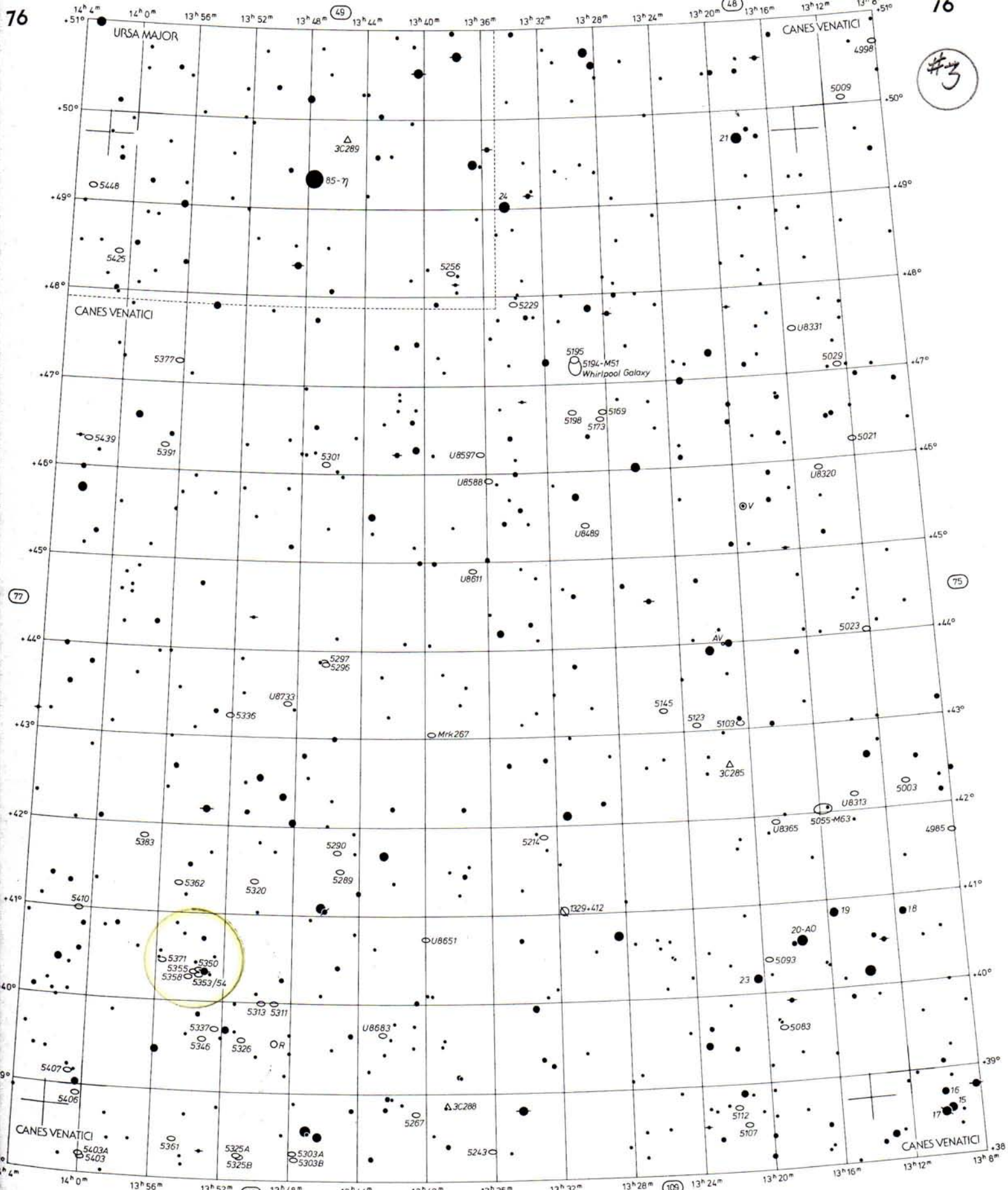


Center of Coma Cluster

#1

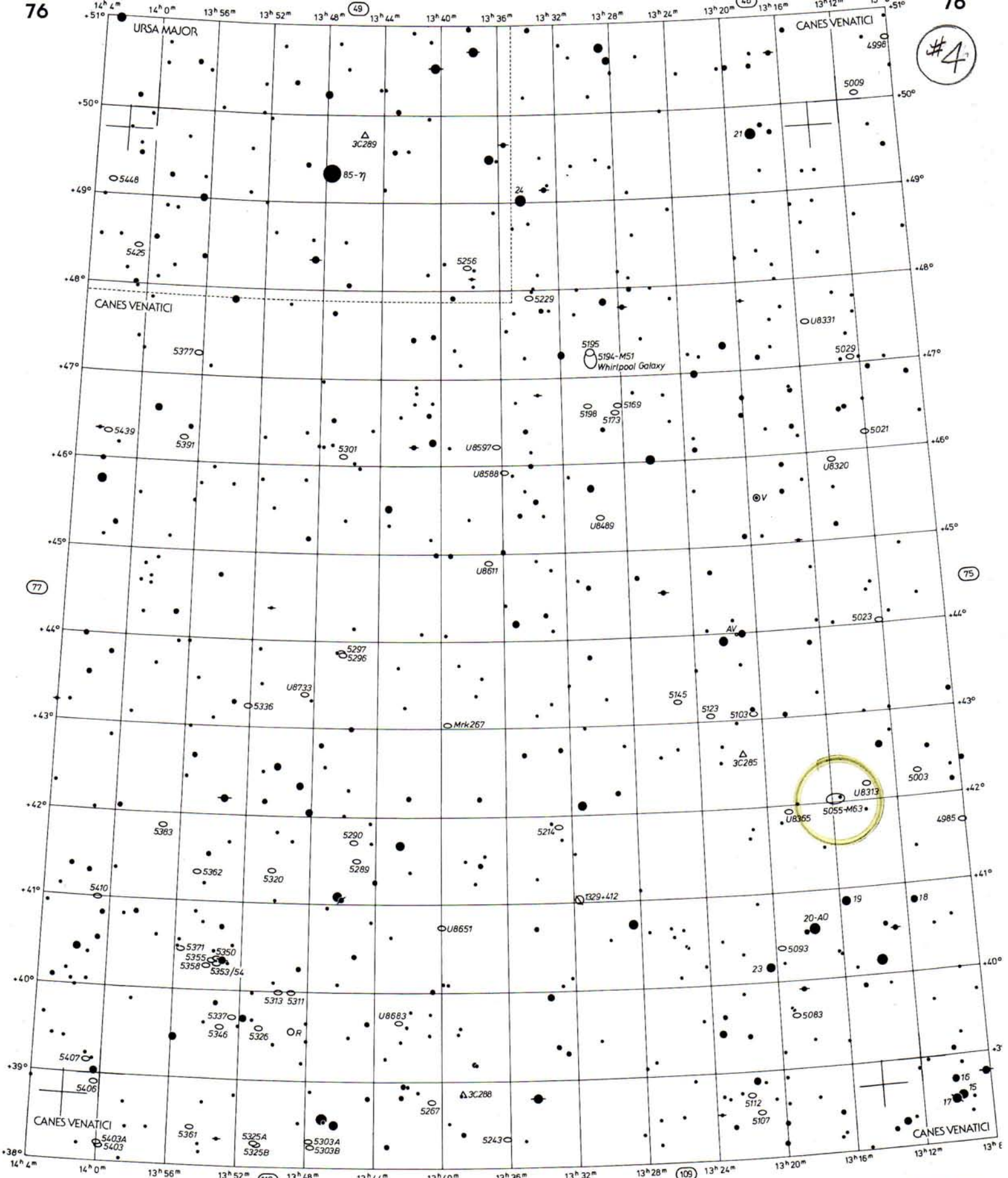


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STELLAR MAGNITUDES <p>-1 0 1 2 3 4 5 6 7 8 9 >9.5</p>	DOUBLE OR MULTIPLE STARS <p>VARIABLE STARS </p>	OPEN STAR CLUSTERS <p>to scale <5'</p>	GLOBULAR STAR CLUSTERS <p>to scale <5'</p>	PLANETARY NEBULAE <p>>120" 120"-60" 60"-30" <30"</p>	BRIGHT NEBULAE <p>to scale 10'-5' <5'</p>	DARK NEBULAE <p>to scale 10'-5' <5'</p>	GALAXIES <p>to scale <5'</p>	QUASAR □ RADIO SOURCE △ X-RAY SOURCE ×
--	---	---	---	--	--	--	---	---

