

The Breakthrough Listen Search for Intelligent Life: Target Selection of Nearby Stars and Galaxies

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ABSTRACT

We present the target selection for the Breakthrough Listen search for extraterrestrial intelligence during the first year of observations at the Green Bank Telescope, Parkes Telescope and Automated Planet Finder. On the way to observing 1,000,000 nearby stars in search of technological signals, we present three main sets of objects we plan to observe in addition to a smaller sample of exotica. We choose the 60 nearest stars, all within 5.1 pc from the sun. Such nearby stars offer the potential to observe faint radio signals from transmitters having a power similar to those on Earth. We add a list of 1649 stars drawn from the Hipparcos catalog that span the Hertzsprung-Russell diagram, including all spectral types along the main sequence, subgiants, and giant stars. This sample offers diversity and inclusion of all stellar types, but with thoughtful limits and due attention to main sequence stars. Our targets also include 123 nearby galaxies composed of a “morphological-type-complete” sample of the nearest spirals, ellipticals, dwarf spheroidals, and irregulars. While their great distances hamper the detection of technological electromagnetic radiation, galaxies offer the opportunity to observe billions of stars simultaneously and to sample the bright end of the technological luminosity function. We will also use the Green Bank and Parkes telescopes to survey the plane and central bulge of the Milky Way. Finally, the complete target list includes several classes of exotica, including white dwarfs, brown dwarfs, black holes, neutron stars, and asteroids in our Solar System.

Subject headings: SETI— methods: observational

1. Introduction

For the last century, searches for extraterrestrial intelligence (SETI) have been conducted by gathering and analyzing electromagnetic radiation, arriving from beyond Earth, and filtering for characteristics not immediately explainable by naturally occurring processes in the universe, (Cocconi & Morrison 1959), (Drake 1961). While the first SETI searches focused on radio wavelengths, more recently optical and infrared searches have also been undertaken. Aside from direct detection of electromagnetic radiation, in SETI one can also pursue the detection of an altered environment that is only explained by the presence of advanced technology, such as detection of Dyson spheres (Wright et al. 2014a), or the presence of artificially created molecules such as CFCs in an exoplanet atmosphere (Lin et al. 2014).

Radio SETI searches take advantage of the transparency of the Earth’s atmosphere at radio wavelengths and the ability of radio waves to pass through the interstellar medium with only small extinction (Tarter 2001; Werthimer et al. 2001; Tarter et al. 2011; Korpela et al. 2011; Siemion et al. 2013; Harp et al. 2016). From the perspective of Earth technology, these searches would be sensitive to powerful radar such as the Arecibo Planetary Radar used to search for and study near Earth asteroids.

Alien civilizations that are interested in sending high volumes of data with low energy may use optical lasers as a means of communication. However, such lasers are more prone to interstellar extinction, leading to a smaller search volume accessible in the optical spectrum. Previous searches in the optical have searched for laser emission (Wright et al. 2001; Reines & Marcy 2002; Howard et al. 2004; Stone et al. 2005; Tellis & Marcy 2015; Lacki 2016; Howard et al. 2007), as well as anomalous features in broadband photometry such as that available from the Kepler Space Mission (Walkowicz et al. 2014) that could point to the alteration of an alien environment such as Dyson spheres (Wright et al. 2016).

SETI observations can be conducted by targeting large telescopes as a primary observer, or in a commensal or piggy-back fashion. In the latter case, one performs an analysis on a duplicate or ancillary data stream produced during what are typically non-SETI observations (Bowyer et al. 1983). This technique has the advantage that large amounts of the time on many telescopes can be utilized for SETI searches. Radio telescopes can operate in this mode with zero loss of sensitivity for the primary observer. However, the secondary or commensal observer usually cannot control the field of view, the exposure times, nor receiver or filter bands of the light waves being observed. While some telescopes, notably interferometric radio telescopes, can overcome these limitations significantly by presenting low level data products from individual antennas with wide fields of view, many observation parameters remain constrained.

In targeted SETI searches, one carefully selects the directions in the sky that the telescope will be pointed. One also selects receivers or filters, the spectral resolution, and the duration of the exposures. Targeted searches offer the opportunity to observe a specified population of targets, at well defined frequencies, spectral resolution, and flux limits. The resulting non-detections, or detections, can then be more easily translated into physical and statistical interpretations. Such observational specificity corresponds to well-defined properties, or upper limits, of extraterrestrial civilizations such as their broadcasting power, frequency of occurrence near stars or galaxies, their number density in the universe, and the fraction of space occupied by their broadcast beams. Flux thresholds can also be compared to the electromagnetic luminosity of the Earth at different frequencies.

Recent targeted SETI searches have been carried out by Tarter (2001), Reines & Marcy (2002), Howard et al. (2007), Harp et al. (2016), Siemion et al. (2013), Maire et al. (2014), Wright et al. (2014a), Wright et al. (2014b), and Tellis & Marcy (2015). Project Phoenix was arguably the worlds most comprehensive targeted search for extraterrestrial intelligence

at radio wavelengths. It used the Parkes 64 m telescope for 16 weeks observing 200 stars, the Green Bank 140-foot telescope from 1996 to 1998, and finished by using the Arecibo 300 m radio telescope. Phoenix targeted nearby, Sun-like stars based on the hypothesis that they represented plausible harbors of intelligent life. In total, Project Phoenix surveyed 800 stars within 65 parsecs, between frequencies of 1.0 to 3.0 GHz at 1 Hz-wide resolution. No signals were reported (Backus & Project Phoenix Team 2002).

As a complement to targeted searches, wide-field surveys serve as a way to sample 10^6 - 10^8 more stars than pointed surveys, albeit at lesser sensitivity. Shostak et al. (1996) surveyed the Small Magellanic Cloud for narrow band signals using Project Phoenix hardware. *Breakthrough Listen* will use improved digital electronics and multi-beam receivers will allow for unprecedented sensitivity to a variety of signal types, including narrow band sources in the Galactic Plane and spatially extended nearby galaxies, such as Andromeda and the Large and Small Magellanic Clouds.

The next-generation SETI program, *Breakthrough Listen*, is initially utilizing three major telescopes, the Green Bank radio telescope, the Parkes radio telescope, and the Automated Planet Finder optical telescope and its Levy spectrometer at Lick Observatory. In this paper we present the method and results regarding the *Breakthrough Listen* selection of targets for these three telescopes. The approach toward selecting targets is guided by four top level goals: 1) Sample all major types of stars over a range of masses, ages (including "evolved" stars), and elemental abundances; 2) sample the region of the Milky Way Galaxy within 50 parsecs of the Sun, as it appears to be not substantially different from the rest of the disk of our Galaxy; 3) for galaxies, favor the nearest representatives of all of the major classes: elliptical, spirals, dwarf spheroidals, and irregulars. Radio observations of galaxies encompass tens of billions of stars in each telescope beam, allowing us to sample the rare but bright end of the extraterrestrial luminosity function; and 4) target some

objects that, while defying the expected habitats for intelligent life due to seemingly harsh environments for life as we know it, are astrophysically anomalous or otherwise present intriguing underexplored possibilities for advanced life.

2. Facilities

Breakthrough Listen is currently using the Green Bank Telescope in West Virginia, the Automated Planet Finder at Lick Observatory and the Parkes Telescope in Australia, with plans to incorporate other large telescopes around the world. This complement of telescopes will allow wavelength coverage from 350 MHz -100 GHz in the radio and 374 to 950 nm in the optical. The combined receiver suite and instrumentation on these facilities allow for a wide array of observing possibilities.

The 100-m Green Bank Telescope, with newly installed *Breakthrough Listen* instrumentation, is currently capable of processing a 3.75 GHz bandwidth in dual polarization, and will soon expand to 10 GHz of bandwidth (MacMahon, in prep). All of the available receivers are capable of feeding the *Breakthrough Listen* instrument. Observations of the primary target list for *Breakthrough Listen* began on 2016 Jan 1, with observations of the first known exoplanet around a sun-like star, 51 Peg. Details of observations so far are listed in Section 7.

The 2.4-m Automated Planet Finder, with its Levy Spectrometer, is capable of producing high resolution optical spectra ($R = 95,000$) over the wavelength range of 374 to 950 nm (Radovan et al. 2014). We use the telescope for 36 nights per year and search each spectrum for optical laser lines originating from the on sky area surrounding the target star on 36 nights per year. The decker size of $1''0 \times 3''0$ corresponds to 10 by 30 au for a star at 10 pc, and proportionally larger regions for more distant stars, making us sensitive to

laser lines emitted from the entire planetary system around each target star as well as from foreground and background stars in the line of sight. The targeted signal-to-noise ratio is 100:1 per pixel with maximum exposure time of 20 minutes. Observations with the APF began in December 2015 and are detailed in Section 7.

Breakthrough Listen observations at the Parkes radio telescope in Australia began on 2016 Nov 7. The 64 m single dish telescope is currently capable of feeding the *Breakthrough Listen* instrument with a single pixel covering up to 1.25 GHz bandwidth at all of the available receivers, including the 13mm, H-OH, and MARS receivers. Installation of an ultra-wide-band feed that will cover 0.7-4 GHz along with an increase in bandwidth allowed by instrument upgrades will result in up to 5 GHz of total bandwidth in 2017 February, including observations using all 13 pixels of the Parkes Multibeam Receiver. The multi-beam and ultra-wide band feeds will be used for both a targeted star search and a survey of the Galactic plane and bulge which will provide a much shallower survey of billions of stars in the Milky Way. A special focus on the Galactic bulge will use the multi-bream receiver from 1.2 - 1.5 GHz.

3. The Stellar Sample

The stellar sample is defined by two selection criteria. The first is a volume-limited sample of stars within 5 pc of the Sun. The second is a spectral class complete sample consisting of stars across the main sequence and some giant branch stars, all within 50 pc. Details of the selection criteria are described below. We combined the two sub-samples (5 pc and 5-50 pc) to produce the final set of 1709 target stars which are listed in Table 1.

3.1. The 5-Parsec Sub-sample

We constructed a target sample containing all 60 known stars within 5 pc. Designed for observations with the GBT, APF, Parkes, and any other SETI observational projects such as NIROSETI (Wright et al. 2014b), this sub-sample contains all stars within 5 pc from the RECONS list (Henry et al. 2006) and its online updates¹, and the Gliese Catalog of Nearby Stars (3rd Edition)

(Gliese & Jahreiss 1995). We extracted their coordinates, trigonometric parallaxes, proper motions and photometry, including V and B-V magnitudes. Nearly all of these stars have large proper motions, in the range $0.1 - 5 \text{ arcsec yr}^{-1}$, accumulating during 16 years (since epoch 2000) to tens of arcseconds, comparable to the field of view of optical telescopes. We include proper motions for all observations.

Roughly half of the stars in the 5 pc sample have a binary companion. For any star having a companion within an angular separation of 2 arcseconds, we simply enter the star in the *Breakthrough Listen* target list once, as they will not be spatially resolved at either optical or radio wavelengths. Binary stars with separations greater than 2 arcseconds receive an observation for each star, with knowledge that both stars may fall into the observable view of the telescope. The H-R Diagram of the 5-Parsec star sample is shown in Figure 1. Most of these stars are red, low mass, M dwarfs with $B-V > 1.0$. The *Breakthrough Listen* observing strategy may in the future be modified to boost the exposure time of these nearby stars, to enable the detection of radio transmitters having modest (Earth-like) power measured in tens or hundreds of megawatts.

¹ <http://www.recons.org>

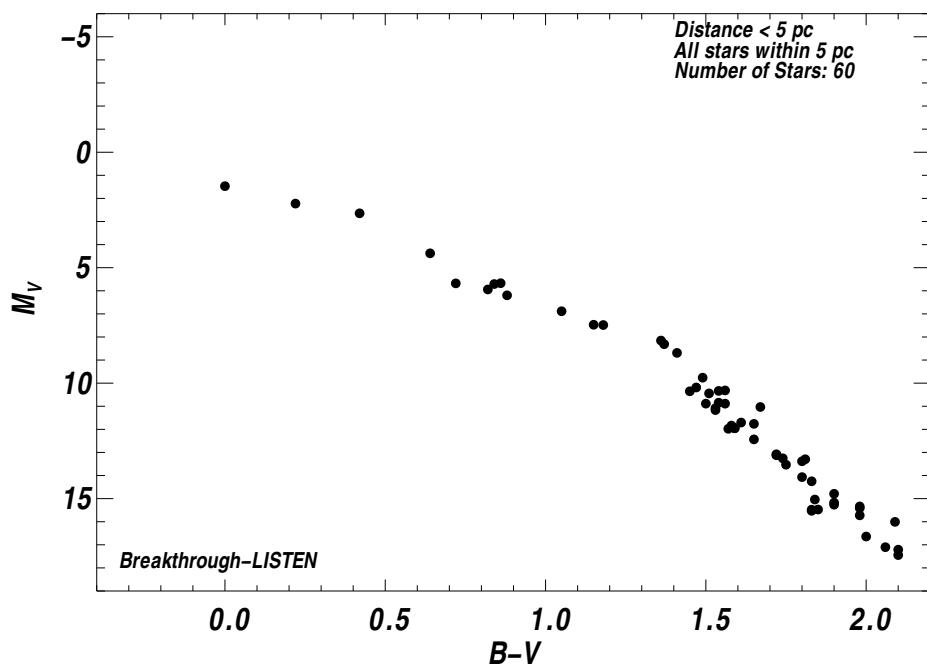


Fig. 1.— The H-R Diagram of the 5-parsec sample of target stars for *Breakthrough Listen*. It includes all stars within 5 pc over the entire sky, north and south.

3.2. 5-50 Parsec Sub-Sample of Main Sequence and Giant Stars

The second sub-sample of the *Breakthrough Listen* target list includes nearby main sequence and giant stars at all declinations, north and south, suitable for the Green Bank, APF, and Parkes telescopes. The selection criteria for the 5-50 pc target stars follow from the goal of searching nearby stars with a broad sampling of all types of main sequence stars. The 5-50 pc target stars are drawn from the Hipparcos Catalog Perryman et al. (1997), which provides accurate coordinates, distances, and proper motions. The following descriptions and figures illustrate the selection criteria of these 5-50 pc main sequence and giant stars.

Figure 2 shows the H-R Diagram of the 5-50 pc sub-sample of stars. The figure exhibits rectangular domains along the Main Sequence stars in color (B-V) and visible luminosity (M_v) of size 0.1 mag and 2.0 mag, respectively, as shown in the upper left of Figure 2. Many domains contain more than 100 stars in this distance range. To spread more uniformly the distribution of target stars along the main sequence, the nearest 100 stars were identified and culled within each domain. The number of stars in each domain is indicated at the top of each domain. If there were fewer than 100 stars in a domain, all of the stars were retained as targets. In addition, a domain of subgiant and giant stars was constructed, as shown in the rectangle at the upper right of Figure 2. These 100 nearest evolved stars were retained as targets. This selection of main sequence, subgiant, and giant stars between 5-50 pc yields 1649 target stars.

3.3. The Combined Stellar Sample

The H-R Diagram of the combined sample of 1709 stars is shown in Figure 3 and listed in Table 1. Inclusion of stars across the main sequence suppresses bias against any

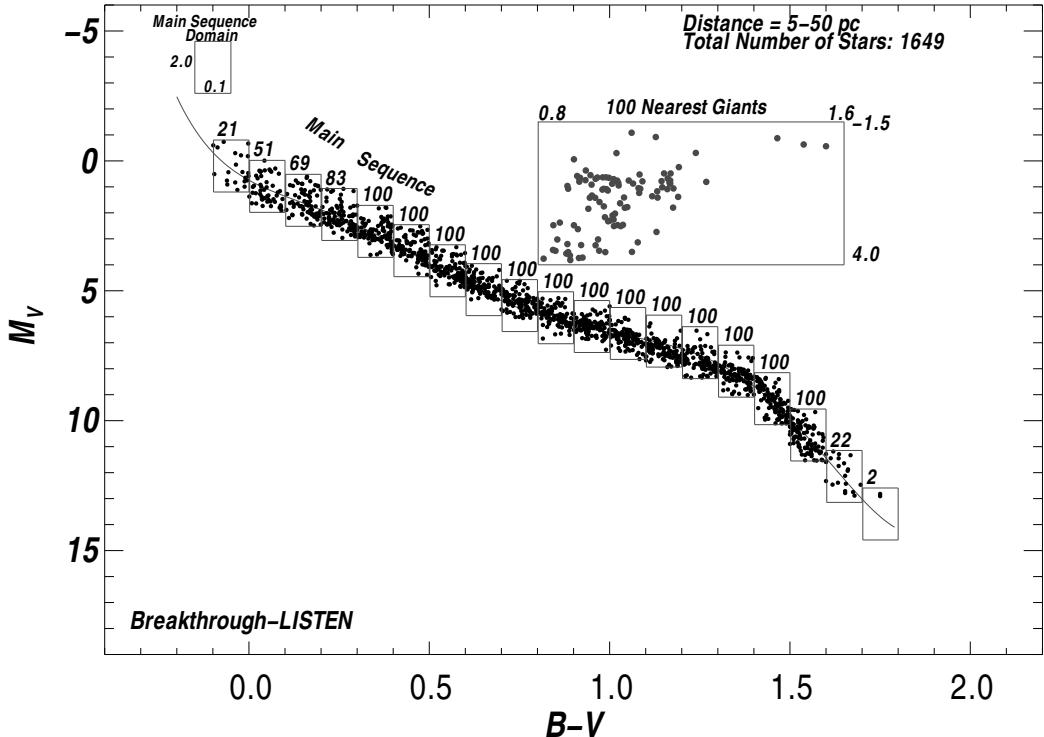


Fig. 2.— The H-R Diagram of the 5-50 pc sub-sample of target stars for *Breakthrough Listen*. Domains of $B - V$ and M_V were constructed along the main sequence, within which the nearest 100 stars were selected to be included in the final *Breakthrough Listen* target list. In addition, a domain of giant stars was constructed and the nearest 100 such stars were identified.

type of star. The nearest stars, within 5 pc, are composed mostly of M dwarfs, down to spectral type M8 ($B - V > 2$), near the brown dwarf boundary. We retained stars having hydrogen-burning ages of less than a few billion years (stars more than twice the mass of the Sun) despite the concern about adequate time for evolution to yield intelligence, as well as giants, which evolved off the main sequence less than 100 million years ago.

This survey spreads the investment of telescope time across a broad distribution of the nearest main sequence, sub-giant, and giant stars, with special inclusion of all stars within 5 pc. Figure 4 shows the position of all 1709 targets (main sequence and giant stars) on the sky in equatorial coordinates. Each star is color coded to represent its spectral type (BAFGKM), from hottest to coolest surface temperature.

The histogram of distances to the entire target sample of 1709 stars is shown in Figure 5. The distances range from 1.3 pc (the Alpha Cen triple system) to 50 pc. The peak is near 25 pc, representing the typical distance to the nearest 100 FGK stars within 50 pc. The M dwarfs are concentrated at distances under 20 pc, due to their high number density in the Galactic disk and to the purposeful inclusion of all stars within 5 pc that are mostly M dwarfs. The most distant stars in the sample, located beyond 30 pc, are composed mostly of early G, F, A, and B type stars and giants that have a lower number density for which the nearest are farther away.

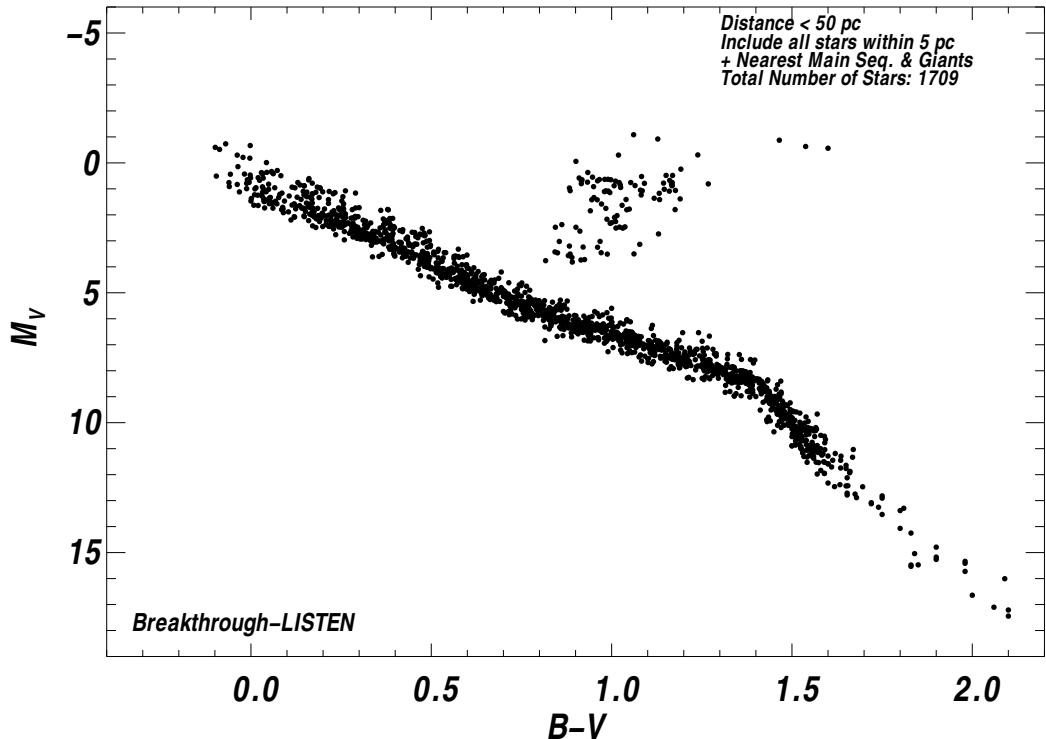


Fig. 3.— The H-R Diagram of the 5-50 pc and 5 pc samples of target stars for *Breakthrough Listen*. Domains of $B - V$ and M_V were constructed along the Main Sequence, within which the nearest 100 stars were selected to be included in the final *Breakthrough Listen* target list. In addition, a domain of giant stars was constructed and the nearest 100 such stars were identified.

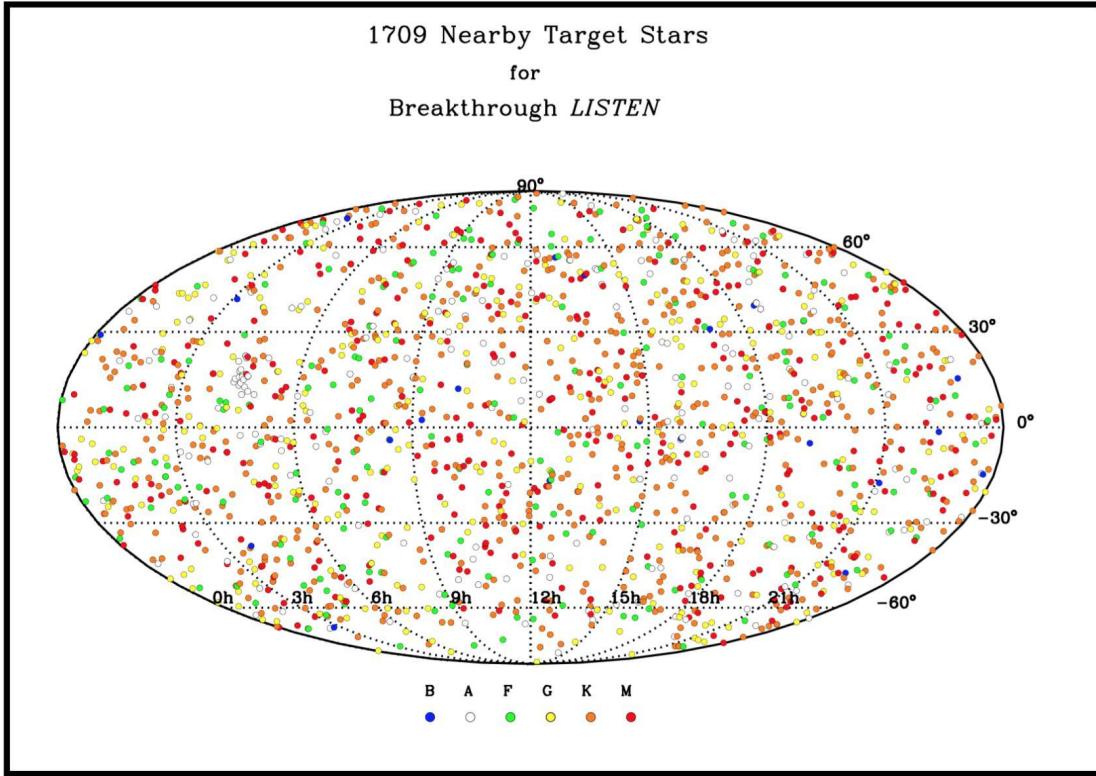


Fig. 4.— The equatorial coordinates of the entire set of *Breakthrough Listen* target stars. It includes all stars within 5 pc and the nearest stars within B-V domains in a 5-50 pc sub-sample. The goal is to construct a sample of target stars for *Breakthrough Listen* that has a sampling of the diversity of stars found within 50 pc.

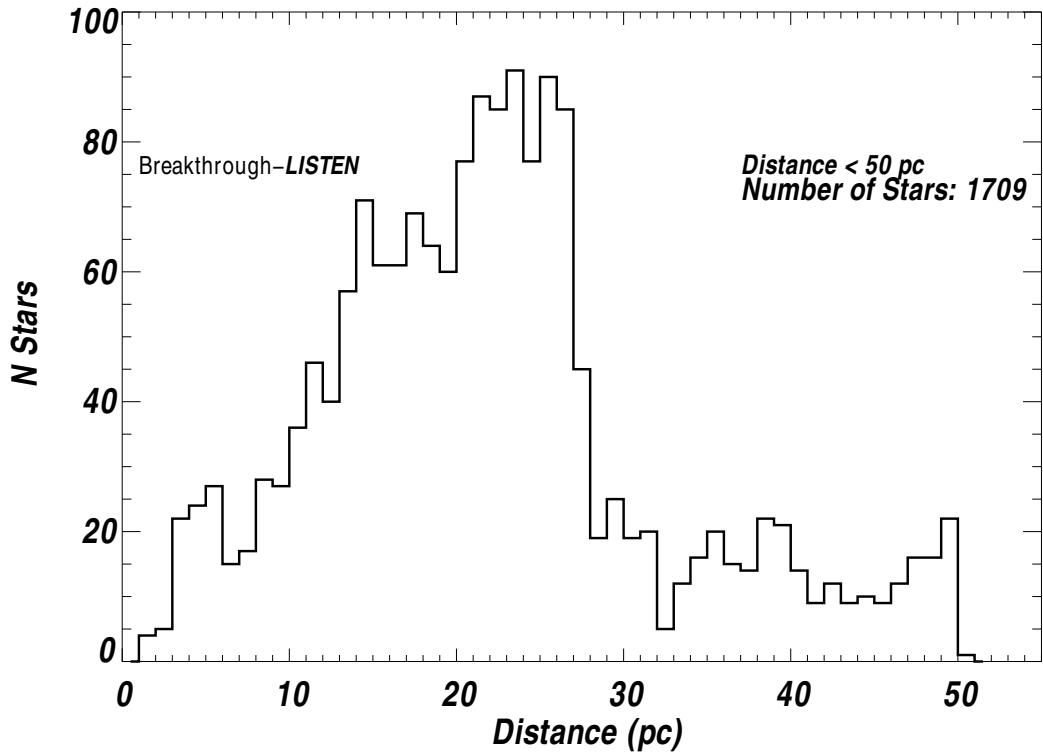


Fig. 5.— The histogram of distances to all 1709 target stars of the *Breakthrough Listen* survey. The nearest stars (at far left) are typically M dwarfs and the bulk of the stars from 10-30 pc are typically FGKM stars. The stars beyond 30 pc are F, A, and B stars and giants, for which their low number density in the Galaxy necessitates greater distances to include the nearest of them.

4. Galaxies

As SETI targets, galaxies offer both challenges and opportunities. The great distances to the nearest large galaxies, measured in millions of light years, require extraterrestrial technologies to generate luminosities of order 10^7 TW of equivalent isotropically radiated power (EIRP) to be detected, i.e. a million times the EIRP of the most powerful transmitter at Arecibo. Still, this power requirement is only a technological hurdle, not an obstacle of physical principle. The angular sizes of nearby galaxies are typically tens of arcminutes, comparable to the beam sizes of the Green Bank and Parkes telescopes, depending on frequency and dish size. Thus, a single radio observation captures any SETI signals coming from anywhere within a large fraction of an entire galaxy, including billions of stars and their planets, simultaneously. If advanced civilizations are very rare, but occasionally produce energetic radio emission of over 10^7 TW, such radio observations of galaxies would sample that domain of the ETI luminosity function. Indeed, few SETI programs have included galaxies in their target list, making them fresh hunting ground.

The selection process of target galaxies for the *Breakthrough Listen* program spans the entire sky and includes those galaxies to be the nearest representatives of the five major morphological classes of galaxies. With all due appreciation of the habitability of our home spiral galaxy, we find no compelling argument that technological life might preferentially arise in one type of galaxy over any other, as long as the abundance of heavy elements is within an order of magnitude of solar. Specifically, we have included 40 spirals, 40 ellipticals, 20 dwarf spheroidals, 20 irregulars, and three S0 galaxies. We constructed the sample from two sources: NEARGALCAT, a catalog of all known galaxies within 11 Mpc (Karachentsev et al. 2013) and Djorgovski & Davis (1987) which contains properties of 85 nearby, regular giant elliptical galaxies.

The NEARGALCAT contains all 869 known galaxies within 11 Mpc, including spirals,

dwarf spheroidals, and irregulars. However, NEARGALCAT contains only three normal giant elliptical galaxies, reflecting their general paucity in the Universe. Indeed, Ann et al. (2015) show that normal giant elliptical galaxies comprise only 1.5% of all galaxies. In contrast, spirals make up 32% of all galaxies and irregulars contribute 42%. Normal elliptical galaxies occur mostly in galaxy clusters, such as Coma or Virgo.

To include normal giant ellipticals in the *Breakthrough Listen* target list requires that we reach out to 30 Mpc. From Djorgovski & Davis (1987), which established the Fundamental Plane, we identify a subset of ellipticals having $z < 0.01$, systematically the closest ellipticals from that paper which included galaxies at $z < 0.025$. The galaxies in Djorgovski & Davis (1987) are biased toward the northern hemisphere, all having a declination > -25 deg. However, this bias does not matter for *Breakthrough Listen*, as over half of these galaxies are accessible by both GBT and Parkes, allowing a free allocation of targets to each.

Analogous to the 5-50 pc sample of stars across all spectral types described above, we chose a roughly uniform distribution of the different types of the nearest galaxies in all five morphological classes: 40 nearest spirals, 40 nearest ellipticals, 20 nearest irregulars, 20 nearest dwarf spheroidals, and three nearby S0 galaxies (Table 2). Figure 6 shows the distribution of the selected galaxies on the celestial sphere. The angular sizes of most of these 123 nearby galaxies are less than 10 arcminutes. Of course the very nearest galaxies, such as Andromeda, have angular sizes over 30 arcminutes, depending on which isophot one adopts as the edge. Observations of galaxies with GBT and Parkes may consist of one, or at most a few, pointings near the center of each galaxy. The typical radio beam size at most frequencies will cover a large fraction of the stars in the nuclei, bulges, and outskirts of most of these galaxies.

