the matching Gaia source. 2MASS stars with multiple Gaia sources are removed from the Candidate Target List (CTL) but still appear in the TIC. 2MASS stars with multiple Gaia sources that are also in the Cool Dwarf list are not removed from the CTL. See section 2.1.2 of the full documentation for details.
2. We include new relations to transform to TESS magnitude using Gaia G magnitudes and Johnson V, 2MASS J, H or Ks magnitudes.
3. We include new relations to transform Gaia G, 2MASS Ks color to Johnson V and have changed the order of preference of observed and calculated V magnitudes.
4. The spectroscopic catalogs of APOGEE-2 (from SDSS DR-14), LAMOST DR-3, RAVE DR-5 and HERMES DR-1 have been added to our spectroscopic database increasing the number of stars with spectra from 1.5 million to 2.6 million. Please see the notes on column 64 for the updated priority scheme.
5. The proper motion catalogs of Hot Stuff for One Year and UCAC-5 have been added to the proper motion table. Please see the notes on column 17 for the updated preference scheme for proper motions.
6. An updated version of the specially curated cool dwarf list has been added to the catalog as well as curated lists for hot subdwarfs, bright stars, known planet hosts, and stars which were identified as missing in TIC-5 during Cycle 1 of the NASA Guest Investigator program.
7. Stars in the specially curated list of known exoplanet hosts (as detailed in the NASA exoplanet archive) have been included in the CTL and appropriately flagged. Due to time constraints, the specially curated list could not be fully incorporated into CTL-6. Stars which were in the CTL, prior to the list's delivery, are listed with their full CTL-6 default stellar parameters (~800 stars). Stars which were not in the CTL prior to the list's delivery, have no stellar parameters provided and their priority values have been set to 0 (~1600 stars). The full set of stellar parameters for these stars will be included in future versions of the CTL.
8. The CTL priority function (column 88) has been updated with the following:
    a. The radius now scales as R^1.5, rather than R (column 71).
    b. For both CTL6.1 and CTL6.2, the given star's priority is now boosted based on the star's ecliptic latitude (column 28) and the number of sectors the star is likely to appear in, rather than a factor of sqrt(13) if the star was in the continuous viewing zone. Generally, this boosts the priority of stars closer to a continuous viewing zone. For CTL-6.2, the gaps in priority from the expected positions of camera gaps have been removed
    c. For CTL-6.1, the priority function scaled with (sqrt(cratio+1)*phot_err) rather than sqrt(sqrt(cratio+1)*phot_err), where cratio is the contamination ratio (column 85) and phot_err is the photometric error provided by Sullivan et al. 2015 based on the TESS magnitude of the star (column 61). For CTL-6.2,the expected photometric error is now directly calculated using the same formalism from Sullivan et al. 2015, where the total noise (N) is defined as: N= sqrt(Nstar^2+Nsky^2+Ncont^2+Nread^2+Nsys^2). Nstar represents the photon error from the star; Nsky represents the photon error from the sky background; Ncont is the expected photon error from contaminants in the aperture (this replaces the contamination ratio); Nread is the readout error of the detector; and N sys is the unrecoverable 60ppm systematic error that is expected. Pepper et al. 2018 explains this new formalism in greater detail.
9. We have removed all SDSS extended sources (~120 million extended sources) that are not also in 2MASS. This is the largest set of objects that initially appeared in TIC-5 that were specifically removed from TIC-6. Many of the brighter objects in the SDSS extended source catalog, have

been shown to be ghost images created by SDSS diffraction spikes and were erroneously classified as galaxies in TIC-5 (see Full Documentation Section 2.1.3). These objects created numerous duplicate objects in the TIC and caused many unintended effects on the distribution of CTL parameters and objects (typically resembling the SDSS footprint in an all sky map). Removing these objects alleviated these effects.