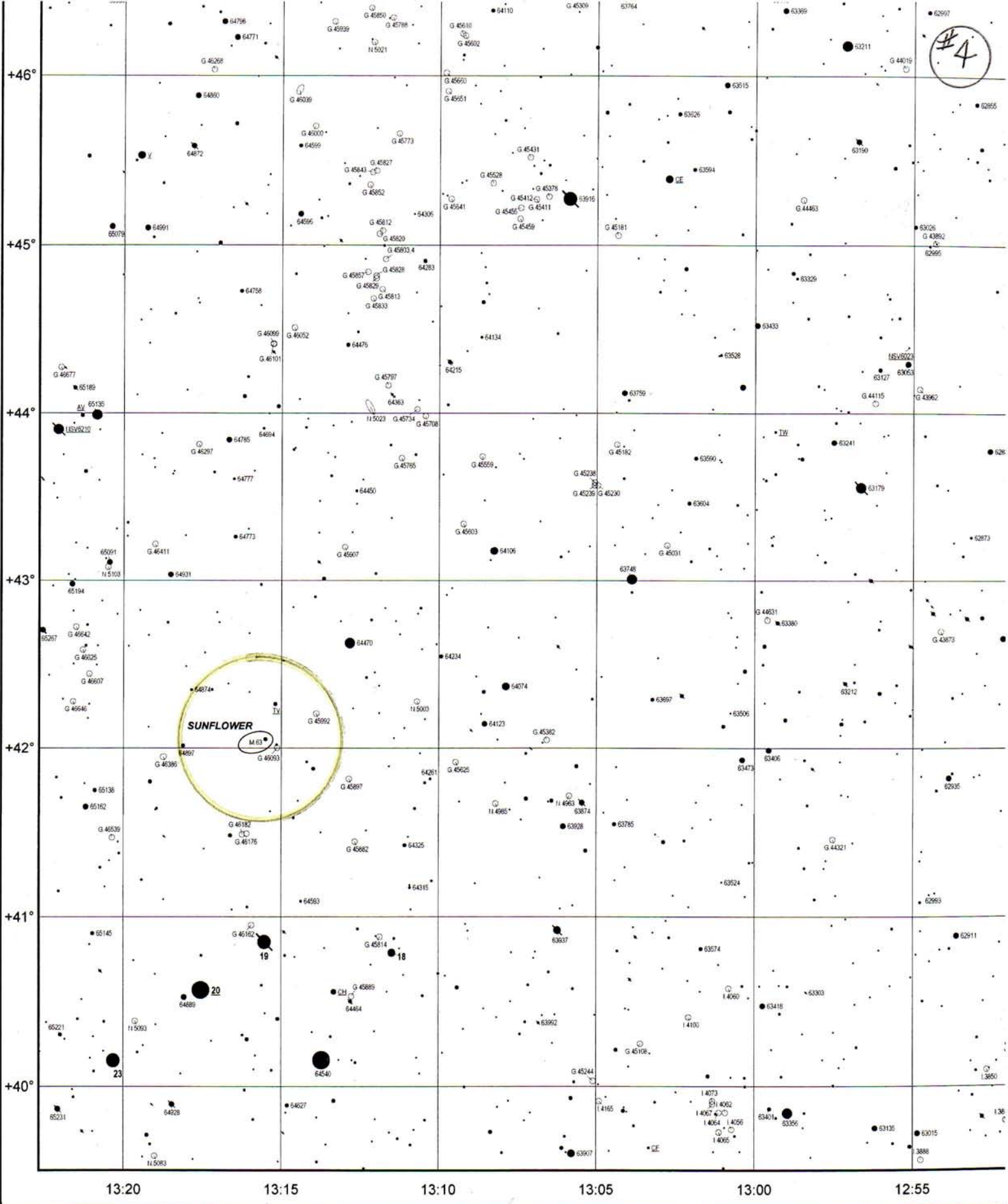
Bary Ruppel & Wil Jira

#4

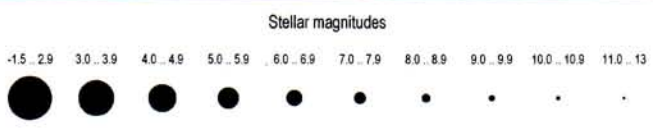


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STELLAR MAGNITUDES 	DOUBLE OR MULTIPLE STARS 	OPEN STAR CLUSTERS 	GLOBULAR STAR CLUSTERS 	PLANETARY NEBULAE 	BRIGHT NEBULAE 	DARK NEBULAE 	GALAXIES 	QUASAR RADIO SOURCE X-RAY SOURCE
-1 0 1 2 3 4 5 6 7 8 9 >9.5	VARIABLE STARS 	to scale < 5'	to scale < 5'	> 120" 120" - 60" 60" - 30" < 30"	to scale 10' - 5' < 5'	to scale 10' - 5' < 5'	to scale < 5'	



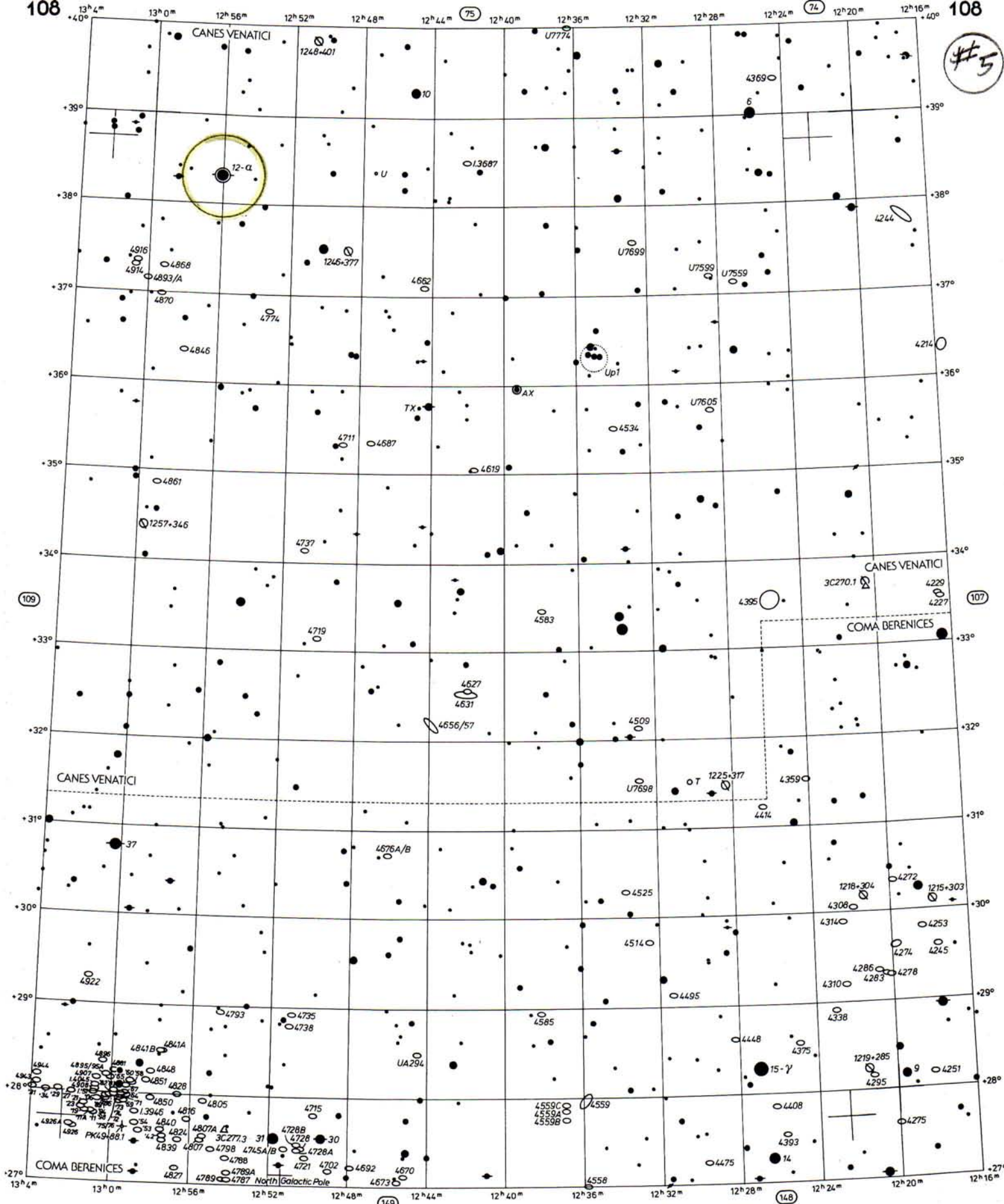
50



Double or multiple stars
Individual components are plotted if separation exceeds 36"

Symbols and catalogue numbers of stars
 J. Bayer, 1603 Uranometria
 J. Flamsteed, 1725 Hist. Coelestis Britannica
 ESA, 1997 Hipparcos cat.
 α ... (○) 1 .. 140 1 .. 118322

Variable stars
 RR V334 USV1234
 (○) 140



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STELLAR MAGNITUDES 	DOUBLE OR MULTIPLE STARS 	OPEN STAR CLUSTERS 	GLOBULAR STAR CLUSTERS 	PLANETARY NEBULAE 	BRIGHT NEBULAE 	DARK NEBULAE 	GALAXIES 	QUASAR	RADIO SOURCE	X-RAY SOURCE
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12:25