We will observe the galactic plane and bulge of the Milky Way over 1200-1550 MHz using

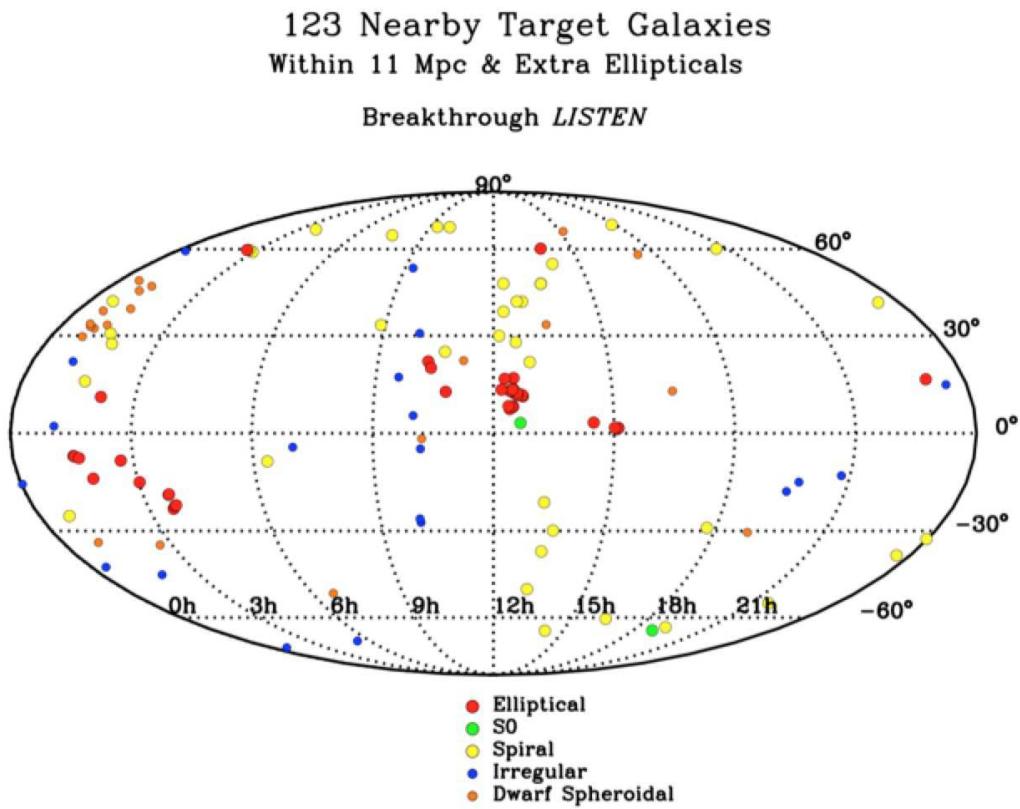


Fig. 6.— A map, in equatorial coordinates, of the *Breakthrough Listen* target galaxies. This spatial distribution is non-uniform because of natural clumping and association rather than selection effects.

the 21-cm multibeam receiver on the Parkes 64-m radio telescope (Staveley-Smith et al. 1996). This broad Milky Way survey will include billions of the stars located within the densest regions of our galaxy. The Parkes telescope is well suited to this task, due to the southern declination of the Galactic center and the high survey speed afforded by the 21-cm multibeam receiver. We will employ a step-and-stare mosaic strategy, as used in the High Time Resolution Universe survey (Keith et al. 2010), to survey roughly 3000 square degrees over galactic longitudes $-174 \text{ deg} < l < 60 \text{ deg}$ and latitudes $|b| < 6.5 \text{ deg}$. To leverage potential scintillation-induced signal amplification and intermittency (Cordes et al. 1997), each sky position will be observed several times. We anticipate observing the 3000 square degree survey area over 1500 hours total, leading to roughly 1080 s total dwell time per pointing.

For high northern latitude portions of the galactic plane, the Parkes observations will be supplemented with appropriate parity using the GBT.

The two nearest galaxies outside of the Milky Way, the Large and Small Magellanic Clouds (LMC, SMC) serve as galactic targets that are 10 times closer than M31. The Parkes Telescope has previously been used to survey the Magellanic Clouds for continuum sources (Haynes et al. 1991) and for SETI signals (Shostak et al. 1996). The latter SETI survey searched 3 pointings (1/1000 of the projected angular size of the SMC) over the bandpass from 1.2 - 1.75 GHz using the Project Phoenix hardware but found no narrow band or slow pulsed signals greater than 19 Jy.

Due to its large angular size on the sky, roughly 100 square degrees, LMC and SMC are target galaxies with over 10^{10} and 10^7 stars, respectively (de Vaucouleurs et al. 1991). Using the 21 cm multi-beam receiver with a similar step and stare strategy to that proposed for the Galactic Plane Survey, with a dwell time of 1080 s dwell time per pointing, the two surveys could be conducted in 50 hours and 10 hours of observing time, respectively.

5. Exotica

In addition to stars and galaxies, the *Breakthrough Listen* target list will also include an exotica category. This category contains classes of astronomical objects that seem less likely to harbor technological life as we expect it, e.g. environments very different than our own planet, but present intriguing opportunities for more speculative investigations. Fundamentally, these objects merit SETI observations in case our anthropocentric expectations are wrong. Such a list will include, but not be limited to: brown dwarfs, white dwarfs, pulsars, black holes, asteroids, KBOs, Pluto, Sedna, the Moon, pulsars, and active galactic nuclei such as the M87 nucleus. Solar system asteroids will also be considered for observation as suggested by Gertz (2016). We expect less than 5% of observing time will be spent on exotic objects.

6. Observing Strategy

When observing the 5 pc sample, the 5-50 pc sample and the galaxy sample, we implement an on-source/off-source strategy. Each primary target is observed three times with an observation of an off source target observed after each primary target observation. In all cases, we move the telescope off of the primary target to ensure that any emission from the primary target is sufficiently attenuated in off-source observations. We initially observed the off-source in a uniform way by moving, one degree in declination away from the primary source. We then modified our strategy to observe known stars as off-source targets. This set of off-source stars is composed of the brightest 40,000 stars from the Hipparcos catalog that are not in already in the primary sample. Having such a large number of stars ensures that we do not need to spend excessive telescope time on slew times from the primary (A) to off-source targets (B, C, D). For each primary star, we choose three nearby off-source stars and observe in the pattern ABACAD. So that the signal to

noise ratio is roughly the same, we use the same exposure time for each pointing.

Special care is required when observing galaxies that are extended on the sky. The same on/off source strategy is employed, with slight modifications to account for the angular extent of the galaxy and to ensure optimal on-source time. A single pointing allows us to observe the majority of stars within a galaxy, and with the off source positioning, we can distinguish local radio interference from signals originating in the observed galaxy.

7. Observations to Date

7.1. Green Bank Telescope

In 2016, we observed the 5 pc and 5-50 pc samples at L-band for stars above declination of -20 degrees. L-band ($1.1 - 1.9$ GHz) was chosen as the first receiver as it is a well characterized receiver and well matched to early incarnations of the *Breakthrough Listen* digital instrumentation. We are now moving to S-band, spanning $1.7 - 2.6$ GHz, and later will extend to higher frequencies as we gain confidence with our instrumentation and install additional processing capacity.

The standard cadence for a single target is a set of six, five-minute observations ABACAD as described above. From each five minute observation, we compute three separate data products, the sum of which is roughly 2 percent of the volume of the raw voltage data. A Graphics Processing Unit (GPU) accelerated code is used to produce three dynamic spectra data files with resolutions of 3 Hz, 366 Hz, and 3 KHz. The volume of each 5 minute observation is 1 TB per data writing disk. In L-band, the bandwidth is 800 MHz, requiring 4 computers to simultaneously write to disk. With the full future capacity of 10 GHz of bandwidth, 64 computers will write data to disk at the combined rate of 64 TB of raw voltage data per 5 min observation. The final data product will be 1.28 TB of data per

5 minute observation of dynamic spectra data. Similar data products will be produced for data acquired with the Parkes Telescope. As much data as possible will be made publicly available².

7.1.1. Data Quality Analysis, Raw Voltage

While the primary archival data product is total power dynamic spectra, the raw time-domain (voltage) data used to produce dynamic spectra remain temporarily available in order to conduct focused signal analysis. These data enable the search for wider bandwidth signals through detection of communication features such as circularity, cyclostationarity or higher-order statistics. They are also essential to compensate coherently for Doppler frequency shifts induced by relative accelerations (e.g. correcting to “magic” reference frames), identifying subtle terrestrial radio frequency interference, and more broadly, monitoring the system and data quality through statistical analysis. A raw data software package is being developed to provide to any user the tools to perform signal processing, analysis and detection on raw voltages that may become available in the future.

7.1.2. Data Quality Analysis, W3 Maser

In early tests of our observing system, we observed the W3(OH) star-forming region using the L-band receiver of the GBT with the BL data recorder systems (MacMahon, in prep). Figure 7 shows the Stokes I spectra of OH maser emission in the W3 star-forming region, generated from BL observations on MJD 57424.92. The figure shows an extracted 0.2 MHz band, centered at 1667.5 MHz, with 2.8 Hz channel resolution, using a 20 second

²<http://www.breakthroughinitiatives.org/OpenDataSearch>

integration period. See Wright et al. (2004) for comparison.

7.1.3. Data Quality Analysis, Voyager 1 Observations

Narrow band signals have been the favorite among ETI searches for a variety of reasons, but especially due to their obviously artificial nature. In particular, most searches look for narrow band signals that drift in frequency over time. Drifting signals are produced when a Doppler acceleration exists between the transmitter and the receiver, typically signals that are not stationary at the Earth’s surface. However, it is still possible to have signals that are man-made and also far away from the earth, such as the Voyager 1 spacecraft. Its signal drifts in frequency due to the relative acceleration between the Earth and the spacecraft in an uncorrected frame of reference. Figure 8 shows a five minute observation with the GBT of the Voyager 1 spacecraft, the carrier signal as well as the two side bands. The lower plots show the dynamic spectrum of each of the three signals. The plots on the top show the integrated spectrum with and without the drift correction at the best fit drift rate. This serves as a proof of concept on how the drift rate search is needed to detect an extra terrestrial signal, man-made or not.

Observations like the Voyager signal are a good test of our search algorithms due to their drift and narrow band properties. We analyze narrow-band drifting signals for a wide range of drift rates (eg. $dr = \pm 10 \text{ Hz } s^{-1}$). The 18 sec time bins together with the 3 Hz frequency resolution allow for a change in drift rate, Δdr , of $0.167 \text{ Hz } s^{-1}$. This is sufficient to have a good characterization of a signal wider than the frequency resolution. Additional details on this analysis pipeline and presentation of results of early observations are forthcoming (Enriquez in prep.).

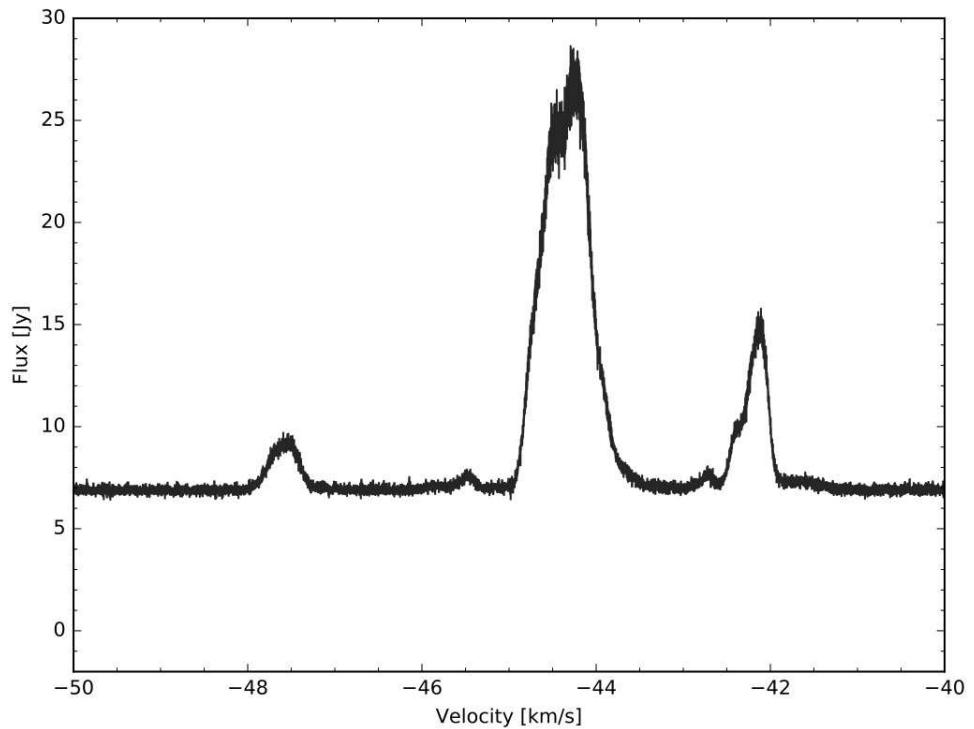


Fig. 7.— Example *Breakthrough Listen* data showing Stokes I spectra of OH maser emission in the W3 star-forming region. The plotted data correspond to 0.2 MHz, centered at 1667.5 MHz, with 2.8 Hz channel resolution.

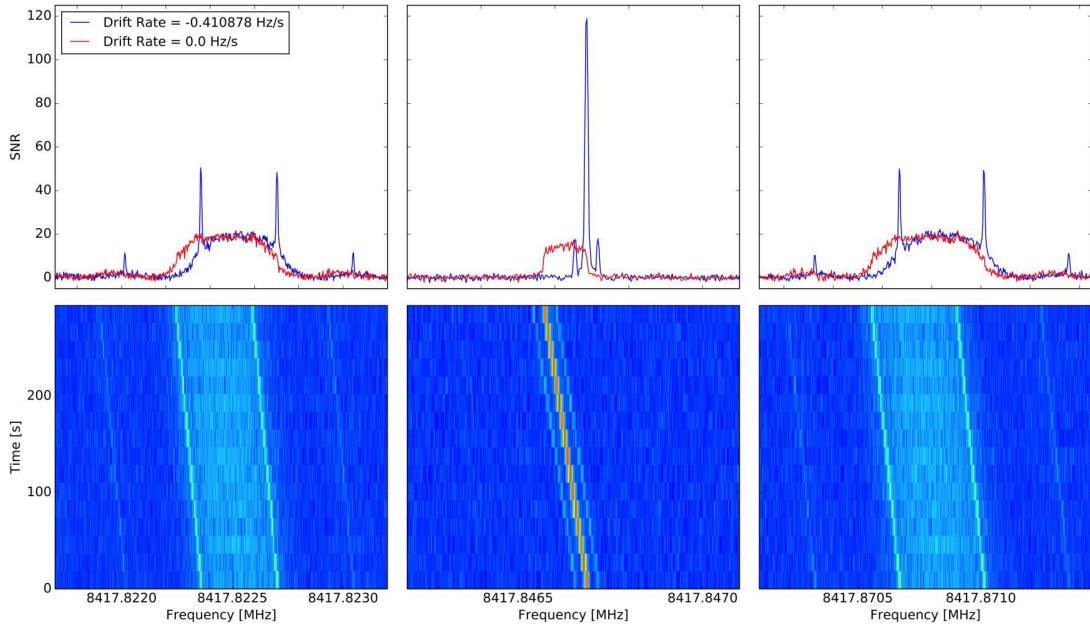


Fig. 8.— A 5 min long observation of the Voyager 1 spacecraft using the GBT showing the Voyager I carrier wave and drift pattern. The top plots show the integrated spectrum with and without drift rate correction. The bottom plots show the drifting signals with time. The coarseness of the 18 sec time integration of the filterbank is visible in the pixelation of the time axis. Each time bin is not drift-corrected, limiting our search to incoherent drift corrections. Motion of the Earth relative to Voyager 1 causes received signals to appear near 8417.8 MHz, offset from the native downlink frequency of Voyager 1 at 8415 MHz.

7.2. Automated Planet Finder

The APF is observing the 5 pc and 5-50 pc spectral type complete sample. The limiting magnitude for pointing on the APF is $V = 14$. We choose to observe only targets brighter than $V = 12.0$ in order to acquire sufficient throughput in the 20 minute observations. Due to the similar optical qualities and wavelength coverage between the Levy Spectrometer and the HIRES spectrometer on Keck, we choose to exclude stars already observed with Keck/HIRES by the California Planet Search (CPS). All spectra observed with Keck/HIRES are available to the public online, once the initial proprietary period is past(12 – 18 months). Since the CPS targets are slowly rotating FGK stars, the 5-50 parsec sample that will be observed with the APF includes many young stars, active stars, rapid rotators and stars hotter than 6200 K, which are typically excluded from radial velocity planet searches. Our sensitivity to laser lines will match that of Tellis & Marcy (2015) to the order of 1 photon per $\text{m}^{-2} \text{ s}^{-1}$. Extinction due to interstellar dust will limit detection of laser lines to a few thousand light years from the Earth.

Of the 1185 stars above a declination of -20 degrees, 414 of them have been previously observed with Keck/HIRES. Of the remaining 771, 560 of them have been observed since the *Breakthrough Listen* APF program was initiated. All of the spectra are available for download from the *Breakthrough Listen* public archive³.

8. Conclusions

In an effort to conduct the most complete and unbiased SETI search possible, we choose targets for a focused SETI search that includes stars, galaxies, and other exotic targets including brown dwarfs and asteroids. Using new and established instruments at the

³<http://www.breakthroughinitiatives.org/OpenDataSearch>

Green Bank Observatory, Parkes Telescope and APF, we are undertaking targeted searches in the radio and at optical wavelengths, with radio telescopes that together cover the entire sky.

Our goal remains to make a detection of a candidate extraterrestrial signal, amenable to follow-up observations that provide validation (or rejection) and characterization. If we are left with merely non-detections, we must provide quantitative upper limits on the flux density at all observed frequencies and for all targets, with the goal of defining the science goals for the next generation of SETI searches, ensuring they sample distinct domains of parameter space of ETI signals. Indeed we see promise with current and future radio arrays, and with next-generation optical/IR surveys of the entire sky sampled at high cadence.

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Facilities: *Green Bank Telescope, Automated Planet Finder, Lick Observatory, Parkes Observatory*

Table 1. Stellar Targets

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP2	00:00:01.0	-19:29:55	2000	9.27	K3V	45.6	0.18	0.00
HIP169	00:02:08.7	-68:16:50	2000	9.24	M0V	15.8	0.21	-0.23
HIP171	00:02:10.2	27:04:56	2000	5.80	G3V	12.4	0.78	-0.92
HIP194	00:02:29.7	08:29:07	2000	5.70	F0V	37.6	-0.09	-0.05
HIP400	00:04:56.3	23:16:10	2000	7.82	G9V	25.6	0.38	-0.01
HIP428	00:05:10.9	45:47:11	2000	9.95	M2	11.4	0.87	-0.15
HIP436	00:05:17.7	-67:49:57	2000	8.49	K5V	16.0	-0.12	-0.56
HIP443	00:05:20.1	-05:42:27	2000	4.61	K1III	39.4	-0.01	0.09
GJ1	00:05:24.4	-37:21:26	2000	8.54	M1.5V	4.34	5.64	-2.33
HIP518	00:06:15.8	58:26:12	2000	5.98	G5V	20.2	0.25	0.02
HIP522	00:06:19.2	-49:04:30	2000	5.70	G1IV...	25.6	0.58	-0.04
HIP544	00:06:36.8	29:01:17	2000	6.07	K0V	13.7	0.38	-0.18
GJ1002	00:06:43.8	-07:32:22	2000	13.7	M5.0V	4.69	-0.82	-1.87
HIP560	00:06:50.1	-23:06:27	2000	6.19	F2IV	39.0	0.10	-0.05
HIP677	00:08:23.3	29:05:25	2000	2.07	B9p	29.7	0.14	-0.16
HIP910	00:11:15.9	-15:28:04	2000	4.89	F5V	18.8	-0.08	-0.27
HIP916	00:11:21.1	58:20:59	2000	9.50	K7	28.0	0.23	0.02
HIP950	00:11:44.0	-35:07:59	2000	5.24	F3/F5V	21.8	0.17	0.11
HIP974	00:12:04.0	27:05:56	2000	8.73	K0	25.7	0.28	-0.08
HIP1031	00:12:50.3	-57:54:45	2000	7.22	K0V	20.3	-0.12	0.04
HIP1086	00:13:30.8	41:02:07	2000	5.71	F0IV	35.0	-0.12	-0.15
HIP1242	00:15:28.1	-16:08:01	2000	11.4	M:	5.21	0.73	-0.62
HIP1292	00:16:12.7	-79:51:04	2000	6.59	G6V	17.6	0.43	-0.06
HIP1349	00:16:53.9	-52:39:04	2000	6.84	G2V	23.0	0.31	0.18
HIP1368	00:17:06.4	40:56:53	2000	8.99	M0	14.9	0.57	0.08

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP1444	00:17:58.9	-13:27:20	2000	6.51	G2V	26.1	0.40	0.00
HIP1463	00:18:16.6	10:12:10	2000	10.8	M0	16.2	0.00	-0.03
HIP1473	00:18:19.7	36:47:06	2000	4.51	A2V	43.2	-0.07	-0.04
GJ15A	00:18:22.9	44:01:23	2000	8.08	M1.5V	3.57	2.89	0.41
GJ15B	00:18:25.5	44:01:37	2000	11.0	M3.5V	3.57	2.89	0.41
HIP1499	00:18:41.9	-08:03:10	2000	6.47	G0V	23.4	0.42	-0.14
HIP1532	00:19:05.6	-09:57:53	2000	9.90	K7V	20.7	-0.04	-0.30
HIP1599	00:20:04.3	-64:52:29	2000	4.23	F9V	8.59	1.71	1.17
HIP1692	00:21:13.3	-08:16:52	2000	9.19	K2	23.0	0.00	0.00
HIP1768	00:22:23.6	-27:01:57	2000	8.30	K1V	22.4	0.21	-0.40
HIP1803	00:22:51.8	-12:12:33	2000	6.39	G3V	20.3	0.39	0.06
HIP1837	00:23:16.0	-33:10:03	2000	8.74	K3/K4V	22.2	-0.03	0.13
HIP1936	00:24:25.9	-27:01:36	2000	7.92	K2V	18.0	0.67	0.08
HIP2072	00:26:12.2	-43:40:47	2000	3.93	A7V	23.5	0.11	0.03
HIP2081	00:26:17.1	-42:18:21	2000	2.40	K0III..	23.7	0.23	-0.35
HIP2120	00:26:52.7	70:08:32	2000	10.5	M0	16.2	-0.14	-0.15
HIP2422	00:30:55.1	77:01:09	2000	6.18	K0IV	39.4	0.34	-0.03
HIP2552	00:32:29.4	67:14:08	2000	10.2	M2.5Ve	10.1	1.74	-0.22
HIP2578	00:32:43.9	-63:01:53	2000	5.07	A0V	46.4	0.09	-0.05
HIP2711	00:34:27.8	-52:22:23	2000	5.57	F3IV-V	25.6	0.23	0.04
HIP2762	00:35:14.9	-03:35:34	2000	5.20	F8V...	21.0	0.41	-0.04
HIP2852	00:36:06.9	-22:50:32	2000	6.06	A5m...	49.7	-0.07	-0.05
HIP2941	00:37:20.7	-24:46:02	2000	5.57	K1V+...	15.5	1.42	-0.02
HIP3092	00:39:19.7	30:51:39	2000	3.27	K3III..	31.0	0.12	-0.08
HIP3093	00:39:21.8	21:15:01	2000	5.88	K0V	11.1	-0.46	-0.37

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP3170	00:40:25.7	-59:27:16	2000	5.89	G1V	25.4	0.88	0.44
HIP3206	00:40:49.3	40:11:13	2000	7.36	K2V	17.2	0.36	-0.67
HIP3418	00:43:32.9	33:50:40	2000	8.73	K8	20.7	-0.20	-0.36
HIP3419	00:43:35.4	-17:59:11	2000	2.04	K0III	29.3	0.23	0.03
HIP3497	00:44:39.3	-65:38:58	2000	6.55	G3V	21.8	0.16	-0.74
HIP3505	00:44:44.4	-22:00:22	2000	5.22	F0V	27.8	-0.07	0.08
HIP3535	00:45:04.9	01:47:07	2000	8.03	K2V	22.0	-0.05	-0.57
HIP3583	00:45:45.6	-47:33:07	2000	5.80	G5IV	14.9	0.18	0.08
HIP3588	00:45:48.3	-41:54:33	2000	7.89	K5V com	16.0	0.30	-0.08
HIP3765	00:48:23.0	05:16:50	2000	5.74	K2V	7.46	0.76	-1.14
HIP3821	00:49:06.3	57:48:54	2000	3.46	G0V SB	5.95	1.09	-0.56
HIP3850	00:49:26.8	-23:12:44	2000	7.15	G8/K0V	18.8	0.52	0.12
HIP3876	00:49:46.5	70:26:58	2000	7.75	K0	21.5	0.37	0.20
HIP3909	00:50:07.6	10:38:39	2000	5.17	F7IV-V	15.4	-0.22	-0.23
HIP3979	00:51:10.8	-05:02:21	2000	6.98	G0	22.0	0.26	-0.12
HIP3998	00:51:21.8	18:44:21	2000	9.22	K2	21.8	0.05	-0.27
HIP4022	00:51:34.0	-22:54:36	2000	8.95	K5V	15.1	0.61	-0.28
HIP4148	00:53:01.1	-30:21:24	2000	7.15	K2V	14.0	0.62	0.03
HIP4151	00:53:04.2	61:07:26	2000	4.80	F8V	18.5	-0.07	0.17
HIP4288	00:54:58.1	23:37:42	2000	5.46	K1IV	38.9	0.14	-0.05
HIP4436	00:56:45.2	38:29:57	2000	3.86	A5V	41.7	0.15	0.04
HIP4454	00:57:04.4	69:02:36	2000	9.12	K4V	24.1	0.72	-0.23
HIP4473	00:57:19.7	-62:14:44	2000	9.50	K7V	19.3	1.03	0.13
HIP4569	00:58:27.9	-27:51:25	2000	11.7		13.1	1.29	-0.30
HIP4845	01:02:21.1	10:25:25	2000	10.0	K7V	21.6	0.02	-0.18

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP4849	01:02:24.6	05:03:41	2000	8.16	K2	21.4	0.34	0.22
HIP4856	01:02:32.2	71:40:47	2000	9.98	M3.5e	8.14	1.75	-0.38
HIP4872	01:02:38.9	62:20:42	2000	9.56	K5V...	10.0	0.73	0.09
HIP4907	01:02:57.2	69:13:37	2000	7.67	G5	25.8	0.22	-0.15
HIP5027	01:04:24.1	-25:36:17	2000	9.78	K4/K5V	25.6	-0.03	-0.32
HIP5110	01:05:29.9	15:23:24	2000	8.66	K2V	26.5	0.01	-0.20
HIP5247	01:07:08.2	63:56:28	2000	9.00	K7V	15.0	1.55	0.32
HIP5286	01:07:37.9	22:57:17	2000	8.41	K4V	20.7	0.10	-0.49
HIP5310	01:07:57.2	20:44:20	2000	5.56	A3V	49.4	0.09	-0.09
HIP5336	01:08:16.4	54:55:13	2000	5.17	G5Vp	7.55	3.42	-1.60
HIP5346	01:08:22.2	05:38:59	2000	5.51	F0III-I	35.9	-0.25	-0.17
HIP5364	01:08:35.4	10:10:56	2000	3.46	K2III	36.0	0.22	-0.14
HIP5369	01:08:40.4	17:14:33	2000	10.5	K6	27.7	-0.06	-0.58
HIP5496	01:10:22.9	-67:26:41	2000	9.80	K	8.13	0.39	0.57
HIP5521	01:10:41.9	42:55:54	2000	7.66	K0	26.7	-0.15	-0.20
HIP5542	01:11:06.2	55:08:59	2000	4.34	A7Vvar	42.1	0.23	-0.02
GJ54.1	01:12:30.6	-16:59:56	2000	12.1	M4.0V	3.71	1.21	0.65
HIP5663	01:12:46.1	-25:14:08	2000	9.55	K4V	22.0	0.13	0.02
HIP5799	01:14:24.0	-07:55:22	2000	5.14	F5V	24.3	0.12	0.28
HIP5842	01:15:01.0	-68:49:08	2000	7.22	K2V	21.1	0.42	0.08
HIP5862	01:15:11.1	-45:31:53	2000	4.97	F8V	15.0	0.66	0.18
HIP5896	01:15:46.2	-68:52:33	2000	4.25	F6IV	20.4	0.41	0.13
HIP5938	01:16:24.2	-12:05:49	2000	7.55	K0V	26.5	0.13	0.00
HIP5944	01:16:29.3	42:56:21	2000	6.59	G0	23.6	-0.11	-0.03
HIP5957	01:16:39.4	25:19:53	2000	10.1	K5	22.7	0.43	-0.10

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP6069	01:17:53.3	05:28:26	2000	11.0	M2V:	15.3	0.09	-0.63
HIP6290	01:20:40.7	57:19:40	2000	10.3	K6V:	18.9	-0.29	0.44
HIP6344	01:21:30.9	80:09:06	2000	9.67	K8	24.1	0.28	-0.08
HIP6351	01:21:34.6	-41:39:23	2000	10.1	K5	16.8	1.24	-0.46
HIP6379	01:21:59.1	76:42:36	2000	7.17	K0	16.8	-0.03	-0.03
HIP6414	01:22:23.1	-33:12:51	2000	10.3		26.9	0.36	-0.30
HIP6537	01:24:01.4	-08:10:59	2000	3.60	K0III	35.1	-0.08	-0.21
HIP6706	01:26:15.3	19:10:20	2000	5.35	F2V:var	26.0	-0.03	0.01
HIP6748	01:26:51.6	-13:03:23	2000	5.51	F0V	36.2	0.01	0.01
HIP6813	01:27:39.4	45:24:24	2000	4.83	F5IV	28.3	0.36	-0.11
HIP6917	01:29:04.9	21:43:23	2000	7.74	K2V	23.1	0.46	-0.19
HIP7078	01:31:13.8	70:15:52	2000	5.82	F6V	29.2	0.14	-0.08
HIP7235	01:33:15.8	-24:10:40	2000	6.97	K0V	19.5	0.27	-0.16
HIP7339	01:34:33.3	68:56:53	2000	6.52	G6V	20.9	-0.38	0.12
HIP7387	01:35:15.0	-58:08:22	2000	6.03	F2V	40.4	0.28	-0.03
HIP7513	01:36:47.8	41:24:19	2000	4.10	F8V	13.4	-0.17	-0.38
HIP7535	01:37:05.9	12:08:29	2000	5.54	F0V	33.8	-0.07	0.01
HIP7576	01:37:35.5	-06:45:37	2000	7.66	G5	23.6	0.17	-0.10
GJ65A	01:39:01.3	-17:57:01	2000	12.6	M5.5V	2.67	3.32	0.56
HIP7734	01:39:36.0	45:52:39	2000	6.60	G5IV	21.3	0.22	-0.23
HIP7748	01:39:45.7	73:42:32	2000	9.81	...	27.2	0.16	-0.11
HIP7751	01:39:47.5	-56:11:47	2000	5.76	K0V	8.14	0.29	0.02
HIP7918	01:41:47.1	42:36:48	2000	4.96	G2V	12.6	0.79	-0.18
HIP7978	01:42:29.3	-53:44:27	2000	5.52	F8V	17.3	0.17	-0.11
HIP7981	01:42:29.8	20:16:06	2000	5.24	K1V	7.46	-0.30	-0.68