10. The size of the CTL has been decreased from ~10 million stars to ~3.8 millions stars. Stars are now considered for the CTL if they are: 1) identified as RPMJ dwarfs with greater than 2-sigma confidence; and 2) meet one of the following temperature criteria: (T<12 and Teff >= 5500K) or (T<13 and Teff < 5500K) where T is the star's TESS magnitude (column 61) and Teff is the effective temperature of the star (column 65). Additionally, any star that is a member of the bright star list (T < 6) or specially curated cool dwarf list is included in the CTL.
11. We exclude any star from the CTL that only has: 1) an effective temperature which has not been corrected for reddening; 2) falls within a tolerance strip during the dereddening process; and 3) those stars with effective temperatures which have been corrected for reddening but are cooler than 3840K. Stars within the bright star list are not subject to these stipulations.
12. Stellar characteristics are calculated for the stars in the bright star list but should not be accepted at face value. Many objects in the bright star list are giants and the stellar parameter calculations are designed for dwarfs.
13. Stars from CTL-5 that are no longer in CTL-6 are not assigned a priority but have had their stellar parameters updated with CTL-6 procedures to be consistent with the rest of TIC-6.

Notes on the individual columns

No. Name Notes

1 TICID A unique identifier for every object in the TIC. The ID is unique and permanent. If an object is removed from the TIC in later versions, a new object will never inherit an old ID.

2 Version This column denotes the date YYYYMMDD, in which the TIC was finalized and prepared for delivery.

7 SDSS The values given are the 64-bit "objID" values, not the IAU-format "SDSS J" identifiers.

9 GAIA Gaia IDs in TIC-6 are included for stars which are found in the Gaia-provided Gaia-2MASS look-up table. For TIC stars with more than one associated Gaia magnitude, the ID of the brightest matching Gaia source is provided.

10 APASS APASS stars do not have an identifier, only coordinates. We use the primary key of an internal TESS version of the APASS database table as a proxy identifier.

16 Posflag Flag to denote the source of a given TIC object's position.

hip - stellar source is hipparcos

cooldwarfs - stellar source is the cool dwarf list

2mass - stellar source is 2MASS

lepine - Lepines All-sky Catalog of Bright M Dwarfs (2011)

tmgaia - stellar source from Gaia with unique 2MASS match

tmmgaia - stellar source from Gaia without unique 2MASS match

hotsubdwarf - stellar source is the hot subdwarf list

gicycle1 - stellar source is the GI cycle 1 program

2MASSEXT - extended source from 2MASS extended source catalog

17 pmRA The right ascension proper motions, in order of preference, are: (1) Gaia-TGAS, (2) Superblink, (3) Tycho-2, (4) Hipparcos. (5-7) Stars only found to have proper motions in UCAC4, UCAC-5 or HSOY were subject to a new set of requirements. Total UCAC-4 proper motion > 1800 mas/yr; total UCAC-5 proper motions > 200 mas/yr and < 1800 mas/yr; total HSOY proper motion < 200 mas/yr. If a star did not have a proper motion in these catalogs, it is not provided.

18 pmRA_e The right ascension proper motion errors are taken directly from the given proper motion catalog except in the case of SuperBlink, which in its delivered state, does not provide proper motion errors. In this case, we adopt an error of 2 mas/yr for stars with updated proper motions from Gaia and 8 mas/yr for stars without updated proper motions from Gaia.

19 pmDec See notes for column 17.

20 pmDec _e See notes for column 18.

22 plx The parallax values, in order of preference, are: (1) Gaia-TGAS, and (2) Hipparcos. Some values are negative because of the way the parallaxes were measured in TGAS and Hipparcos.

29 Bmag Johnson B magnitude. When a Johnson B magnitude was not found in one of the optical catalogs, the TIC reports a Johnson B derived from the USNO-A2.0 magnitude given in the 2MASS catalog.

31 Vmag Johnson V magnitude. Observed V magnitudes are preferred when they are converted from Tycho Vt or Hipparcos. We now calculate a Johnson V magnitude from a G-Ks color for stars which do not have a reliable observed Johnson V magnitude.

59 Gmag Gaia magnitudes are now included for all stars with such values in Gaia DR-1.

61 Tmag This column is never NULL. The Tmag values are typically based on relations that depend on J and V-Ks or J-Ks (see column 63 for method flag). TESS magnitudes for objects for which only poor catalog photometry was available were computed simply as offsets from a reference magnitude (see Documentation Section 2.2.2).