12:20

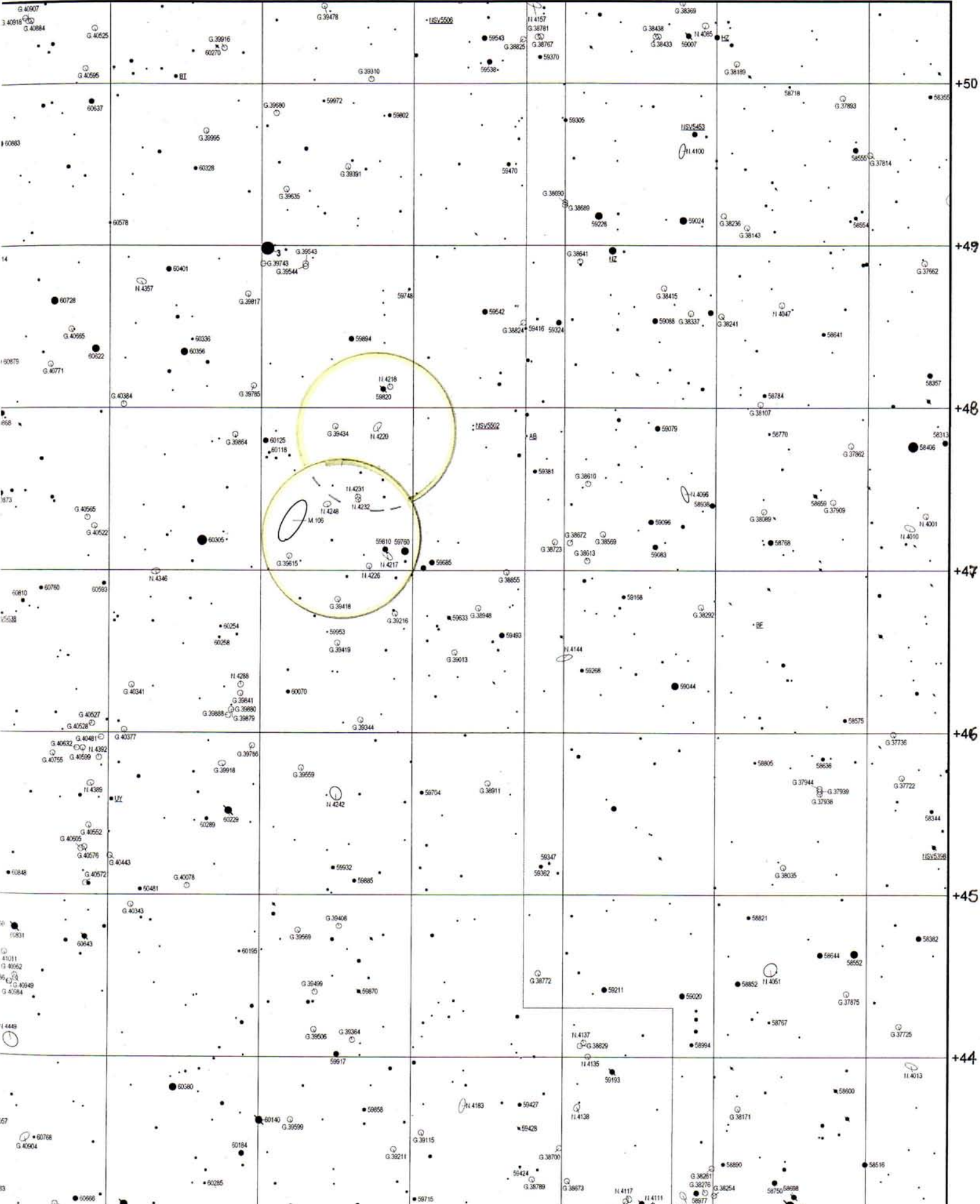
12:15

12:10

12:05

12:00

CVn UMa



+50

+49

+48

+47

+46

+45

+44

63

57

50

45

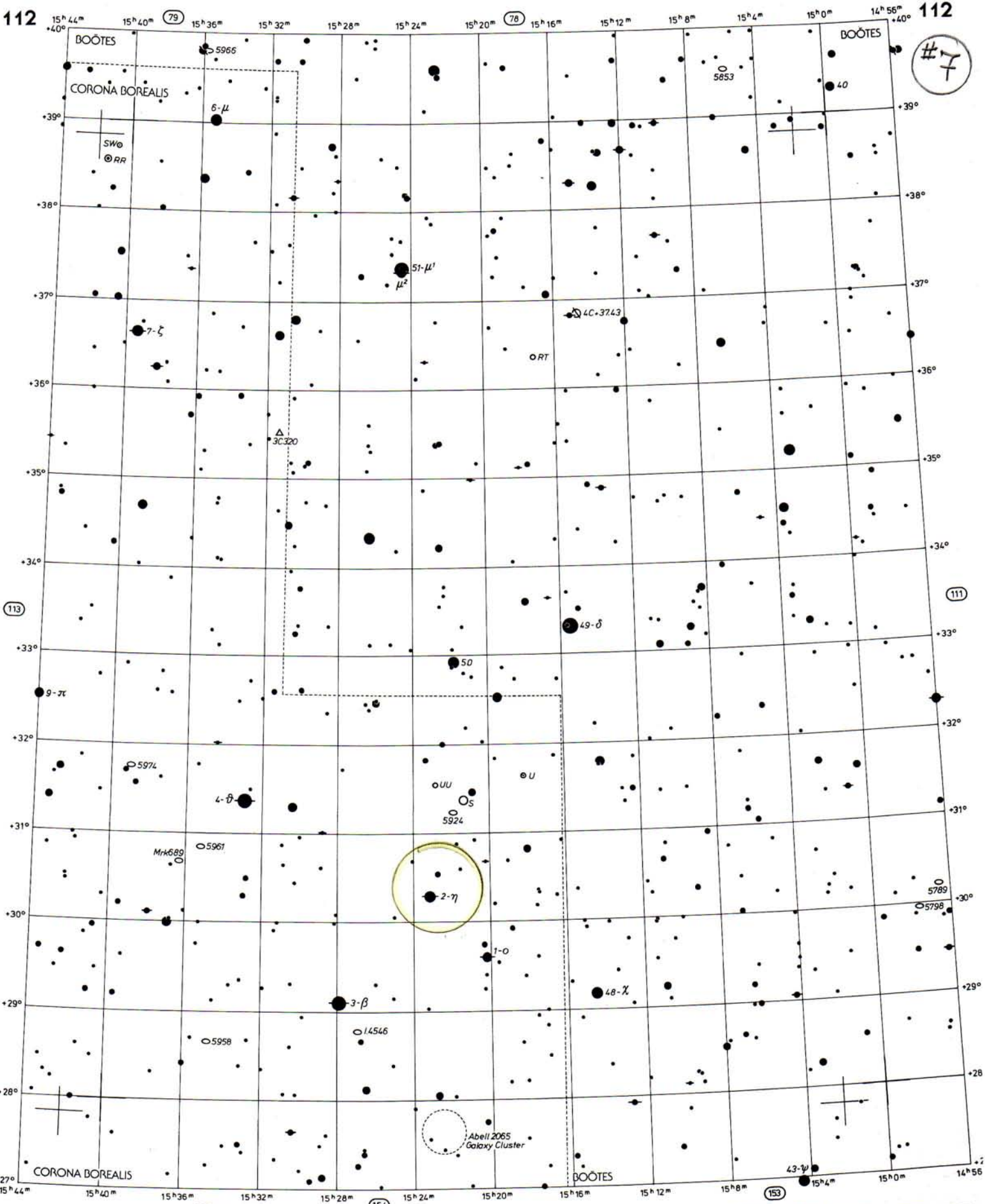
37

36

14

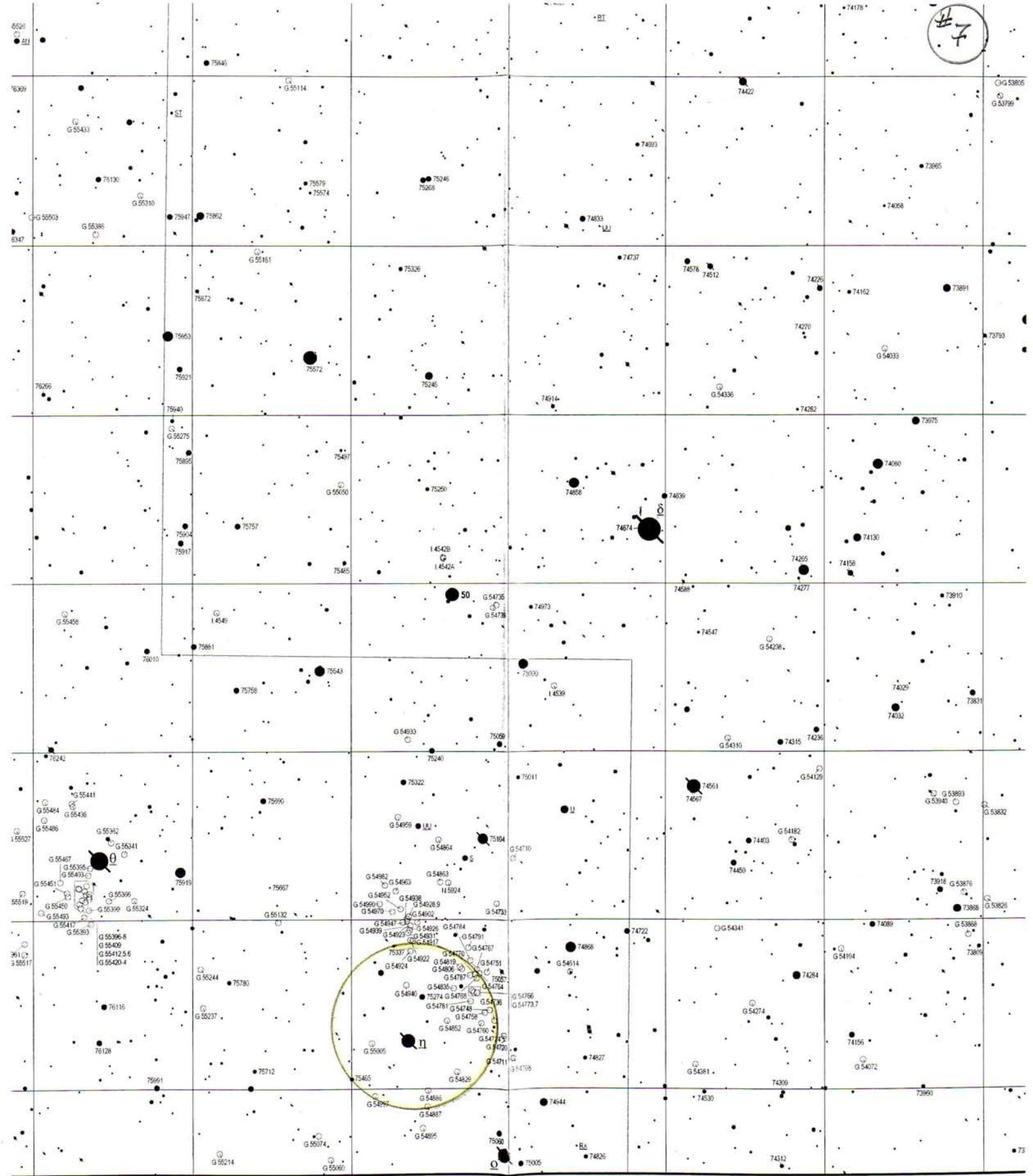
60883

3 40918 G.40884



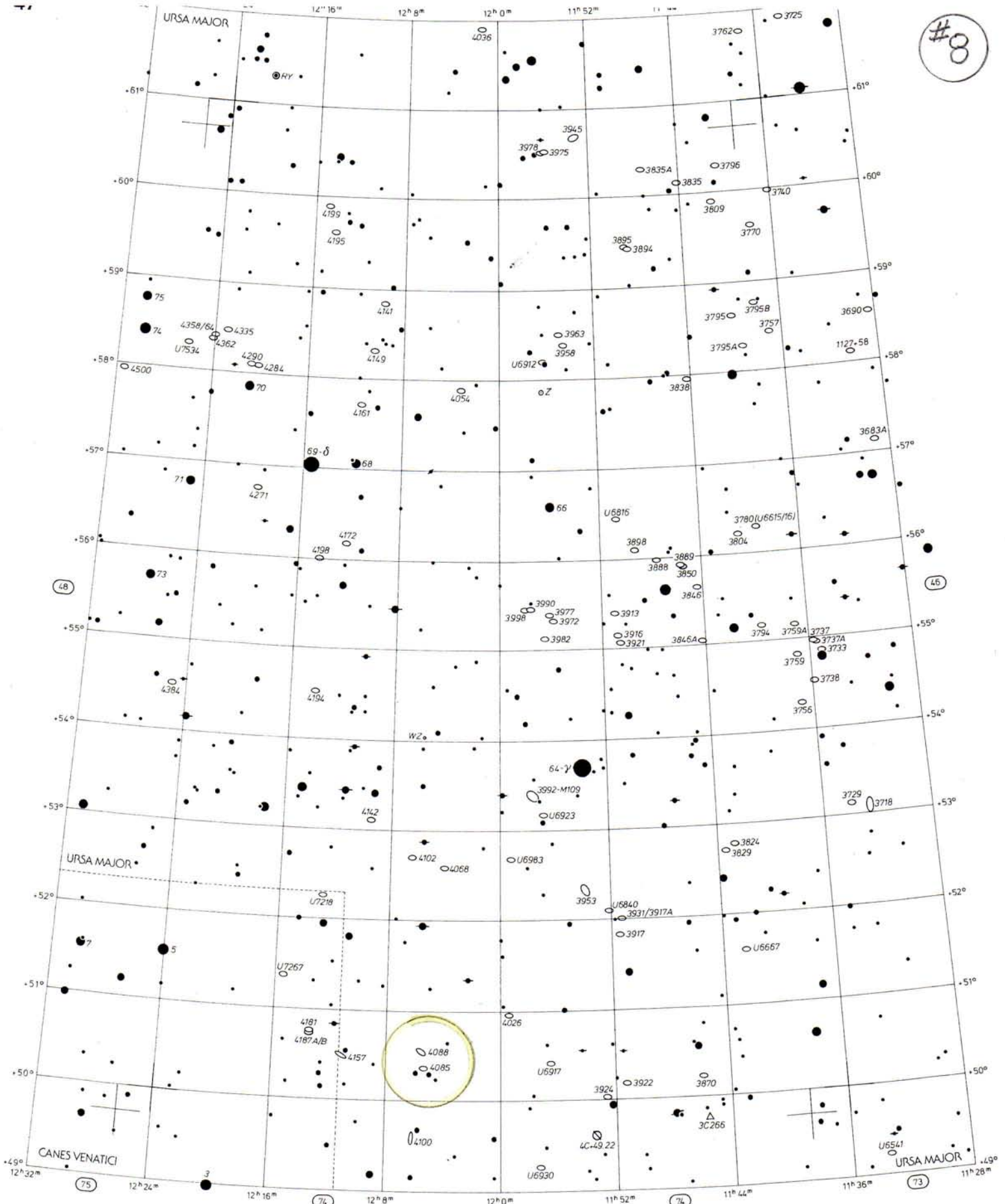
©1987 WILLMANN-BELL, INC.