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP8051	01:43:20.2	04:19:18	2000	10.9	M2V:	11.2	-0.42	-0.76
HIP8070	01:43:40.7	63:49:24	2000	8.42	K5V	13.4	-0.39	-0.58
GJ71	01:44:04.1	-15:56:15	2000	3.49	G8.5V	3.65	-1.72	0.85
HIP8209	01:45:38.8	-25:03:09	2000	5.29	F2IV	27.4	0.16	-0.07
HIP8275	01:46:38.7	12:24:42	2000	8.91	K5	23.0	0.03	-0.08
HIP8362	01:47:44.8	63:51:09	2000	5.63	K0V	9.97	0.58	-0.25
HIP8486	01:49:23.4	10:42:12	2000	6.72	G0	23.0	-0.12	-0.10
HIP8497	01:49:35.1	10:41:11	2000	4.66	F3III	23.6	-0.15	-0.09
HIP8543	01:50:07.9	29:27:52	2000	8.06	K1V	26.7	-0.04	-0.06
HIP8768	01:52:49.2	-22:26:05	2000	8.89	K5/M0V	11.0	0.84	0.00
HIP8867	01:54:06.1	66:10:34	2000	8.47	G5	22.1	-0.04	-0.14
HIP8903	01:54:38.4	20:48:28	2000	2.64	A5V...	18.2	0.10	-0.11
HIP9007	01:55:57.5	-51:36:32	2000	3.69	G5IV	17.4	0.68	0.28
HIP9044	01:56:32.5	-60:13:35	2000	8.61	K5V	19.7	0.45	0.19
HIP9085	01:56:60.0	-51:45:58	2000	6.10	F8V	26.3	0.35	0.25
HIP9094	01:57:09.6	10:14:32	2000	6.42	G5	33.9	-0.37	-0.24
HIP9153	01:57:55.7	23:35:45	2000	4.79	F0V	40.8	-0.09	-0.01
HIP9236	01:58:46.2	-61:34:11	2000	2.86	F0V	21.8	0.26	0.03
HIP9269	01:59:06.6	33:12:34	2000	7.14	G5	24.5	0.24	-0.35
GJ83.1	02:00:13.2	13:03:08	2000	12.3	M4.0V	4.44	1.12	-1.77
HIP9480	02:01:57.5	70:54:25	2000	4.49	A3IV	35.8	-0.05	-0.01
HIP9487	02:02:02.8	02:45:49	2000	3.82	A2	42.6	0.03	0.00
HIP9598	02:03:26.1	72:25:16	2000	3.95	A2V	49.7	-0.04	0.02
HIP9716	02:04:59.3	-15:40:41	2000	7.79	K0V	25.5	0.02	-0.05
HIP9724	02:05:04.8	-17:36:52	2000	10.1	M3	9.43	1.32	-0.17

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP9727	02:05:07.4	77:16:52	2000	5.27	F0Vn	33.5	0.14	-0.05
HIP9829	02:06:30.2	24:20:02	2000	6.89	G2V	23.1	0.01	-0.15
HIP9884	02:07:10.4	23:27:44	2000	2.01	K2III	20.2	0.19	-0.15
HIP10138	02:10:25.9	-50:49:25	2000	6.12	K0V	10.9	2.09	0.65
HIP10279	02:12:21.0	03:34:32	2000	10.0	M3V:	10.3	-1.76	-1.85
HIP10306	02:12:48.1	21:12:39	2000	5.23	F5V	30.1	0.16	0.00
HIP10337	02:13:12.2	-21:11:47	2000	9.84	K7V	23.2	0.38	0.05
HIP10395	02:13:53.6	-32:02:28	2000	10.3	...	12.3	0.76	-0.53
HIP10416	02:14:13.6	-03:38:06	2000	8.55	K2	22.8	-0.01	-0.22
HIP10542	02:15:46.1	-18:14:17	2000	7.94	K3V	22.2	-0.04	-0.12
HIP10617	02:16:41.2	-30:59:18	2000	12.0	...	14.2	0.68	0.25
HIP10644	02:17:03.2	34:13:27	2000	4.84	G0V	10.8	1.15	-0.25
HIP10670	02:17:18.9	33:50:49	2000	4.03	A1Vnn	36.0	0.04	-0.05
HIP10723	02:18:01.4	01:45:28	2000	5.60	G0.5IV	24.9	0.37	0.37
HIP10798	02:18:58.5	-25:56:44	2000	6.33	G8V	12.6	-0.22	0.44
HIP10812	02:19:10.1	-36:46:41	2000	11.5	...	13.9	1.39	0.55
HIP10925	02:20:42.9	-39:02:01	2000	8.67	K3/K4V	25.4	0.21	-0.03
HIP11000	02:21:44.4	-06:52:46	2000	9.07	K0	26.7	0.30	0.05
HIP11001	02:21:44.9	-68:39:33	2000	4.08	A3V	41.4	-0.05	0.00
HIP11029	02:22:01.5	10:46:39	2000	5.43	F0V	29.8	0.15	-0.08
HIP11048	02:22:14.6	47:52:48	2000	9.40	M2	11.9	0.22	0.04
HIP11090	02:22:50.3	41:23:46	2000	5.81	F0III-I	47.2	-0.07	-0.10
HIP11452	02:27:45.9	04:25:55	2000	8.69	K7V:	16.6	0.09	0.24
HIP11477	02:28:01.7	-33:48:39	2000	5.13	A2/A3V	46.8	0.02	0.01
HIP11565	02:29:01.7	-19:58:44	2000	8.78	K4V	18.9	0.61	0.19

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP11569	02:29:03.9	67:24:08	2000	4.46	A5p Sr	43.4	-0.03	0.04
HIP11759	02:31:42.5	-15:16:24	2000	8.67	K2V	26.1	-0.08	-0.12
HIP11783	02:32:05.2	-15:14:40	2000	4.74	F5V	25.8	-0.08	-0.15
HIP11852	02:32:58.9	-72:41:14	2000	8.84	K4V	22.5	0.14	0.20
HIP11964	02:34:22.6	-43:47:46	2000	8.89	K7V com	11.5	0.06	-0.29
HIP12097	02:35:53.3	20:13:11	2000	10.6	M2	13.9	0.25	-0.14
HIP12110	02:36:00.8	-23:31:16	2000	8.34	K3V	21.2	0.08	0.01
HIP12114	02:36:04.9	06:53:12	2000	5.79	K3V	7.20	1.81	1.44
HIP12158	02:36:41.8	-03:09:22	2000	8.10	K0	24.3	0.32	0.06
HIP12225	02:37:24.4	-52:32:35	2000	5.30	A6V	44.4	0.11	0.00
HIP12351	02:39:01.2	-58:11:13	2000	9.48	M0Ve	16.5	-0.02	0.03
HIP12390	02:39:33.8	-11:52:19	2000	4.83	F5V	27.0	0.17	-0.24
HIP12394	02:39:35.4	-68:16:00	2000	4.12	B9III	47.0	0.09	0.00
HIP12413	02:39:48.0	-42:53:30	2000	4.74	A2V	39.7	0.09	-0.02
HIP12444	02:40:12.4	-09:27:10	2000	5.79	F6V	21.5	-0.14	-0.08
HIP12447	02:40:15.7	06:06:42	2000	6.26	F3V:	39.6	0.05	0.00
HIP12493	02:40:42.9	01:11:55	2000	9.51	M0	22.3	0.28	0.23
HIP12530	02:41:14.0	-00:41:44	2000	5.72	F7IV	21.6	0.22	-0.13
HIP12653	02:42:33.5	-50:48:01	2000	5.40	G3IV	17.2	0.33	0.22
HIP12706	02:43:18.0	03:14:08	2000	3.47	A3V	25.1	-0.15	-0.15
HIP12709	02:43:20.9	19:25:45	2000	8.23	K5	18.5	0.43	-0.02
HIP12723	02:43:34.2	-46:27:17	2000	9.04	K5V	27.4	0.07	-0.53
HIP12777	02:44:12.0	49:13:42	2000	4.10	F7V	11.2	0.33	-0.09
HIP12781	02:44:15.5	25:31:24	2000	10.5	M3.5Ve	7.55	0.86	-0.37
HIP12828	02:44:56.5	10:06:50	2000	4.27	F1III-I	25.8	0.29	-0.03

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP12832	02:44:57.6	12:26:44	2000	5.17	A7III-I	38.2	0.12	-0.08
HIP12843	02:45:06.2	-18:34:21	2000	4.47	F5/F6V	13.9	0.33	0.04
HIP12929	02:46:17.3	11:46:30	2000	8.59	K5	15.9	0.27	-0.21
HIP12961	02:46:42.9	-23:05:11	2000	10.2	M0	23.8	0.29	0.14
HIP13008	02:47:11.1	-22:29:08	2000	6.47	F2V	38.1	-0.02	-0.04
HIP13081	02:48:09.1	27:04:07	2000	7.56	K1V	22.3	0.26	-0.13
HIP13218	02:50:09.7	-53:08:20	2000	10.7	M	13.0	-0.12	0.50
HIP13258	02:50:36.9	15:42:35	2000	8.87	K5	22.4	0.34	-0.40
HIP13375	02:52:07.1	34:23:21	2000	9.60	K6:	14.2	0.99	-0.99
HIP13389	02:52:22.2	-63:40:47	2000	11.3	M	11.5	0.98	0.63
HIP13402	02:52:32.1	-12:46:10	2000	6.05	K1V	10.3	0.40	-0.19
SO0253	02:53:00.9	16:52:53	2000	15.1	M6.5V	3.85	3.40	-3.81
HIP13601	02:55:17.4	16:18:33	2000	7.41	G5	26.1	0.20	-0.05
HIP13642	02:55:39.1	26:52:23	2000	7.52	K2	22.8	0.26	-0.19
HIP13665	02:55:56.9	61:31:16	2000	5.59	F4V	26.4	0.15	0.03
HIP13769	02:57:13.2	-24:58:30	2000	7.84	K2V	25.7	0.02	-0.03
HIP13772	02:57:14.7	-24:58:10	2000	7.33	K1/K2V	22.4	0.03	-0.04
HIP13782	02:57:23.8	-23:51:43	2000	5.44	A5IV/V	48.6	0.10	-0.04
HIP13834	02:58:05.2	20:40:07	2000	5.80	F5IV	31.8	0.23	-0.03
HIP13976	03:00:02.8	07:44:59	2000	7.97	G5	23.4	0.33	0.02
HIP14146	03:02:23.5	-23:37:28	2000	4.08	A4V	26.4	-0.15	-0.06
HIP14150	03:02:26.0	26:36:33	2000	6.62	G8V	21.1	0.23	-0.17
HIP14286	03:04:09.6	61:42:21	2000	6.64	G4V	22.8	0.72	-0.69
HIP14293	03:04:16.5	-07:36:03	2000	5.26	A8V	43.0	0.07	0.02
HIP14445	03:06:26.7	01:57:54	2000	9.07	M0V	14.7	0.39	-0.93

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP14576	03:08:10.1	40:57:20	2000	2.09	B8V	28.4	0.00	0.00
HIP14587	03:08:22.4	-60:10:21	2000	9.27	K5V	21.4	0.21	0.13
HIP14632	03:09:04.0	49:36:47	2000	4.05	G0V	10.5	1.26	-0.09
HIP14633	03:09:04.5	76:02:28	2000	9.82	M0	21.3	0.19	-0.49
HIP14668	03:09:29.8	44:51:27	2000	3.79	K0III	34.4	0.17	-0.14
HIP14669	03:09:30.8	45:43:57	2000	10.1	M2	15.4	-0.43	-0.38
HIP14729	03:10:15.2	12:03:01	2000	9.38	K5	27.0	0.25	-0.15
HIP14862	03:11:56.3	74:23:37	2000	4.85	A2Vnn	49.6	0.01	-0.09
HIP14954	03:12:46.4	-01:11:46	2000	5.07	F8V	22.3	0.19	-0.07
HIP15095	03:14:44.6	-26:26:46	2000	9.17	K5V	18.3	0.22	0.10
HIP15099	03:14:47.2	08:58:50	2000	7.83	K0	22.2	0.40	-0.40
HIP15131	03:15:06.4	-45:39:53	2000	6.75	G3V	24.3	-0.13	0.14
HIP15197	03:15:50.0	-08:49:11	2000	4.80	A5m	36.7	0.00	0.05
HIP15201	03:15:57.7	-77:23:18	2000	5.51	F4III	29.3	0.11	0.06
HIP15220	03:16:13.8	58:10:02	2000	10.5	M2	13.4	0.43	-0.32
HIP15330	03:17:46.2	-62:34:31	2000	5.53	G2V	12.1	1.34	0.65
HIP15371	03:18:12.8	-62:30:22	2000	5.24	G1V	12.0	1.33	0.65
HIP15411	03:18:41.1	-18:33:35	2000	5.72	F3V	36.5	0.12	-0.06
HIP15457	03:19:21.7	03:22:12	2000	4.84	G5Vvar	9.15	0.27	0.09
HIP15510	03:19:55.6	-43:04:11	2000	4.26	G8V	6.05	3.04	0.73
HIP15638	03:21:21.8	79:58:02	2000	11.2	M2:	13.7	0.41	0.28
HIP15648	03:21:26.6	43:19:46	2000	4.96	A3V	47.6	-0.06	0.00
HIP15673	03:21:54.8	52:19:53	2000	9.05	K5	22.7	-0.31	-0.27
HIP15771	03:23:15.9	-49:59:38	2000	10.2	K0	19.9	0.23	0.26
HIP15774	03:23:17.2	-49:59:30	2000	8.58	K3V	19.7	0.25	0.27

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP15797	03:23:33.5	43:57:26	2000	8.98	K2	25.5	0.12	-0.33
HIP15799	03:23:35.3	-40:04:35	2000	6.90	K0V	17.0	0.04	0.04
HIP15919	03:24:59.7	-05:21:49	2000	7.86	K5V	15.1	-0.23	-0.77
HIP16069	03:26:59.2	-63:29:56	2000	8.08	K5V	16.3	0.36	-0.25
HIP16134	03:27:52.4	-19:48:16	2000	8.39	K5V	12.6	0.54	0.30
HIP16245	03:29:22.7	-62:56:15	2000	4.71	F5IV-V	21.4	0.38	0.37
HIP16499	03:32:26.3	46:03:24	2000	5.30	F4IIIva	36.4	-0.05	-0.07
GJ144	03:32:55.8	-09:27:29	2000	3.73	K2.0V	3.21	-0.98	0.02
HIP16536	03:32:55.9	-44:42:07	2000	11.4	...	10.8	-0.31	0.13
HIP16711	03:35:00.9	-48:25:08	2000	8.57	K7V	13.3	0.40	0.31
GJ1061	03:35:59.7	-44:30:45	2000	13.0	M5.0V	3.67	0.73	-0.38
HIP16846	03:36:47.3	00:35:15	2000	5.82	G5IV/V	28.9	-0.03	-0.16
HIP16852	03:36:52.4	00:24:05	2000	4.29	F9V	13.7	-0.23	-0.48
HIP17027	03:39:01.1	-05:37:34	2000	5.97	K1V	35.1	-0.01	-0.21
LP944-020	03:39:35.2	-35:25:41	2000	18.6	M9.0V	4.96	0.32	0.30
HIP17147	03:40:22.1	-03:13:01	2000	6.68	F9V	24.3	0.69	-0.21
HIP17157	03:40:29.4	-47:55:30	2000	9.59	K7	25.1	0.10	0.10
HIP17346	03:42:44.7	-24:27:58	2000	9.20	K5V	25.9	0.02	-0.37
HIP17378	03:43:14.9	-09:45:48	2000	3.52	K0IV	9.04	-0.09	0.74
HIP17395	03:43:33.8	10:29:08	2000	5.59	A5m	42.9	-0.01	-0.02
HIP17405	03:43:45.2	16:40:02	2000	10.8	M1	16.2	0.16	-0.31
HIP17414	03:43:52.6	16:40:19	2000	9.99	M2	17.2	0.16	-0.32
HIP17420	03:43:55.3	-19:06:39	2000	7.10	K2V	14.0	0.31	0.16
HIP17439	03:44:09.2	-38:16:54	2000	6.99	K1V	16.2	0.21	0.29
HIP17440	03:44:12.0	-64:48:24	2000	3.84	K0IV SB	30.5	0.31	0.08

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP17496	03:44:51.1	11:55:12	2000	9.13	K8V:	21.8	0.32	0.13
HIP17544	03:45:24.1	-27:51:44	2000	8.21	K2V	21.7	0.32	0.14
HIP17609	03:46:20.1	26:12:55	2000	9.61	K5	14.5	0.39	-0.20
HIP17651	03:46:50.9	-23:14:59	2000	4.22	F3/F5V	17.9	-0.16	-0.53
HIP17666	03:47:02.1	41:25:38	2000	7.67	K1V	24.4	0.60	-1.24
HIP17749	03:48:01.0	68:40:22	2000	9.17	K0	17.3	0.13	0.24
HIP17797	03:48:35.9	-37:37:12	2000	4.30	A+...	49.4	0.08	-0.01
HIP17978	03:50:35.5	-42:33:55	2000	8.61	K2V	26.7	0.20	0.62
HIP18267	03:54:28.0	16:36:57	2000	6.81	G0	20.6	0.22	-0.17
HIP18280	03:54:35.5	-06:49:33	2000	9.02	M0V	15.4	0.00	0.53
HIP18324	03:55:03.8	61:10:00	2000	7.84	K0V	21.2	0.44	-0.25
HIP18413	03:56:11.5	59:38:30	2000	6.53	G0	21.3	-0.28	0.16
HIP18450	03:56:36.4	-41:20:36	2000	8.85	K5V	17.6	0.06	0.09
HIP18512	03:57:28.7	-01:09:34	2000	8.07	K4V	15.7	-0.18	-0.14
HIP18774	04:01:19.6	76:09:33	2000	8.20	K4V	15.9	0.33	-0.55
HIP18859	04:02:36.7	-00:16:08	2000	5.38	F5V	19.2	0.15	-0.25
HIP18907	04:03:09.4	05:59:21	2000	3.91	A1V	39.6	0.01	0.00
HIP18975	04:03:56.6	08:11:50	2000	5.45	F2V	35.9	0.17	0.03
HIP19076	04:05:20.3	22:00:32	2000	5.90	G5V	16.7	0.17	-0.13
HIP19165	04:06:34.8	-20:51:11	2000	9.70	K7	23.5	0.05	-0.78
HIP19205	04:07:00.5	29:00:04	2000	5.21	F1V	27.5	-0.09	0.00
HIP19233	04:07:21.5	-64:13:20	2000	6.37	G3V	23.1	0.19	0.34
HIP19255	04:07:34.3	38:04:28	2000	7.13	G5	20.5	0.17	-0.23
HIP19333	04:08:35.7	-59:31:36	2000	9.71	K4V	25.6	-0.08	-0.12
HIP19335	04:08:36.6	38:02:23	2000	5.52	F7V	21.3	0.16	-0.20

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP19337	04:08:37.4	33:38:13	2000	10.1	M1	13.6	0.52	0.13
HIP19422	04:09:35.0	69:32:28	2000	7.70	G5	18.4	0.07	-0.30
HIP19554	04:11:20.3	05:31:22	2000	5.71	F4V	38.6	0.15	0.00
HIP19655	04:12:42.2	70:12:05	2000	9.73	M0V:	25.8	-0.10	0.03
HIP19719	04:13:33.1	07:42:57	2000	5.29	F3V...	36.9	0.00	0.00
HIP19747	04:14:00.1	-42:17:39	2000	3.85	K1III	35.9	0.04	-0.20
HIP19832	04:15:09.5	-04:25:05	2000	9.38	K5V	20.4	0.10	-0.09
GJ166	04:15:16.3	-07:39:09	2000	4.43	K0.5V	4.98	-2.24	-3.42
HIP19849	04:15:16.3	-07:39:10	2000	4.43	K1V	5.04	-2.24	-3.42
GJ166BC	04:15:21.7	-07:39:16	2000	9.52	M5V	4.98	-2.18	-3.44
HIP19855	04:15:25.8	06:11:58	2000	6.94	G5IV	20.8	-0.10	-0.11
HIP19859	04:15:28.8	06:11:12	2000	6.32	G0IV...	21.1	-0.11	-0.11
HIP19884	04:15:56.9	-53:18:35	2000	7.64	K5V	13.0	0.78	0.40
HIP19893	04:16:01.6	-51:29:11	2000	4.26	F4III	20.3	0.10	0.18
HIP19921	04:16:29.0	-59:18:07	2000	4.44	K2IV	18.2	-0.05	-0.17
HIP19930	04:16:32.7	36:30:06	2000	8.25	K2	25.5	-0.03	-0.23
HIP19990	04:17:15.7	20:34:42	2000	4.93	A3m	28.6	-0.04	-0.06
HIP20219	04:19:57.7	14:02:06	2000	5.58	F3V...	44.8	0.12	-0.02
HIP20261	04:20:36.3	15:05:43	2000	5.26	F0V	47.1	0.11	-0.02
HIP20542	04:24:05.8	17:26:38	2000	4.80	A7V	44.7	0.11	-0.03
HIP20635	04:25:22.2	22:17:37	2000	4.21	A7IV-V	47.0	0.11	-0.04
HIP20641	04:25:25.0	22:11:59	2000	5.27	A7V	44.1	0.11	-0.05
HIP20648	04:25:29.4	17:55:40	2000	4.30	A2IV	45.3	0.11	-0.03
HIP20713	04:26:20.7	15:37:05	2000	4.48	F0V...	47.9	0.11	-0.03
HIP20842	04:28:00.8	21:37:11	2000	5.72	Am	47.9	0.10	-0.04

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP20901	04:28:50.2	13:02:51	2000	5.02	A7V	49.1	0.11	-0.02
HIP20917	04:29:00.1	21:55:21	2000	8.30	K7V	11.4	-0.07	0.18
HIP21029	04:30:33.6	16:11:38	2000	4.78	A6IV	44.3	0.10	-0.03
HIP21036	04:30:37.4	13:43:27	2000	5.40	F0V	45.7	0.11	-0.02
HIP21039	04:30:38.9	15:41:30	2000	5.47	Am	44.3	0.10	-0.02
HIP21223	04:33:09.3	-36:56:45	2000	8.74	K4V	25.0	-0.02	0.04
HIP21248	04:33:30.6	-29:45:59	2000	4.49	K0III	38.1	-0.11	-0.27
HIP21272	04:33:50.4	05:23:06	2000	7.92	K0	26.7	-0.09	-0.28
HIP21273	04:33:50.9	14:50:39	2000	4.65	A8V	46.7	0.10	-0.03
HIP21284	04:34:01.2	-43:31:28	2000	8.81	K5V	22.4	0.06	-0.08
HIP21402	04:35:39.3	10:09:38	2000	4.25	A5m	46.1	0.04	-0.05
HIP21421	04:35:55.2	16:30:33	2000	0.87	K5III	19.9	0.06	-0.19
HIP21482	04:36:48.2	27:07:55	2000	8.10	K2	17.8	0.23	-0.15
HIP21547	04:37:36.1	-02:28:24	2000	5.22	F0V	29.7	0.04	-0.06
HIP21553	04:37:40.9	52:53:37	2000	8.62	K8V	10.1	0.31	-0.48
HIP21556	04:37:41.9	-11:02:19	2000	10.3	M1	11.0	-0.23	-0.19
HIP21589	04:38:09.5	12:30:38	2000	4.27	A6V	45.8	0.10	-0.01
HIP21594	04:38:10.8	-14:18:14	2000	3.86	K1III	33.5	-0.08	-0.18
HIP21673	04:39:09.2	15:47:59	2000	5.08	A4m	46.5	0.03	-0.08
HIP21683	04:39:16.5	15:55:04	2000	4.67	A5Vn	48.7	0.08	-0.02
HIP21770	04:40:33.7	-41:51:49	2000	4.44	F2V	20.1	-0.14	-0.07
HIP21818	04:41:18.9	20:54:05	2000	8.09	K3V	13.4	-0.23	-0.25
HIP21861	04:42:03.5	-37:08:39	2000	5.04	F3V	27.6	0.05	0.19
HIP21932	04:42:55.8	18:57:29	2000	9.95	M2	9.41	0.66	-1.11
HIP21988	04:43:35.4	27:41:14	2000	8.00	K5III	22.3	0.05	-0.27

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP22044	04:44:25.8	11:08:46	2000	5.39	F0V	48.2	0.10	-0.01
HIP22122	04:45:38.6	-50:04:27	2000	7.58	K0V	20.4	-0.45	-0.34
HIP22263	04:47:36.3	-16:56:04	2000	5.49	G3V	13.3	0.13	0.17
HIP22287	04:48:00.3	56:45:25	2000	5.29	A3m	49.7	0.05	-0.15
HIP22288	04:48:01.1	10:56:01	2000	9.53	K7V	26.1	0.08	-0.11
HIP22361	04:48:50.4	75:56:28	2000	5.96	A9IV	45.6	0.04	-0.13
HIP22449	04:49:50.4	06:57:40	2000	3.19	F6V	8.02	0.46	0.01
HIP22451	04:49:52.3	-35:06:27	2000	7.49	K2V	17.9	-0.03	-0.11
HIP22498	04:50:25.1	63:19:58	2000	9.99	K7	23.4	0.22	-0.19
HIP22531	04:50:55.3	-53:27:41	2000	5.58	F0IV...	37.0	-0.08	0.09
HIP22627	04:52:05.7	06:28:35	2000	11.9	M4	12.1	0.15	-0.31
HIP22715	04:53:04.7	22:14:06	2000	8.78	K5V	26.9	0.15	-0.13
HIP22738	04:53:31.2	-55:51:37	2000	10.7	M2Ve	11.1	0.13	0.07
HIP22762	04:53:50.0	-17:46:24	2000	10.9	M3	12.3	0.41	-0.64
HIP22787	04:54:04.2	-35:24:16	2000	7.60	K0V	25.9	0.13	0.16
HIP22844	04:54:53.0	-58:32:51	2000	6.11	F3V	30.8	0.10	0.07
HIP22845	04:54:53.7	10:09:02	2000	4.64	A0V	36.9	0.04	-0.13
HIP22907	04:55:41.9	-28:33:50	2000	8.13	K3/K4V	17.9	0.19	-0.23
HIP23147	04:58:50.6	49:50:57	2000	9.80	M2	16.5	0.11	-0.11
HIP23179	04:59:15.4	37:53:24	2000	4.93	A1V	48.7	0.05	-0.10
HIP23296	05:00:39.8	-02:03:57	2000	6.31	A8IV	49.5	-0.01	0.00
HIP23309	05:00:47.1	-57:15:25	2000	10.0	...	26.2	0.04	0.07
HIP23311	05:00:49.0	-05:45:13	2000	6.22	K3V	8.81	0.55	-1.11
HIP23437	05:02:17.1	-56:04:49	2000	7.02	G5V	22.2	-0.05	0.73
HIP23452	05:02:28.4	-21:15:23	2000	8.31	M0V	8.51	-0.14	-0.22

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP23482	05:02:48.7	-49:09:05	2000	5.37	F2V	26.1	-0.04	0.03
HIP23497	05:03:05.7	21:35:23	2000	4.62	A7V	49.9	0.07	-0.04
HIP23512	05:03:20.1	-17:22:24	2000	11.7	K:	9.27	-0.23	-0.45
HIP23516	05:03:21.9	-23:15:00	2000	9.28	K5V	26.3	0.25	0.16
HIP23693	05:05:30.7	-57:28:21	2000	4.71	F7V	11.6	-0.03	0.12
HIP23708	05:05:47.4	-57:33:13	2000	8.98	K7V	11.5	-0.03	0.12
HIP23783	05:06:40.6	51:35:51	2000	4.98	F0V	26.2	-0.03	-0.17
HIP23786	05:06:42.2	14:26:46	2000	7.74	K0V	23.9	0.28	-0.24
HIP23875	05:07:51.0	-05:05:11	2000	2.78	A3IIIva	27.2	-0.08	-0.08
HIP23932	05:08:35.0	-18:10:19	2000	10.2	M5	9.31	0.50	-1.40
HIP23941	05:08:43.7	-04:27:22	2000	5.11	F2V	25.0	0.06	0.02
GJ191	05:11:40.6	-45:01:06	2000	8.85	M2.0V	3.91	6.50	-5.73
HIP24284	05:12:42.2	19:39:56	2000	10.8	M5	12.7	0.28	0.24
HIP24332	05:13:17.4	37:20:14	2000	6.48	F8	25.9	-0.14	-0.14
HIP24340	05:13:25.7	38:29:04	2000	4.82	A4m	49.8	-0.02	-0.07
HIP24454	05:14:48.1	00:39:43	2000	9.97	K2III	26.2	0.24	-0.45
HIP24659	05:17:29.1	-34:53:42	2000	4.81	K0/K1II	33.7	0.09	-0.34
HIP24783	05:18:47.2	-21:23:37	2000	9.35	K4V	20.2	-0.14	-0.04
HIP24786	05:18:50.5	-18:07:48	2000	5.96	G0V	24.9	0.38	0.06
HIP24813	05:19:08.5	40:05:56	2000	4.69	G0V	12.6	0.52	-0.66
HIP24819	05:19:12.7	-03:04:25	2000	7.77	K3V	16.8	0.70	0.14
HIP24874	05:19:59.6	-15:50:22	2000	8.72	K3V	24.3	0.17	0.20
HIP25110	05:22:33.5	79:13:52	2000	5.08	F6V	20.9	-0.08	0.16
HIP25119	05:22:37.5	02:36:11	2000	7.76	K3V	19.9	0.05	-0.14
HIP25220	05:23:38.4	17:19:26	2000	7.93	K2	14.3	0.25	0.00

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP25278	05:24:25.5	17:23:00	2000	5.00	F8V SB	14.6	0.25	-0.01
HIP25283	05:24:30.2	-38:58:10	2000	9.08	K2	17.7	0.04	-0.06
HIP25421	05:26:14.7	-32:30:17	2000	7.70	K2/K3V	17.9	0.25	-0.09
HIP25486	05:27:04.8	-11:54:03	2000	6.30	F7V:	26.8	0.02	-0.05
HIP25544	05:27:39.4	-60:24:57	2000	6.99	G5V	19.5	-0.15	-0.09
HIP25578	05:28:00.2	09:38:38	2000	12.4	M5	8.69	-0.19	-0.76
HIP25623	05:28:26.1	-03:29:58	2000	7.65	K5V	12.9	-0.31	-0.80
HIP25647	05:28:44.8	-65:26:54	2000	6.88	K1III(p)	14.9	0.03	0.15
HIP25775	05:30:14.0	-42:41:50	2000	9.72	M0V	19.3	0.03	-0.15
HIP25878	05:31:27.4	-03:40:38	2000	7.97	M1V	5.69	0.76	-2.09
HIP25918	05:31:53.0	-76:20:27	2000	5.18	K4III	30.8	0.14	0.29
HIP26335	05:36:31.0	11:19:40	2000	8.78	K7	11.3	0.00	-0.06
HIP26366	05:36:54.4	09:17:26	2000	4.09	G8III-I	35.5	0.10	-0.30
HIP26369	05:36:55.1	-47:57:48	2000	9.84		24.2	0.01	0.02
HIP26373	05:36:56.9	-47:57:52	2000	7.95	K0V	23.8	0.03	0.00
HIP26394	05:37:09.9	-80:28:08	2000	5.65	G3IV	18.2	0.31	1.05
HIP26501	05:38:09.4	-46:06:21	2000	7.33	G5	25.2	-0.13	-0.47
HIP26505	05:38:11.9	51:26:44	2000	7.74	K2V	20.5	-0.55	0.11
HIP26563	05:38:53.1	-07:12:46	2000	4.77	A4V	47.0	-0.01	-0.05
HIP26624	05:39:31.1	-03:33:52	2000	5.99	A8Vs	41.3	0.00	0.00
HIP26779	05:41:20.3	53:28:51	2000	6.21	K1V	12.2	0.00	-0.52
HIP26801	05:41:30.7	53:29:23	2000	9.78	M1	12.4	0.00	-0.52
HIP26857	05:42:09.3	12:29:21	2000	11.5	M5	5.78	2.00	-1.57
HIP27072	05:44:27.8	-22:26:54	2000	3.59	F7V	8.96	-0.29	-0.37
HIP27075	05:44:28.4	-20:07:35	2000	6.34	F8/G0V	25.5	-0.02	0.04