63 TESSflag These flags denote which relation or catalog provides the TIC TESS magnitude. See TIC-6 Documentation Section 2.2.1 for details of each method. While most of these relations (which are used for most Tmag values) are only appropriate for dwarf stars, some are applicable to giants. Extended objects were treated as if they were dwarfs. In general the dwarf relations are strictly valid between specific color ranges and tend to be less accurate for very blue stars (J-Ks < -0.1) or very red stars (J-Ks > 1). Full descriptions can be found in Appendix C of the documentation:

gaiak - magnitude calculated from G and 2MASS Ks

gaiaj - magnitude calculated from G and 2MASS J

joffset2 - magnitude calculated from 2MASS J and an offset (+1.75 for J-Ks > 1)

hipvmag - magnitude calculated Hipparcos V magnitude

gaiaoffset - magnitude calculated from G and an offset

hoffset - magnitude calculated from 2MASS H offset

vjh - magnitude calculated from V and 2MASS J-H

jhk - magnitude calculated from 2MASS J-Ks

vjk - magnitude calculated from V and 2MASS J-Ks

hotsubdwarf - magnitude adopted from hot subdwarf list

vk - magnitude calculated from V and 2MASS Ks

joffset - magnitude calculated from 2MASS J offset (+0.5 for J-Ks < -0.1)

gaiav - magnitude calculated from G and V

tmvk - magnitude calculated from V and 2MASS Ks (same as vk)

from_apass_i - magnitude from cool dwarf list (Muirhead et al 2017)

from_sdss_ik - magnitude from cool dwarf list (Muirhead et al 2017)

gaiah - magnitude calculated from Gaia and 2MASS H

jh - magnitude calculated from 2MASS J-H

cdwarf - magnitude from cool dwarf list (Muirhead et al 2017)

bpjk - magnitude calculated from photographic B and 2MASS J-Ks

voffset - magnitude calculated from V and offset

koffset - magnitude calculated from 2MASS Ks and offset

wmean_vk_jhk - magnitude from cool dwarf list (Muirhead et al 2017)

lepine - magnitude from Lepine catalog

gicycle1 - magnitude from GI Cycle 1 proposal

from_sdss_i - magnitude from cool dwarf list (Muirhead et al 2017)

64 SPFlag These flags denote the origin of stellar parameters:

cdwrf - mass and radius adopted from the Cool Dwarf list

hotsdwrf - mass and radius taken from the Hot Subdwarf list

tplx - parameters computed from measured TGAS parallax

hplx - parameters computed from measured HIP parallax

spec - parameters computed using Torres et al. 2010, A&ARv, 18, 67

spline - parameters computed from unified spline relations

allen - an older flag that is meant to point to spline

65 Teff The effective temperatures come from one of four sources, in the following order of preference: (1) the Cool Dwarf list or the Hot Subdwarf list; (2) spectroscopic catalogs (see Column 64); (3) dereddended V-Ks color; and (4) non-dereddened V-Ks color. We no longer allow stars with effective temperature not corrected for reddening to enter the CTL, except for stars in the bright star list.

66 e_Teff The SPOCS and GALAH catalogs do not provide uncertainties for effective temperatures; 25K and 41K were assigned, respectively, based on the reported statistical error from those catalogs.

67 Logg Surface gravity is calculated using the nominal formula: log10(G*M * Msun/(R * Rsun)^2). Where Msun is the mass of the Sun, G is the gravitational constant, Rsun is the Radius of the Sun, M is the mass of the star (column 73) and R is the radius of the star (column 71). Some stars may have unphysical log(g) values, such as log(g) > 4.8. If the star's stellar characteristics were calculated from de-reddened effective temperature or from a spectroscopic temperature, their priorities have been set to 0 to not prioritize stars with low quality stellar characteristics but the log(g) value remains to keep the TIC internally consistent.

68 e_Logg For stars which do not have spectroscopic log(g) measured, we define the error in the surface gravity as sqrt((M_e/M)^2+(2*R_e/R)^2), where M is the mass of the star (column 73), M_e is the mass error (column 74), R is the radius of the star (column 71) and R_e is the radius error of the star (column 72). For stars with spectroscopic log(g) from a single observation, the error was copied. For stars with multiple observations in the same catalog, the error listed in the TIC is a combination of each single observation's error added in quadrature. The SPOCS and GALAH catalogs do not provide uncertainties for surface gravities; 0.028 and 0.17 dex were assigned, respectively, based on the reported statistical error from those catalogs.

