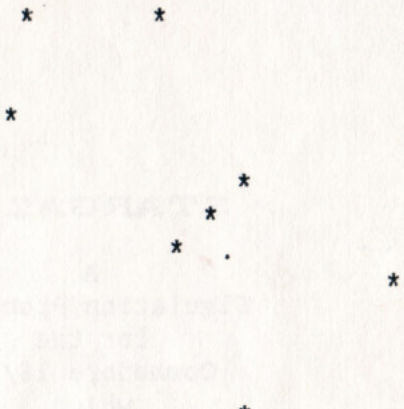

*STARGAZER C16/+4

STARGAZER

A
Simulation Programme
for the
Commodore 16/+4
which
displays
the
Night Sky.

STARGAZER

INTRODUCTION

Stargazer will accurately plot the position of the visible stars for any location on the Earth's surface at any time during this Century thereby enabling the user to identify stars by their Star name.

The Database for this programme contains approximately 1500 stars in 88 constellations and they have magnitudes of brightness down to about Magnitude 5.5.

Therefore on a clear night ALL the stars that are visible to the unaided eye are shown on the screen. Also, the rotation of the Earth may be simulated allowing you to watch the stars change position as the night progresses.

STARGAZER

LOADING TAPE

type: LOAD"",1,1

DISK

type: LOAD"star*",device,1

COMMODORE C16 UNEXPANDED ONLY

type: RUN

Stargazer is a multi-part programme which is larger, in total, than the memory size of the basic C16. Therefore it is necessary to keep the disk in the drive for the whole time that you are running the programme, as different sections of programme are loaded into memory as required.

Note: Ensure the SHIFT LOCK key is up.

STARGAZER

MAIN MENU

1. ENTER OBSERVER'S TIME AND POSITION.

2. SET TIME STEP BETWEEN OBSERVATIONS.

3. PLOT NEW SECTION OF SKY.

4. RE-DISPLAY LAST SKY PLOTTED.

5. SEARCH FOR HEAVENLY BODY.

6. SCAN DATABASE.

7. EXIT.

OPTION?

The following pages will explain fully each of the choices available.

STARGAZER

1. ENTER OBSERVER'S TIME AND POSITION.

Menu as shown below:

YEAR (1901-1999)	1990
MONTH (1-12)	7
DAY (1-28,29,30 or31)	23
HOUR (GMT)	21
MINUTE	0
LATITUDE (0-90)	52
LONGITUDE (0-359)W	0
HEMISPHERE (N/S)	N
ASPECT (N,S,SW,,, or V/VERT)	NE

The programme will not allow you to enter an illegal date, time or location. For instance 29th of February is only allowed on a Leap year.
Note also that time is entered as GMT on a 24 hour clock. Subtract 1 hour from Local time if on British Summer time.

Latitude 0 is on the Equator, and Longitude 0 is the Greenwich meridian. Degrees of Longitude are measured positive to the West, no negative figures are allowed here.

Example:
For the location Sidney, Latitude 24 deg South, Longitude 152 deg East, enter: Latitude 24. Longitude 208. Hemisphere S.

For the entry 'ASPECT' you would enter the point of the compass from which you wish to view the sky, or you may select 'V' for vertical if you wish to view the zenith, directly overhead.
The angles of view given on the screen are: 90 degrees horizontally and 60 degrees vertically from the horizon upwards, so if 'ASPECT' is South then

the left hand edge of the screen is South-East and the right hand edge is South-West.
For the overhead view the angle of view is a circle of diameter 60 degrees

After typing the required figures for each entry press the 'Return' key to move on to the next Parameter. The cursor will be positioned in the correct place for the next selection.

If you do not want to change all of the data just press 'Return' over the entries which are not to be changed.

After entering the 'ASPECT' the screen will show the message:

PRESS * TO CONTINUE

2. SET TIME STEP BETWEEN OBSERVATIONS.

To avoid having to return to the Observation menu to change only the time of observation, the Time step length may be set before plotting the sky. So that when this option is used from the sky plot prompt (see later) the screen will be cleared of stars and plotting will automatically commence corresponding to the new time.

Example:
2100hrs. 5th March 1990. Time step 3 hrs. New plot will be at 0 hrs 6th March 1990.

3. PLOT NEW SECTION OF SKY.

The screen is cleared and the programme begins to search the database of stars, beginning at 0 hrs of Right Ascension (R.A). If within the specified field of view, they are plotted with a size depending on their magnitude. During plotting, note how the stars are plotted in 'bands' of R.A. and how this angle across the screen changes at different latitudes!
As each star is plotted, information about it is printed at the bottom of the screen as follows:

Name - ALP SAGITTARIUS / BS2738 / π TAURUS.
Azimuth - Number of degrees around the horizon. North =0, East =90.
Altitude - Degrees above Horizon.

Magnitude- The larger the number the fainter the star.
Prompt - STEP/EXIT.

Pressing '/' during plotting, toggles on/off single plot mode. The backslash character changes to reverse green and one star is plotted every time a key is pressed. Note the difference between keys that normally 'auto-repeat' (space, cursor..) and normal keys(alphanumeric).
Pressing 'S' clears the screen and displays the sky for the time after the previously setup time step.
Pressing 'X' ends the database search and prompts as below.