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP27080	05:44:31.9	-70:08:36	2000	8.09	K0V	25.5	-0.31	1.24
HIP27100	05:44:46.4	-65:44:07	2000	4.34	A7V	44.4	-0.03	0.01
HIP27188	05:45:48.3	62:14:12	2000	9.02	M0	13.6	0.30	-0.79
HIP27207	05:46:01.9	37:17:04	2000	7.34	K0V	20.5	0.49	-0.51
HIP27288	05:46:57.3	-14:49:19	2000	3.55	A2Vann	21.5	-0.01	0.00
HIP27321	05:47:17.1	-51:03:59	2000	3.85	A3V	19.2	0.00	0.08
HIP27323	05:47:18.2	-48:31:30	2000	9.74	M0V	20.7	0.03	-0.32
HIP27359	05:47:40.6	-36:19:42	2000	10.7	M2	14.9	0.77	-0.12
HIP27435	05:48:34.9	-04:05:40	2000	5.97	G4V	15.5	0.06	-0.23
HIP27628	05:50:57.6	-35:46:05	2000	3.12	K1.5III	26.3	0.06	0.40
HIP27654	05:51:19.3	-20:52:44	2000	3.76	G8III/I	34.4	0.23	-0.65
HIP27803	05:53:00.3	-05:59:41	2000	9.70	M0V	20.1	0.00	-0.35
HIP27887	05:54:04.2	-60:01:24	2000	7.17	K3V	12.8	-0.05	-0.06
HIP27890	05:54:06.1	-63:05:22	2000	4.65	K1III/I	27.2	0.12	0.57
HIP27896	05:54:10.8	-50:21:45	2000	6.53	K1V	34.8	0.09	0.55
HIP27913	05:54:23.0	20:16:34	2000	4.39	G0V	8.66	-0.16	-0.10
HIP27918	05:54:28.6	02:08:32	2000	8.84	K3V	26.6	0.08	-0.65
HIP27922	05:54:30.2	-19:42:15	2000	7.51	G6V	22.7	0.09	-0.03
HIP27947	05:54:50.1	-52:38:07	2000	5.29	F0Ve...	34.9	-0.02	0.24
HIP28103	05:56:24.3	-14:10:03	2000	3.71	F1V	15.0	-0.04	0.14
HIP28267	05:58:21.5	-04:39:02	2000	6.99	G0	23.2	0.07	-0.20
HIP28368	05:59:37.7	58:35:34	2000	10.2	M1	13.5	0.01	-0.25
HIP28442	06:00:19.5	-31:01:43	2000	7.85	K3/K4V	14.9	-0.38	1.02
HIP28614	06:02:23.0	09:38:50	2000	4.12	Am...	46.5	0.01	-0.04
HIP28764	06:04:28.4	-45:02:11	2000	6.35	G0IV-V	26.6	-0.08	0.25

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP28790	06:04:40.1	-45:04:44	2000	5.93	F4V	27.0	-0.08	0.25
HIP28954	06:06:40.5	15:32:31	2000	6.76	K0	15.4	-0.12	-0.10
HIP29052	06:07:43.7	-25:44:41	2000	11.8	...	11.4	-0.18	-0.20
HIP29067	06:07:55.3	67:58:36	2000	9.75	K8	24.9	-0.05	-0.11
HIP29271	06:10:14.5	-74:45:10	2000	5.08	G5V	10.1	0.12	-0.21
HIP29277	06:10:19.8	82:06:24	2000	10.4	M3	9.39	0.05	-1.34
HIP29295	06:10:34.6	-21:51:52	2000	8.15	M1/M2V	5.77	-0.14	-0.71
HIP29432	06:12:00.6	06:46:59	2000	6.85	G4V	23.1	0.20	-0.25
HIP29525	06:13:12.5	10:37:37	2000	6.43	G8V	18.1	0.08	-0.30
HIP29548	06:13:35.3	63:23:38	2000	9.67	M0	24.7	0.17	-0.20
HIP29568	06:13:45.3	-23:51:42	2000	6.37	G5V	16.6	-0.05	0.11
HIP29650	06:14:50.9	19:09:23	2000	5.20	F6V	21.1	-0.10	-0.18
HIP29761	06:16:02.7	70:46:53	2000	7.43	G5	25.7	-0.01	-0.44
HIP29800	06:16:26.6	12:16:19	2000	5.04	F5IV-V	19.6	0.08	0.19
HIP29860	06:17:16.1	05:06:00	2000	5.70	G0.5Vb	19.3	-0.19	0.17
HIP30060	06:19:37.4	59:00:39	2000	4.44	A2Vs	45.7	0.00	0.02
HIP30112	06:20:13.2	02:15:32	2000	9.83	K7V	27.9	-0.12	-0.10
HIP30314	06:22:30.9	-60:13:07	2000	6.53	G1V	23.4	-0.01	0.06
HIP30419	06:23:46.1	04:35:34	2000	4.39	A5IV	39.3	-0.02	0.01
HIP30503	06:24:43.9	-28:46:48	2000	6.37	G2V	22.0	-0.16	-0.12
HIP30630	06:26:10.2	18:45:24	2000	6.78	K0	14.6	-0.12	-0.16
HIP30756	06:27:46.0	20:46:59	2000	8.59	G0	18.0	0.04	-0.03
GJ234	06:29:23.4	-02:48:49	2000	11.1	M4.5V	4.09	0.69	-0.62
HIP31167	06:32:23.1	-05:52:07	2000	5.60	F0Vnn+.	43.2	0.00	-0.04
HIP31592	06:36:41.0	-19:15:21	2000	3.95	K1III+.	19.8	0.06	-0.07

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP31635	06:37:10.8	17:33:53	2000	9.63	M1:	9.84	-0.78	0.33
HIP31634	06:37:11.2	-50:02:17	2000	9.61	K0	15.1	0.16	0.01
HIP31703	06:37:54.9	73:41:44	2000	6.26	F2	35.5	-0.17	0.00
HIP31711	06:38:00.4	-61:32:00	2000	6.15	G1/G2V	21.6	-0.05	0.07
HIP31878	06:39:50.0	-61:28:41	2000	9.71	M1V	21.9	-0.03	0.08
HIP32010	06:41:15.7	23:57:27	2000	8.08	K2	17.5	0.21	-0.28
HIP32322	06:44:52.0	-27:20:30	2000	6.43	F7V	26.5	-0.01	0.29
GJ244	06:45:08.9	-16:42:58	2000	-1.4	A1V	2.63	-0.55	-1.22
HIP32366	06:45:22.9	-31:47:37	2000	5.92	F7V	24.2	-0.20	-0.30
HIP32423	06:46:05.1	32:33:20	2000	8.80	K3V	24.9	-0.45	0.10
HIP32439	06:46:14.2	79:33:53	2000	5.44	F8V	17.8	-0.10	-0.60
HIP32480	06:46:44.3	43:34:38	2000	5.24	G0V	16.5	0.00	0.17
HIP32617	06:48:19.1	-01:19:08	2000	5.75	F1V	40.0	-0.04	-0.03
HIP32765	06:49:54.6	-46:36:52	2000	5.14	F5III	25.2	0.00	0.37
HIP32769	06:49:57.0	60:20:07	2000	8.59	M0p	16.4	0.25	0.41
HIP32851	06:50:49.8	-00:32:27	2000	5.78	F2V	29.8	0.02	-0.19
HIP32919	06:51:32.4	47:22:04	2000	8.95	K2	18.8	-0.25	-0.69
HIP32984	06:52:18.1	-05:10:25	2000	6.58	K3V	8.70	-0.54	0.00
HIP33142	06:54:04.2	60:52:18	2000	11.0	M:	10.6	0.49	-0.99
HIP33202	06:54:38.6	13:10:40	2000	4.73	F0Vp	27.9	0.07	-0.08
HIP33226	06:54:49.0	33:16:05	2000	9.89	K:...	5.51	-0.73	-0.40
HIP33277	06:55:18.7	25:22:32	2000	5.74	G0V	17.2	-0.04	0.03
HIP33302	06:55:37.4	-20:08:11	2000	4.66	F2IV/V	29.2	0.05	0.04
HIP33373	06:56:28.1	40:04:27	2000	9.08	K5V	24.0	0.12	-0.44
HIP33428	06:57:04.7	30:45:23	2000	9.68	M0	18.6	0.08	-0.22

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP33478	06:57:33.9	-24:37:51	2000	5.45	F3V	38.5	-0.10	0.09
HIP33499	06:57:46.6	-44:17:28	2000	10.8	M4+...	8.02	-1.10	-0.04
HIP33537	06:58:11.8	22:28:33	2000	6.94	G5V	24.2	0.05	0.10
HIP33560	06:58:26.1	-12:59:30	2000	9.14	K4V	22.3	0.05	-0.15
HIP33690	06:59:59.7	-61:20:10	2000	6.81	K0IV-V	18.4	-0.16	0.26
HIP33817	07:01:13.7	-25:56:55	2000	6.71	K1V	14.6	0.21	0.04
HIP33852	07:01:38.6	48:22:43	2000	7.98	K3V	20.4	0.55	-0.43
HIP33955	07:02:42.9	-06:47:57	2000	8.38	K5V	18.7	-0.20	-0.31
HIP34017	07:03:30.5	29:20:13	2000	5.93	G4V	19.0	0.16	-0.83
HIP34052	07:03:50.2	-43:33:40	2000	8.67	K5V...	16.9	-0.08	0.40
HIP34065	07:03:57.3	-43:36:28	2000	5.56	G3V...	16.2	-0.10	0.39
HIP34069	07:03:58.9	-43:36:40	2000	6.83	K0V	15.0	-0.10	0.40
HIP34104	07:04:17.7	10:30:31	2000	10.9	M5	15.3	-0.12	-0.82
HIP34115	07:04:25.9	68:17:19	2000	11.9	M5	15.2	0.35	0.05
HIP34341	07:07:09.3	03:26:50	2000	9.84	M0V	26.7	0.01	-0.27
HIP34361	07:07:22.9	-21:27:27	2000	11.1	M2V:	17.2	0.20	-0.21
HIP34414	07:08:04.2	29:50:04	2000	8.32	G5	22.2	-0.16	-0.30
HIP34567	07:09:35.4	25:43:43	2000	7.09	G8V	24.5	-0.12	-0.18
HIP34782	07:12:04.1	-30:49:16	2000	6.10	A8III/I	47.5	-0.04	0.02
HIP34834	07:12:33.6	-46:45:33	2000	4.49	F0IV	21.1	-0.14	0.11
HIP34890	07:13:07.1	-63:20:41	2000	9.08	K5V	19.9	-0.27	0.58
HIP34950	07:13:53.1	25:00:40	2000	8.40	K1V	25.1	-0.41	-0.09
HIP35136	07:15:50.1	47:14:23	2000	5.54	G0V	16.8	0.03	-0.19
HIP35191	07:16:19.8	27:08:32	2000	10.8	...	12.3	-0.04	-0.20
HIP35296	07:17:29.6	-46:58:45	2000	6.70	K2V	14.7	-0.02	0.59

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP35350	07:18:05.6	16:32:25	2000	3.58	A3V...	28.9	-0.05	-0.04
HIP35550	07:20:07.4	21:58:56	2000	3.50	F0IV...	18.0	-0.02	-0.01
HIP35643	07:21:17.5	45:13:41	2000	5.74	A7s	34.4	-0.05	0.01
HIP35821	07:23:14.9	46:05:14	2000	10.5	M2	16.2	-0.12	-0.24
HIP35872	07:23:47.1	12:57:52	2000	8.19	G5	25.0	0.08	-0.43
HIP36046	07:25:43.6	27:47:53	2000	3.78	G9III+.	38.6	-0.12	-0.08
HIP36121	07:26:26.6	-15:46:13	2000	9.21	K4V	25.6	0.05	-0.10
HIP36152	07:26:50.3	21:32:08	2000	6.54	F6V	30.8	-0.31	-0.03
GJ273	07:27:24.5	05:13:33	2000	9.85	M3.5V	3.75	0.57	-3.69
HIP36210	07:27:25.5	-51:24:09	2000	6.72	G5IV-V	22.5	-0.29	0.00
HIP36349	07:28:51.4	-30:14:48	2000	9.96	M1V:e..	15.5	-0.13	-0.13
HIP36357	07:29:01.8	31:59:37	2000	7.73	K2V	17.5	0.16	0.17
HIP36366	07:29:06.7	31:47:04	2000	4.16	F0V...	18.4	0.16	0.19
HIP36393	07:29:20.4	28:07:05	2000	5.07	A4V	50.0	-0.03	-0.05
HIP36399	07:29:25.6	-07:33:04	2000	5.86	F8V	27.8	0.05	0.13
HIP36439	07:29:56.0	49:40:20	2000	5.35	F6V	19.9	0.11	-0.08
HIP36515	07:30:42.5	-37:20:21	2000	6.66	G3V	21.7	-0.09	0.05
HIP36551	07:31:07.7	14:36:50	2000	8.94	K5	21.2	0.07	-0.29
HIP36627	07:31:57.3	36:13:47	2000	11.8	M4	11.4	-0.26	-0.25
HIP36704	07:33:00.6	37:01:47	2000	7.68	G5	19.6	-0.05	0.01
HIP36817	07:34:18.6	-23:28:25	2000	5.06	F6V	29.0	-0.09	0.00
HIP36827	07:34:26.2	-06:53:48	2000	8.16	K2V	24.8	-0.08	-0.04
HIP36850	07:34:35.9	31:53:17	2000	1.58	A2Vm	15.8	-0.21	-0.15
HIP36915	07:35:21.9	54:50:59	2000	11.3	M0	13.1	-0.12	0.02
HIP36927	07:35:26.8	-52:26:33	2000	8.78	K3IV-V	25.2	-0.11	0.26

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP36985	07:36:07.1	-03:06:38	2000	9.87	...	14.3	0.04	-0.25
HIP37217	07:38:41.0	-21:13:28	2000	11.6	M2	10.8	0.45	-0.47
GJ280	07:39:18.1	05:13:29	2000	0.37	F5IV	3.50	-0.72	-1.04
HIP37288	07:39:23.0	02:11:01	2000	9.66	M0	14.8	-0.15	-0.25
HIP37349	07:39:59.3	-03:35:51	2000	7.18	K2V	14.1	0.07	-0.28
HIP37494	07:41:45.1	49:13:19	2000	9.73	K4	26.7	-0.06	0.00
HIP37629	07:43:18.7	28:53:00	2000	4.23	K1III S	37.4	0.06	-0.23
HIP37766	07:44:40.2	03:33:08	2000	11.1	M4.5Ve	5.93	-0.34	-0.45
HIP37826	07:45:18.9	28:01:34	2000	1.16	K0IIIva	10.3	-0.63	-0.05
HIP37853	07:45:35.0	-34:10:20	2000	5.36	G0V	15.1	-0.22	1.72
HIP38048	07:47:56.7	-12:11:33	2000	5.48	F5+...	30.2	-0.10	0.08
HIP38082	07:48:16.4	20:22:05	2000	11.4	M2	14.1	1.45	-0.99
HIP38117	07:48:39.6	53:38:54	2000	8.86	K4V	26.2	-0.12	-0.53
HIP38228	07:49:55.1	27:21:47	2000	6.90	G5IV	21.8	-0.01	-0.01
HIP38325	07:51:05.7	54:07:45	2000	6.03	F6V	30.0	-0.04	0.05
HIP38382	07:51:46.3	-13:53:52	2000	5.16	G2V	16.6	-0.07	-0.34
HIP38423	07:52:15.7	-34:42:19	2000	5.01	F3/F5V	18.0	-0.20	0.24
HIP38594	07:54:10.9	-25:18:11	2000	9.75	M	19.5	-0.30	0.20
HIP38625	07:54:34.2	-01:24:44	2000	7.43	G8V	19.2	-0.25	-0.06
HIP38657	07:54:54.1	19:14:10	2000	7.76	K2	19.9	0.09	-0.45
HIP38712	07:55:31.4	08:51:46	2000	5.86	F2IV	38.1	-0.01	-0.09
HIP38784	07:56:17.2	80:15:55	2000	6.55	G8V	17.0	-0.48	0.09
HIP38908	07:57:46.9	-60:18:11	2000	5.59	G2V...	16.1	0.52	0.12
HIP38910	07:57:48.5	-33:57:07	2000	8.83	K5V	18.3	0.14	0.30
HIP38931	07:57:57.8	-00:48:51	2000	8.05	K5V	17.4	-0.16	0.00

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP38939	07:58:04.4	-25:37:35	2000	8.42	K3V	18.2	0.36	-0.25
HIP38956	07:58:12.7	41:18:13	2000	12.0	M4V	8.16	0.21	-0.69
HIP39064	07:59:33.9	20:50:38	2000	7.68	K0V	23.1	0.18	-0.54
HIP39157	08:00:32.1	29:12:44	2000	6.97	G8V	16.8	-0.17	-1.16
HIP39342	08:02:31.2	-66:01:15	2000	7.18	K1V	17.2	-0.16	-0.13
HIP39494	08:04:22.7	43:57:42	2000	9.83	M0	25.3	0.15	-0.02
HIP39826	08:08:13.2	21:06:18	2000	9.41	M:	17.1	-0.30	-0.35
HIP39896	08:08:56.4	32:49:11	2000	9.90	M0.5V:e	20.7	-0.03	-0.22
HIP39903	08:09:00.7	-61:18:08	2000	4.74	F5V	21.3	-0.16	-0.30
HIP40035	08:10:39.8	-13:47:57	2000	5.53	F7V	22.4	-0.25	0.06
HIP40118	08:11:38.6	32:27:25	2000	6.78	G4V	21.7	-0.46	-0.64
HIP40239	08:13:08.5	-13:55:01	2000	9.38	M0V	21.6	-0.19	-0.51
HIP40375	08:14:35.9	13:01:22	2000	8.79	K5	18.3	-0.42	0.10
HIP40438	08:15:25.2	-52:03:37	2000	6.63	G1V	27.0	-0.01	-0.06
HIP40501	08:16:08.0	01:18:09	2000	10.0	...	9.15	-0.38	0.06
HIP40671	08:18:10.8	30:36:02	2000	8.82	K4V	22.5	-0.28	-0.82
HIP40693	08:18:23.9	-12:37:55	2000	5.95	K0V	12.5	0.28	-0.99
HIP40702	08:18:31.6	-76:55:10	2000	4.05	F5III	19.4	0.11	0.11
HIP40706	08:18:33.3	-36:39:33	2000	4.44	A4m...	28.5	-0.11	0.10
HIP40774	08:19:19.1	01:20:19	2000	8.35	G5	23.3	-0.16	-0.05
HIP40843	08:20:03.9	27:13:03	2000	5.13	F6V	18.1	-0.02	-0.38
HIP40875	08:20:26.1	57:44:35	2000	5.89	F4V	31.6	0.06	0.01
HIP40910	08:20:55.3	14:04:16	2000	9.75	M0	23.4	-0.08	-0.26
HIP41130	08:23:30.9	21:50:57	2000	9.52	M0	27.0	0.30	-0.24
HIP41211	08:24:35.0	-03:45:04	2000	5.61	F3V	27.2	-0.21	-0.03

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP41307	08:25:39.6	-03:54:23	2000	3.91	A0V	38.3	-0.07	-0.02
HIP41312	08:25:44.2	-66:08:12	2000	3.77	K2IIIva	33.1	-0.04	-0.15
HIP41484	08:27:36.8	45:39:10	2000	6.32	G5V	21.7	-0.02	-0.35
GJ1111	08:29:49.5	26:46:37	2000	14.9	M6.0V	3.62	-1.14	-0.60
HIP41689	08:29:56.3	61:43:32	2000	10.2	M0	19.1	0.53	-0.72
HIP41926	08:32:51.5	-31:30:03	2000	6.38	K0V	12.1	-1.11	0.76
HIP42074	08:34:31.6	-00:43:33	2000	7.32	G5	21.7	-0.19	0.02
HIP42080	08:34:36.1	65:08:42	2000	5.47	A2m	48.4	-0.05	-0.04
HIP42172	08:35:51.0	06:37:12	2000	5.91	F8V	26.5	-0.13	-0.13
HIP42173	08:35:51.3	06:37:22	2000	7.25	G5V	23.4	-0.12	-0.13
HIP42220	08:36:25.5	67:17:42	2000	9.28	M2	13.8	-1.07	0.07
HIP42333	08:37:50.3	-06:48:24	2000	6.74	G0	23.6	-0.30	0.04
HIP42418	08:39:00.2	06:57:19	2000	7.90	K0	25.4	-0.09	-0.29
HIP42438	08:39:11.7	65:01:15	2000	5.63	G1.5Vb	14.2	-0.03	0.09
HIP42499	08:39:50.8	11:31:21	2000	7.61	K1V	18.5	-0.11	-0.50
HIP42697	08:42:07.5	-42:55:45	2000	8.11	K2V	22.3	-0.27	-0.09
HIP42748	08:42:44.5	09:33:24	2000	9.62	M0	13.3	0.22	-0.63
HIP42762	08:42:52.2	09:33:11	2000	11.8	M5	15.4	0.22	-0.62
HIP42806	08:43:17.1	21:28:06	2000	4.66	A1IV	48.5	-0.11	-0.04
HIP42808	08:43:18.0	-38:52:56	2000	6.58	K2V	11.1	-0.30	0.34
HIP42913	08:44:42.2	-54:42:31	2000	1.93	A1V	24.4	0.03	-0.10
HIP42940	08:45:10.4	41:40:18	2000	8.52	K3V	25.9	-0.28	-0.65
HIP43233	08:48:26.2	06:28:06	2000	10.3	M0	25.8	0.21	-0.44
HIP43534	08:52:00.3	66:07:53	2000	9.26	K5	16.4	0.09	0.10
HIP43557	08:52:16.4	08:03:46	2000	6.57	G0	24.1	0.15	-0.24

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP43587	08:52:35.8	28:19:50	2000	5.96	G8V	12.5	-0.49	-0.23
HIP43667	08:53:47.3	35:13:19	2000	9.27	M0V:	25.8	-0.20	-0.29
HIP43726	08:54:17.9	-05:26:04	2000	6.01	G3V	17.0	-0.41	0.03
HIP43790	08:55:07.6	01:32:47	2000	9.99	M1	20.0	0.05	-1.04
HIP43797	08:55:11.8	-54:57:56	2000	5.70	F6V	24.1	0.02	-0.09
HIP43852	08:55:55.7	36:11:46	2000	7.69	G5	26.1	-0.02	-0.01
HIP43970	08:57:14.9	15:19:21	2000	5.22	A5III	49.0	0.06	0.02
HIP44001	08:57:35.2	15:34:52	2000	5.68	F0IV	49.2	0.06	0.02
HIP44072	08:58:38.2	20:32:48	2000	9.22	M0	20.6	0.66	-0.17
HIP44075	08:58:43.9	-16:07:57	2000	5.80	F7/F8IV	21.3	0.24	0.21
HIP44127	08:59:12.5	48:02:30	2000	3.12	A7IV	14.6	-0.44	-0.22
HIP44143	08:59:24.2	-59:05:01	2000	5.17	F3V	26.1	-0.17	0.28
HIP44248	09:00:38.4	41:46:58	2000	3.96	F5V	16.4	-0.49	-0.22
HIP44295	09:01:17.5	15:15:56	2000	8.67	M0V:p..	18.3	-0.13	-0.32
HIP44382	09:02:26.8	-66:23:45	2000	4.00	Am	38.1	0.00	-0.10
HIP44722	09:06:45.3	-08:48:24	2000	9.50	M0	14.5	-0.31	0.21
HIP44897	09:08:51.1	33:52:55	2000	5.95	F9V	19.1	-0.19	-0.12
HIP44899	09:08:52.1	-34:50:33	2000	10.3	K7V	22.3	0.24	-0.25
HIP44901	09:08:52.3	51:36:16	2000	4.46	Am	29.3	-0.14	-0.03
HIP44955	09:09:30.6	32:49:09	2000	9.96	M2	21.1	-0.33	-0.63
HIP44984	09:09:46.4	11:33:51	2000	6.48	F2p	37.6	-0.04	-0.06
HIP45038	09:10:23.5	67:08:02	2000	4.80	F7IV-V	20.4	0.01	-0.09
HIP45075	09:10:55.1	63:30:49	2000	4.67	Am	37.3	0.10	-0.06
HIP45170	09:12:17.6	14:59:45	2000	6.49	G9V	20.4	-0.52	0.25
HIP45336	09:14:21.9	02:18:51	2000	3.89	B9.5V	39.4	0.11	-0.31

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP45343	09:14:22.8	52:41:11	2000	7.64	M0V	6.18	-1.53	-0.56
HIP120005	09:14:24.7	52:41:10	2000	7.70	K2	6.27	-1.55	-0.66
HIP45383	09:14:53.7	04:26:34	2000	7.91	K0	18.4	-0.11	0.00
HIP45493	09:16:11.3	54:01:18	2000	4.80	A5V	36.2	0.05	0.06
HIP45617	09:17:53.5	28:33:37	2000	7.20	K3V	17.5	0.05	-0.51
HIP45637	09:18:08.9	-57:46:07	2000	9.52	K7V	23.4	-0.09	0.47
HIP45688	09:18:50.6	36:48:09	2000	3.82	A1V	37.3	-0.03	-0.12
HIP45836	09:20:43.8	51:15:57	2000	6.14	F3V	29.0	-0.03	0.15
HIP45839	09:20:44.3	-05:45:14	2000	9.10	K2	24.1	-0.36	-0.12
HIP45908	09:21:37.6	-60:16:55	2000	9.49	M0V	10.4	-0.84	0.18
HIP45963	09:22:25.9	40:12:03	2000	7.69	K2V	24.2	-0.34	-0.36
HIP46199	09:25:10.8	46:05:53	2000	9.09	K0	25.7	-0.23	0.02
HIP46343	09:26:53.1	75:56:03	2000	9.02	K2	20.0	-0.35	-0.10
HIP46417	09:27:56.2	80:34:48	2000	9.27	K8	22.9	0.01	-0.44
HIP46509	09:29:08.9	-02:46:08	2000	4.59	F6V	17.0	0.10	0.00
HIP46549	09:29:35.0	-05:22:21	2000	9.74	M0:	23.5	-0.48	0.03
HIP46580	09:29:54.8	05:39:18	2000	7.20	K3V	12.6	-0.50	0.11
HIP46626	09:30:28.1	-32:06:12	2000	8.31	K3/K4V	19.3	-0.07	0.32
HIP46651	09:30:42.0	-40:28:00	2000	3.60	F2IV	18.5	-0.15	0.05
HIP46706	09:31:19.4	-13:29:19	2000	10.0	M2	10.5	0.72	0.05
HIP46733	09:31:31.7	63:03:42	2000	3.65	F0IV	23.1	0.11	0.03
HIP46769	09:31:56.3	36:19:12	2000	10.1	M0	13.5	-0.21	-0.52
HIP46816	09:32:25.6	-11:11:04	2000	7.82	K0	18.3	-0.25	0.04
HIP46843	09:32:43.8	26:59:18	2000	7.05	K0	17.7	-0.15	-0.25
HIP46853	09:32:51.4	51:40:38	2000	3.17	F6IV	13.4	-0.95	-0.54

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP47080	09:35:39.5	35:48:36	2000	5.40	G8IV-V	11.1	-0.73	-0.26
HIP47103	09:36:01.6	-21:39:38	2000	10.9	K	8.97	0.14	-0.99
HIP47175	09:36:49.5	-49:21:18	2000	4.34	A5V	32.9	-0.13	0.04
HIP47201	09:37:11.3	22:41:38	2000	9.43	M0V:	21.9	-0.15	-0.18
HIP47300	09:38:21.8	40:14:23	2000	5.28	F0V	38.3	-0.01	0.01
HIP47425	09:39:46.4	-41:04:03	2000	10.7	M:	9.49	-0.53	0.36
HIP47513	09:41:10.4	13:12:34	2000	10.3	M2	11.3	-0.66	-0.14
HIP47592	09:42:14.4	-23:54:56	2000	4.93	G0V	14.8	-0.40	0.26
HIP47690	09:43:25.7	42:41:29	2000	8.13	K5V	17.7	0.03	-0.83
HIP47701	09:43:33.3	29:58:28	2000	5.64	A2IV	48.8	-0.02	-0.10
HIP47741	09:43:55.6	26:58:08	2000	12.0	M:	14.1	-0.58	-0.10
HIP47780	09:44:29.8	-45:46:35	2000	10.2	M1:	9.81	-0.47	-0.59
HIP48331	09:51:07.1	-43:30:10	2000	7.67	K5V	11.1	0.46	-0.47
HIP48336	09:51:09.6	-12:19:47	2000	10.0	M0	13.6	1.14	-1.46
HIP48390	09:51:53.0	24:23:43	2000	5.29	A5IV	40.1	0.02	-0.17
HIP48411	09:52:11.4	03:13:18	2000	8.86	K5	20.9	-0.43	0.02
HIP48477	09:53:11.8	-03:41:24	2000	10.5	M0	15.6	-0.10	-0.46
HIP48659	09:55:23.9	-27:15:40	2000	12.0	...	11.4	-0.10	-0.15
HIP48714	09:56:08.7	62:47:18	2000	8.99	M2	10.4	-0.30	-0.58
HIP48833	09:57:41.0	41:03:20	2000	5.11	F6Vs	28.8	-0.12	-0.03
HIP48904	09:58:34.3	-46:25:30	2000	11.2	M5	15.9	0.48	-0.48
HIP48926	09:58:52.3	-35:53:27	2000	5.23	A8IV	32.6	-0.09	-0.02
HIP49081	10:01:00.7	31:55:25	2000	5.37	G1V	14.8	-0.53	-0.43
HIP49127	10:01:37.3	-15:25:29	2000	8.65	K3V	26.1	-0.25	0.03
HIP49197	10:02:28.3	44:34:42	2000	9.09	K0	27.7	-0.28	-0.09

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP49366	10:04:37.7	-11:43:46	2000	8.15	K0	23.1	-0.19	-0.03
HIP49544	10:06:56.9	02:57:51	2000	9.95	M0	22.3	-0.06	-0.10
HIP49593	10:07:25.8	35:14:40	2000	4.49	A7V	27.9	0.05	0.00
HIP49669	10:08:22.3	11:58:01	2000	1.36	B7V	23.7	-0.25	0.00
HIP49699	10:08:43.1	34:14:32	2000	7.56	K0	18.0	-0.06	-0.06
HIP49809	10:10:05.9	-12:48:57	2000	5.30	F2/F3IV	27.3	-0.12	-0.11
HIP49841	10:10:35.3	-12:21:14	2000	3.61	K0III	35.1	-0.20	-0.10
HIP49868	10:10:58.5	75:08:28	2000	9.48	M0	21.2	0.22	0.26
GJ380	10:11:22.1	49:27:14	2000	6.59	K7.0V	4.86	-1.36	-0.50
HIP49969	10:12:04.7	-02:41:05	2000	10.6	M0	12.3	0.52	-0.60
HIP49973	10:12:08.2	-18:37:04	2000	9.93	K7V	17.0	-0.50	-0.03
HIP49986	10:12:17.7	-03:44:44	2000	9.26	M3	7.81	-0.15	-0.24
HIP50070	10:13:22.8	-51:13:58	2000	5.27	A7V	49.8	-0.04	-0.01
HIP50075	10:13:24.7	-33:01:54	2000	6.38	G0V	22.7	-0.37	0.06
HIP50125	10:13:57.4	52:30:24	2000	9.53	K5	22.8	0.09	-0.76
HIP50191	10:14:44.2	-42:07:18	2000	3.85	A2V	31.5	-0.15	0.05
HIP50341	10:16:46.0	-11:57:42	2000	10.9	M0	13.7	-0.42	-0.60
HIP50372	10:17:05.8	42:54:51	2000	3.45	A2IV	41.2	-0.17	-0.04
HIP50384	10:17:14.5	23:06:22	2000	5.81	F8Vw	22.7	-0.41	-0.10
HIP50485	10:18:32.8	43:02:54	2000	6.48	G5	35.6	-0.12	-0.08
HIP50505	10:18:52.0	44:02:53	2000	6.66	G5	20.6	0.06	-0.30
GJ388	10:19:36.4	19:52:09	2000	9.29	M2.5V	4.88	-0.50	-0.05
HIP50564	10:19:44.2	19:28:15	2000	4.78	F6IV	21.1	-0.23	-0.21
HIP50583	10:19:58.4	19:50:29	2000	2.01	K0III	38.5	0.31	-0.15
HIP50782	10:22:09.5	11:18:36	2000	7.78	G5	26.8	0.02	-0.32