70 e_M/H For stars with spectroscopic metallicity from a single observation, the error was copied from the relevant catalog. For stars with multiple obs ervations in the same catalog, the error listed in the TIC is a combination of each single observation's error added in quadrature. The SPOCS and GALAH catalogs do not provide uncertainties for metallicities; 0.10 and 0.05 dex were assigned, respectively, based on the reported statistical error from these catalogs.

71 Radius The stellar radii were estimated using a variety of techniques, in the following order of preference: (1) radii provided by the specially curated Cool Dwarf list or the Hot Subdwarf list; (2) using the Gaia parallax and bolometric corrections; (3) spectroscopic relations from Torres et al. 2010, A&ARv, 18, 67; and (4) a unified relation based on measured radii for eclipsing binaries as well as simulations using Galactic structure models.

73 Mass If an object's mass is provided in the specially curated cool dwarf list or hot subdwarf listit is included in the TIC. Otherwise, the stellar masses were estimated using an unified relation based on measured masses for eclipsing binaries as well as simulations using Galactic structure models (see section 3.2.2 in the full documentation for details).

75 Rho The density in solar units is calculated using the formula M/R^3, where M is the mass of the star (column 73) and R is the radius of the star (column 71).

76 Rho_e The error in the density is calculated using the following formula: 3.0*Rho*(R_e/R), where Rho is the density (column 75), R_e is the error in the radius (column 72) and R is the radius of the star (column 71).

77 LumClass This is a boolean dwarf flag. If this is set, LumClass = DWARF, or otherwise GIANT. SUBGIANT is not used at present. However, the DWARF flag for TIC-6 effectively means that the star is either a dwarf or a subgiant, based on reduced proper motion cuts.

78 Lum The luminosity is calculated using the following formula and defined in solar units: R^2/(Teff/5772)^4, where R is the radius of the star (column 73) and Teff is the effective temperature (column 65).

79 Lum_e The error in the luminosity is calculated using the following formula: 2.0* L * (R_e / R). Where L is the luminosity (column 78), R_e is the radius error (column 74) and R is the radius (column 73). If the luminosity error was found to be larger than the luminosity, it was set to be equal to the luminosity.

82 E(B-V) Stars for which E(B-V) > 1.5 have their E(B-V) values set to a maximum of 1.5.

85 contratio The contamination ratio is defined as the nominal flux from the contaminants divided by the flux from the source. Flux contamination is calculated for all stars in the CTL. Contaminants are searched for within 10 TESS pixels of the target and the contaminating flux is calculated within a radius that depends on the target's TESS magnitude (Tmag, column 61). The PSF is modeled using a 2D-Gaussian based on preliminary PSF measurements from the SPOC. See section 3.2.3 of the full documentation for details.

88 priority Priority of target for observation. This is a floating-point value ranging from 0 to 1, where 1 is highest priority. The priority is based on the relative ability of TESS to detect small planetary transits, and is calculated using the radius of the star, the contamination ratio, and the total expected photometric precision. Stars are given a boost factor to their priority which scales with a probabilistic model of the expected number of sectors any given star could fall in. Typically, the closer the star is to the Ecliptic North or South pole, the larger the boost factor. Stars close to the Galactic Plane (|b|<15) have been de-boosted by a factor of 0.1 since we generally have a poor understanding of their true reddening, unless they are in the specially curated Cool Dwarf list (see Muirhead et al. 2017). The formula for CTL 6.1 was defined as: sqrt(Ns)/(R1.5*sqrt(epsilon+1)*sigma) where Ns is the expected number of TESS sectors to observe the star; R is the radius of the star (column 71), epsilon is the contamination ratio (column 87) and sigma is the expected photometric precision of the star based on the TESS magnitude (column 61). The formula for CTL 6.2 is defined as: sqrt(Ns)/(R1.5*sigma) where Ns is the expected number of TESS sectors to observe the star; R is the radius of the star (column 71), and sigma is the expected photometric precision of the star based on the TESS magnitude (column 61) using the formulation from Sullivan et al. 2015. The priority is normalized by the priority for a star with R = 0.1 solar, Ns = 12.654 sectors, epsilon = 0 contamination and sigma = 61.75 ppm.