STELLAR MAGNITUDES <p>-1 0 1 2 3 4 5 6 7 8 9 >9.5</p>	DOUBLE OR MULTIPLE STARS <p>VARIABLE STARS </p>	OPEN STAR CLUSTERS to scale <5'	GLOBULAR STAR CLUSTERS to scale <5'	PLANETARY NEBULAE >120" 120"-60" 60"-30" <30"	BRIGHT NEBULAE to scale 10'-5' <5'	DARK NEBULAE to scale 10'-5' <5'	GALAXIES to scale <5'	QUASAR ⊠ RADIO SOURCE △ X-RAY SOURCE ×
--	--	---	---	--	--	--	-------------------------------------	---



15:35 15:30 15:25 15:20 15:15 15:10 15:05

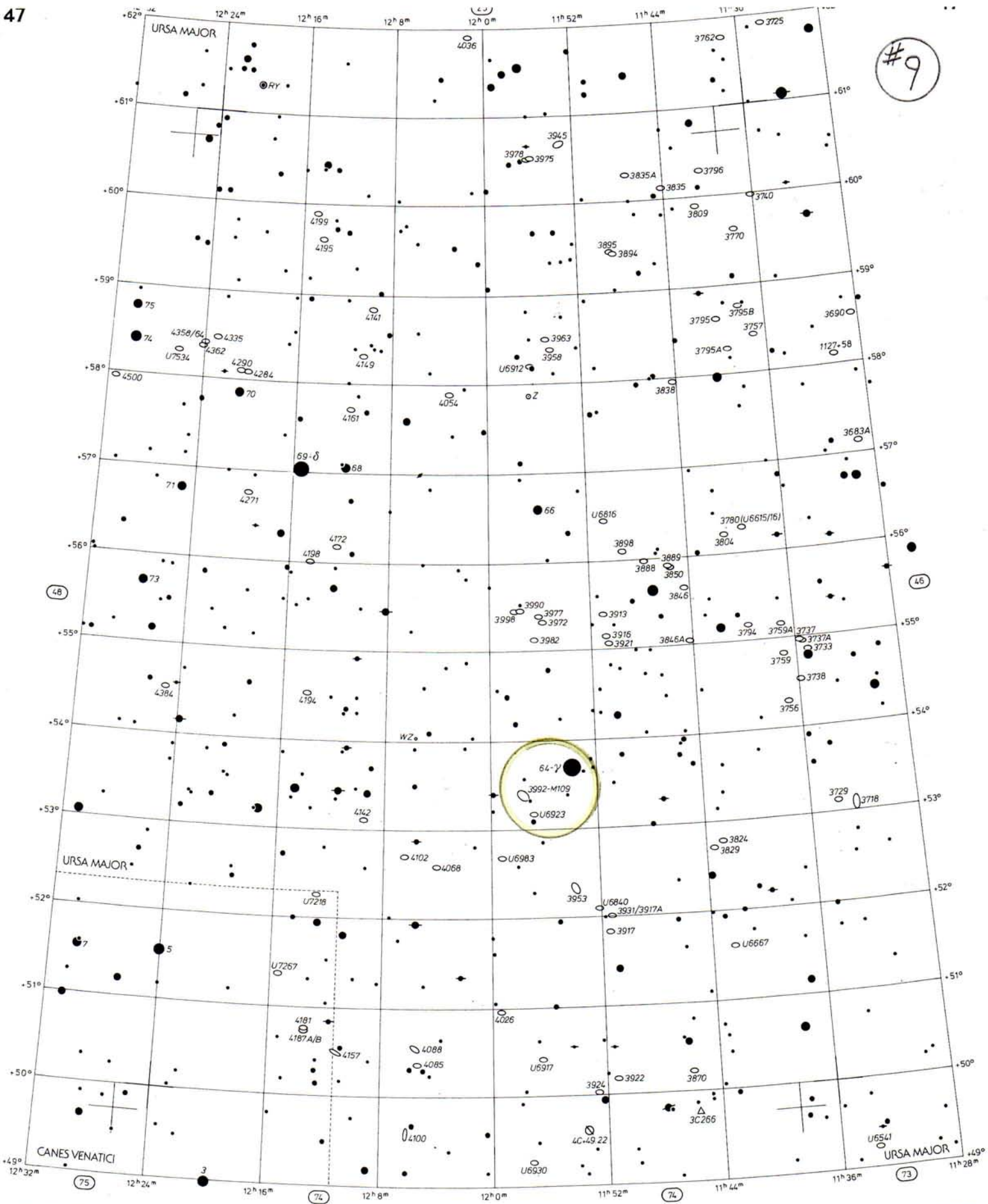
Variable stars	Catalogue numbers of nonstellar objects					Galaxies	Globular clusters	Open clusters	Planetary nebulae	Bright nebulae	Nonstellar objects shown to scale
BE V334 USV1234	Messier	NGC	IC	PGC	Sh-2	RCW	<8.0	8.0-10.0	>10.0		
(O) 140	M 110	I 1740	I 5366	G 73187	S 313	R 182					



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STELLAR MAGNITUDES	DOUBLE OR MULTIPLE STARS	OPEN STAR CLUSTERS	GLOBULAR STAR CLUSTERS	PLANETARY NEBULAE	BRIGHT NEBULAE	DARK NEBULAE	GALAXIES	QUASAR	RADIO SOURCE	X-RAY SOURCE
 -1 0 1 2 3 4 5 6 7 8 9 >9.5	 VARIABLE STARS 	 to scale <5'	 to scale <5'	 >120" 120"-60" 60"-30" <30"	 to scale 10'-5' <5'	 to scale 10'-5' <5'	 to scale <5'			