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP50888	10:23:29.3	-38:00:35	2000	5.34	A8V	40.4	-0.16	-0.05
HIP50921	10:23:55.3	-29:38:43	2000	6.92	G5V	22.0	-0.04	0.10
HIP50944	10:24:14.9	10:24:21	2000	9.98	K4.5	27.2	0.28	-0.25
HIP50954	10:24:23.7	-74:01:53	2000	3.99	F2IV	16.2	-0.02	-0.03
HIP51007	10:25:10.8	10:13:43	2000	10.1	M0	12.4	-0.69	0.12
HIP51138	10:26:47.6	-62:54:09	2000	9.50	K5	27.0	-0.29	-0.35
HIP51248	10:28:03.9	48:47:05	2000	6.42	G1V	23.5	0.08	-0.88
HIP51254	10:28:10.4	06:44:06	2000	8.53	K0	25.1	0.03	0.33
HIP51271	10:28:23.5	-51:42:18	2000	8.90	K4V	24.2	0.03	-0.03
HIP51317	10:28:55.5	00:50:27	2000	9.65	M2	7.23	-0.60	-0.73
HIP51384	10:29:41.5	84:15:07	2000	5.52	F0IV	40.7	-0.13	-0.04
HIP51459	10:30:37.6	55:58:49	2000	4.82	F8V	12.8	-0.18	-0.03
HIP51468	10:30:47.0	59:45:03	2000	8.74	K5	22.3	-0.44	-0.29
HIP51502	10:31:04.7	82:33:30	2000	5.25	F2V	21.4	-0.08	0.02
HIP51525	10:31:24.2	45:31:33	2000	8.85	K7V	15.6	-0.57	-0.59
HIP51547	10:31:43.2	57:06:57	2000	9.63	M0	17.4	-0.07	0.17
HIP51658	10:33:13.9	40:25:31	2000	4.72	A7IV	34.3	-0.14	0.01
HIP51814	10:35:09.7	57:04:57	2000	5.16	F1V	26.4	0.07	0.04
HIP51819	10:35:11.3	84:23:57	2000	7.29	K0	21.0	0.02	0.05
HIP51933	10:36:32.4	-12:13:48	2000	5.71	F7V	24.5	0.27	-0.67
HIP51986	10:37:18.1	-48:13:32	2000	3.84	A3m+...	26.5	-0.13	0.00
HIP52190	10:39:44.4	-37:55:13	2000	11.0	...	14.6	0.19	-0.13
HIP52296	10:41:09.3	-36:53:43	2000	9.97	M0V	16.3	0.17	-0.19
HIP52316	10:41:24.2	-01:44:29	2000	6.25	K1IV	34.3	-0.14	-0.12
HIP52341	10:41:51.8	-36:38:00	2000	10.1	K7V	16.3	-0.09	0.07

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP52369	10:42:13.3	-13:47:15	2000	6.79	G2/G3V	23.4	0.24	-0.17
HIP52422	10:43:01.9	26:19:32	2000	5.51	A4Vn	45.4	-0.10	-0.05
HIP52462	10:43:28.3	-29:03:51	2000	7.72	K1V	21.5	-0.22	-0.05
HIP52469	10:43:32.9	46:12:13	2000	5.18	F5III	35.6	-0.27	-0.07
HIP52470	10:43:33.8	48:12:50	2000	8.02	G5	25.2	-0.33	0.18
LHS288	10:44:21.2	-61:12:35	2000	13.9	M5.5V	4.76	-0.35	1.61
HIP52596	10:45:16.7	-30:48:26	2000	11.2	...	13.8	-0.03	-0.23
HIP52600	10:45:21.5	38:30:42	2000	9.16	M2	14.1	-0.03	0.15
HIP52708	10:46:36.9	-24:35:07	2000	9.37	K5V	20.1	-0.14	-0.11
HIP52727	10:46:46.2	-49:25:12	2000	2.69	G5III S	35.4	0.06	-0.05
LHS292	10:48:12.6	-11:20:13	2000	15.7	M6.5V	4.53	0.60	-1.53
DEN1048	10:48:14.7	-39:56:06	2000	17.3	M8.5V	4.02	-1.16	-1.00
HIP53020	10:50:52.1	06:48:29	2000	11.6	M4:	5.63	-0.80	-0.81
HIP53229	10:53:18.7	34:12:53	2000	3.79	K0III-I	29.9	0.09	-0.29
HIP53252	10:53:29.5	-20:08:19	2000	5.23	F6V	31.3	0.08	-0.24
HIP53253	10:53:29.7	-58:51:11	2000	3.78	K0III-I	29.6	0.08	0.04
GJ406	10:56:29.2	7:00:53	2000	13.5	M5.5V	2.38	-3.83	-2.72
HIP53486	10:56:30.8	07:23:18	2000	7.37	K0	17.5	-0.26	-0.08
HIP53580	10:57:38.1	69:35:47	2000	10.2	M0	23.0	-0.63	0.06
HIP53721	10:59:28.0	40:25:48	2000	5.03	G0V	14.0	-0.32	0.06
HIP53767	11:00:04.3	22:49:58	2000	10.0	M3	6.62	-0.43	-0.28
HIP53824	11:00:44.8	06:06:05	2000	4.98	A5III	46.2	-0.05	-0.02
HIP53910	11:01:50.5	56:22:56	2000	2.34	A1V	24.3	0.08	0.03
HIP53954	11:02:19.8	20:10:47	2000	4.42	A1m	37.9	-0.01	0.04
HIP53985	11:02:38.3	21:58:01	2000	9.57	K	11.6	0.14	-0.05

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
GJ411	11:03:20.2	35:58:12	2000	7.47	M2.0V	2.54	-0.58	-4.77
HIP54061	11:03:43.7	61:45:03	2000	1.81	F7V com	37.9	-0.14	-0.04
HIP54155	11:04:41.5	-04:13:15	2000	7.64	G5	24.6	-0.18	-0.10
HIP54182	11:05:01.0	07:20:09	2000	4.62	F2III-I	28.9	-0.34	-0.05
GJ412A	11:05:28.6	43:31:35	2000	8.77	M1.0V	4.86	-4.41	0.95
GJ412B	11:05:30.4	43:31:18	2000	14.4	M5.5V	4.86	-4.43	0.93
HIP54288	11:06:22.9	-35:44:54	2000	9.62	K5	25.5	0.11	-0.03
HIP54418	11:08:06.3	-28:16:05	2000	9.32	K7V	26.8	-0.50	-0.04
HIP54426	11:08:14.0	38:25:35	2000	8.35	K0	22.7	-0.21	0.04
HIP54459	11:08:31.8	15:46:03	2000	9.75	K0	25.9	0.16	-0.38
HIP54532	11:09:31.3	-24:35:55	2000	10.4	M:	10.6	-0.80	-0.45
HIP54646	11:11:05.2	30:26:45	2000	8.31	K8V	11.9	0.59	-0.20
HIP54651	11:11:10.7	10:57:03	2000	9.23	K5V	20.8	-0.94	0.59
HIP54677	11:11:33.1	-14:59:29	2000	9.06	K4V	22.7	0.70	-0.60
HIP54704	11:12:01.2	-26:08:11	2000	7.05	G8/K0V	21.6	0.27	-0.06
HIP54745	11:12:32.4	35:48:50	2000	6.41	G0V	21.7	-0.25	-0.15
HIP54746	11:12:33.1	-49:06:03	2000	5.37	A2III	49.9	-0.10	0.03
HIP54810	11:13:13.2	04:28:56	2000	8.70	K5V	17.9	-0.32	-0.03
HIP54872	11:14:06.5	20:31:25	2000	2.56	A4V	17.6	0.14	-0.13
HIP54906	11:14:33.2	25:42:37	2000	7.76	K1V	21.2	-0.11	0.05
HIP54922	11:14:48.2	-23:06:17	2000	9.02	K4V	22.6	-0.30	-0.37
HIP54952	11:15:11.9	73:28:30	2000	7.68	K5	14.6	-0.40	0.11
HIP54966	11:15:20.9	-18:08:42	2000	9.97	K7V	20.6	0.32	-0.71
HIP55052	11:16:06.8	-30:10:41	2000	10.3	...	25.2	-0.31	0.09
HIP55119	11:17:07.5	-27:48:48	2000	9.78	M0V	17.5	0.21	-0.08

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP55210	11:18:22.0	-05:04:02	2000	7.29	G8V	21.9	0.79	-0.15
HIP55360	11:20:04.8	65:50:47	2000	9.31	M1Vvar	9.09	-2.95	0.18
HIP55454	11:21:26.7	-20:27:13	2000	8.57	K4/K5V	13.1	0.18	-0.12
HIP55691	11:24:40.3	-61:38:51	2000	7.22	K7V+...	12.8	-0.51	0.08
HIP55705	11:24:52.9	-17:41:02	2000	4.06	A9V	25.7	-0.10	0.00
HIP55718	11:24:59.8	40:00:12	2000	10.2	M0	22.7	-0.11	-0.02
HIP55779	11:25:43.1	-63:58:20	2000	5.18	F7V	27.4	-0.31	-0.07
HIP55846	11:26:45.3	3:00:47	2000	6.49	K0IV	17.6	-0.73	0.18
HIP55848	11:26:46.3	3:00:22	2000	7.58	K2V	17.9	-0.73	0.19
HIP56035	11:29:04.6	61:46:42	2000	5.83	F5Vawva	32.8	-0.11	0.24
HIP56153	11:30:35.0	-57:08:01	2000	8.34	K4V	22.2	-0.55	0.04
HIP56157	11:30:41.8	-08:05:42	2000	11.9	...	13.9	-0.35	0.26
HIP56199	11:31:13.1	63:09:27	2000	9.98	M0	23.3	0.07	0.03
HIP56238	11:31:43.4	22:40:01	2000	10.3	...	16.1	-0.58	0.03
HIP56242	11:31:44.9	14:21:52	2000	6.27	G0V	23.0	-0.33	-0.19
HIP56244	11:31:46.5	-41:02:47	2000	11.5	M	10.4	-0.72	0.17
HIP56343	11:33:00.1	-31:51:27	2000	3.54	G8III	39.6	-0.21	-0.04
HIP56445	11:34:22.0	03:03:36	2000	5.76	F5V	26.5	-0.18	-0.10
HIP56452	11:34:29.5	-32:49:52	2000	5.96	K0V	9.53	-0.67	0.82
HIP56528	11:35:27.0	-32:32:23	2000	9.81	M2V	9.03	-0.07	-0.85
HIP56630	11:36:40.9	39:11:26	2000	10.0	M0	24.3	0.44	-0.41
HIP56802	11:38:40.0	-13:12:06	2000	5.48	F7V	26.9	0.10	0.13
HIP56809	11:38:44.9	45:06:30	2000	6.29	G0V	23.2	-0.59	0.01
HIP56829	11:38:59.7	42:19:43	2000	8.22	K5V	19.7	-0.13	0.44
HIP56998	11:41:02.5	-44:24:18	2000	7.77	K5V	12.5	-0.66	0.24

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP56997	11:41:03.0	34:12:05	2000	5.31	G8Vvar	9.54	-0.01	-0.38
HIP57274	11:44:41.0	30:57:33	2000	8.97	K8	25.8	-0.03	-0.38
HIP57328	11:45:17.0	08:15:29	2000	4.84	A4V	36.6	0.06	-0.02
HIP57363	11:45:36.4	-66:43:43	2000	3.63	A7III	39.3	-0.10	0.03
HIP57443	11:46:31.1	-40:30:01	2000	4.89	G3/G5V	9.23	-1.53	0.40
HIP57493	11:47:03.5	50:58:18	2000	9.51	M0V:p	24.6	0.06	-0.11
HIP57494	11:47:03.8	-11:49:26	2000	9.03	K2	24.6	-0.21	-0.06
HIP57507	11:47:15.8	-30:17:11	2000	6.48	G5V	17.7	-0.27	-0.23
GJ447	11:47:44.4	00:48:15	2000	11.1	M4.0V	3.35	0.61	-1.22
HIP57632	11:49:03.6	14:34:19	2000	2.14	A3Vvar	11.0	-0.50	-0.11
HIP57757	11:50:41.7	01:45:53	2000	3.59	F8V	10.9	0.74	-0.27
HIP57802	11:51:07.3	35:16:19	2000	9.76	M1V	8.55	-0.27	0.25
HIP57866	11:52:08.3	18:45:18	2000	8.40	K2	25.3	0.03	-0.30
HIP58001	11:53:49.8	53:41:41	2000	2.41	A0V SB	25.6	0.11	0.01
HIP58293	11:57:16.3	-26:08:29	2000	8.93	K3/K4V	26.7	-0.35	0.15
HIP58345	11:57:56.2	-27:42:25	2000	6.99	K4V	10.1	-1.08	-0.62
HIP58374	11:58:11.7	-23:55:25	2000	8.70	K3V	26.0	-0.17	-0.05
HIP58451	11:59:10.0	-20:21:13	2000	7.92	K2V	20.8	0.14	-0.42
HIP58576	12:00:44.5	10:26:45	2000	5.54	K0IV	12.9	0.14	-0.48
HIP58684	12:02:06.8	43:02:44	2000	5.22	A7m	33.9	-0.35	0.06
HIP58803	12:03:39.6	-42:26:02	2000	5.15	F6V	24.2	0.32	-0.11
HIP59000	12:05:50.7	-18:52:30	2000	9.99	K5V	22.5	-0.02	-0.32
HIP59072	12:06:52.9	-64:36:49	2000	4.14	F2III	19.6	0.03	-0.04
HIP59199	12:08:24.8	-24:43:43	2000	4.02	F0IV/V	14.7	0.10	-0.04
HIP59280	12:09:37.3	40:15:07	2000	7.46	K0V	24.3	-0.31	-0.05

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP59296	12:09:55.0	-46:12:30	2000	8.46	K5V	20.1	-0.38	-0.08
HIP59378	12:10:56.9	41:03:28	2000	10.6	M2V	21.2	0.01	0.23
HIP59406	12:11:11.8	-19:57:38	2000	11.6	...	12.7	-0.21	-0.18
HIP59496	12:12:05.2	58:55:35	2000	10.0	K5	28.3	0.10	0.02
HIP59504	12:12:11.9	77:36:58	2000	5.14	A5m	33.6	0.01	0.02
HIP59514	12:12:20.9	54:29:08	2000	9.71	M2	15.3	0.23	0.09
HIP59608	12:13:25.9	10:15:44	2000	5.85	A2m	49.5	-0.09	-0.01
HIP59750	12:15:10.6	10:18:44	2000	6.11	F5V	22.5	0.03	-1.01
HIP59774	12:15:25.6	57:01:57	2000	3.32	A3Vvar	24.9	0.10	0.01
HIP59780	12:15:27.1	-31:05:38	2000	9.74	K5V	20.1	0.15	-0.06
HIP59816	12:15:58.3	05:38:24	2000	9.45	K8	25.8	-0.34	-0.07
HIP60303	12:21:54.1	42:08:01	2000	9.36	M0V	15.9	0.18	-0.52
HIP60310	12:21:59.8	-41:03:33	2000	8.54	K4V	24.1	0.01	-0.11
HIP60559	12:24:52.5	-18:14:32	2000	11.2	M4	8.88	1.10	-2.31
HIP60759	12:27:13.7	27:01:28	2000	8.24	K2V	27.5	0.09	-0.25
HIP60866	12:28:31.6	-18:17:50	2000	9.24	K4V	24.9	0.17	-0.18
HIP60910	12:28:57.6	08:25:31	2000	11.9	M:	13.5	-0.63	-0.26
HIP60965	12:29:51.9	-16:30:55	2000	2.94	B9.5V	26.9	-0.21	-0.14
HIP60994	12:30:04.8	-13:23:35	2000	6.37	G1/G2V	24.9	-0.26	-0.05
HIP61053	12:30:50.1	53:04:35	2000	6.20	F9V	21.9	0.02	0.18
HIP61084	12:31:010.0	-57:06:47	2000	1.59	M4III	26.9	0.03	-0.26
HIP61094	12:31:15.8	08:48:38	2000	9.74	M0:	13.4	-0.64	-0.52
HIP61099	12:31:18.3	20:13:04	2000	7.91	K0	25.2	-0.02	-0.17
HIP61100	12:31:18.9	55:07:07	2000	8.08	K2V	23.7	0.10	-0.01
HIP61174	12:32:04.2	-16:11:45	2000	4.30	F2V	18.2	-0.42	-0.06

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP61212	12:32:36.0	-13:51:32	2000	5.74	F3IV/V	36.9	-0.15	-0.05
GJ473AB	12:33:17.4	09:01:15	2000	13.2	M5.0V	4.38	-1.80	0.23
HIP61291	12:33:31.4	-68:45:20	2000	7.13	K0V	16.1	-0.55	-0.31
HIP61317	12:33:44.5	41:21:26	2000	4.24	G0V	8.37	-0.71	0.29
HIP61329	12:33:59.7	-14:38:19	2000	9.10	K3/K4V	25.5	-0.50	-0.03
HIP61451	12:35:33.5	-34:52:54	2000	7.84	K4V	21.6	-0.23	-0.13
HIP61468	12:35:45.5	-41:01:18	2000	5.12	A7III	34.5	-0.11	0.00
HIP61481	12:35:51.3	51:13:17	2000	8.52	K0	26.2	0.11	-0.01
HIP61622	12:37:42.2	-48:32:28	2000	3.85	A2V	40.3	-0.19	-0.01
HIP61621	12:37:42.3	-27:08:20	2000	5.41	F0V	34.5	0.08	-0.09
HIP61792	12:39:51.1	-77:50:35	2000	9.05	K5V	26.8	-0.85	0.36
HIP61874	12:40:46.3	-43:33:58	2000	12.2	M4	7.66	-0.78	0.69
HIP61901	12:41:06.5	15:22:36	2000	7.91	K2	14.2	0.12	-0.37
HIP61941	12:41:39.6	-01:26:57	2000	2.74	F0V+...	11.8	-0.62	0.06
HIP61946	12:41:44.5	55:43:28	2000	8.27	K3V	23.2	0.12	0.00
HIP62145	12:44:14.5	51:45:33	2000	7.01	K3V	15.0	-0.38	-0.18
HIP62207	12:44:59.4	39:16:44	2000	5.95	G0V	17.3	-0.36	0.14
HIP62229	12:45:14.4	-57:21:28	2000	7.82	K3V	20.1	-0.20	-0.13
HIP62268	12:45:38.1	-60:58:52	2000	4.69	K1III	38.2	0.11	-0.06
HIP62471	12:48:010.0	-24:48:16	2000	9.90	K0	18.7	-0.31	0.17
HIP62472	12:48:10.7	-24:48:23	2000	8.90	K4/K5V	19.8	-0.31	0.17
HIP62505	12:48:32.3	-15:43:10	2000	7.93	K2V	21.1	0.08	0.04
HIP62512	12:48:39.5	60:19:11	2000	5.83	F5V	24.1	0.11	-0.03
HIP62523	12:48:47.0	24:50:24	2000	6.29	G7V	17.1	-0.33	-0.11
HIP62687	12:50:43.6	-00:46:05	2000	8.49	M0.5V	10.7	-0.03	-0.40

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP62956	12:54:01.7	55:57:35	2000	1.76	A0p	24.8	0.11	-0.01
HIP63076	12:55:28.6	65:26:18	2000	5.23	A5n	28.8	0.00	-0.03
HIP63121	12:56:00.4	38:18:53	2000	5.61	F0V	25.0	-0.20	0.09
HIP63257	12:57:44.0	-14:27:48	2000	9.11	K4V	23.1	-0.35	0.03
HIP63366	12:59:01.6	-09:50:02	2000	7.54	K0V	21.0	-0.83	0.20
HIP63406	12:59:32.8	41:59:12	2000	8.60	G9V	24.1	-0.24	0.18
HIP63467	13:00:17.0	-02:42:17	2000	9.78	K7V	25.8	-0.80	0.01
HIP63490	13:00:32.7	-33:30:18	2000	6.01	F3V	40.0	-0.07	-0.07
HIP63503	13:00:43.7	56:21:58	2000	4.93	F2V	24.9	0.11	0.00
HIP63510	13:00:46.6	12:22:32	2000	9.76	M2	11.4	-0.62	-0.02
HIP63550	13:01:19.6	-63:11:42	2000	10.9	...	16.8	-0.39	-0.41
HIP63608	13:02:10.6	10:57:32	2000	2.85	G8IIIva	31.3	-0.28	0.02
HIP63613	13:02:16.3	-71:32:55	2000	3.61	K2III	27.8	0.26	-0.02
HIP63618	13:02:20.7	-26:47:13	2000	8.35	K4V	17.5	-0.15	-0.20
HIP63742	13:03:49.7	-05:09:42	2000	7.69	G5V	22.1	-0.19	-0.22
HIP63762	13:04:07.1	87:06:55	2000	8.77	K0	24.3	-0.10	0.18
HIP63833	13:04:57.5	-52:26:34	2000	9.05	K8V	15.7	-0.79	-0.80
HIP63894	13:05:41.4	49:28:18	2000	9.26	K0	21.8	0.06	0.14
HIP63942	13:06:15.4	20:43:45	2000	9.44	M0	18.5	-0.05	0.10
HIP64048	13:07:35.1	34:24:06	2000	9.28	K3III	23.8	-0.13	0.00
HIP64241	13:09:59.3	17:31:45	2000	4.32	F5V	14.3	-0.45	0.13
HIP64394	13:11:52.4	27:52:41	2000	4.23	G0V	9.15	-0.80	0.88
HIP64457	13:12:43.8	-02:15:54	2000	7.56	K0	20.4	-0.14	0.01
HIP64475	13:12:54.3	-30:42:42	2000	8.03	K1IV/V	26.7	-0.21	0.15
HIP64550	13:13:52.2	-45:11:08	2000	6.93	G2V	24.4	-0.11	-0.11

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP64577	13:14:10.9	-19:55:51	2000	5.31	G8III/I	38.6	-0.12	0.16
HIP64583	13:14:15.1	-59:06:11	2000	4.90	F7IV	18.0	-0.25	-0.15
HIP64690	13:15:26.4	-87:33:38	2000	7.11	G5IV-V	24.6	-0.22	-0.16
HIP64725	13:15:58.8	-19:56:35	2000	5.21	K1III	38.9	0.30	-0.12
HIP64792	13:16:46.5	09:25:26	2000	5.19	G0Vs	17.9	-0.33	0.19
HIP64797	13:16:51.1	17:01:01	2000	6.49	K2V	11.2	0.63	-0.26
HIP64924	13:18:24.3	-18:18:40	2000	4.74	G5V	8.52	-1.07	-1.06
HIP65011	13:19:33.6	35:06:36	2000	9.48	M0	13.1	0.39	-0.78
HIP65026	13:19:45.7	47:46:40	2000	8.48	K0	10.3	0.09	-0.02
HIP65109	13:20:35.8	-36:42:44	2000	2.75	A2V	17.9	-0.34	-0.09
HIP65143	13:20:58.1	34:16:44	2000	10.6	M0	16.0	0.49	-0.30
HIP65327	13:23:23.3	57:54:22	2000	9.69	M0V	25.1	0.13	0.00
HIP65343	13:23:32.8	29:14:14	2000	8.88	K5	18.5	-0.47	0.24
HIP65352	13:23:39.2	02:43:23	2000	7.06	G5	16.0	0.01	0.20
HIP65355	13:23:40.8	02:43:30	2000	7.35	G5	16.7	0.00	0.20
HIP65378	13:23:55.5	54:55:31	2000	2.23	A2V	23.9	0.12	-0.02
HIP65420	13:24:33.2	-05:09:50	2000	5.76	F3V	30.0	0.16	-0.04
HIP65477	13:25:13.5	54:59:16	2000	3.99	A5V SB	24.8	0.12	-0.02
HIP65515	13:25:45.5	56:58:13	2000	7.29	G9IV-V	21.8	-0.22	0.01
HIP65520	13:25:48.9	-28:22:26	2000	11.0	M	16.2	-0.45	-0.11
HIP65530	13:25:59.9	63:15:40	2000	6.50	G6V	21.3	-0.39	0.22
HIP65714	13:28:21.1	-02:21:37	2000	11.2	M4+...	14.1	0.15	-0.49
HIP65859	13:29:59.8	10:22:37	2000	9.05	M1V	7.62	1.13	-1.07
HIP66077	13:32:44.6	16:48:39	2000	11.3	M4Ve	13.7	0.25	-0.22
HIP66147	13:33:32.4	08:35:12	2000	7.98	K0	18.4	-0.51	0.09

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP66193	13:34:03.2	33:13:42	2000	9.19	K5IV	22.9	-0.26	0.33
HIP66222	13:34:21.5	04:40:02	2000	9.95	M0.5V:	20.5	0.15	-0.12
HIP66249	13:34:41.6	-00:35:44	2000	3.38	A3V	22.4	-0.28	0.05
HIP66252	13:34:43.2	-08:20:31	2000	9.24	K7V	19.7	-0.29	-0.09
HIP66459	13:37:28.8	35:43:03	2000	9.06	M9	10.9	0.32	-0.06
HIP66492	13:37:51.2	48:08:17	2000	9.77	M0...	21.9	-0.23	-0.14
HIP66675	13:40:07.1	-04:11:09	2000	9.61	M0V	14.5	-0.39	0.48
HIP66704	13:40:23.2	50:31:09	2000	6.31	F7.7V	25.2	-0.12	0.06
HIP66765	13:41:04.2	-34:27:50	2000	6.92	K1V	15.6	0.21	-0.17
HIP66781	13:41:13.4	56:43:37	2000	7.77	K0IV-V	23.7	-0.02	0.07
HIP66840	13:41:55.7	-00:07:44	2000	9.76	M0V	23.7	-0.16	-0.43
HIP66886	13:42:26.0	-01:41:10	2000	9.24	K7V	24.2	-0.29	-0.15
HIP67090	13:45:05.1	17:47:07	2000	9.79	...	13.0	0.45	-1.83
HIP67105	13:45:14.7	08:50:09	2000	8.47	K2	20.9	-0.07	-0.10
HIP67153	13:45:41.2	-33:02:37	2000	4.23	F3V	19.2	-0.46	-0.15
HIP67155	13:45:43.8	14:53:29	2000	8.46	M3V	5.43	1.78	-1.46
HIP67164	13:45:50.7	-17:58:05	2000	11.8	M:	11.3	-0.31	-0.55
HIP67275	13:47:15.7	17:27:24	2000	4.50	F7V	15.5	-0.48	0.05
HIP67301	13:47:32.4	49:18:47	2000	1.85	B3V SB	30.8	-0.12	-0.02
HIP67422	13:49:04.0	26:58:47	2000	7.05	K2	13.6	-0.43	-0.09
HIP67487	13:49:44.8	-22:06:39	2000	8.16	K4/K5V	14.1	-1.75	-0.49
HIP67601	13:51:05.9	-53:44:06	2000	9.53	K3V	26.9	-0.22	-0.07
HIP67620	13:51:20.3	-24:23:25	2000	6.43	G5V	19.9	-0.58	-0.24
HIP67691	13:52:00.0	49:57:03	2000	8.82	K5	14.0	0.42	-0.14
HIP67742	13:52:35.9	-50:55:18	2000	7.37	K1V	16.4	-0.58	-0.06

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP67808	13:53:27.6	12:56:33	2000	9.78	M0	20.8	-0.15	-0.65
HIP67960	13:55:02.6	-29:05:25	2000	9.53	K5/M0V	16.7	-0.28	-0.10
HIP67986	13:55:20.8	-76:16:14	2000	8.33	K2V	26.6	-0.17	-0.04
HIP68030	13:55:50.0	14:03:23	2000	6.16	F6V	24.2	-0.29	0.01
HIP68184	13:57:32.1	61:29:34	2000	6.49	K3V	10.1	-0.03	0.22
HIP68337	13:59:19.4	22:52:11	2000	9.05	K	23.8	-0.16	0.01
HIP68469	14:01:03.2	-02:39:17	2000	9.71	K5	10.1	-0.82	0.60
HIP68634	14:02:56.9	14:58:31	2000	7.12	G5	26.1	-0.06	0.00
HIP68682	14:03:32.4	10:47:12	2000	6.27	G8V	16.6	0.09	-0.30
HIP68895	14:06:22.3	-26:40:56	2000	3.25	K2III	31.0	0.04	-0.14
HIP68933	14:06:40.9	-36:22:11	2000	2.06	K0IIIb	18.6	-0.52	-0.52
HIP69357	14:11:46.2	-12:36:42	2000	7.93	K1V	23.0	-0.26	-0.18
HIP69414	14:12:45.2	-03:19:12	2000	7.05	G0	22.2	-0.16	-0.32
HIP69454	14:13:12.9	-56:44:31	2000	10.2	M2V:	11.7	0.36	0.18
HIP69454	14:13:12.9	-56:44:31	2000	10.2	M2V:	11.7	0.36	0.18
HIP69483	14:13:29.0	51:47:23	2000	4.53	A8IV	47.5	0.06	-0.01
HIP69526	14:13:57.1	30:13:01	2000	8.03	K5	17.3	-0.40	0.18
HIP69562	14:14:21.4	-15:21:21	2000	10.3	K4V	26.4	-0.20	-0.17
HIP69671	14:15:38.7	-45:00:02	2000	6.31	F9V	21.0	0.13	-0.14
HIP69673	14:15:39.7	19:10:56	2000	-0.0	K2IIIp	11.2	-1.09	-2.00
HIP69713	14:16:09.9	51:22:02	2000	4.75	A9V	29.8	-0.15	0.09
HIP69732	14:16:23.0	46:05:17	2000	4.18	A0sh	29.7	-0.19	0.16
HIP69824	14:17:24.4	45:26:40	2000	10.1	M0	18.6	0.05	-0.02
HIP69896	14:18:13.9	-81:00:27	2000	4.89	A2m...	42.8	-0.02	-0.07
HIP69962	14:18:58.3	-06:36:13	2000	9.10	K7V	21.5	-0.01	-0.43