Some stars will have distinct priorities:

a. Stars with log(g) values that are greater than 4.8 and temperature sources from 'dered' or 'spec' have their priority values set to 0 to avoid biases from Giant stars masquerading as dwarfs.

b. Stars in the bright star list always have their priority set to 1.

c. Stars with absolute ecliptic latitudes (column 28) less than ~6 are not expected to be observed as part of the main mission due to a gap in camera coverage between the Southern and Northern observations. Therefore, their Ns values are 0 and thus the priority is 0.

Known Issues and Quirks:

There are a number of minor issues which have been identified by the TSWG. We expect to address these issues in a future version of the TIC. The issues include:

1. All coordinates are for the epoch of observation (often 2MASS or SDSS for extended objects). Epochs are not currently supplied.
2. Because some stars have poor quality 2MASS photometry flags (such as 'D', 'U'), offsets where applied to G, V, J, H, or Ks magnitudes to provide a more realistic TESS magnitude but may be different from the true value by a magnitude or more.

3. ‘allen’ is a deprecated flag that should be replaced by the spline flag.
4. Some stars will show an error in the stellar density which is larger than the density itself. In these cases, the error should be interpreted as equal to the density.
5. The error in the luminosity currently only reflects the effect of the radius error but should also include the effects of temperature.
6. The following 13 stars do not have a TESS magnitude and should be ignored in TIC-6.
    a. TIC-IDS: 75834098, 144190256, 158983365, 101677906, 122564545, 147784016, 180764901, 6059840, 459225192, 229259238, 247903820, 590866, 54776047
7. Due to the preference of proper motion catalogs which are based on PPMXL, there is structure in the distribution of high priority candidates mainly above declinations larger than -30 deg.
8. Stars which have ecliptic latitudes between -6 and 6 degree have priorities set to 0, unless they are in the bright star list. This “gap” in priority is meant to mimic the expected gap in camera coverage for the 2 year primary TESS mission.
9. Some bright stars may have nearby impostor stars with similar magnitudes that lie along diffraction spikes from 2MASS photometry. Users can identify these impostors by checking 2MASS quality flags for very poor photometry (such as ‘D’, ‘E’, ‘F’, ‘U’). These objects should be removed in future versions of the TIC.

Planned Improvements in Future Versions:

There are a number of planned improvements for the future versions of the TIC. At present these improvements include:

1. Inclusion of all known exoplanets reported at the NASA archives with a full set of CTL parameters wherever this is possible and feasible.

Column Number, Column Name, Column Data Type and Brief Description:

Column Number	Column Name	Data Type	Description
1	ID	I11	TESS Input Catalog identifier
2	Version	A8	Version Identifier for this entry [yyyymmdd]
3	HIP	I6	Hipparcos Identifier
4	TYC	A12	Tycho2 Identifier
5	UCAC	A10	UCAC4 Identifier
6	TWOMASS	A16	2MASS Identifier
7	SDSS	A20	SDSS DR9 Identifier
8	ALLWISE	A20	ALLWISE Identifier
9	GAIA	A20	GAIA Identifier
10	APASS	A30	APASS Identifier
11	KIC	I8	KIC Identifier
12	Objtype	A10	Object Type
13	Typesrc	A12	Source of the object
14	RA	D10.6	Right Ascension JD2000 (deg)
15	Dec	D10.6	Declination JD2000 (deg)
16	Posflag	A12	Source of the position
17	pmRA	D10.3	Proper Motion in Right Ascension (mas/yr)
18	e_pmRA	D10.3	Uncertainty in PM Right Ascension (mas/yr)
19	pmDec	D10.3	Proper Motion in Declination (mas/yr)
20	e_pmDec	D10.3	Uncertainty in PM Declination (mas/yr)
21	PMFlag	A12	Source of the Proper Motion
22	plx	D10.3	Parallax (mas)
23	e_plx	D10.3	Error in the parallax (mas)
24	PARFlag	A12	Source of the parallax
25	GalLong	D10.6	Galactic Longitude (deg)
26	GalLat	D10.6	Galactic Latitude (deg)
27	EcLong	D10.6	Ecliptic Longitude (deg)
28	EcLat	D10.6	Ecliptic Latitude (deg)
29	Bmag	E6.3	Johnson B (mag)