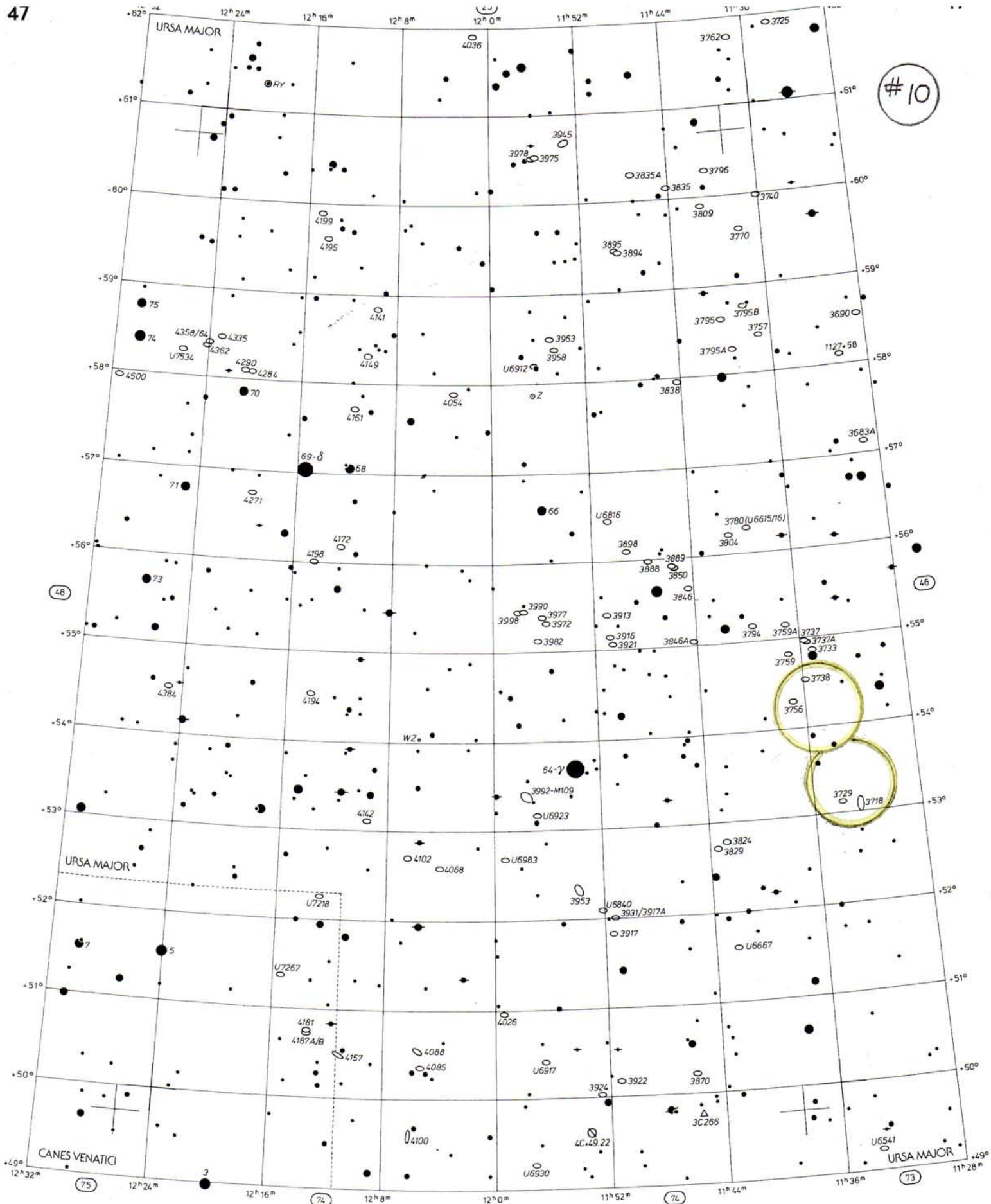
#9



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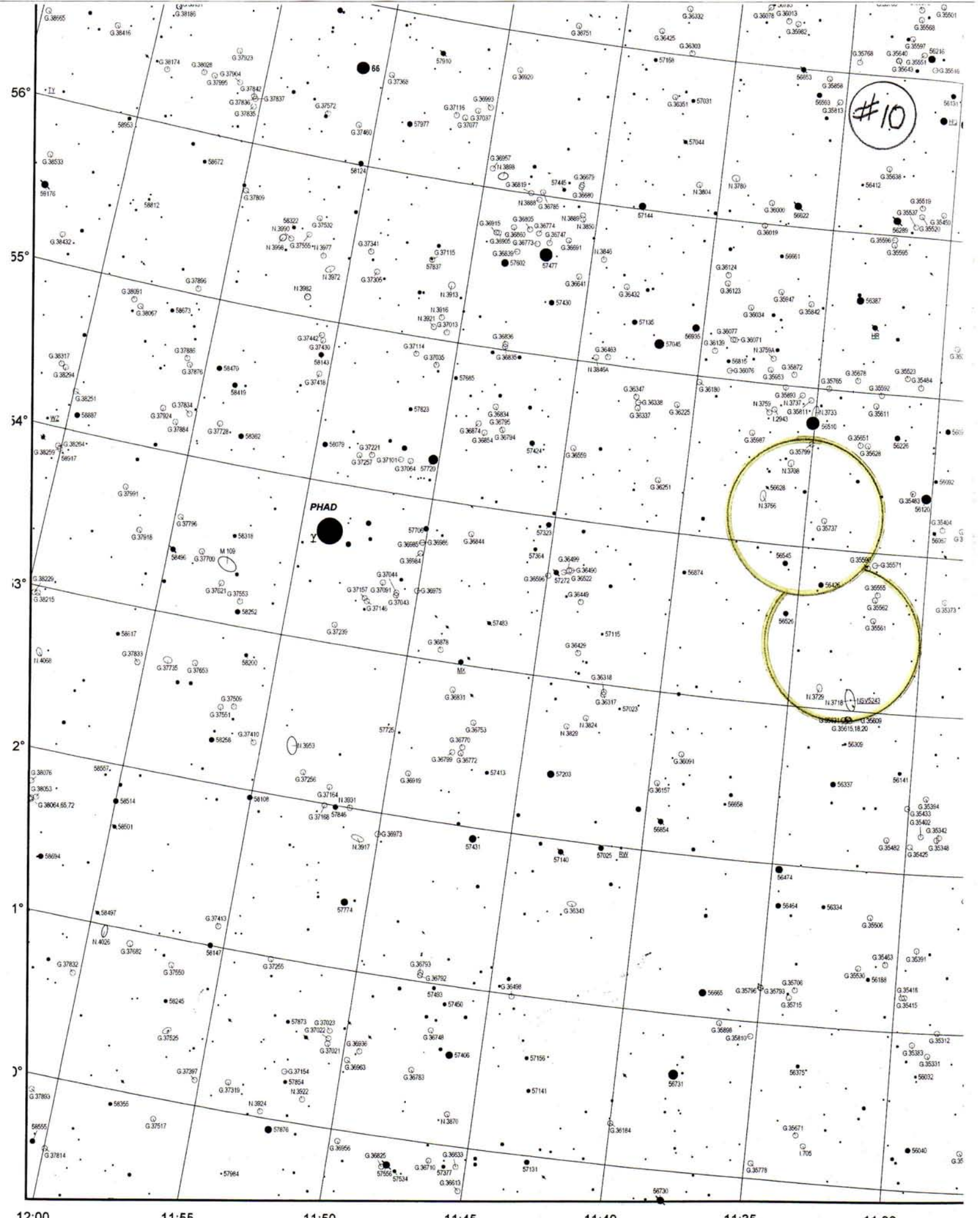
<p>STELLAR MAGNITUDES</p> <p>● -1 ● 0 ● 1 ● 2</p> <p>● 3 ● 4 ● 5 ● 6 ● 7 ● 8 ● 9 ● >9.5</p>	<p>DOUBLE OR MULTIPLE STARS</p> <p>● ● ● ● ●</p> <p>VARIABLE STARS</p> <p>● ○ ● ● ●</p>	<p>OPEN STAR CLUSTERS</p> <p>○ ○ ○ ○ ○</p> <p>to scale < 5'</p>	<p>GLOBULAR STAR CLUSTERS</p> <p>⊕ ⊕ ⊕ ⊕ ⊕</p> <p>to scale < 5'</p>	<p>PLANETARY NEBULAE</p> <p>◇ >120"</p> <p>◇ 120"-60"</p> <p>◇ 60"-30"</p> <p>◇ <30"</p>	<p>BRIGHT NEBULAE</p> <p>☁ to scale</p> <p>□ 10'-5'</p> <p>□ <5'</p>	<p>DARK NEBULAE</p> <p>☁ to scale</p> <p>☐ 10'-5'</p> <p>☐ <5'</p>	<p>GALAXIES</p> <p>○ ○ ○ ○ ○</p> <p>to scale < 5'</p>	<p>QUASAR ○</p> <p>RADIO SOURCE △</p> <p>X-RAY SOURCE ×</p>
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#10



STELLAR MAGNITUDES 	DOUBLE OR MULTIPLE STARS 	OPEN STAR CLUSTERS 	GLOBULAR STAR CLUSTERS 	PLANETARY NEBULAE 	BRIGHT NEBULAE 	DARK NEBULAE 	GALAXIES 	QUASAR RADIO SOURCE X-RAY SOURCE
	VARIABLE STARS 							
		to scale	to scale	> 120" 120"-60" 60"-30" < 30"	to scale	to scale	to scale	< 5"
		< 5"	< 5"		10'-5' < 5'	10'-5' < 5'	< 5"	

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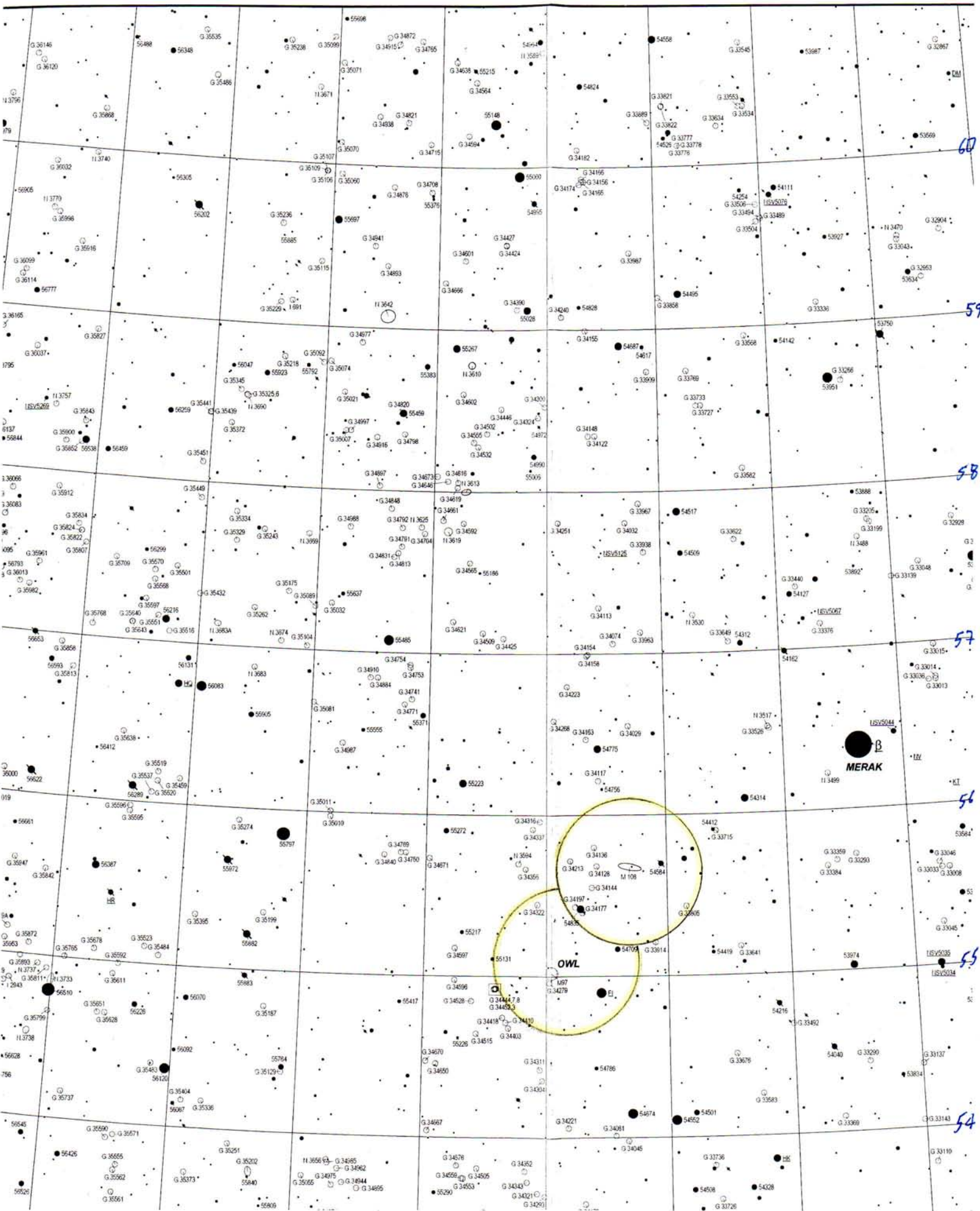
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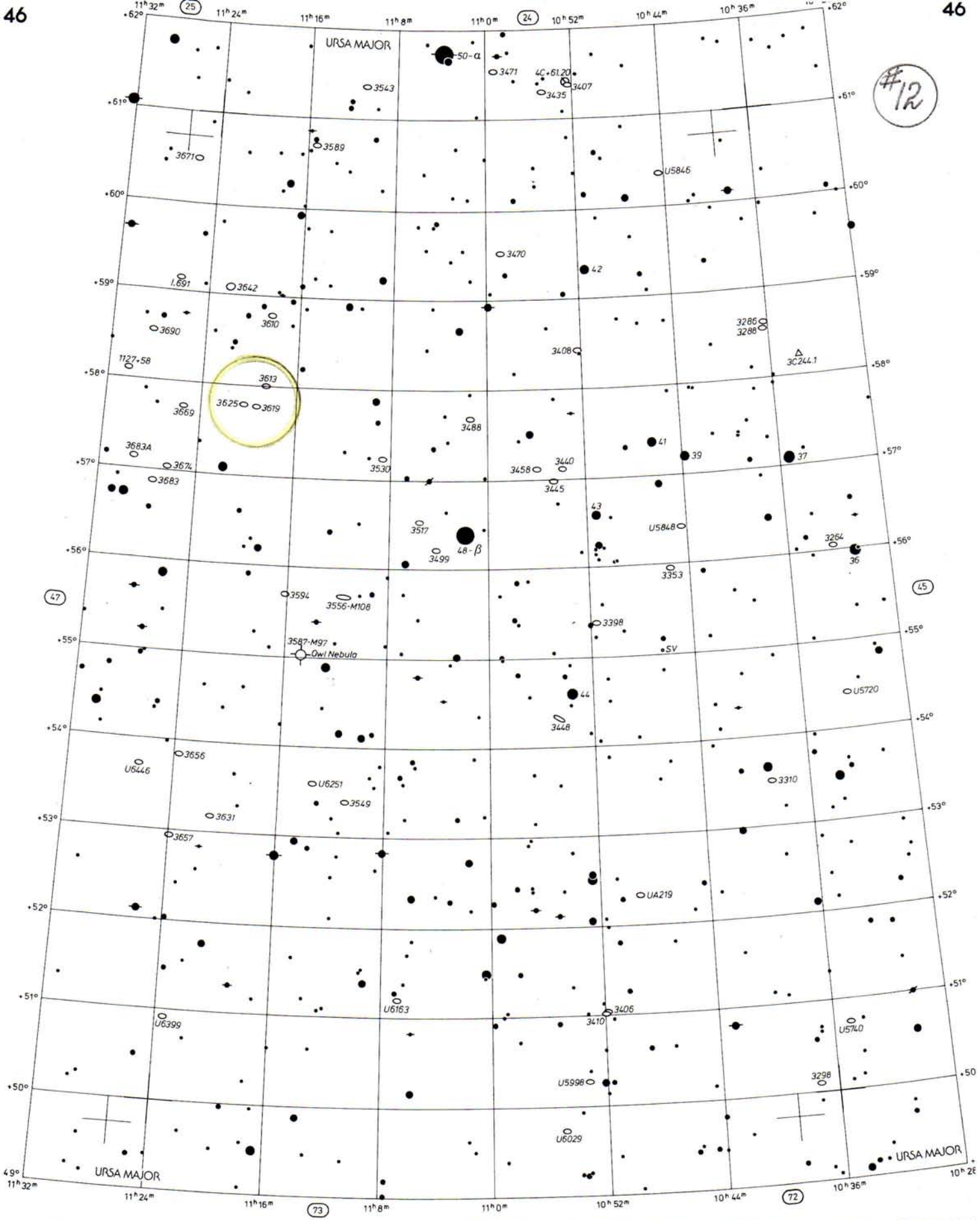
PHAD