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP69965	14:19:00.9	-25:48:55	2000	5.87	F7Vw	17.7	-0.36	0.37
HIP69972	14:19:04.8	-59:22:44	2000	6.66	K3V	11.8	-0.45	-0.81
HIP69989	14:19:16.3	13:00:15	2000	5.41	F5IV	26.0	0.11	-0.03
HIP70016	14:19:34.9	-05:09:04	2000	7.58	K1V	20.7	-0.63	-0.12
HIP70035	14:19:51.5	-61:16:22	2000	5.22	Am	48.3	-0.17	-0.09
HIP70218	14:21:57.2	29:37:46	2000	8.56	K5V	14.4	-0.63	-0.31
HIP70319	14:23:15.3	01:14:29	2000	6.25	G1V	17.5	0.22	-0.48
HIP70400	14:24:11.3	05:49:12	2000	5.10	A5V	46.3	-0.08	0.01
HIP70475	14:24:56.0	08:53:15	2000	12.2	M:	14.3	0.55	0.16
HIP70497	14:25:11.8	51:51:02	2000	4.04	F7V	14.5	-0.24	-0.40
HIP70529	14:25:43.5	23:37:01	2000	9.77	M1	16.7	0.79	-1.12
HIP70536	14:25:46.7	23:37:13	2000	9.98	M2	15.7	0.80	-1.12
HIP70857	14:29:22.3	80:48:35	2000	6.88	G5	19.5	-0.07	-0.13
HIP70865	14:29:29.7	15:31:57	2000	10.6	M3	14.2	-1.05	1.30
GJ551	14:29:43.0	-62:40:46	2000	11.0	M5.0V	1.30	-3.78	0.77
HIP70950	14:30:45.0	35:27:13	2000	8.68	K3V	21.9	-0.48	0.20
HIP70952	14:30:46.1	63:11:08	2000	6.10	F4IV	31.7	-0.18	0.01
HIP70956	14:30:47.7	-08:38:46	2000	9.40	K7V	16.5	-1.27	-0.24
HIP71075	14:32:04.7	38:18:29	2000	3.04	A7IIIva	26.1	-0.12	0.15
HIP71181	14:33:28.9	52:54:31	2000	7.24	K3V	13.4	-0.19	0.25
HIP71253	14:34:16.8	-12:31:10	2000	11.3	M4	6.11	-0.36	0.60
HIP71284	14:34:40.8	29:44:42	2000	4.47	F3Vwvar	15.4	0.19	0.13
HIP71311	14:34:57.8	33:44:48	2000	9.54	K8	20.3	-0.71	0.24
HIP71395	14:36:00.6	09:44:47	2000	7.48	K0	16.5	0.21	-0.25
GJ559B	14:39:35.1	-60:50:13	2000	1.34	K0V	1.33	-3.60	0.95

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
GJ559A	14:39:36.5	-60:50:02	2000	0.01	G2.0V	1.33	-3.68	0.48
HIP71743	14:40:31.1	-16:12:33	2000	7.24	G6V	23.5	-0.11	-0.07
HIP71855	14:41:52.5	-75:08:22	2000	6.73	G5V	20.3	0.12	-0.02
HIP71908	14:42:30.4	-64:58:30	2000	3.18	F1Vp	16.4	-0.19	-0.23
HIP71914	14:42:33.7	19:28:47	2000	9.10	M0	22.4	-0.25	-0.15
HIP71957	14:43:03.6	-05:39:29	2000	3.87	F2III	18.6	0.10	-0.32
HIP72044	14:44:12.0	22:11:07	2000	9.89	M0	26.3	0.00	0.12
HIP72146	14:45:24.2	13:50:46	2000	7.87	K0	19.5	-0.23	-0.23
HIP72197	14:46:00.1	-25:26:35	2000	5.15	F0V + G	30.4	-0.15	-0.11
HIP72220	14:46:14.9	01:53:34	2000	3.73	A0V	39.4	-0.12	-0.02
HIP72237	14:46:23.3	16:29:48	2000	9.23	K5V	17.5	-0.11	-0.92
HIP72312	14:47:16.1	02:42:11	2000	7.76	G8V	19.6	-0.29	-0.08
HIP72493	14:49:23.7	-67:14:09	2000	7.26	K0V	23.9	-0.11	-0.32
HIP72567	14:50:15.8	23:54:42	2000	5.86	G2V	17.9	0.14	0.03
HIP72603	14:50:41.2	-15:59:50	2000	5.15	F3V	23.6	-0.14	-0.06
HIP72607	14:50:42.3	74:09:19	2000	2.07	K4IIIva	38.7	-0.03	0.01
HIP72622	14:50:52.7	-16:02:30	2000	2.75	A3IV	23.6	-0.11	-0.07
HIP72659	14:51:23.4	19:06:01	2000	4.54	G8V + K	6.69	0.15	-0.07
HIP72688	14:51:40.5	-24:18:14	2000	7.81	K3V	16.9	-0.94	-0.43
HIP72848	14:53:23.8	19:09:10	2000	6.00	K2V	11.5	-0.44	0.22
HIP72875	14:53:41.6	23:20:42	2000	8.65	K3V	22.9	-0.82	0.00
HIP72944	14:54:29.2	16:06:03	2000	10.1	M2Ve	9.81	0.28	-0.12
HIP72944	14:54:29.2	16:06:03	2000	10.1	M2Ve	9.81	0.28	-0.12
HIP73005	14:55:11.0	53:40:49	2000	7.77	K1V	23.9	-0.97	0.48
HIP73100	14:56:23.0	49:37:42	2000	5.63	F7V	24.8	0.11	-0.23

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP73165	14:57:11.0	-04:20:47	2000	4.47	F0V	27.9	-0.10	-0.15
HIP73184	14:57:28.0	-21:24:55	2000	5.72	K4V	5.90	1.03	-1.73
HIP73457	15:00:43.4	-11:08:06	2000	9.49	K7V	19.5	-0.02	-0.48
HIP73470	15:00:55.6	45:25:34	2000	9.15	M0	11.6	0.24	0.37
HIP73631	15:03:03.6	-46:17:37	2000	9.87	K5V	24.8	-0.30	-0.01
HIP73633	15:03:06.1	-41:59:33	2000	8.98	K3V	24.3	0.11	-0.20
HIP73695	15:03:47.3	47:39:14	2000	4.83	G2V + G	12.7	-0.44	0.02
HIP73850	15:05:33.9	-30:33:03	2000	6.48	F6V	31.8	0.01	0.08
HIP73996	15:07:18.1	24:52:09	2000	4.93	F5V	19.7	0.18	-0.16
HIP74190	15:09:35.6	03:10:00	2000	11.4	M:	14.4	-0.60	0.48
HIP74273	15:10:44.7	-61:25:20	2000	6.29	G3IV	24.1	-0.18	-0.01
HIP74395	15:12:17.1	-52:05:57	2000	3.41	G8III	35.6	-0.11	-0.07
HIP74537	15:13:50.9	-01:21:05	2000	6.58	K0V	17.3	-1.27	-0.50
HIP74666	15:15:30.2	33:18:53	2000	3.46	G8III	35.7	0.08	-0.11
HIP74689	15:15:49.1	00:22:19	2000	5.62	A4V	49.5	-0.11	0.01
HIP74702	15:15:59.2	00:47:46	2000	6.92	K0	15.5	0.18	-0.14
HIP74824	15:17:30.8	-58:48:04	2000	4.07	A3V	29.6	-0.10	-0.14
HIP74926	15:18:39.5	-18:37:35	2000	10.3	...	26.2	0.45	-0.35
HIP74981	15:19:21.2	29:12:22	2000	10.2	K7	28.6	-0.14	0.39
HIP74995	15:19:26.8	-07:43:20	2000	10.5	M5	6.26	-1.22	-0.10
HIP75101	15:20:47.0	-02:24:47	2000	6.34	K0V	36.9	-0.26	-0.17
HIP75181	15:21:48.1	-48:19:03	2000	5.65	G2V	14.5	-1.62	-0.28
HIP75201	15:22:04.1	-04:46:38	2000	9.46	K7V	18.8	-0.29	-0.01
HIP75253	15:22:36.7	10:39:40	2000	7.97	K2V	21.8	-0.06	-0.20
HIP75266	15:22:42.5	01:25:07	2000	8.28	K3V	25.4	-0.36	-0.36

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP75277	15:22:46.8	18:55:08	2000	7.16	K0	20.1	-0.23	0.08
HIP75312	15:23:12.3	30:17:16	2000	4.99	G2V	18.6	0.13	-0.18
HIP75458	15:24:55.8	58:57:57	2000	3.29	K2III	31.3	-0.01	0.02
HIP75542	15:25:58.5	-26:42:20	2000	8.82	K3/K4V	24.4	-0.82	-0.01
HIP75718	15:28:09.6	-09:20:53	2000	6.89	K2V	19.8	0.07	-0.36
HIP75722	15:28:12.2	-09:21:28	2000	7.57	K2V	20.8	0.08	-0.36
HIP75761	15:28:38.2	01:50:31	2000	5.15	A8IV	37.4	-0.08	-0.03
HIP75809	15:29:11.2	80:26:54	2000	6.57	G8IV-V+	22.0	-0.23	0.11
HIP75829	15:29:23.6	80:27:00	2000	7.30	G5	21.7	-0.22	0.11
HIP76074	15:32:12.9	-41:16:32	2000	9.31	M0	5.93	-1.18	-1.03
HIP76219	15:34:10.7	10:03:52	2000	4.61	K1IV	28.9	0.31	-0.23
HIP76233	15:34:20.8	-05:41:42	2000	6.52	F7V	25.1	-0.09	0.01
HIP76267	15:34:41.3	26:42:52	2000	2.22	A0V	22.9	0.12	-0.09
HIP76315	15:35:20.0	60:05:13	2000	8.39	K5	19.0	0.17	-0.16
HIP76375	15:35:56.6	39:49:52	2000	7.65	K3V	22.2	-0.45	0.05
HIP76568	15:38:16.2	46:47:51	2000	5.76	F2V	35.7	0.10	-0.10
HIP76602	15:38:40.0	-08:47:41	2000	6.56	F6IV-V	22.6	0.00	-0.02
HIP76603	15:38:40.1	-08:47:29	2000	6.45	F6V	24.8	0.02	-0.03
HIP76779	15:40:34.6	-18:02:56	2000	8.92	K5V	15.7	0.16	0.09
HIP76829	15:41:11.4	-44:39:40	2000	4.64	F5IV-V	17.5	-0.17	-0.27
HIP76832	15:41:16.6	75:59:34	2000	12.2	M4	13.0	0.78	-0.76
HIP76952	15:42:44.6	26:17:44	2000	3.81	A1Vs	44.4	-0.11	0.05
HIP77052	15:44:01.8	02:30:54	2000	5.86	G5V	14.6	-0.04	-0.14
HIP77060	15:44:04.4	-15:40:22	2000	5.41	A6IV	45.0	-0.03	-0.06
HIP77070	15:44:16.1	06:25:32	2000	2.63	K2III	22.4	0.13	0.04

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP77233	15:46:11.3	15:25:18	2000	3.65	A3V	46.9	0.07	-0.04
HIP77257	15:46:26.6	07:21:11	2000	4.42	G0Vvar	11.7	-0.23	-0.07
HIP77349	15:47:24.6	10:53:47	2000	11.2	K:....	15.5	-0.33	-0.36
HIP77358	15:47:29.1	-37:54:58	2000	6.01	G6IV	15.2	-0.42	-0.21
HIP77408	15:48:09.5	01:34:18	2000	7.44	G8V	21.3	-0.18	-0.17
HIP77409	15:48:010.0	74:24:50	2000	9.24	K5	26.3	0.11	-0.30
HIP77464	15:48:56.8	-03:49:06	2000	5.53	A5IV	49.1	-0.03	0.01
HIP77516	15:49:37.2	-03:25:48	2000	3.54	A0V	47.7	-0.10	-0.03
HIP77574	15:50:16.3	-45:24:06	2000	6.11	F0V	44.9	0.04	-0.03
HIP77622	15:50:49.0	04:28:39	2000	3.71	A2m	21.5	0.13	0.06
HIP77655	15:51:13.9	35:39:26	2000	4.79	K0III-I	31.1	-0.01	-0.35
HIP77660	15:51:15.6	-03:05:25	2000	5.09	A3Vn	48.8	-0.09	-0.03
HIP77725	15:52:08.2	10:52:28	2000	9.34	M2	22.5	-0.27	-0.24
HIP77760	15:52:40.5	42:27:05	2000	4.60	F9V	15.8	0.44	0.63
HIP77801	15:53:12.1	13:11:47	2000	6.07	G0IV	17.4	-0.15	-0.56
HIP77908	15:54:38.4	-26:00:15	2000	9.20	K5V	25.3	-0.23	0.10
HIP77952	15:55:08.6	-63:25:50	2000	2.83	F2III	12.3	-0.19	-0.40
HIP78072	15:56:27.2	15:39:41	2000	3.85	F6V	11.1	0.31	-1.28
HIP78170	15:57:40.7	-42:37:27	2000	8.06	K5V	14.6	-0.26	-0.19
HIP78180	15:57:47.4	54:44:59	2000	4.96	F0IV	33.8	-0.15	0.11
HIP78241	15:58:32.0	27:44:23	2000	8.02	K0V	26.0	-0.78	0.30
HIP78286	15:59:04.4	49:52:51	2000	6.04	F0IV	49.0	0.02	-0.06
HIP78353	15:59:53.4	-08:15:11	2000	10.4	M0	13.9	0.20	-0.02
HIP78459	16:01:02.7	33:18:12	2000	5.39	G2V	17.4	-0.20	-0.77
HIP78662	16:03:32.1	-57:46:30	2000	4.63	A7IV	42.9	-0.12	-0.08

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP78709	16:04:03.7	25:15:17	2000	7.10	G8V	21.4	-0.49	0.70
HIP78734	16:04:23.2	-33:03:39	2000	10.0	...	23.2	-0.24	-0.07
HIP78775	16:04:56.8	39:09:23	2000	6.66	G8V	14.3	-0.57	0.05
HIP78843	16:05:40.5	-20:27:00	2000	7.39	K3/K4V	18.5	0.30	-0.36
HIP78914	16:06:29.4	-45:10:23	2000	4.73	Am	37.8	0.02	0.04
HIP78913	16:06:29.6	38:37:56	2000	8.58	K3V	23.4	0.23	-0.54
HIP79119	16:08:58.3	36:29:27	2000	4.73	K0III-I	34.6	-0.04	0.34
HIP79137	16:09:11.2	06:22:43	2000	5.93	K1+...	30.4	0.26	-0.75
HIP79190	16:09:42.8	-56:26:42	2000	7.11	K3V	14.3	-0.14	0.33
HIP79248	16:10:24.3	43:49:03	2000	6.61	K0V	18.1	0.13	-0.30
HIP79492	16:13:18.4	13:31:36	2000	6.68	G8V	24.3	0.18	-0.42
HIP79537	16:13:48.6	-57:34:13	2000	7.53	K0V	13.7	-0.85	-1.41
HIP79578	16:14:11.9	-31:39:49	2000	6.55	G1V	21.8	-0.08	-0.25
HIP79607	16:14:40.9	33:51:31	2000	5.23	F8V	21.6	-0.27	-0.09
HIP79672	16:15:37.3	-08:22:10	2000	5.49	G1V	14.0	0.23	-0.50
HIP79702	16:15:57.1	07:21:25	2000	8.70	K4V	25.7	0.17	-0.47
HIP79755	16:16:42.7	67:14:19	2000	8.61	M0Vvar	10.6	-0.50	0.09
HIP79762	16:16:45.3	67:15:22	2000	10.6	M3	10.7	-0.49	0.09
HIP79796	16:17:05.4	55:16:09	2000	9.87	M1.5Ve	20.6	0.08	-0.44
HIP79822	16:17:30.3	75:45:19	2000	4.95	F5V	29.8	-0.09	0.26
HIP79881	16:18:17.9	-28:36:50	2000	4.80	A0V:	43.0	-0.03	-0.10
HIP79882	16:18:19.3	-04:41:33	2000	3.23	G8III	32.9	0.08	0.04
HIP79958	16:19:15.9	-55:30:17	2000	9.25	K5III	27.6	0.00	0.02
HIP80000	16:19:50.4	-50:09:19	2000	4.01	G8III	39.0	-0.16	-0.05
HIP80008	16:19:55.1	39:42:30	2000	5.48	F3IV-V	26.8	-0.13	0.00

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP80018	16:20:03.5	-37:31:44	2000	10.5	M4	8.47	-0.73	0.99
HIP80043	16:20:18.0	-48:13:32	2000	8.91	K3V	25.7	-0.40	-0.79
HIP80093	16:20:52.7	40:57:41	2000	8.99	M0	15.9	-0.01	0.11
HIP80179	16:22:04.3	01:01:44	2000	4.82	F0V	27.3	-0.16	0.05
HIP80268	16:23:07.6	-24:42:35	2000	10.2	M2	16.8	-0.35	-0.68
HIP80331	16:23:59.5	61:30:51	2000	2.73	G8III	26.8	-0.02	0.06
HIP80337	16:24:01.3	-39:11:34	2000	5.37	G3/G5V	12.8	0.07	0.00
HIP80366	16:24:19.8	-13:38:30	2000	8.40	K2V	21.5	-0.22	-0.21
HIP80459	16:25:24.6	54:18:14	2000	10.1	M2	6.58	0.43	-0.17
HIP80480	16:25:43.2	78:57:49	2000	5.55	F0V	42.3	-0.11	0.10
HIP80628	16:27:48.2	-08:22:18	2000	4.62	A3m	37.4	-0.07	-0.01
HIP80644	16:27:56.9	07:18:19	2000	8.83	K5	17.7	-0.25	-0.26
HIP80645	16:27:57.3	-64:03:28	2000	5.28	F4IV	40.4	0.05	0.03
HIP80686	16:28:28.1	-70:05:03	2000	4.90	F9V	12.1	0.20	0.11
HIP80725	16:28:52.7	18:24:50	2000	6.98	K2V	19.5	-0.35	0.39
GJ628	16:30:18.1	-12:39:44	2000	10.1	M3.5V	4.26	-0.09	-1.19
HIP80925	16:31:30.0	-39:00:44	2000	7.24	K0V	24.6	-0.43	-0.33
HIP81262	16:35:50.4	-53:45:25	2000	8.78	K4V	22.3	-0.12	-0.24
HIP81300	16:36:21.4	-02:19:28	2000	5.77	K2V	9.77	0.46	-0.31
HIP81348	16:36:49.1	31:05:48	2000	9.49	K5	25.6	0.34	-0.45
HIP81375	16:37:08.4	00:15:15	2000	7.09	K0	20.1	0.09	0.08
HIP81520	16:39:04.1	-58:15:29	2000	7.01	G3V	21.6	-0.23	-0.29
HIP81657	16:40:50.5	-60:26:47	2000	6.17	F2III-I	30.7	0.06	-0.07
HIP81813	16:42:38.6	68:06:07	2000	7.56	K1V	24.3	-0.28	0.43
HIP81833	16:42:53.8	38:55:20	2000	3.48	G8III-I	34.3	0.04	-0.08

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP81919	16:43:56.3	43:28:31	2000	8.30	K5	27.3	-0.07	-0.06
HIP81935	16:44:15.0	-38:56:37	2000	7.52	K2V	14.3	-0.02	-0.06
HIP82003	16:45:06.4	33:30:33	2000	8.10	K7V	9.77	-0.04	0.38
HIP82020	16:45:17.8	56:46:54	2000	4.84	F2V	26.7	0.03	0.07
HIP82333	16:49:24.7	39:16:34	2000	9.67	M0	22.6	0.10	-0.28
HIP82389	16:50:05.3	18:54:01	2000	8.85	K0	26.7	-0.04	-0.07
HIP82396	16:50:09.8	-34:17:35	2000	2.29	K2IIIb	20.0	-0.61	-0.26
HIP82587	16:52:58.1	31:42:06	2000	5.34	F0V	30.0	-0.09	-0.02
HIP82588	16:52:58.8	-00:01:35	2000	6.65	G8V	16.9	-0.71	-1.48
HIP82817	16:55:28.8	-08:20:10	2000	9.02	M3Ve	5.73	-0.83	-0.88
HIP82834	16:55:38.0	-32:04:03	2000	9.58	K4/K5V	18.6	0.10	-0.33
HIP82860	16:56:01.7	65:08:05	2000	4.88	F6Vvar	15.0	0.24	0.05
HIP82926	16:56:48.6	-39:05:38	2000	11.1	M3Ve+..	14.5	0.07	-0.11
HIP83000	16:57:40.1	09:22:30	2000	3.19	K2IIIva	26.3	-0.29	-0.01
HIP83006	16:57:42.2	47:21:43	2000	7.93	K0	17.5	-0.14	0.26
HIP83020	16:57:53.2	47:22:00	2000	7.76	K0	17.9	-0.15	0.27
HIP83043	16:58:08.8	25:44:38	2000	9.70	M2	10.3	-0.11	-0.51
HIP83101	16:58:54.1	-39:33:30	2000	8.33	K3/K4V	19.1	0.27	0.22
HIP83207	17:00:17.4	30:55:35	2000	3.92	A0V	49.9	-0.05	0.03
HIP83363	17:02:16.3	-61:34:06	2000	8.74	K3V	25.4	-0.05	-0.19
HIP83389	17:02:36.4	47:04:54	2000	6.76	G8V	18.0	0.12	0.85
HIP83431	17:03:08.7	-53:14:13	2000	5.27	F6V	26.3	0.00	-0.17
HIP83451	17:03:18.7	59:35:07	2000	8.61	K4V...	25.1	-0.36	0.24
HIP83541	17:04:27.8	-28:34:57	2000	6.59	K1V	18.0	0.08	-0.27
HIP83591	17:05:03.4	-05:03:59	2000	7.70	K5V	10.7	-0.92	-1.14

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP83599	17:05:13.8	-05:05:39	2000	10.0	M0V	11.1	-0.92	-1.13
HIP83601	17:05:16.8	00:42:09	2000	6.00	F9V	20.3	-0.02	-0.34
HIP83608	17:05:20.1	54:28:12	2000	4.91	F5	26.9	-0.07	0.07
HIP83613	17:05:22.7	12:44:27	2000	4.89	A4IV	44.0	0.05	-0.01
HIP83762	17:07:07.5	21:33:14	2000	11.6	M3	13.5	-0.47	-0.03
HIP83846	17:08:07.3	-41:43:26	2000	8.30	K5V	22.5	-0.21	-0.32
HIP83945	17:09:31.5	43:40:52	2000	11.7	M3	7.25	0.33	-0.28
HIP83990	17:10:10.4	-60:43:43	2000	7.38	K0V	13.6	0.07	0.59
HIP83988	17:10:10.5	54:29:39	2000	8.85	K0	21.2	0.09	-0.10
HIP83996	17:10:12.4	54:29:24	2000	9.34	K8	20.8	0.09	-0.11
HIP84012	17:10:22.7	-15:43:29	2000	2.43	A2.5Va	25.7	0.04	0.10
HIP84051	17:10:59.1	-52:30:55	2000	10.0	...	12.5	-0.25	0.16
HIP84123	17:11:52.3	-01:51:06	2000	11.4	G	10.8	-0.53	-0.33
HIP84183	17:12:32.6	62:52:27	2000	5.54	F0IV	41.6	0.02	0.05
HIP84195	17:12:37.6	18:21:04	2000	7.95	K0	20.5	0.10	-0.12
HIP84223	17:12:55.1	42:19:54	2000	10.0	M1V:	23.8	-1.02	-0.35
HIP84379	17:15:01.9	24:50:21	2000	3.12	A3IVv S	24.0	-0.02	-0.16
HIP84405	17:15:21.0	-26:36:10	2000	4.33	K2:III:	5.98	-0.47	-1.14
HIP84478	17:16:13.4	-26:32:46	2000	6.33	K5V	5.96	-0.48	-1.12
HIP84521	17:16:41.0	08:03:30	2000	11.4	M3.5	14.9	-0.28	-0.07
HIP84607	17:17:40.5	29:13:37	2000	8.43	K2	24.0	-0.07	0.22
HIP84616	17:17:50.4	52:26:49	2000	7.93	K2	18.5	0.02	-0.20
HIP84709	17:18:57.2	-34:59:23	2000	5.91	K4V	6.97	1.15	-0.09
HIP84720	17:19:03.8	-46:38:10	2000	5.47	M0V	8.78	1.04	0.11
HIP84790	17:19:52.7	41:42:49	2000	11.3	M4	12.3	0.29	-0.82

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP84862	17:20:39.6	32:28:03	2000	5.38	G0V	14.3	0.14	-1.04
HIP84893	17:21:00.4	-21:06:46	2000	4.39	F2/F3V	17.3	0.26	-0.20
HIP85042	17:22:51.3	-02:23:17	2000	6.28	G5IV	19.4	0.05	-0.11
HIP85157	17:24:06.6	22:57:36	2000	5.70	F0IV	42.7	-0.04	-0.04
HIP85235	17:25:00.1	67:18:24	2000	6.44	K0V	12.7	-0.53	0.00
HIP85295	17:25:45.2	02:06:41	2000	7.54	K7V	7.71	-0.58	-1.18
HIP85340	17:26:22.2	-24:10:31	2000	4.16	A3IV:m	25.6	0.00	-0.12
HIP85365	17:26:37.9	-05:05:11	2000	4.53	F3V	30.0	-0.09	-0.04
GJ674	17:28:39.9	-46:53:43	2000	9.37	M2.5V	4.54	0.57	-0.88
HIP85561	17:29:06.6	-23:50:10	2000	9.61	K5V	18.1	-0.29	-0.07
HIP85582	17:29:20.1	29:23:30	2000	8.99	K2	23.5	-0.20	-0.28
HIP85647	17:30:11.2	-51:38:13	2000	9.58	M0	16.1	-0.26	-0.19
HIP85653	17:30:16.4	47:24:07	2000	7.22	G5	22.3	0.17	0.08
HIP85665	17:30:22.7	05:32:54	2000	9.33	M1V...	9.98	0.03	-0.25
HIP85699	17:30:47.6	86:58:04	2000	5.78	A2m	47.8	0.06	0.01
HIP85810	17:32:01.0	34:16:16	2000	6.52	G5V	23.6	-0.24	0.06
HIP85819	17:32:10.6	55:11:03	2000	4.89	Am...	30.3	0.15	0.05
HIP85829	17:32:16.0	55:10:22	2000	4.86	Am	30.6	0.14	0.06
HIP85922	17:33:29.8	-05:44:41	2000	5.61	A5V	48.4	-0.04	-0.10
HIP86032	17:34:56.1	12:33:36	2000	2.08	A5III	14.3	0.11	-0.22
HIP86036	17:34:59.6	61:52:28	2000	5.23	G0V	14.0	0.28	-0.53
HIP86057	17:35:13.6	-48:40:51	2000	10.1	K5	9.77	0.08	0.46
HIP86087	17:35:34.5	61:40:53	2000	9.98	M1	14.0	0.26	-0.51
HIP86141	17:36:13.4	71:52:42	2000	8.55	K5	19.0	0.09	-0.04
GJ687	17:36:25.9	68:20:21	2000	9.17	M3.0V	4.53	-0.32	-1.27

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP86201	17:36:57.1	68:45:28	2000	4.77	F5V	23.4	0.00	0.32
HIP86214	17:37:03.7	-44:19:09	2000	10.9	M5	5.04	-0.71	-0.94
GJ682	17:37:03.7	-44:19:08	2000	10.9	M4.0V	5.04	-0.71	-0.94
HIP86282	17:37:48.7	22:57:20	2000	9.29	M0...	22.1	-0.15	-0.15
HIP86287	17:37:53.4	18:35:30	2000	9.62	M1	8.12	0.93	0.98
HIP86305	17:38:05.5	-54:30:01	2000	5.25	A7V	42.1	-0.05	-0.15
HIP86340	17:38:34.1	71:19:56	2000	9.10	M0	23.9	-0.12	0.31
HIP86400	17:39:16.9	03:33:18	2000	6.53	K3V	10.7	-0.18	-0.10
HIP86456	17:39:55.7	65:00:05	2000	8.39	K0	26.4	-0.02	0.11
HIP86486	17:40:23.8	-49:24:56	2000	4.76	F3IV	21.8	0.10	-0.18
HIP86614	17:41:56.4	72:08:55	2000	4.57	F5IV-V	22.0	0.03	-0.27
HIP86620	17:41:58.1	72:09:24	2000	5.81	G0V	22.3	0.03	-0.27
HIP86623	17:41:58.6	15:57:08	2000	5.54	F4Vw	35.5	-0.01	0.10
HIP86722	17:43:15.6	21:36:33	2000	7.51	K0V	23.5	-0.12	-0.62
HIP86736	17:43:25.8	-21:40:59	2000	4.86	F6/F7V	17.5	-0.10	-0.04
HIP86742	17:43:28.4	04:34:02	2000	2.76	K2III	25.1	-0.04	0.16
HIP86776	17:43:56.0	43:22:43	2000	10.4	M3	9.48	0.01	-0.60
HIP86796	17:44:08.7	-51:50:02	2000	5.12	G5V	15.2	-0.02	-0.19
HIP86990	17:46:34.2	-57:19:08	2000	10.7	M5	5.81	-1.12	-1.35
HIP87108	17:47:53.6	02:42:26	2000	3.75	A0V	29.0	-0.02	-0.08
HIP87261	17:49:51.5	-37:02:35	2000	3.19	K0/K1II	38.8	0.04	0.03
HIP87558	17:53:14.2	06:06:05	2000	5.77	F4IV-V	31.3	-0.13	0.07
HIP87579	17:53:29.9	21:19:31	2000	8.50	K0	24.8	-0.07	0.06
HIP87585	17:53:31.7	56:52:21	2000	3.73	K2III	34.1	0.09	0.08
HIP87768	17:55:44.9	18:30:01	2000	9.22	K5	23.0	-0.05	-0.05

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
GJ699	17:57:48.5	04:41:36	2000	9.57	M3.5V	1.83	-0.79	10.33
HIP87938	17:57:51.0	46:35:19	2000	11.7	M:	13.5	-0.02	0.58
HIP88175	18:00:29.0	-03:41:24	2000	4.62	F3V	23.1	0.15	-0.04
HIP88348	18:02:30.9	26:18:46	2000	7.01	K0V	21.9	0.39	-0.60
HIP88574	18:05:07.6	-03:01:52	2000	9.37	M2V	7.79	0.57	-0.33
HIP88601	18:05:27.3	02:30:00	2000	4.03	K0V SB	5.08	0.12	-0.96
GJ702A	18:05:27.3	02:30:00	2000	4.21	K0.0V	5.10	0.13	-0.96
GJ702B	18:05:27.3	02:30:00	2000	6.01	K5V	5.10	0.13	-0.96
HIP88622	18:05:37.5	04:39:25	2000	6.80	G0V	24.3	-0.03	-0.32
HIP88635	18:05:48.5	-30:25:26	2000	2.98	K0III	29.4	-0.06	-0.18
HIP88684	18:06:15.2	-04:45:04	2000	5.74	K1IV	34.9	0.14	-0.03
HIP88694	18:06:23.7	-36:01:11	2000	5.94	G3V	17.3	0.11	0.01
HIP88726	18:06:49.9	-43:25:30	2000	4.92	A5V	43.8	0.01	-0.10
HIP88745	18:07:01.5	30:33:43	2000	5.05	F7V	15.6	-0.10	0.11
HIP88771	18:07:21.0	09:33:49	2000	3.71	A4IVs	25.3	-0.06	0.08
HIP88866	18:08:34.8	-63:40:06	2000	4.33	Am	42.4	0.02	-0.21
HIP88972	18:09:37.4	38:27:28	2000	6.38	K2V	11.0	-0.32	-0.47
HIP89042	18:10:26.2	-62:00:07	2000	5.47	G0V	17.7	-0.08	0.23
HIP89087	18:10:56.3	49:58:16	2000	10.0	K7	26.7	-0.01	-0.23
HIP89211	18:12:21.4	-43:26:41	2000	8.38	K7V	12.9	0.13	-0.42
HIP89348	18:13:53.8	64:23:50	2000	4.99	F5V	23.4	0.35	0.04
HIP89474	18:15:32.5	45:12:33	2000	6.30	G2V	22.6	-0.08	-0.11
HIP89560	18:16:31.1	45:33:28	2000	10.3	M0	17.1	-0.01	0.34
HIP89805	18:19:40.1	-63:53:11	2000	6.17	F9V	22.9	0.04	-0.28
HIP89825	18:19:50.8	-01:56:18	2000	9.66	K7V	19.3	0.00	0.00