When the database search is complete the prompt changes to:

I/STEP/MENU

Pressing 'I' will display a flashing cursor 'sight' in the middle of the screen. Move it around using the cursor keys until it is aligned with any star.

Note: Ensure at least one star is plotted before pressing 'I'.

Use any combination of the Shift, Commodore and Control keys (plus cursor) to move more quickly to the desired star. Shift *1, Comm *2, Ctrl *4, - All *7.

Press the F1 key to start the database search, the name of the star will be displayed with it's Right Ascension, Declination and Magnitude. After viewing the name, press any key (twice - if no others are found) to show next prompt.

4. RE-DISPLAY LAST SKY PLOTTED.

This option allows you to return to a previously plotted sky, if certain conditions are met.

1. The observation details have not been changed.

2. The sky display has not been overwritten by another part of the programme. *

A short message will be briefly displayed if this option is not allowed, before beginning a new plot, as menu option 3.

* Un-expanded C16 only

5. SEARCH FOR HEAVENLY BODY.

Date, time and observer's location are initially displayed. Then the prompt:

ENTER B.S. NO. OR CONSTELLAT./NAME.

The programme is asking for either a Bright Star Catalogue Number, name of a Constellation or the Old Name of a star.

Example:
Enter BS 118 or BS8959. For 3 figure numbers the space is important.
Or GEMINI or PEGASUS.
Or BETELGEUSE or ALMAAK.

If you choose to enter a Constellation name then a further prompt appears:

ENTER IDENTIFIER.

Now type in the designation of the target star. ALPHA, BETA.. EPSILON etc.

Note: You only need type as many characters as is necessary to uniquely identify the name.

ALP=Alpha PEG=Pegasus LEO MI=Leo Minor

Once the full name has been accepted as correct the programme searches the database for a match and when it is found it will display the name along with it's Right Ascension and Declination (equivalent to Terrestrial longitude and latitude) and Magnitude.

The programme then calculates if the star is above the horizon for the current time and place and, if so, it will display the Azimuth, Altitude and Magnitude.

6. SCAN DATABASE.

As it says, each entry is printed to the screen.

```
                R.A     Dec    Mag
THE OCTANS      .01   -77.2   4.8     EXIT
```

Press a key to progress through the database. Keys which normally repeat (cursor keys,space) will scroll through the Database quickly. Keys which don't repeat normally will step onwards by one entry at each key-press.

Use the minus key to reverse direction through the database, and the plus key to go forwards again.

7. EXIT.

Exit to Basic. The programme remains intact and may be run again, if required.

Current Observational details will be lost, and the programme will start with the original stored values.(C16 U only)

Note: Use of colour in the programme.

Instructions / messages appear in Orange.
Prompts appear in Red with reverse video highlighting the letter of the key to press.
Values shown in Light Blue are Right Ascension, Declination and Magnitude.
Values shown in Light Green are Azimuth, Altitude and Magnitude.

NOTES ON USE

Note during plotting, the names and positions of the brightest stars (using single plot if necessary), so that when plotting is complete the user can trace out, using the ID facility, the main stars in a particular constellation.

OR

Use Search for alpha, beta, gamma etc. of a particular constellation to find the position information, and then set up the Observation Details to view that portion of the sky. Confirm with the ID.

When 'ID'ing a bright star, ensure that the cursor sight position is exactly in the centre of the object. An error of two pixels in any direction may be sufficient to 'miss' the entry in the database!

APPENDIX

List of Constellations		Area sq°
Andromeda	Daughter of Cepheus	722
Antilia	The Air Pump	239
Apus	Bird of Paradise	206
Aquarius	Water Bearer	980
Aquila	The Eagle	652
Ara	The Alter	237
Aries	The Ram	441
Auriga	The Charioteer	657
Bootes	The Bear Driver	907
Caelum	The Sculptor's Chisel	125
Camelopard.	The Giraffe	757
Canes Vene.	The Hunting Dogs	465
Canis Majo.	The Greater Dog	380
Canis Mino.	The Lesser Dog	183
Cancer	The Crab	506
Capricorn	The Goat	414
Carina	The Keel (of Argo)	494
Cassiopeia	Mother of Andromeda	598
Centaurus	The Centaur	1060
Cepheus	King of Ethiopia	588

APPENDIX

Constellations (contd)		
Cetus	Sea Monster(Whale)	1231
Chamaeleon	The Chameleon	132
Circinus	The Compasses	93
Columba	The Dove	270
Coma Beren.	Berenice's Hair	386
Corvus	The Crow/Raven	184
Corona Aus.	Southern Crown	128
Corona Bor.	Northern Crown	179
Crater	The Cup	282
Crux	Southern Cross	68
Cygnus	The Swan	804
Delphinus	The Dolphin	189
Dorado	The Swordfish	179
Draco	The Dragon	1083
Equuleus	The Foal	72
Eridanus	The River	1138
Fornax	The Laboratory Furnace	398
Gemini	The Twins	514
Grus	The Crane	366
Hercules	Hercules	1225