12:00 11:55 11:50 11:45 11:40 11:35 11:30

#11

11:40 11:35 11:30 11:25 11:20 11:15 11:10 11:05 11:00 10:55



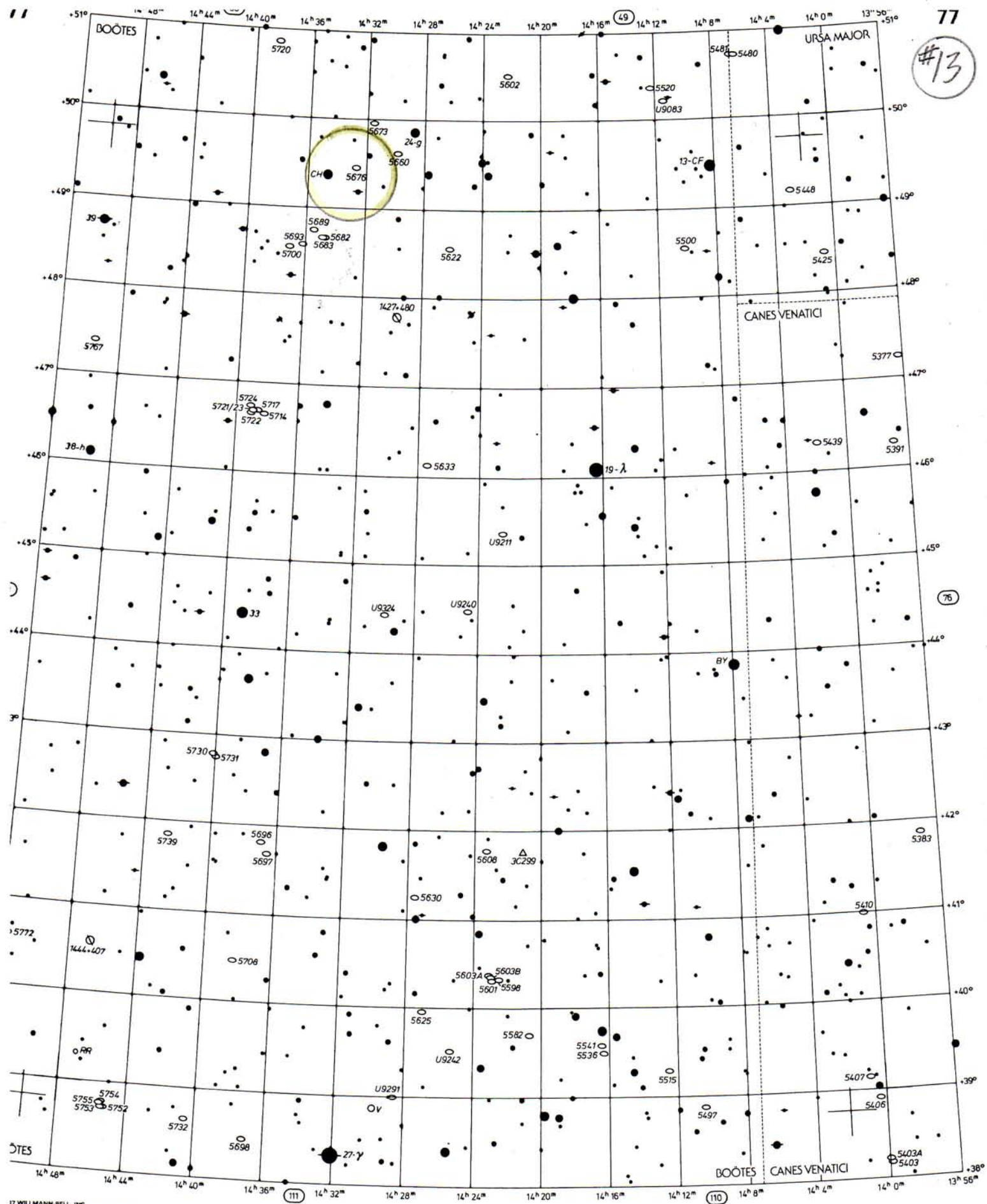


#12

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STELLAR MAGNITUDES <p>-1 0 1 2 3 4 5 6 7 8 9 >9.5</p>	DOUBLE OR MULTIPLE STARS <p>VARIABLE STARS </p>	OPEN STAR CLUSTERS to scale <5'	GLOBULAR STAR CLUSTERS to scale <5'	PLANETARY NEBULAE >120" 120"-60" 60"-30" <30"	BRIGHT NEBULAE to scale 10'-5' <5'	DARK NEBULAE to scale 10'-5' <5'	GALAXIES to scale <5'	QUASAR RADIO SOURCE X-RAY SOURCE
--	---	---	---	--	--	--	-------------------------------------	---

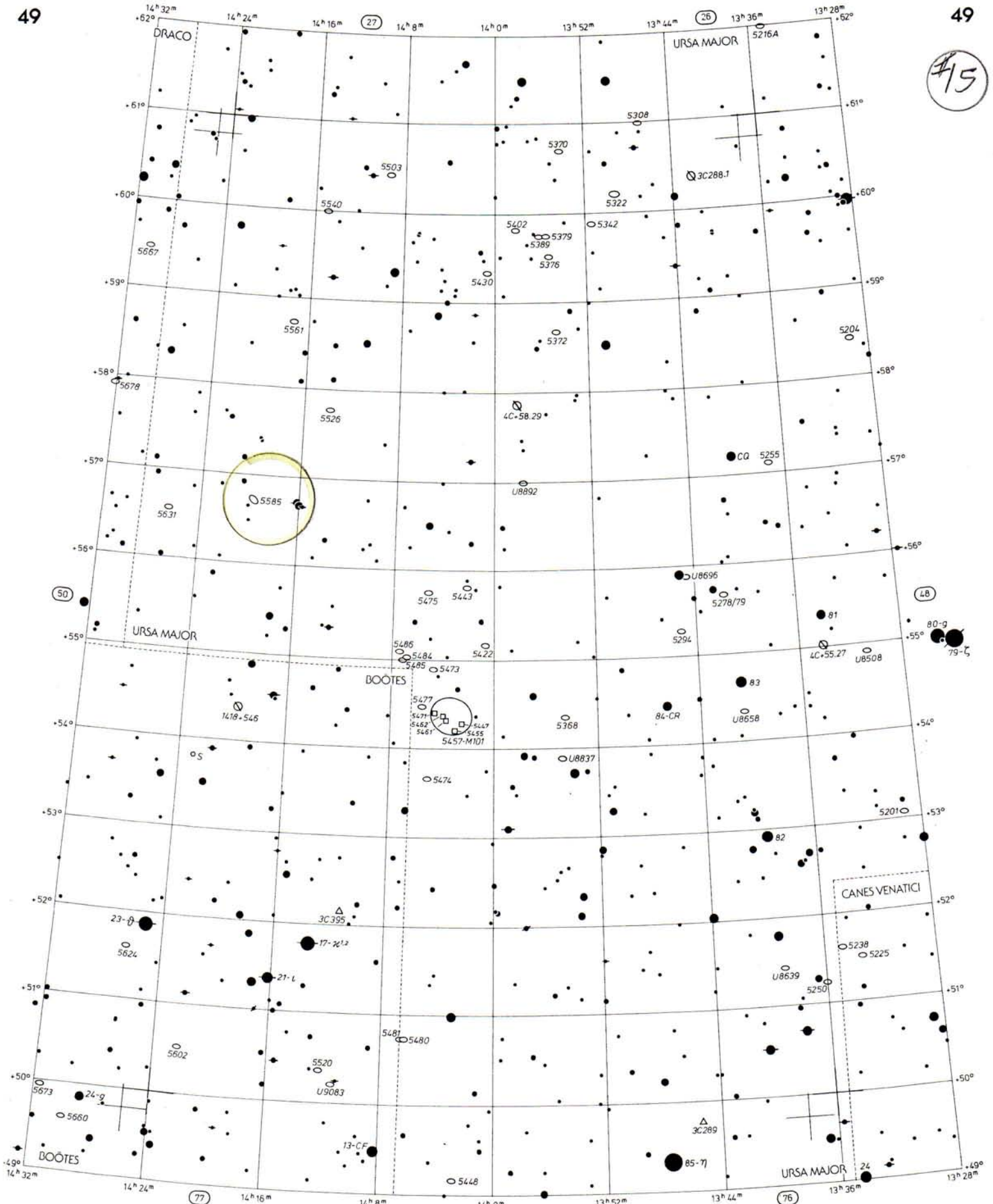
#13



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TELLAR MAGNITUDES 	DOUBLE OR MULTIPLE STARS 	OPEN STAR CLUSTERS 	GLOBULAR STAR CLUSTERS 	PLANETARY NEBULAE 	BRIGHT NEBULAE 	DARK NEBULAE 	GALAXIES 	QUASAR RADIO SOURCE X-RAY SOURCE
-1 0 1 2 3 4 5 6 7 8 9 >9.5	VARIABLE STARS 	to scale < 5'	to scale < 5'	>120" 120"-60" 60"-30" <30"	to scale 10'-5' <5'	to scale 10'-5' <5'	to scale < 5'	