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP89937	18:21:03.4	72:43:58	2000	3.55	F7Vvar	8.05	0.53	-0.35
HIP89962	18:21:18.6	-02:53:55	2000	3.23	K0III-I	18.9	-0.55	-0.70
HIP90035	18:22:17.2	01:42:25	2000	10.1	K7V	26.8	0.08	-0.02
HIP90139	18:23:41.9	21:46:11	2000	3.85	K2III	39.3	0.20	-0.24
HIP90376	18:26:28.8	79:25:23	2000	9.24	K5	24.4	0.02	0.36
HIP90496	18:27:58.2	-25:25:18	2000	2.82	K1IIIb	23.6	-0.04	-0.19
HIP90568	18:28:49.9	-49:04:14	2000	4.10	G8/K0II	39.0	0.14	-0.23
HIP90626	18:29:31.9	09:03:43	2000	8.65	K2	26.8	0.19	0.07
HIP90656	18:29:52.4	-01:49:05	2000	8.04	K3V	18.7	0.17	-0.19
HIP90790	18:31:19.0	-18:54:31	2000	6.81	K1V	13.2	-0.14	-0.19
HIP90945	18:33:05.1	-54:15:47	2000	8.50	K4Vp...	18.8	-0.12	-0.14
HIP90959	18:33:17.8	22:18:51	2000	8.90	K4V	23.4	-0.18	-0.47
HIP90979	18:33:28.8	-11:38:09	2000	10.0	K7V	25.4	-0.29	-0.24
HIP91009	18:33:55.8	51:43:08	2000	8.20	K7Vvar	16.4	0.19	-0.32
HIP91128	18:35:18.4	45:44:38	2000	9.84	M2	15.4	0.45	0.36
HIP91154	18:35:49.8	-61:13:36	2000	9.34	K3V	21.5	-0.02	-0.43
HIP91217	18:36:27.8	09:07:20	2000	5.38	F5III	38.8	-0.01	-0.13
HIP91237	18:36:39.1	06:40:18	2000	5.43	F3V	31.7	-0.03	-0.14
HIP91262	18:36:56.3	38:47:01	2000	0.03	A0Vvar	7.75	0.20	0.29
HIP91430	18:38:44.7	-14:29:25	2000	11.2	M1V:	12.7	0.11	-0.57
HIP91438	18:38:53.4	-21:03:06	2000	5.85	G5V	12.9	-0.07	-0.15
HIP91605	18:40:54.9	31:31:59	2000	8.54	K3V	23.8	0.09	-0.84
HIP91608	18:40:57.3	-13:22:46	2000	10.6	M	16.2	-0.09	-0.67
HIP91699	18:41:59.0	31:49:49	2000	11.2	M4	11.3	-0.30	0.01
GJ725	18:42:46.7	59:37:48	2000	8.90	M3.0V	3.52	-1.33	1.80

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
GJ725	18:42:47.0	59:37:35	2000	9.69	M3.5V	3.52	-1.39	1.85
HIP91919	18:44:20.3	39:40:12	2000	4.67	F1V	49.7	0.01	0.06
HIP91926	18:44:22.8	39:36:45	2000	4.59	A8Vn	49.1	0.01	0.05
HIP91971	18:44:46.4	37:36:18	2000	4.34	Am	47.1	0.03	0.03
HIP91973	18:44:48.2	37:35:40	2000	5.73	F0IVvar	46.0	0.02	0.02
SCR1845	18:45:05.3	-63:57:47	2000	17.4	M8.5V	3.85	2.59	0.62
HIP92024	18:45:26.9	-64:52:16	2000	4.78	A7V	29.2	0.03	-0.15
HIP92043	18:45:39.7	20:32:46	2000	4.19	F6V	19.0	-0.01	-0.34
HIP92161	18:47:01.3	18:10:53	2000	4.34	A5III	28.4	0.08	0.12
HIP92200	18:47:27.3	-03:38:23	2000	8.81	K5	14.1	-0.13	-0.27
HIP92270	18:48:16.4	23:30:53	2000	6.19	F8V	28.6	0.03	-0.01
HIP92283	18:48:29.2	10:44:43	2000	7.97	K0	17.3	0.13	-0.44
HIP92311	18:48:51.9	17:26:20	2000	9.17	M0	17.0	-0.41	-0.42
GJ729	18:49:49.4	-23:50:09	2000	10.4	M3.5V	2.96	0.64	-0.19
HIP92451	18:50:26.6	-62:03:03	2000	10.7	M3	16.6	0.09	0.06
HIP92549	18:51:34.9	52:58:30	2000	5.51	G9IVa	26.0	-0.07	0.25
HIP92573	18:51:51.2	16:34:59	2000	10.1	M2	15.5	-0.23	-0.48
HIP92858	18:55:18.8	-37:29:54	2000	7.98	K1V	23.9	0.14	-0.36
HIP92871	18:55:27.4	08:24:08	2000	10.1	M2Ve	11.5	0.09	-0.07
HIP92919	18:55:53.2	23:33:23	2000	8.16	K0V	21.4	0.13	-0.28
HIP92946	18:56:13.2	04:12:12	2000	4.62	A5V	40.4	0.04	0.03
HIP92951	18:56:14.6	04:12:07	2000	4.98	A5Vn	43.7	0.05	0.03
HIP92984	18:56:37.2	04:15:54	2000	6.71	G5	27.0	0.00	-0.09
HIP93017	18:57:01.6	32:54:04	2000	5.20	G0V	14.9	0.20	-0.14
HIP93069	18:57:30.6	-55:59:30	2000	8.86	M2V	12.6	0.00	-0.44

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP93101	18:58:00.1	05:54:29	2000	9.22	M2V	11.1	-0.19	-1.22
HIP93174	18:58:43.4	-37:06:26	2000	4.83	F3IV/V	29.9	-0.13	-0.11
HIP93185	18:58:51.0	30:10:50	2000	6.80	G0	23.4	0.06	0.19
HIP93408	19:01:26.4	46:56:05	2000	5.00	A7V	39.1	0.01	-0.09
HIP93506	19:02:36.7	-29:52:48	2000	2.60	A3IV	27.3	-0.01	0.00
HIP93747	19:05:24.6	13:51:48	2000	2.99	A0Vn	25.5	-0.01	-0.10
HIP93805	19:06:14.9	-04:52:57	2000	3.43	B9Vn	38.3	-0.02	-0.09
HIP93843	19:06:37.7	28:37:42	2000	5.53	F0III	40.8	0.08	0.08
HIP93858	19:06:52.5	-37:48:38	2000	6.15	G8V	17.1	-0.19	-0.37
HIP93864	19:06:56.4	-27:40:13	2000	3.32	K1/K2II	36.9	-0.05	-0.25
HIP93871	19:07:02.0	07:36:57	2000	9.23	K5V	24.2	-0.32	-0.76
HIP93873	19:07:05.6	20:53:16	2000	10.7	M2	8.62	-0.48	-0.35
HIP93899	19:07:13.2	20:52:37	2000	10.7	M2	8.86	-0.48	-0.33
HIP93917	19:07:25.6	32:30:06	2000	5.20	F0V	40.5	0.12	0.03
HIP94083	19:09:09.9	76:33:37	2000	5.11	A9V	27.2	0.05	-0.12
HIP94114	19:09:28.3	-37:54:16	2000	4.11	A0/A1V	39.7	0.09	-0.10
HIP94150	19:09:52.9	-68:25:27	2000	5.31	G8/K0II	36.8	0.15	-0.04
HIP94225	19:10:52.3	-47:09:31	2000	9.36	K7V	20.0	-0.05	-0.63
HIP94346	19:12:11.4	57:40:19	2000	7.04	G8V	20.0	0.22	0.41
HIP94349	19:12:14.6	02:53:11	2000	11.0	M4	10.1	1.79	-0.52
HIP94376	19:12:33.3	67:39:41	2000	3.07	G9III	30.7	0.09	0.09
HIP94645	19:15:33.2	-24:10:45	2000	6.25	F8V	27.0	0.11	-0.10
HIP94650	19:15:35.0	11:33:16	2000	8.06	K0	25.3	0.18	-0.17
HIP94739	19:16:42.9	-45:53:21	2000	9.38	K9V...	15.7	0.22	-0.41
HIP94779	19:17:06.2	53:22:06	2000	3.80	K0III	37.7	0.06	0.12

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP95149	19:21:29.8	-34:59:00	2000	6.48	G1/G2V	20.8	0.08	-0.11
HIP95261	19:22:51.2	-54:25:26	2000	5.03	A0Vn	47.6	0.03	-0.08
HIP95319	19:23:34.0	33:13:19	2000	6.37	G8V	15.4	0.08	0.16
HIP95467	19:25:09.6	-66:28:07	2000	8.40	K5V	26.1	-0.23	0.24
HIP95501	19:25:29.9	03:06:53	2000	3.36	F0IV	15.3	0.25	0.08
HIP95575	19:26:26.0	49:27:55	2000	8.01	K3V	25.1	0.46	0.71
HIP95730	19:28:15.4	12:32:09	2000	9.17	K2	27.5	-0.05	-0.04
HIP95853	19:29:42.4	51:43:47	2000	3.76	A5Vn	37.5	0.02	0.13
HIP95995	19:31:08.0	58:35:09	2000	6.60	K1V	16.7	-0.51	-0.40
HIP96085	19:32:06.7	-11:16:29	2000	7.53	K2V	18.0	0.24	0.02
HIP96100	19:32:21.6	69:39:40	2000	4.67	K0V	5.76	0.60	-1.74
HIP96113	19:32:30.3	-35:27:06	2000	8.69	K3/K4V	22.0	-0.29	0.16
HIP96183	19:33:25.6	21:50:25	2000	6.89	G5V	20.1	-0.02	-0.20
HIP96229	19:34:05.4	07:22:44	2000	4.45	K3III	33.8	0.21	-0.16
HIP96258	19:34:19.8	51:14:11	2000	5.71	F7V	25.5	0.03	-0.19
HIP96285	19:34:39.8	04:34:57	2000	9.35	K5	14.4	0.52	0.31
HIP96395	19:35:55.6	56:59:02	2000	6.73	G0	24.2	0.00	-0.20
HIP96441	19:36:26.5	50:13:16	2000	4.49	F4V	18.5	-0.01	0.26
HIP96710	19:39:36.2	-26:45:07	2000	10.4	...	22.3	0.37	-0.26
HIP96895	19:41:49.0	50:31:30	2000	5.99	G2V	21.6	-0.15	-0.16
HIP96901	19:41:52.0	50:31:03	2000	6.25	G5V	21.4	-0.14	-0.16
HIP97051	19:43:25.3	10:05:22	2000	10.0	M0	22.6	0.19	0.10
HIP97222	19:45:33.5	33:36:07	2000	7.68	K3V	20.3	0.01	-0.44
HIP97222	19:45:33.5	33:36:07	2000	7.68	K3V	20.3	0.01	-0.44
HIP97223	19:45:35.6	30:00:36	2000	9.15	K5V	20.6	-0.07	-0.10

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP97295	19:46:25.6	33:43:39	2000	5.00	F5	20.8	0.02	-0.45
HIP97534	19:49:25.3	-72:30:12	2000	5.39	A4III	41.5	0.01	0.01
HIP97650	19:50:46.8	10:45:48	2000	5.38	F0V	26.4	-0.03	0.03
HIP97649	19:50:47.0	08:52:05	2000	0.76	A7IV-V	5.14	0.54	0.39
GJ768	19:50:47.0	08:52:06	2000	0.77	A7IV	5.11	0.54	0.39
HIP97675	19:51:01.6	10:24:56	2000	5.12	F8V	19.3	0.24	-0.13
GJ1245AC	19:53:54.2	44:24:55	2000	13.4	M5.5V	4.54	0.44	-0.58
GJ1245B	19:53:55.2	44:24:56	2000	14.0	M6V	4.54	0.44	-0.58
HIP98036	19:55:18.8	06:24:24	2000	3.71	G8IVvar	13.7	0.05	-0.48
HIP98106	19:56:16.1	-72:21:51	2000	8.40	K5V	23.3	-0.01	-0.30
HIP98130	19:56:37.0	-31:20:07	2000	8.42	K3/K4V	19.1	0.41	0.03
HIP98192	19:57:13.4	29:49:26	2000	7.91	K1V	25.4	0.11	0.24
HIP98204	19:57:19.6	-12:34:04	2000	9.29	K4V	18.8	-0.09	-0.51
HIP98316	19:58:33.0	-54:56:12	2000	8.54	K3V	22.7	0.11	-0.12
HIP98416	19:59:47.3	-09:57:29	2000	5.87	F8V	24.5	-0.25	-0.39
HIP98421	19:59:51.4	-34:41:52	2000	5.30	A4/A5IV	48.0	0.11	-0.07
HIP98470	20:00:20.3	-33:42:12	2000	5.65	F7V	20.8	0.13	-0.29
HIP98505	20:00:43.7	22:42:39	2000	7.67	G5	19.2	0.00	-0.25
HIP98677	20:02:34.2	15:35:31	2000	7.15	G7V	19.3	-0.16	-0.58
HIP98698	20:02:47.0	03:19:34	2000	7.46	K4V	13.1	-0.09	0.12
HIP98767	20:03:37.4	29:53:48	2000	5.73	G6IV+..	15.8	0.68	-0.52
HIP98792	20:03:52.1	23:20:26	2000	7.28	K1V	15.5	-1.00	-0.91
HIP98819	20:04:06.2	17:04:12	2000	5.80	G1V	17.6	-0.39	-0.41
HIP98828	20:04:10.0	25:47:24	2000	7.82	K3V	21.6	-0.08	-0.04
HIP98906	20:05:02.2	54:26:03	2000	11.9	M3	15.8	-1.17	-0.90

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP98921	20:05:09.8	38:28:42	2000	6.18	G5IV	18.8	0.26	0.11
HIP98959	20:05:32.8	-67:19:15	2000	6.07	G2V	17.7	0.84	-0.67
HIP99031	20:06:21.8	35:58:20	2000	5.38	K0IV	24.1	-0.22	-0.44
HIP99137	20:07:35.1	-55:00:57	2000	6.26	F8V	23.2	0.02	0.04
HIP99150	20:07:45.0	-31:45:14	2000	12.1	M	14.6	0.29	-0.75
HIP99240	20:08:43.6	-66:10:55	2000	3.55	G5IV-Vv	6.10	1.21	-1.13
HIP99316	20:09:34.3	16:48:20	2000	7.56	K0...	24.3	0.00	0.18
HIP99385	20:10:19.6	-20:29:36	2000	8.91	K4Vp	15.6	-0.46	-0.38
HIP99427	20:10:52.4	77:14:20	2000	8.88	K5	16.7	0.06	0.51
HIP99452	20:11:06.1	16:11:16	2000	7.34	K1V	20.4	-0.41	0.40
HIP99461	20:11:11.9	-36:06:04	2000	5.32	K2V	6.05	0.46	-1.57
HIP99572	20:12:25.9	-12:37:03	2000	5.84	F5V	28.0	0.19	-0.20
HIP99655	20:13:23.9	56:34:03	2000	4.28	A3IV-Vn	46.7	0.06	0.08
HIP99701	20:13:53.4	-45:09:50	2000	7.97	M0V	6.20	0.78	-0.16
HIP99711	20:13:59.8	-00:52:00	2000	7.79	K0	19.8	-0.06	0.26
HIP99742	20:14:16.6	15:11:51	2000	4.94	A2V	47.0	0.06	0.06
HIP99764	20:14:28.2	-07:16:55	2000	10.1	K7V	20.3	0.01	-0.27
HIP99770	20:14:32.0	36:48:22	2000	4.93	A2V	41.0	0.07	0.07
HIP99825	20:15:17.4	-27:01:58	2000	5.73	K3V	8.82	1.24	-0.18
HIP99880	20:15:52.6	42:58:44	2000	9.98	M0	24.4	0.01	-0.06
HIP100017	20:17:31.3	66:51:13	2000	5.91	G3V	17.5	0.47	0.30
HIP100064	20:18:03.3	-12:32:41	2000	3.58	G6/G8II	33.3	0.06	0.00
HIP100184	20:19:17.8	-47:34:48	2000	6.13	F5V	29.4	0.19	-0.18
HIP100223	20:19:36.9	-46:25:41	2000	8.73	K5V	17.9	-0.38	-0.10
HIP100511	20:22:52.4	14:33:03	2000	6.16	F8V	26.1	0.08	-0.01

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP100852	20:26:53.0	-37:24:10	2000	6.24	K1IV	39.6	-0.26	-0.11
HIP100859	20:27:02.3	49:23:00	2000	5.73	F0V:	37.6	0.07	0.06
HIP100923	20:27:41.7	-27:44:51	2000	11.4	M3	15.4	-0.20	-0.88
HIP100925	20:27:44.2	-30:52:04	2000	6.61	G6/G8V	19.4	-0.01	-0.52
HIP101027	20:28:51.6	-17:48:49	2000	4.77	F3V	30.2	-0.02	-0.01
HIP101093	20:29:34.9	62:59:38	2000	4.21	A7III	41.5	0.05	-0.01
HIP101150	20:30:10.7	26:50:34	2000	9.69	M2	23.1	-0.16	-0.13
HIP101180	20:30:32.0	65:26:58	2000	10.5	M3	7.96	0.44	0.28
HIP101262	20:31:32.1	33:46:33	2000	9.22	K5	26.1	0.14	0.02
HIP101382	20:32:51.6	41:53:54	2000	7.08	G9V	22.2	-0.16	0.45
HIP101612	20:35:34.9	-60:34:54	2000	4.75	F1III	27.5	0.07	-0.19
HIP101772	20:37:34.0	-47:17:29	2000	3.11	K0III	31.0	0.05	0.07
HIP101955	20:39:37.7	04:58:19	2000	7.88	K5V	18.5	0.86	0.07
HIP101997	20:40:11.8	-23:46:25	2000	6.36	G8/K0V	14.6	0.50	0.46
HIP102040	20:40:45.1	19:56:07	2000	6.43	G5V	20.9	0.12	0.31
HIP102101	20:41:28.2	57:25:47	2000	10.2	M0	23.9	0.10	0.21
HIP102141	20:41:51.2	-32:26:06	2000	10.2	Mpe	10.2	0.27	-0.37
HIP102186	20:42:18.8	-52:41:57	2000	8.83	K7V	12.1	0.08	-1.07
HIP102226	20:42:49.4	20:50:40	2000	8.26	K0	25.3	-0.08	-0.35
HIP102253	20:43:11.0	66:39:26	2000	5.59	A8V	42.5	0.03	0.03
HIP102264	20:43:16.0	-29:25:26	2000	6.95	G3/G5V	22.4	-0.04	-0.21
HIP102332	20:44:00.6	-21:21:20	2000	9.84	K7V	26.1	0.03	-0.27
HIP102333	20:44:02.3	-51:55:15	2000	4.51	A6:var	24.1	0.16	-0.05
HIP102409	20:45:09.5	-31:20:27	2000	8.81	M1Ve	9.94	0.28	-0.36
HIP102422	20:45:17.4	61:50:19	2000	3.41	K0IV	14.3	0.09	0.82

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP102485	20:46:05.7	-25:16:15	2000	4.13	F5V	14.6	-0.05	-0.16
HIP102488	20:46:12.7	33:58:12	2000	2.48	K0III	22.0	0.36	0.33
HIP102531	20:46:38.9	16:07:26	2000	5.15	A2Ia+..	31.5	-0.01	-0.20
HIP102532	20:46:39.5	16:07:27	2000	4.27	K1IV	31.1	-0.03	-0.20
HIP102766	20:49:16.2	32:17:05	2000	8.25	K2	23.6	-0.16	-0.27
HIP102805	20:49:37.8	12:32:42	2000	6.01	F5V	29.5	0.05	0.10
HIP102843	20:50:04.9	44:03:33	2000	5.06	A4me...	42.2	0.12	0.13
HIP102851	20:50:10.6	29:23:02	2000	8.32	K5V	20.6	0.02	-0.06
HIP102870	20:50:33.1	52:53:58	2000	9.69	K5	22.4	0.29	0.44
HIP103039	20:52:33.0	-16:58:29	2000	11.4		5.48	-0.31	0.03
HIP103096	20:53:19.8	62:09:15	2000	8.55	M2V	7.04	0.00	-0.77
HIP103256	20:55:06.9	13:10:36	2000	8.82	K3V	22.7	0.55	0.37
HIP103388	20:56:46.6	10:26:54	2000	11.3	M4	14.7	-0.02	-1.11
HIP103389	20:56:47.3	-26:17:46	2000	5.70	F7V	21.0	0.10	-0.07
HIP103441	20:57:25.4	22:21:45	2000	11.9	M3	13.6	0.77	-0.21
HIP103458	20:57:40.1	-44:07:45	2000	6.52	G0V	21.6	-0.52	-0.98
HIP103650	21:00:03.4	70:40:07	2000	9.32	K2	25.7	0.15	-0.05
HIP103673	21:00:21.5	-51:15:55	2000	5.76	F5IV-V	28.5	-0.09	0.13
HIP103768	21:01:39.1	-32:31:28	2000	9.37	K5V	20.4	0.24	-0.12
HIP103800	21:01:58.6	-06:19:07	2000	11.2	M3	13.8	-0.23	-0.45
HIP103859	21:02:40.8	45:53:05	2000	7.69	K2	19.3	0.40	0.14
HIP103910	21:03:13.9	-56:57:48	2000	12.8	M4	14.1	-0.36	0.35
HIP104019	21:04:24.3	-19:51:18	2000	4.82	A5V	48.4	-0.04	-0.02
HIP104092	21:05:19.7	07:04:09	2000	8.27	K5	14.8	0.08	-0.56
HIP104139	21:05:56.8	-17:13:58	2000	4.08	A1V	48.5	0.08	-0.06

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
GJ820A	21:06:53.9	38:44:57	2000	5.20	K5.0V	3.49	4.16	3.26
GJ820B	21:06:55.3	38:44:30	2000	6.03	K7.0V	3.49	4.11	3.14
HIP104239	21:07:10.4	-13:55:22	2000	7.12	K1V	17.6	0.38	-0.05
HIP104383	21:08:45.5	-04:25:36	2000	9.45	M1	26.3	-0.08	-0.03
HIP104436	21:09:20.7	-82:01:38	2000	6.98	G3V	24.2	0.26	-0.05
HIP104440	21:09:22.4	-73:10:22	2000	5.67	G3IV	18.7	0.46	-0.29
HIP104521	21:10:20.5	10:07:53	2000	4.70	F0p	35.2	0.05	-0.15
HIP104644	21:11:49.6	-43:36:49	2000	11.9	M1:	14.3	0.22	-0.69
HIP104887	21:14:47.5	38:02:43	2000	3.74	F1IV	20.9	0.20	0.41
HIP105038	21:16:32.5	09:23:37	2000	7.88	K2	16.1	0.15	-0.12
GJ825	21:17:15.3	-38:52:02	2000	6.67	K9.0V	3.94	-3.26	-1.15
HIP105152	21:18:03.0	00:09:41	2000	8.15	K2	19.2	0.47	-0.19
HIP105184	21:18:27.3	-43:20:04	2000	6.75	G5V	23.7	0.24	0.02
HIP105199	21:18:34.8	62:35:08	2000	2.45	A7IV-V	14.9	0.15	0.05
HIP105312	21:19:45.6	-26:21:10	2000	6.56	G5V	18.7	-0.58	-0.36
HIP105319	21:19:52.0	-53:26:57	2000	4.39	A5V	29.7	0.11	-0.07
HIP105341	21:20:13.8	-19:51:08	2000	9.09	K5V	16.3	-0.17	-0.72
HIP105406	21:21:01.4	40:20:42	2000	6.39	F8V	26.5	-0.02	-0.21
HIP105668	21:24:11.5	-12:52:41	2000	5.48	F0V	48.0	0.09	0.01
HIP105675	21:24:15.1	-58:41:32	2000	8.68	K3V	25.3	-0.10	-0.02
HIP105712	21:24:40.6	-68:13:40	2000	6.98	G5V	20.4	0.14	0.17
HIP105769	21:25:19.6	46:42:51	2000	5.59	F0V	34.3	0.19	0.05
HIP105858	21:26:26.6	-65:21:58	2000	4.21	F6V	9.21	0.08	0.80
HIP105860	21:26:26.7	19:22:32	2000	6.08	A8m	46.0	0.08	0.02
HIP105905	21:26:58.5	-56:07:30	2000	8.65	K3V	23.1	0.66	0.14

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP105911	21:27:01.3	-44:48:30	2000	7.49	K0V	23.5	0.26	0.18
HIP105932	21:27:16.9	-06:50:39	2000	11.0	M0	16.2	0.02	-0.40
HIP105932	21:27:16.9	-06:50:39	2000	11.0	M0	16.2	0.02	-0.40
HIP106106	21:29:36.8	17:38:35	2000	10.3	M4	6.74	1.01	0.38
HIP106147	21:30:02.8	-12:30:36	2000	9.11	K4/K5V	18.0	1.02	-0.26
HIP106231	21:31:01.7	23:20:07	2000	9.23	K8	25.0	0.13	-0.14
HIP106400	21:33:01.1	62:00:08	2000	9.34	K	23.1	0.37	0.19
GJ832	21:33:34.0	-49:00:31	2000	8.66	M1.5V	4.94	-0.05	-0.82
HIP106481	21:33:58.8	45:35:30	2000	3.98	G8III	38.1	-0.02	-0.09
HIP106559	21:34:51.1	-20:05:03	2000	5.70	F5V	27.1	-0.03	0.04
HIP106696	21:36:41.2	-50:50:43	2000	7.14	K2V	14.7	0.42	-0.20
HIP106811	21:38:00.4	27:43:25	2000	9.83		13.1	0.47	-0.08
HIP106897	21:39:01.2	20:15:55	2000	5.77	F2V	39.1	0.12	0.00
HIP107022	21:40:29.8	-74:04:27	2000	7.07	G8V	22.1	-0.14	0.21
HIP107089	21:41:28.6	-77:23:24	2000	3.73	K0III	21.1	0.06	-0.24
HIP107143	21:42:10.2	-41:07:29	2000	8.82	K5V	23.5	0.24	-0.29
HIP107346	21:44:30.0	41:35:50	2000	9.65	K0	20.2	-0.06	0.04
HIP107350	21:44:31.3	14:46:19	2000	5.96	G0V	18.3	0.23	-0.11
HIP107522	21:46:35.8	-57:42:12	2000	8.77	K7V	19.0	0.09	-0.91
HIP107556	21:47:02.4	-16:07:38	2000	2.85	A5mF2 (11.8	0.26	-0.30
HIP107625	21:48:00.0	-40:15:21	2000	8.62	K3V	23.7	0.11	-0.35
HIP107649	21:48:15.8	-47:18:12	2000	5.57	G2V	15.6	0.17	-0.29
HIP107705	21:49:05.8	-72:06:08	2000	9.53	M2Ve	16.1	0.30	-0.29
HIP107711	21:49:11.9	-41:33:32	2000	11.5	M6	13.4	0.95	-0.47
HIP107772	21:49:59.8	-41:14:42	2000	10.5	M0	22.4	-0.24	0.23

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP107788	21:50:08.7	17:17:09	2000	5.34	F2III-I	33.4	0.09	-0.04
HIP107975	21:52:29.9	28:47:36	2000	5.52	F6IVwva	27.6	-0.06	-0.06
HIP108028	21:53:05.4	20:55:49	2000	8.18	K0	23.9	-0.01	-0.10
HIP108036	21:53:17.8	-13:33:06	2000	5.08	F3IV	27.6	0.31	0.01
HIP108092	21:53:59.0	41:46:44	2000	10.3	M2	23.2	0.38	-0.36
HIP108156	21:54:45.0	32:19:42	2000	7.73	K0	20.3	0.21	-0.23
HIP108159	21:54:45.3	-46:59:33	2000	11.9	M3	15.1	-0.31	-0.37
HIP108162	21:54:51.3	-77:20:16	2000	8.23	K3IV	26.3	0.22	-0.19
HIP108162	21:54:51.3	-77:20:16	2000	8.23	K3IV	26.3	0.22	-0.19
HIP108506	21:58:55.0	-04:22:23	2000	6.24	K2V	36.0	0.00	-0.25
HIP108567	21:59:32.1	-60:55:58	2000	9.53	K7	23.2	-0.01	-0.09
HIP108569	21:59:34.7	-59:45:10	2000	9.74	M2	11.8	0.89	-0.13
HIP108752	22:01:49.0	16:28:02	2000	10.6	M2	16.4	0.39	0.15
HIP108782	22:02:10.3	01:24:00	2000	9.17	M0	10.3	-0.46	-0.28
GJ845A	22:03:21.7	-56:47:09	2000	4.68	K4.0V	3.62	3.96	-2.54
HIP108917	22:03:47.5	64:37:40	2000	4.26	Am	31.1	0.21	0.09
HIP109176	22:07:00.7	25:20:42	2000	3.77	F5V	11.7	0.30	0.03
HIP109268	22:08:14.0	-46:57:39	2000	1.73	B7IV	31.0	0.13	-0.15
HIP109285	22:08:23.0	-32:59:18	2000	4.50	A2V	39.9	0.08	-0.03
HIP109378	22:09:29.9	-07:32:55	2000	6.54	G0	21.2	0.09	-0.45
HIP109388	22:09:40.3	-04:38:26	2000	10.4	M3	8.77	1.13	-0.02
HIP109422	22:10:08.8	-32:32:54	2000	4.94	F6V	18.7	0.43	0.01
HIP109427	22:10:12.0	06:11:52	2000	3.52	A2V	29.6	0.28	0.03
HIP109474	22:10:38.8	70:07:57	2000	5.52	F2V	32.6	-0.06	0.02
HIP109527	22:11:11.9	36:15:22	2000	7.23	K0	22.4	0.03	-0.25

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP109555	22:11:30.1	18:25:34	2000	10.2	M2	11.4	0.33	0.18
HIP109638	22:12:35.9	08:33:11	2000	11.9	M3	13.8	0.12	-0.66
HIP109822	22:14:38.2	-15:49:06	2000	6.55	K0/K1V	38.1	-0.01	-0.36
HIP109821	22:14:38.7	-41:22:54	2000	6.23	G5V	22.1	0.57	-0.79
HIP109857	22:15:02.2	57:02:36	2000	4.18	F0IV	25.7	0.48	0.05
HIP109926	22:15:54.1	54:40:22	2000	7.50	K1V	21.4	0.21	0.07
HIP109980	22:16:31.8	68:20:23	2000	9.23	K5	23.9	0.38	-0.01
HIP110066	22:17:39.4	-48:39:01	2000	8.40	K3V	25.3	0.20	-0.11
HIP110078	22:17:50.6	-77:30:41	2000	5.49	F3III	38.4	-0.04	0.01
HIP110109	22:18:15.6	-53:37:37	2000	5.36	G1V	13.6	0.44	-0.63
HIP110341	22:20:55.8	08:11:12	2000	6.18	F6V	31.7	0.04	0.02
HIP110395	22:21:39.4	-01:23:14	2000	3.86	A0V	48.3	0.13	0.01
HIP110443	22:22:16.2	-54:33:38	2000	8.98	K7V	13.3	-0.19	0.23
HIP110506	22:23:08.0	-45:55:42	2000	5.62	F3III-I	40.6	0.23	-0.06
HIP110526	22:23:29.1	32:27:33	2000	10.7	M0...	16.0	0.25	-0.21
HIP110640	22:24:45.5	22:33:04	2000	8.83	M0	21.3	-0.17	-0.07
HIP110712	22:25:51.2	-75:00:56	2000	6.12	G3IV	23.0	0.06	0.01
HIP110750	22:26:13.5	-19:11:18	2000	9.25	K3/K4V	26.7	0.24	-0.03
HIP110774	22:26:32.7	63:52:45	2000	9.52	K7	25.0	0.20	0.21
HIP110778	22:26:34.3	-16:44:31	2000	5.55	G3V	20.0	0.21	0.00
GJ860B	22:27:59.6	57:41:45	2000	11.4	M4.0V	4.03	-0.87	-0.47
GJ860A	22:28:00.4	57:41:49	2000	9.79	M3.0V	4.03	-0.87	-0.47
HIP110935	22:28:37.7	-67:29:20	2000	5.56	A3V	43.5	0.15	-0.07
HIP110951	22:28:45.9	18:55:54	2000	10.7		22.5	0.17	-0.13
HIP110996	22:29:15.2	-30:01:06	2000	7.65	K4V	15.4	0.22	-0.81