Constellations (contd)

Horologium	The Clock	249
Hydra	The Water Serpent	1303
Hydrus	The Water Snake	243
Indus	The American Indian	294
Lacerta	The Lizard	201
Leo Major	The Lion	947
Leo Minor	The Lion Cub	232
Lepus	The Hare	290
Libra	The Scales or Balance	538
Lupus	The Wolf	334
Lynx	The Lynx	545
Lyra	The Lyre	286
Mensa	The Table Mountain	153
Microscopi.	The Microscope	210
Monoceros	The Unicorn	482
Musca	The Fly	138
Norma	The Carpenter's Square	165
Octans	The Octant	291
Ophiuchus	The Serpent Holder	948
Orion	The Great Hunter	594

Constellations (contd)

Pavo	The Peacock	378
Pegasus	The Winged Horse	1121
Perseus	The Hero,Son of Zeus	615
Phoenix	The Phoenix	469
Pictor	The Painter's Easel	247
Pisces	The Fishes	889
Piscis Aus.	The Southern Fish	245
Puppis	The Stern(of Argo Navis	673
Pyxis	The Compass Box	221
Reticulum	The Net	114
Sagitta	The Arrow	80
Sagittariu.	The Archer	867
Scorpius	The Scorpion	497
Sculptor	The Sculptor's Workshop	475
Scutum	The Shield	109
Serpens	The Serpent	637
Sextans	The Sextant	314
Taurus	The Bull	797
Triang.A.	The Southern Triangle	110
Triangulum	The Triangle	132

APPENDIX

Constellations (contd)		
Telescopiu.	The Telescope	252
Tucana	The Toucan	295
Ursa Major	The Great Bear	1280
Ursa Minor	The Lesser Bear	256
Vela	The Sail(of Argo Navis)	500
Virgo	The Virgin or Maiden	1294
Volans	The Flying Fish	141
Vulpecula	The Fox	268

The names above have been truncated to 10 letters to fit on the display. Following are the full names of those which have been shortened.

Camelopardus	Canes Venetices
Canis Major	Canis Minor
Coma Berenices	Canes Venetices
Microscopium	Piscis Australis
Sagittarius	Triangulum Australis
Telescopium	

APPENDIX

The Greek Alphabet

α = Alpha	ν = Nu
β = Beta	ξ = Xi
γ = Gamma	o = Omicron
δ = Delta	π = Pie
ϵ = Epsilon	ρ = Rho
ζ = Zeta	σ = Sigma
η = Eta	τ = Tau
θ = Theta	υ = Upsilon
ι = Iota	ϕ = Phi
κ = Kappa	χ = Chi
λ = Lambda	ψ = Psi
μ = Mu	ω = Omega

APPENDIX

List of Star Names

Asterope	Al nasl	Aacrux	Acrab
Achernar	Alamech	Acamar	Adara
Aldebaran	Albireo	Adhara	Agena
Alderamin	Alcyone	Alhena	Alcor
Alphecca	Algenib	Alioth	Algol
Alphekka	Algeiba	Alkaid	Ankaa
Alpheratz	Algieba	Almak	Arkab
Arcturus	Al kaff	Almaak	Arneb
Belatrix	Alnilam	Alnair	Atlas
Benetnasch	Alnitak	Nath	Avior
Betelgeuse	Alfirk	Alnath	Caph
Cor caroli	Alphard	Altair	Chaph
Cor hydrae	Alphirk	Alwaid	Deneb
Denebola	Alshaim	Arided	Dubhe
Fomalhaut	Antares	Aridif	Enif
Kaus australis	Azimech	Castor	Errai
Kornephoros	Canopus	Difda	Furud
Menkalinam	Capella	Diphda	Gemma
Menkalinan	Electra	Etamin	Hadar
Mesarthim	Eltanin	Gacrux	Hamal

APPENDIX

Miaplacido	El nath	Markab	Izar
Pherkad major	Gomeisa	Megrez	Juba
Pleiades	Menkent	Menkar	Kocab
Pulcherrimma	Mintaka	Merope	Maia
Rastaban	Mirfak	Mimosa	Merak
Rasalgethi	Mirphak	Mirach	Media
Ras alhague	Murzim	Mirzam	Mira
Rasalhague	Polaris	Nekkar	Mizar
Rasalague	Pleione	Phecda	Nibal
Rigel kent	Procyon	Pollux	Nihal
Sadachbia	Regulus	Rukbat	Nunki
Sadalmelik	Schedar	Scheat	Phad
Sadalsud	Shedar	Shaula	Rigel
Sharatan	Seginus	Shedir	Sabik
Sheratan	Sheliak	Sirius	Sadr
Sulaphat	Talitha	Sirrah	Saiph
Unukalhai	Tarazed	Spica	Skat
Vindemiatrix	Taygeta	Suhail	Tsih
Zavijava	Wezen	Thuban	Vega
Zubenesch	Zarijan		
Zuben el genubi			

APPENDIX

Because there are often many different ways to spell certain star names, only the most common spellings are included in the list. (see below)

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