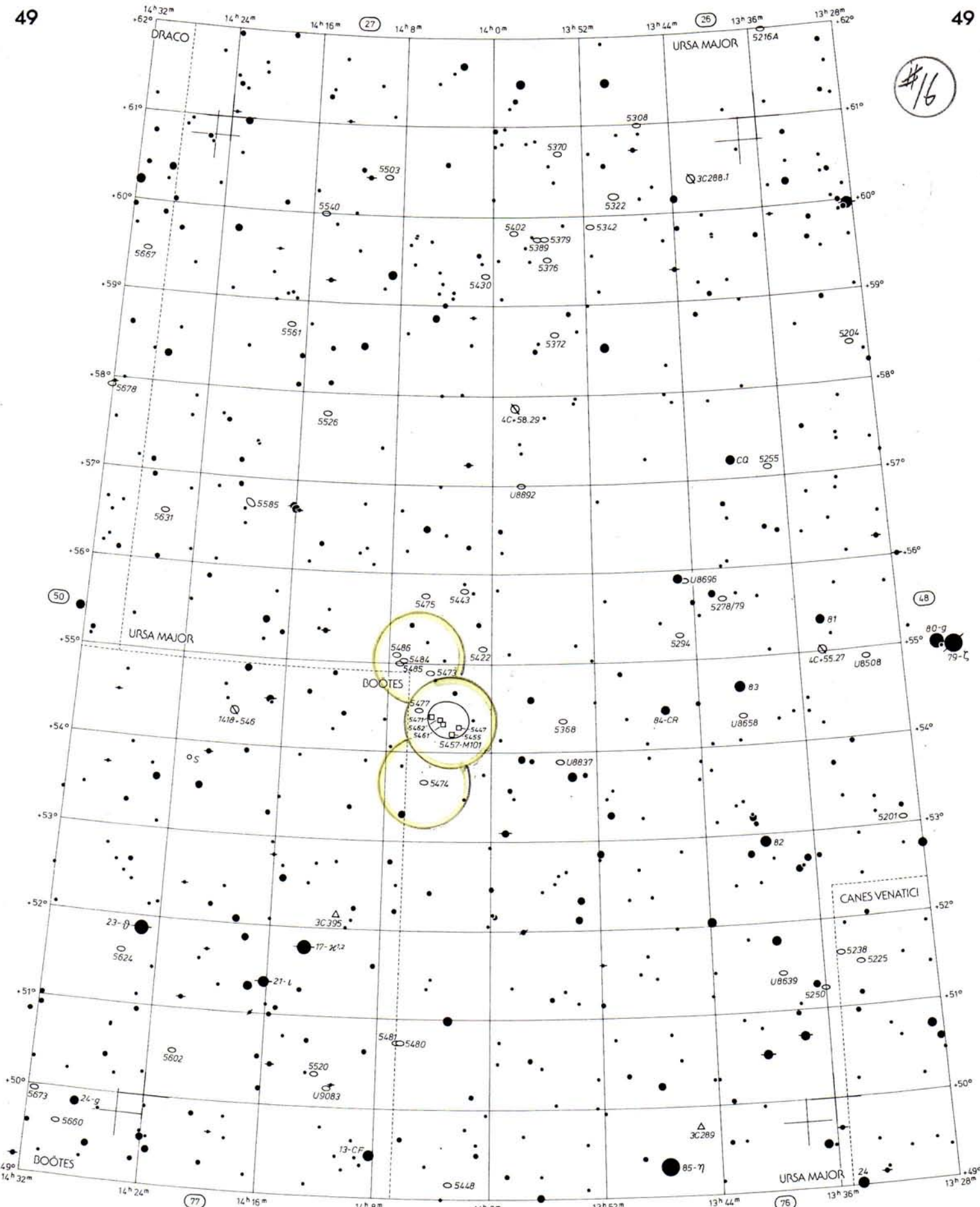
#15



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STELLAR MAGNITUDES <p>-1 0 1 2 3 4 5 6 7 8 9 >9.5</p>	DOUBLE OR MULTIPLE STARS <p>VARIABLE STARS </p>	OPEN STAR CLUSTERS <p>to scale <5'</p>	GLOBULAR STAR CLUSTERS <p>to scale <5'</p>	PLANETARY NEBULAE <p>>120" 120"-60" 60"-30" <30"</p>	BRIGHT NEBULAE <p>to scale 10'-5' <5'</p>	DARK NEBULAE <p>to scale 10'-5' <5'</p>	GALAXIES <p>to scale <5'</p>	QUASAR ⊠ RADIO SOURCE △ X-RAY SOURCE ×
--	---	---	---	--	--	--	---	---

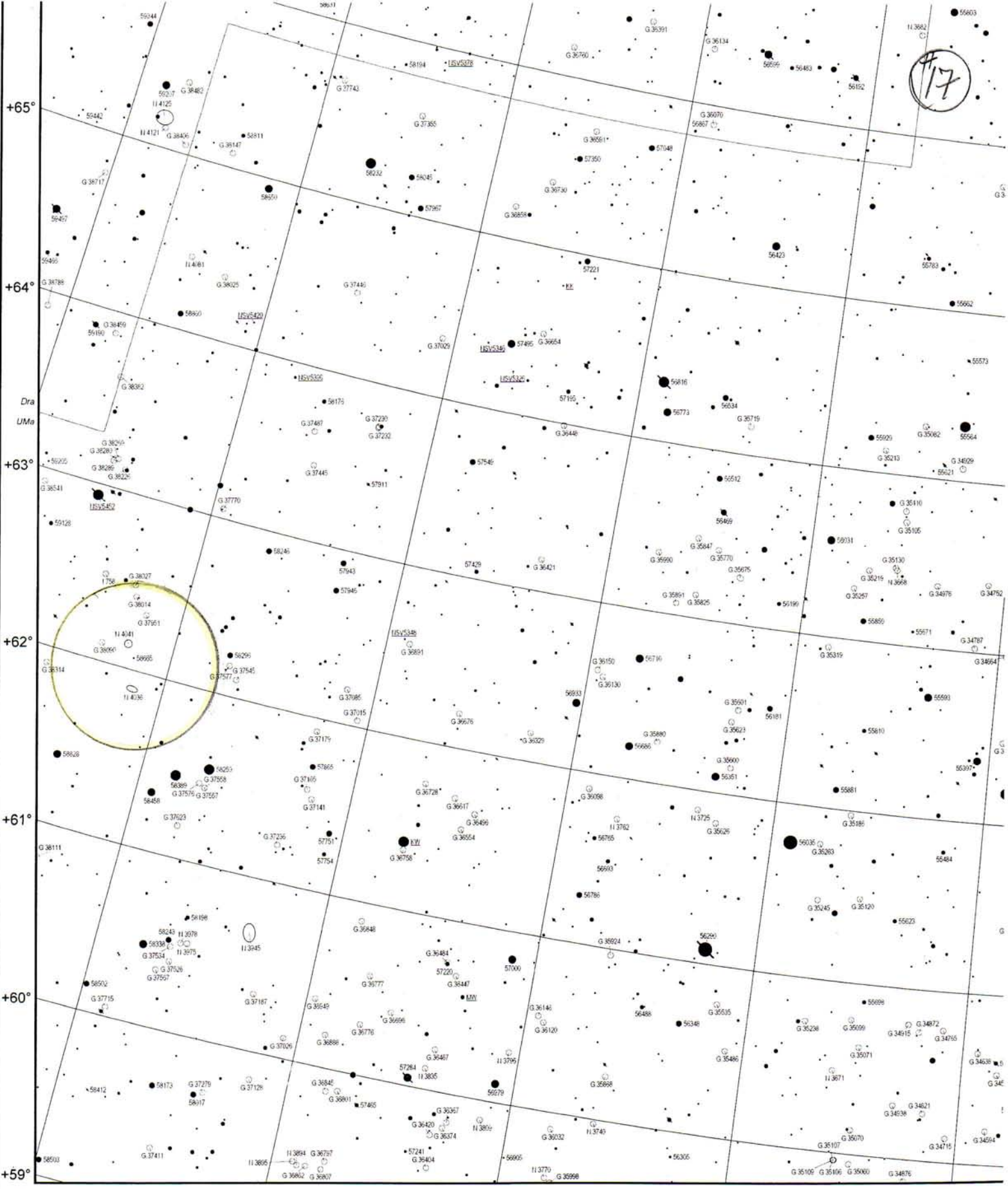
#16



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STELLAR MAGNITUDES 	DOUBLE OR MULTIPLE STARS 	OPEN STAR CLUSTERS 	GLOBULAR STAR CLUSTERS 	PLANETARY NEBULAE 	BRIGHT NEBULAE 	DARK NEBULAE 	GALAXIES 	QUASAR
VARIABLE STARS 	RADIO SOURCE	X-RAY SOURCE						

17



12:00 11:50 11:40 11:30 11:20

18

Stellar magnitudes

-1.5..2.9 3.0..3.9 4.0..4.9 5.0..5.9 6.0..6.9 7.0..7.9 8.0..8.9 9.0..9.9 10.0..10.9 11.0..13



Double or multiple stars

Individual components are plotted if separation exceeds 36"