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP111169	22:31:17.5	50:16:56	2000	3.76	A1V	31.3	0.14	0.02
HIP111170	22:31:18.3	-06:33:18	2000	6.15	F7V	25.5	0.16	-0.11
HIP111188	22:31:30.3	-32:20:45	2000	4.29	A1V	45.4	0.06	-0.02
HIP111313	22:33:02.2	09:22:40	2000	10.3	M0V:	12.8	0.54	0.14
HIP111449	22:34:41.6	-20:42:29	2000	5.21	F7V	22.7	0.22	-0.15
HIP111685	22:37:29.9	39:22:51	2000	9.41	M2	18.8	0.02	-0.34
HIP111766	22:38:29.8	-65:22:42	2000	11.5		14.8	0.83	-0.16
GJ866	22:38:33.4	-15:18:07	2000	13.0	M5.0V	3.45	2.36	2.24
HIP111802	22:38:45.6	-20:37:16	2000	9.06	M0Vpe	8.64	0.45	-0.08
HIP111888	22:39:50.8	04:06:58	2000	8.48	K2	22.6	0.18	0.11
HIP111960	22:40:43.4	-29:40:28	2000	7.83	K4/K5V	13.5	0.38	-0.02
HIP111978	22:40:55.2	-31:59:24	2000	7.41	G8/K0V	26.7	0.34	0.02
HIP111983	22:40:58.7	-46:12:07	2000	9.14	K5V	22.9	0.10	-0.02
HIP112117	22:42:36.9	-47:12:38	2000	5.99	G0	23.5	0.01	-0.33
HIP112190	22:43:21.3	-06:24:02	2000	8.11	K0	21.5	-0.15	-0.29
HIP112245	22:44:05.8	64:34:14	2000	7.50	G8V	25.1	0.05	-0.30
GJ873	22:46:49.7	44:20:02	2000	10.2	M3.5V	5.04	-0.70	-0.46
HIP112496	22:47:13.6	18:23:04	2000	9.02	G0	26.6	0.25	0.09
HIP112527	22:47:31.9	83:41:49	2000	7.53	K2	19.9	-0.15	0.12
HIP112623	22:48:33.3	-51:19:00	2000	3.49	A3V	39.7	0.11	-0.07
HIP112724	22:49:40.8	66:12:01	2000	3.50	K0III	35.3	-0.07	-0.12
HIP112748	22:50:00.2	24:36:05	2000	3.51	M2III	35.7	0.14	-0.04
HIP112774	22:50:19.4	-07:05:24	2000	9.86	K5	13.9	-0.10	0.10
HIP112870	22:51:26.4	13:58:11	2000	8.29	K0	21.0	0.40	0.20
HIP112909	22:51:53.5	31:45:15	2000	11.6	M3.5Ve	14.2	0.53	-0.05

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP112915	22:52:00.5	57:43:00	2000	8.01	K5III	24.2	-0.09	-0.22
HIP112918	22:52:02.5	23:24:47	2000	9.79	K8	27.1	0.13	-0.15
HIP112935	22:52:24.1	09:50:08	2000	5.16	F7IV	26.8	0.52	0.04
GJ876	22:53:16.7	-14:15:48	2000	10.1	M3.5V	4.66	0.96	-0.68
HIP113283	22:56:24.1	-31:33:55	2000	6.48	K4Vp	7.63	0.33	-0.16
HIP113357	22:57:28.0	20:46:07	2000	5.45	G5V	15.3	0.21	0.06
HIP113368	22:57:39.1	-29:37:20	2000	1.17	A3V	7.68	0.33	-0.16
HIP113409	22:58:06.3	-13:38:33	2000	10.1	K2V:	27.0	0.04	-0.33
HIP113421	22:58:15.5	-02:23:43	2000	6.17	G8IV	19.7	-0.01	-0.02
HIP113576	23:00:16.1	-22:31:27	2000	7.88	K5/M0V	8.14	-0.90	0.06
HIP113638	23:00:52.8	-52:45:14	2000	4.11	G8III	34.4	-0.07	-0.01
HIP113697	23:01:37.8	-44:59:18	2000	8.93	K5V	25.7	0.10	0.01
HIP113718	23:01:51.5	-03:50:55	2000	7.48	K4V	16.9	0.40	-0.21
HIP113829	23:03:05.0	20:55:06	2000	6.65	G5V	24.2	-0.12	-0.03
HIP113860	23:03:29.8	-34:44:57	2000	5.12	A9V	28.5	0.07	0.08
HIP113944	23:04:30.2	66:45:51	2000	9.86	M1V:	20.0	0.30	-0.08
HIP113963	23:04:45.7	15:12:18	2000	2.49	B9.5III	42.8	0.06	-0.04
GJ887	23:05:52.0	-35:51:10	2000	7.34	M1.0V	3.27	6.77	1.33
HIP114156	23:07:07.1	-23:09:34	2000	9.62	K5V	21.1	0.15	-0.25
HIP114189	23:07:28.7	21:08:03	2000	5.97	A5V	39.9	0.11	-0.05
HIP114233	23:08:07.0	03:19:44	2000	10.9	M1V:	15.6	0.49	0.25
HIP114361	23:09:41.0	-67:43:58	2000	8.29	K5V	15.0	-0.32	-0.22
HIP114379	23:09:57.4	47:57:30	2000	7.91	K0Ve	25.2	0.15	0.01
HIP114411	23:10:15.7	-25:55:52	2000	11.2	...	15.6	0.72	0.02
HIP114416	23:10:20.6	-68:50:20	2000	8.70	K3V	20.8	0.07	0.32

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP114430	23:10:27.2	43:32:39	2000	5.91	F5IV	28.2	-0.20	-0.21
HIP114456	23:10:50.1	45:30:44	2000	6.98	K0	23.4	-0.09	-0.29
HIP114570	23:12:33.0	49:24:22	2000	4.53	F0V	24.4	0.09	0.10
HIP114622	23:13:17.0	57:10:06	2000	5.57	K3Vvar	6.52	2.07	0.29
HIP114622	23:13:17.0	57:10:06	2000	5.57	K3Vvar	6.52	2.07	0.29
HIP114886	23:16:18.2	30:40:12	2000	8.07	K2V	24.1	0.36	0.09
HIP114924	23:16:42.3	53:12:48	2000	5.58	F7V	20.2	0.11	-0.24
HIP114948	23:16:57.7	-62:00:04	2000	5.64	F7V	20.5	0.18	-0.03
HIP114971	23:17:09.9	03:16:56	2000	3.70	G7III	40.1	0.76	0.02
HIP114980	23:17:17.4	-66:56:16	2000	9.02	K5V	27.1	0.35	-0.41
HIP114986	23:17:20.8	-66:55:09	2000	8.71	K5v...	27.2	0.36	-0.42
HIP115123	23:19:05.4	-60:31:14	2000	8.93	K7V	19.2	-0.10	-0.04
HIP115142	23:19:24.0	-05:07:27	2000	5.56	F3IV	34.8	0.20	-0.02
HIP115147	23:19:26.6	79:00:12	2000	7.53	G9V	19.7	0.20	0.07
HIP115331	23:21:36.5	44:05:52	2000	7.36	K1V	21.9	0.64	0.22
HIP115341	23:21:44.5	45:10:33	2000	8.12	K2	20.9	0.20	-0.07
HIP115445	23:23:04.9	10:45:51	2000	7.80	K2V	19.4	0.45	0.26
HIP115562	23:24:30.5	57:51:15	2000	10.0	M2	13.1	-0.06	-0.28
HIP115738	23:26:56.0	01:15:20	2000	4.95	A0p	49.7	0.09	-0.09
HIP116003	23:30:13.4	-20:23:27	2000	11.0	M2Ve	14.7	0.31	-0.21
HIP116085	23:31:22.2	59:09:55	2000	6.76	K2V	16.8	1.11	0.11
HIP116106	23:31:31.5	-04:05:14	2000	6.50	F8V	26.2	0.18	-0.19
HIP116215	23:32:49.4	-16:50:44	2000	8.59	K5/M0V	13.9	0.34	-0.22
HIP116384	23:35:00.3	01:36:19	2000	9.59	M0	19.3	0.34	0.03
HIP116416	23:35:25.6	31:09:40	2000	7.90	G5	23.4	-0.20	-0.28

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP116491	23:36:18.3	-48:35:17	2000	10.0	M0	23.7	-0.13	-0.03
HIP116495	23:36:23.3	02:06:08	2000	5.68	F6Vbwva	30.9	-0.10	0.06
HIP116584	23:37:33.8	46:27:29	2000	3.81	G8III-I	25.8	0.16	-0.42
HIP116613	23:37:58.5	46:11:58	2000	6.58	G5	23.1	0.36	-0.01
HIP116727	23:39:20.8	77:37:56	2000	3.21	K1IV	13.7	-0.05	0.13
HIP116745	23:39:37.4	-72:43:19	2000	7.09	K3V	11.3	0.14	-0.74
HIP116758	23:39:47.1	-14:13:19	2000	4.97	A7IV	41.0	0.05	-0.06
HIP116763	23:39:51.3	-32:44:36	2000	7.18	K1V	18.6	0.14	-0.30
HIP116771	23:39:57.0	05:37:34	2000	4.13	F7V	13.7	0.38	-0.44
HIP116819	23:40:37.9	-18:59:20	2000	7.59	G5V	26.2	0.30	-0.04
HIP116838	23:40:51.4	20:21:57	2000	8.27	K2	25.3	0.22	0.06
GJ905	23:41:54.7	44:10:30	2000	12.2	M5.5V	3.16	0.08	-1.61
HIP116936	23:42:10.6	-02:34:36	2000	10.3	M0	23.5	-0.19	-0.26
HIP116971	23:42:43.3	-14:32:41	2000	4.49	B9V	47.2	0.10	-0.07
HIP117197	23:45:49.5	36:15:18	2000	9.89	M0	19.6	0.35	0.05
HIP117410	23:48:25.7	-12:59:14	2000	9.59	K8	27.0	0.23	0.02
HIP117452	23:48:55.5	-28:07:49	2000	4.59	A0V	43.9	0.10	-0.10
HIP117463	23:49:01.2	03:10:52	2000	8.38	G5	26.6	0.06	0.00
HIP117473	23:49:12.5	02:24:04	2000	8.98	M2V	5.96	1.00	-0.97
HIP117542	23:50:14.9	-29:24:06	2000	7.88	K1V	25.2	0.19	0.02
HIP117559	23:50:27.9	30:21:11	2000	9.35	M0	24.8	0.25	0.01
HIP117712	23:52:25.3	75:32:40	2000	6.36	K3V	10.7	0.34	0.04
HIP117779	23:53:08.6	29:01:05	2000	9.75	...	22.4	-0.07	0.02
HIP117795	23:53:19.8	59:56:42	2000	10.4	K8	27.3	0.08	0.03
HIP117815	23:53:39.9	-65:56:49	2000	6.64	G0V	25.8	-0.04	0.09

Table 1—Continued

Star Name	RA	Dec	Epoch	V mag	Sp Type	Distance (pc)	PM RA	PM Dec
HIP117828	23:53:50.1	-75:37:57	2000	9.99	M...	10.1	0.24	-0.38
HIP117946	23:55:26.6	22:11:35	2000	8.77	K0	25.4	0.20	-0.15
HIP118008	23:56:10.7	-39:03:08	2000	8.24	K3V	22.0	0.21	-0.19
HIP118121	23:57:35.1	-64:17:53	2000	5.00	A1V	48.7	0.08	-0.06
HIP118162	23:58:06.8	50:26:51	2000	6.72	G5	24.1	-0.05	0.25
HIP118212	23:58:43.5	46:43:44	2000	9.57	M0	17.3	0.67	-0.01
HIP118261	23:59:13.7	-26:02:55	2000	8.69	K3/K4V	24.4	-0.23	0.01
HIP118278	23:59:28.4	-20:02:04	2000	7.47	G8V	25.7	0.51	-0.28
HIP118310	23:59:47.8	06:39:50	2000	8.85	K5	25.3	-0.06	-0.17

Table 2. Galaxies

Galaxy	RA	Dec	B mag	K mag	Distance (Mpc)	Morphology
Milky Way	17:45:40.0	-29:00:28	-4.6	0.0	0.01	Spiral
MESSIER031	00:42:44.6	41:16:09	4.2	0.9	0.77	Spiral
MESSIER033	01:33:50.8	30:39:37	6.2	4.1	0.85	Spiral
Dw1	02:56:56.0	58:54:42	15.0	5.1	2.80	Spiral
Maffei2	02:41:54.6	59:36:11	14.7	4.5	2.80	Spiral
NGC2403	07:36:51.5	65:35:57	8.8	6.1	3.18	Spiral
IC0342	03:46:48.7	68:05:44	9.3	4.5	3.28	Spiral
NGC5102	13:21:58.0	-36:37:46	10.2	6.9	3.40	Spiral
MESSIER081	09:55:33.6	69:04:00	7.7	3.8	3.63	Spiral
NGC4945	13:05:26.2	-49:28:15	9.2	4.4	3.80	Spiral
NGC7793	23:57:49.3	-32:35:24	9.7	6.8	3.91	Spiral
NGC0253	00:47:34.4	-25:17:31	7.9	3.7	3.94	Spiral
CIRCINUS	14:13:09.1	-65:20:21	12.1	5.2	4.20	Spiral
NGC4826	12:56:44.2	21:41:04	9.3	5.3	4.37	Spiral
NGC4244	12:17:29.8	37:48:26	10.8	7.7	4.49	Spiral
NGC4736	12:50:53.5	41:07:09	8.7	5.1	4.66	Spiral
NGC5236	13:37:00.1	-29:52:04	8.2	4.6	4.92	Spiral
NGC6503	17:49:27.5	70:08:40	10.8	7.3	5.27	Spiral
NGC5068	13:18:55.4	-21:02:21	10.5	7.5	5.45	Spiral
NGC6946	20:34:51.2	60:09:15	9.6	5.3	5.89	Spiral
ESO137-018	16:20:59.3	-60:29:14	12.2	8.3	6.40	Spiral
NGC7090	21:36:28.4	-54:33:25	11.3	8.1	6.70	Spiral
NGC3344	10:43:30.4	24:55:24	10.4	7.4	6.85	Spiral
NGC0672	01:47:53.2	27:26:00	11.3	8.5	7.20	Spiral
NGC0628	01:36:41.4	15:47:12	9.7	6.8	7.31	Spiral

Table 2—Continued

Galaxy	RA	Dec	B mag	K mag	Distance (Mpc)	Morphology
NGC4600	12:40:23.2	03:07:04	13.7	9.8	7.35	S0
MESSIER101	14:03:13.0	54:21:02	8.3	5.5	7.38	Spiral
NGC2787	09:19:18.5	69:12:11	11.8	7.2	7.48	Spiral
NGC5195	13:29:58.6	47:16:05	10.4	6.2	7.66	S0
NGC2683	08:52:40.8	33:25:01	10.3	6.3	7.73	Spiral
NGC7713	23:36:15.1	-37:56:20	11.4	9.1	7.80	Spiral
NGC4258	12:18:57.6	47:18:14	9.1	5.4	7.83	Spiral
NGC4136	12:09:17.6	29:55:38	11.6	9.3	7.90	Spiral
NGC7640	23:22:06.6	40:50:44	11.6	8.6	7.90	Spiral
NGC4618	12:41:32.6	41:09:02	11.3	8.6	7.90	Spiral
NGC4559	12:35:57.8	27:57:34	10.2	7.5	8.10	Spiral
NGC6744	19:09:46.1	-63:51:28	9.1	5.9	8.30	Spiral
NGC5194	13:29:52.8	47:14:03	8.6	5.5	8.40	Spiral
UGCA127	06:20:55.7	-08:29:44	14.1	8.3	8.50	Spiral
NGC6684	18:48:58.0	-65:10:23	11.3	7.0	8.70	S0
Maffei1	02:36:35.6	59:39:17	13.4	5.5	3.01	Elliptical
NGC3379	10:47:49.6	12:34:54	10.2	6.2	11.12	Elliptical
NGC1400	03:39:31.0	-18:41:17	11.9	7.8	24.50	Elliptical
LMC	05:23:34.4	-69:45:21	0.9	-1.7	0.05	Irregular
SMC	00:52:37.9	-72:48:01	2.7	0.1	0.06	Irregular
LeoT	09:34:53.4	17:03:05	16.5	14.0	0.42	Irregular
Phoenix	01:51:06.5	-44:26:40	13.7	11.3	0.44	Irregular
NGC6822	19:44:57.8	-14:48:11	9.3	6.0	0.50	Irregular
LGS 3	01:03:55.1	21:53:06	15.0	12.4	0.65	Irregular
IC0010	00:20:24.4	59:17:30	11.7	6.5	0.66	Irregular

Table 2—Continued

Galaxy	RA	Dec	B mag	K mag	Distance (Mpc)	Morphology
IC1613	01:04:47.6	02:07:59	9.8	7.4	0.73	Irregular
Pegasus	23:28:34.0	14:44:48	13.2	9.8	0.76	Irregular
LeoA	09:59:26.5	30:44:47	12.9	10.4	0.81	Irregular
DDO210	20:46:52.0	-12:50:53	14.0	11.2	0.94	Irregular
WLM	00:01:58.1	-15:27:39	11.0	9.0	0.97	Irregular
Sag dIr	19:29:58.9	-17:40:41	14.1	12.1	1.04	Irregular
SexA	10:11:01.0	-04:41:34	11.8	10.1	1.32	Irregular
Antlia	10:04:04.1	-27:19:54	16.1	12.7	1.32	Irregular
NGC3109	10:03:07.2	-26:09:35	10.3	7.5	1.32	Irregular
SexB	10:00:00.0	05:19:55	11.8	9.5	1.36	Irregular
UGC04879	09:16:02.3	52:50:24	13.8	11.5	1.36	Irregular
HIZSS003	07:00:29.2	-04:12:29	18.0	11.3	1.67	Irregular
ESO294-010	00:26:33.4	-41:51:20	15.5	14.0	1.92	Irregular
Sag dSph	18:55:03.0	-30:28:41	4.5	-0.2	0.02	Dwarf Spheroidal
UMin	15:09:11.2	67:12:51	11.9	7.6	0.06	Dwarf Spheroidal
Draco	17:20:01.3	57:54:33	10.9	6.6	0.08	Dwarf Spheroidal
SexDSph	10:13:03.0	-01:36:51	11.3	7.0	0.09	Dwarf Spheroidal
Sculptor	01:00:09.4	-33:42:33	10.0	5.9	0.09	Dwarf Spheroidal
Carina	06:41:36.6	-50:57:57	11.3	6.9	0.10	Dwarf Spheroidal
Fornax	02:39:54.7	-34:31:32	9.2	5.1	0.14	Dwarf Spheroidal
Hercules	16:31:01.9	12:47:30	15.0	10.6	0.15	Dwarf Spheroidal
LeoII	11:13:29.3	22:09:16	12.6	8.4	0.21	Dwarf Spheroidal
CVnI	13:28:03.4	33:33:20	13.9	9.7	0.22	Dwarf Spheroidal
And XVI	00:59:29.8	32:22:36	15.7	11.3	0.52	Dwarf Spheroidal
And XXIV	01:18:29.9	46:21:57	17.2	12.7	0.60	Dwarf Spheroidal

Table 2—Continued

Galaxy	RA	Dec	B mag	K mag	Distance (Mpc)	Morphology
NGC0185	00:38:57.8	48:20:09	9.9	6.5	0.61	Dwarf Spheroidal
Bol520	00:50:42.4	32:54:59	16.2	13.3	0.63	Dwarf Spheroidal
And X	01:06:33.8	44:48:15	16.7	12.1	0.63	Dwarf Spheroidal
And II	01:16:29.6	33:25:09	15.1	10.7	0.65	Dwarf Spheroidal
And XIV	00:51:34.9	29:41:48	16.9	12.5	0.73	Dwarf Spheroidal
And XI	00:46:19.9	33:48:05	18.5	14.0	0.73	Dwarf Spheroidal
And I	00:45:40.0	38:02:13	13.9	9.5	0.73	Dwarf Spheroidal
And XXIII	01:29:21.8	38:43:08	15.1	10.7	0.73	Dwarf Spheroidal
NGC4489	12:30:52.3	16:45:31	13.2	9.4	15.20	Elliptical
NGC4486B	12:30:32.0	12:29:24	14.5	10.1	15.40	Elliptical
MESSIER59	12:42:02.2	11:38:49	11.0	6.7	15.50	Elliptical
MESSIER49	12:29:46.8	8:00:01	13.2	5.4	15.81	Elliptical
NGC4478	12:30:17.4	12:19:42	12.4	8.4	16.00	Elliptical
MESSIER86	12:26:11.7	12:56:46	9.8	6.1	16.08	Elliptical
NGC4473	12:29:48.9	13:25:45	11.2	7.2	16.18	Elliptical
NGC4660	12:44:32.0	11:11:25	12.1	8.2	16.40	Elliptical
MESSIER60	12:43:40.0	11:33:09	10.3	5.7	16.55	Elliptical
MESSIER87	12:30:49.4	12:23:28	9.6	5.8	16.60	Elliptical
MESSIER84	12:25:03.7	12:53:13	12.1	6.2	16.70	Elliptical
NGC4564	12:36:27.0	11:26:21	12.1	7.9	16.90	Elliptical
NGC4551	12:35:38.0	12:15:50	13.0	8.9	16.90	Elliptical
NGC4387	12:25:41.7	12:48:37	13.0	9.2	17.00	Elliptical
NGC4239	12:17:14.9	16:31:53	13.5	10.2	17.40	Elliptical
NGC4458	12:28:57.6	13:14:30	12.9	9.3	17.60	Elliptical
NGC584	01:31:20.7	-06:52:05	11.4	7.3	19.09	Elliptical

Table 2—Continued

Galaxy	RA	Dec	B mag	K mag	Distance (Mpc)	Morphology
NGC1052	02:41:04.8	-08:15:20	11.4	7.5	19.72	Elliptical
NGC596	01:32:52.1	-07:01:54	11.5	8.0	21.08	Elliptical
NGC7454	23:01:06.5	16:23:18	13.6	8.9	21.14	Elliptical
NGC1395	03:38:29.7	-23:01:39	10.7	6.9	21.27	Elliptical
NGC4365	12:24:28.3	07:19:03	11.5	6.6	21.40	Elliptical
NGC4434	12:27:36.7	08:09:15	13.2	9.2	22.10	Elliptical
NGC1426	03:42:49.1	-22:06:30	12.2	8.7	22.30	Elliptical
NGC720	01:53:00.5	-13:44:19	12.4	7.3	23.18	Elliptical
NGC1407	03:40:11.9	-18:34:48	10.6	6.7	23.26	Elliptical
NGC1172	03:01:36.0	-14:50:11	12.9	9.2	23.70	Elliptical
NGC821	02:08:21.1	10:59:41	12.2	7.9	23.92	Elliptical
NGC5638	14:29:40.4	03:13:59	12.1	8.3	24.00	Elliptical
NGC1439	03:44:50.0	-21:55:13	12.2	8.6	24.09	Elliptical
NGC5322	13:49:15.3	60:11:25	11.3	9.9	24.10	Elliptical
NGC4318	12:22:43.3	08:11:53	14.1	10.3	24.16	Elliptical
NGC636	01:39:06.5	-07:30:45	12.5	8.4	24.90	Elliptical
NGC5846	15:06:29.3	01:36:20	11.9	6.9	26.90	Elliptical
NGC3193	10:18:24.9	21:53:38	11.8	8.0	27.50	Elliptical
NGC5831	15:04:07.0	01:13:11	13.1	8.4	27.50	Elliptical
NGC5845	15:06:00.8	01:38:01	13.8	9.1	27.60	Elliptical
NGC4168	12:12:17.3	13:12:18	12.1	8.4	28.10	Elliptical
NGC3226	10:23:27.0	19:53:54	14.3	8.6	29.10	Elliptical
NGC5813	15:01:11.2	01:42:07	11.5	7.6	29.20	Elliptical

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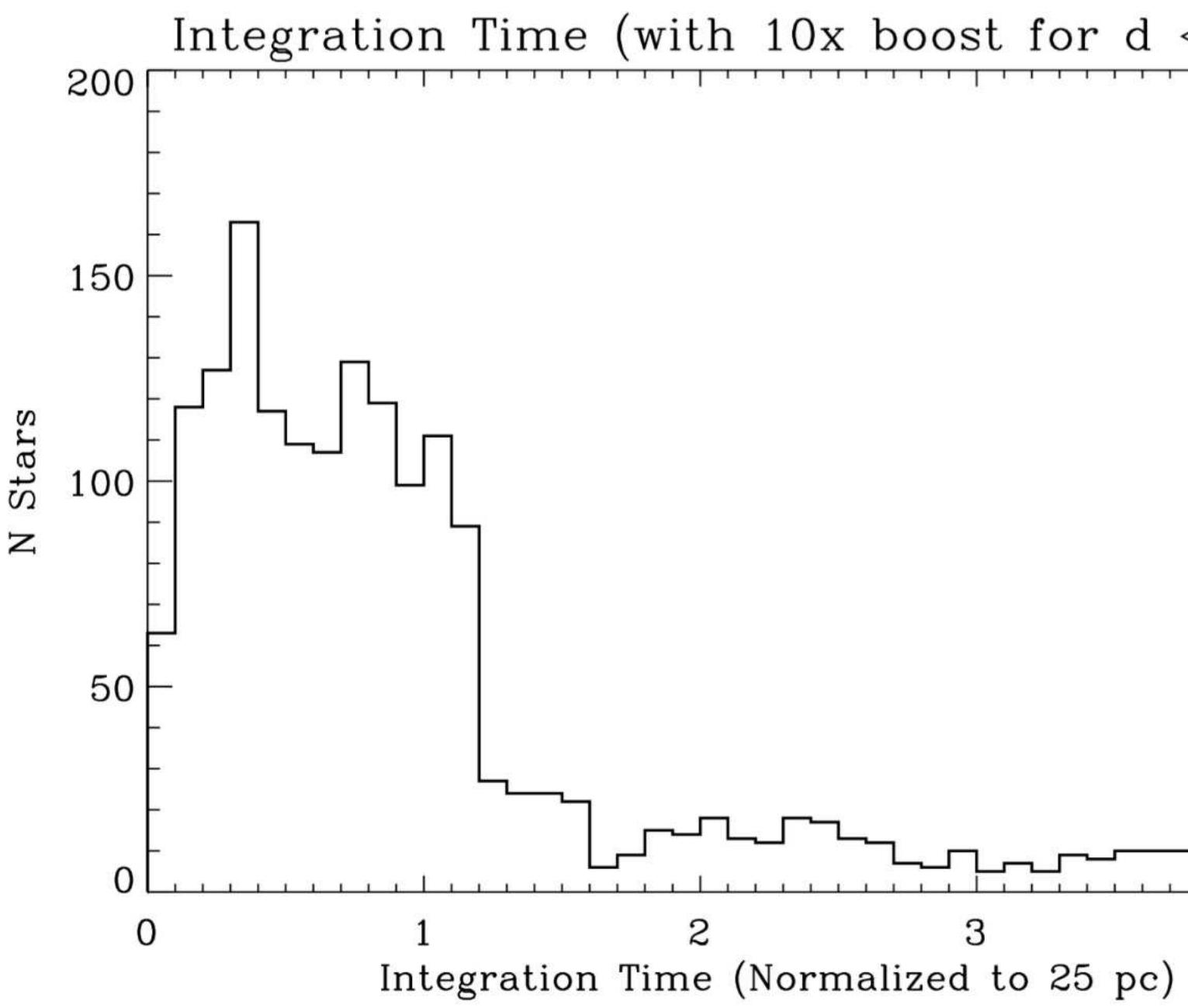
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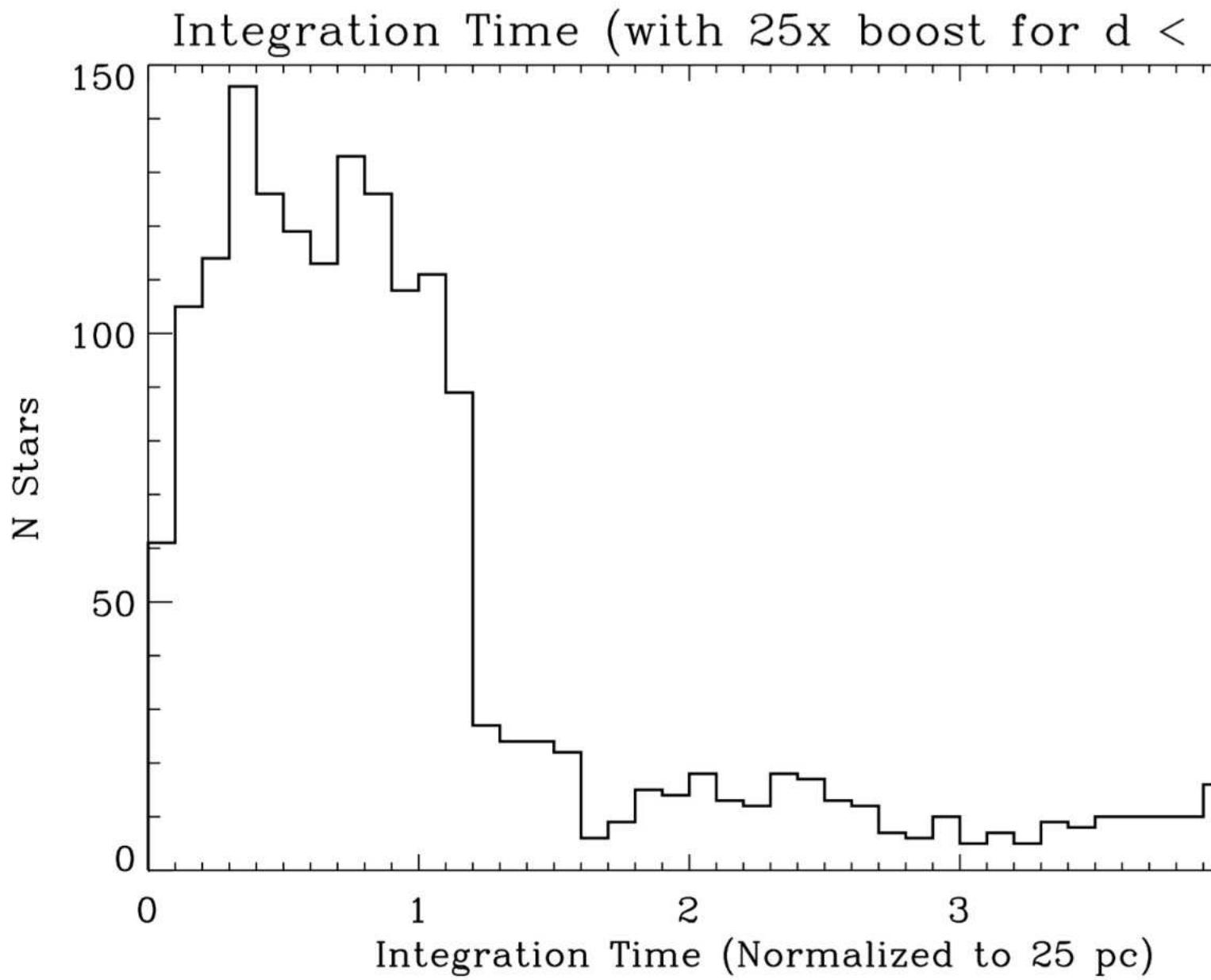
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Integration Time vs B-V