30	e_Bmag	E6.3	Uncertainty in Johnson B (mag)
31	Vmag	E6.3	Johnson V (mag)
32	e_Vmag	E6.3	Uncertainty in Johnson V (mag)
33	umag	E6.3	Sloan u (mag)
34	e_umag	E6.3	Uncertainty in Sloan u (mag)
35	gmag	E6.3	Sloan g (mag)
36	e_gmag	E6.3	Uncertainty in Sloan g (mag)
37	rmag	E6.3	Sloan r (mag)
38	e_rmag	E6.3	Uncertainty in Sloan r (mag)
39	imag	E6.3	Sloan I (mag)
40	e_imag	E6.3	Uncertainty in Sloan I (mag)
41	zmag	E6.3	Sloan z (mag)
42	e_zmag	E6.3	Uncertainty in Sloan z (mag)
43	Jmag	E6.3	2MASS J (mag)
44	e_Jmag	E6.3	Uncertainty in 2MASS J (mag)
45	Hmag	E6.3	2MASS H (mag)
46	e_Hmag	E6.3	Uncertainty in 2MASS H (mag)
47	Kmag	E6.3	2MASS K (mag)
48	e_Kmag	E6.3	Uncertainty in 2MASS K (mag)
49	TWOMflag	A20	Quality Flags for 2MASS
50	prox	E6.3	2MASS Nearest Neighbor
51	W1Mag	E6.3	WISE W1 (mag)
52	e_W1Mag	E6.3	Uncertainty in WISE W1 (mag)
53	W2Mag	E6.3	WISE W2 (mag)
54	e_W2Mag	E6.3	Uncertainty in WISE W2 (mag)
55	W3Mag	E6.3	WISE W3 (mag)
56	e_W3Mag	E6.3	Uncertainty in WISE W3 (mag)
57	W4mag	E6.3	WISE W4 (mag)
58	e_W4Mag	E6.3	Uncertainty in WISE W4 (mag)
59	Gmag	E6.3	GAIA G Mag (mag)
60	e_Gmag	E6.3	Uncertainty in GAIA G (mag)
61	Tmag	E6.3	TESS Magnitude (mag)
62	e_Tmag	E6.3	Uncertainty in TESS Magnitude (mag)
63	TESSFlag	A5	TESS Magnitude Flag
64	SPFlag	A5	Stellar Properties Flag
65	Teff	E6.0	Effective Temperature (K)
66	e_Teff	E6.0	Uncertainty in Effective Temperature (K)
67	logg	E6.3	log of the Surface Gravity (cgs)
68	e_logg	E6.3	Uncertainty in Surface Gravity (cgs)
69	M/H	E6.3	Metallicity (dex)
70	e_M/H	E6.3	Uncertainty in the Metallicity (dex)
71	Rad	E8.3	Radius (solar)
72	e_Rad	E8.3	Uncertainty in the Radius (solar)
73	Mass	E8.3	Mass (solar)
74	e_Mass	E8.3	Uncertainty in the Mass (solar)
75	rho	E10.3	Stellar Density (solar)
76	e_rho	E10.3	Uncertainty in the Stellar Density (solar)

77	LumClass	A10	Luminosity Class
78	Lum	E10.3	Stellar Luminosity (solar)
79	e_Lum	E10.3	Uncertainty in Luminosity (solar)
80	d	E8.1	Distance (pc)
81	e_d	E8.1	Uncertainty in the distance (pc)
82	e(b-v)	E6.3	Color Excess (mag)
83	e_e(b-v)	E6.3	Uncertainty in Color Excess (mag)
84	numcont	I6	Number of Contamination Sources
85	contratio	E8.6	Contamination Ratio
86	disposition	A10	Disposition type
87	dup_id	I10	Points to the TIC ID
88	priority	E	CTL priority