Symbols and catalogue numbers of stars

J. Bayer, 1903 J. Flamsteed, 1725 ESA, 1997
 Uranometria Hist. Coelestis Britannica Hipparcos cat.

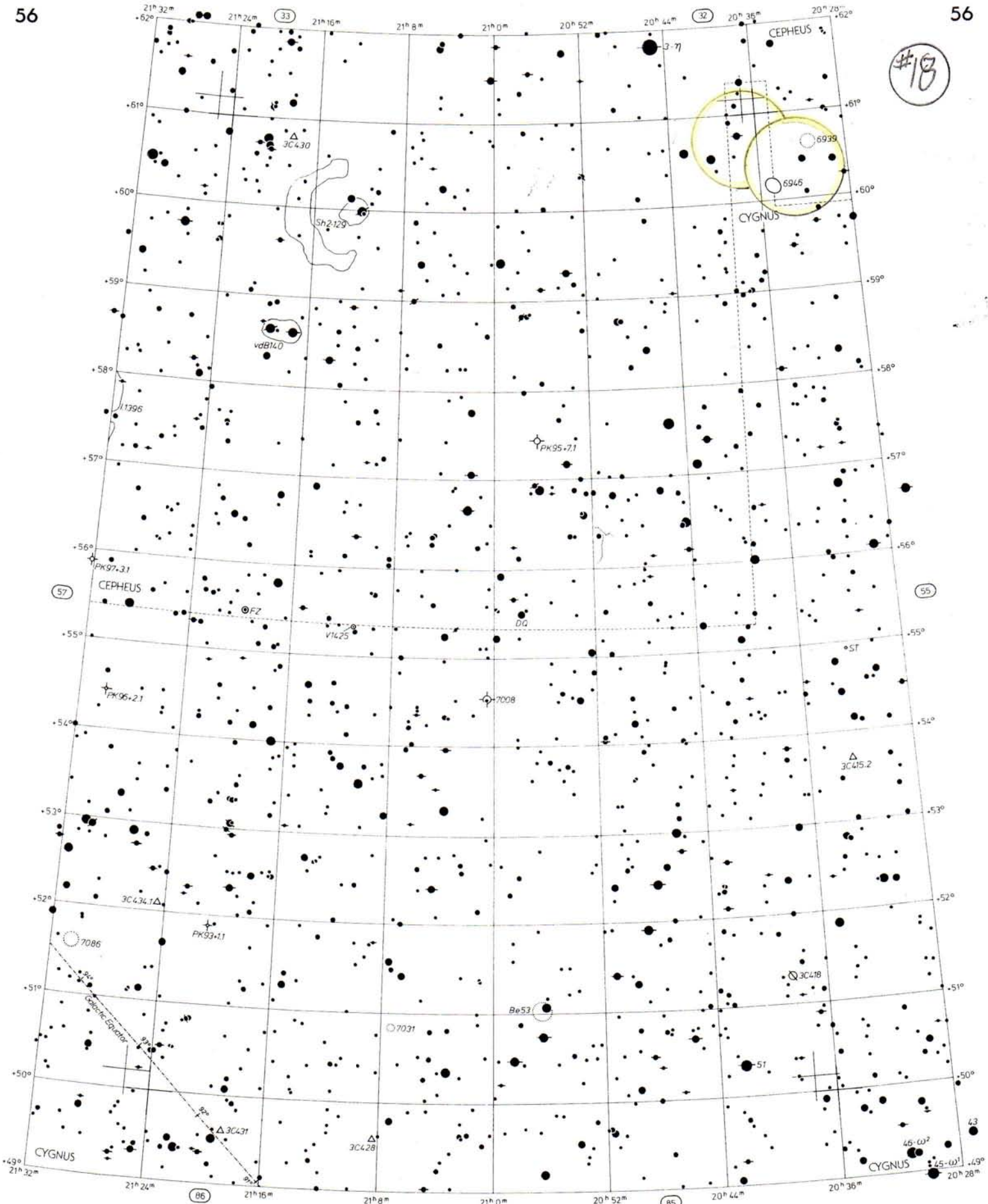
CL .. () 1..140 I 11832

Variable stars

RR V334 LSV1234

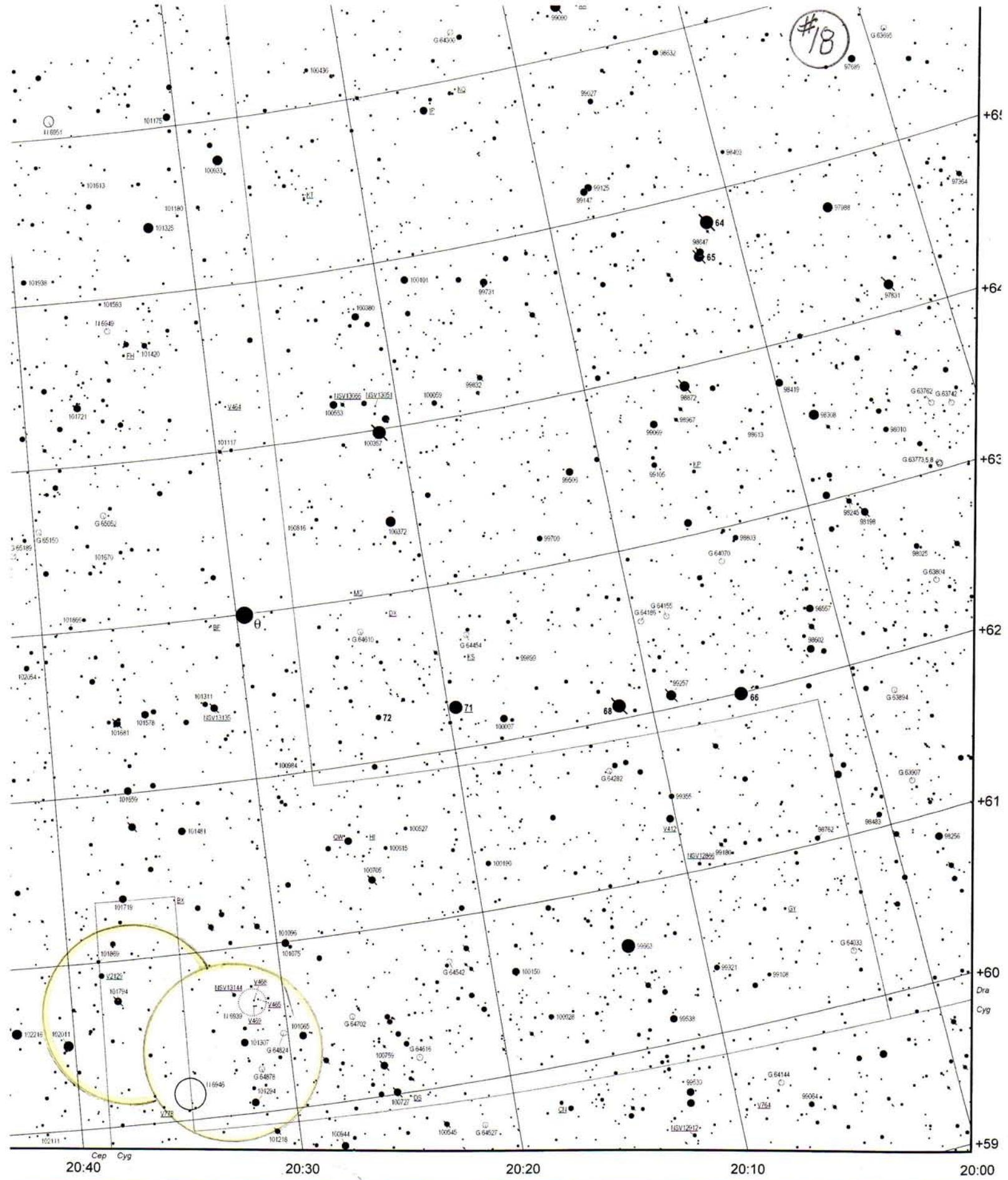
(O) 140

#18



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STELLAR MAGNITUDES 	DOUBLE OR MULTIPLE STARS 	OPEN STAR CLUSTERS 	GLOBULAR STAR CLUSTERS 	PLANETARY NEBULAE 	BRIGHT NEBULAE 	DARK NEBULAE 	GALAXIES 	QUASAR RADIO SOURCE X-RAY SOURCE
	VARIABLE STARS 	to scale < 5'	to scale < 5'	> 120" 120" - 60" 60" - 30" < 30"	to scale 10' - 5' < 5'	to scale 10' - 5' < 5'	to scale < 5'	



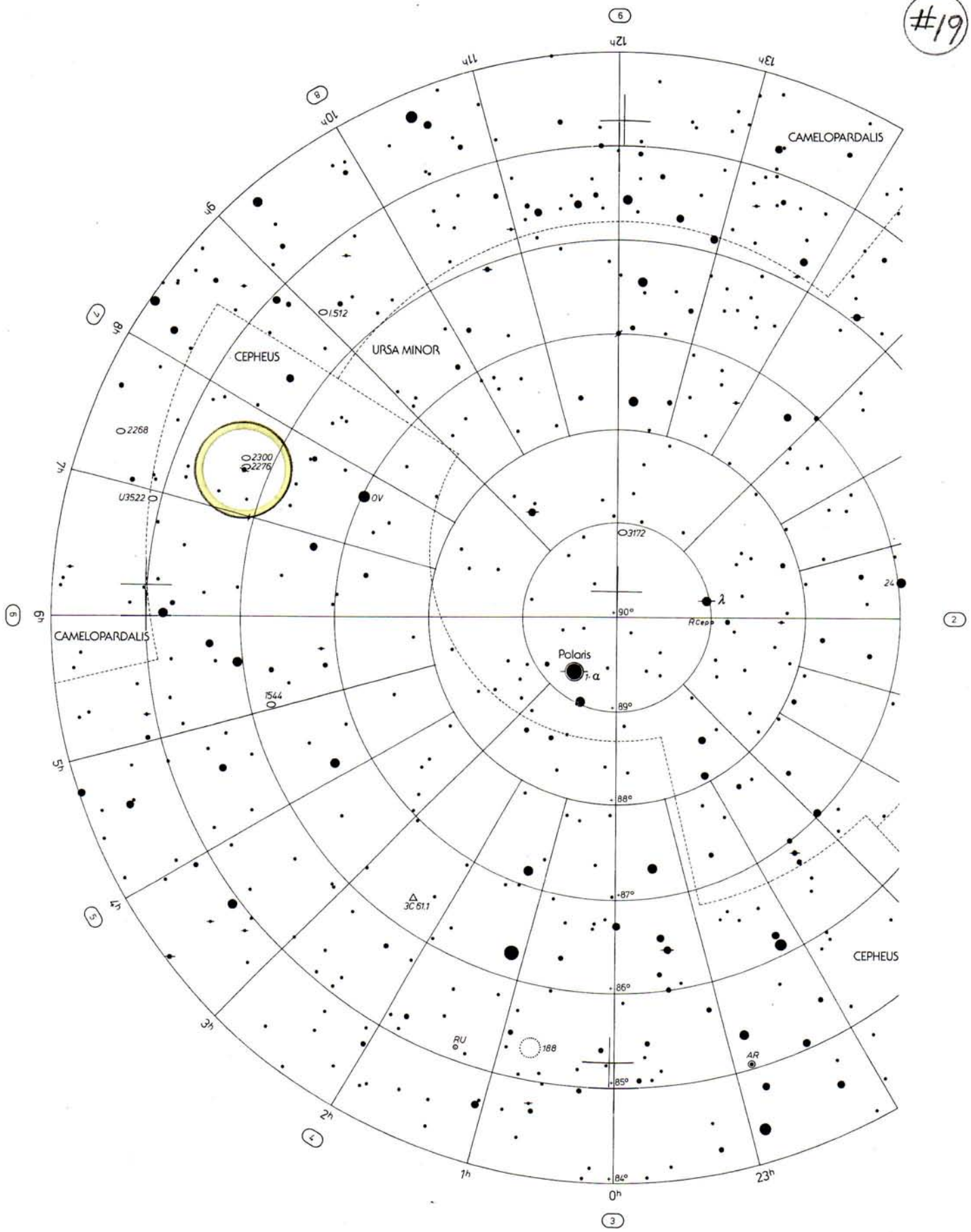
#18

it nebulae
Nonstellar objects are shown to scale if diameter is larger than:
- 2' for galaxies
- 5' for other

Constellations on this map:
Cepheus, Cygnus, Draco

◀ 24 ▲ 12
▼ 39 ▷ 22

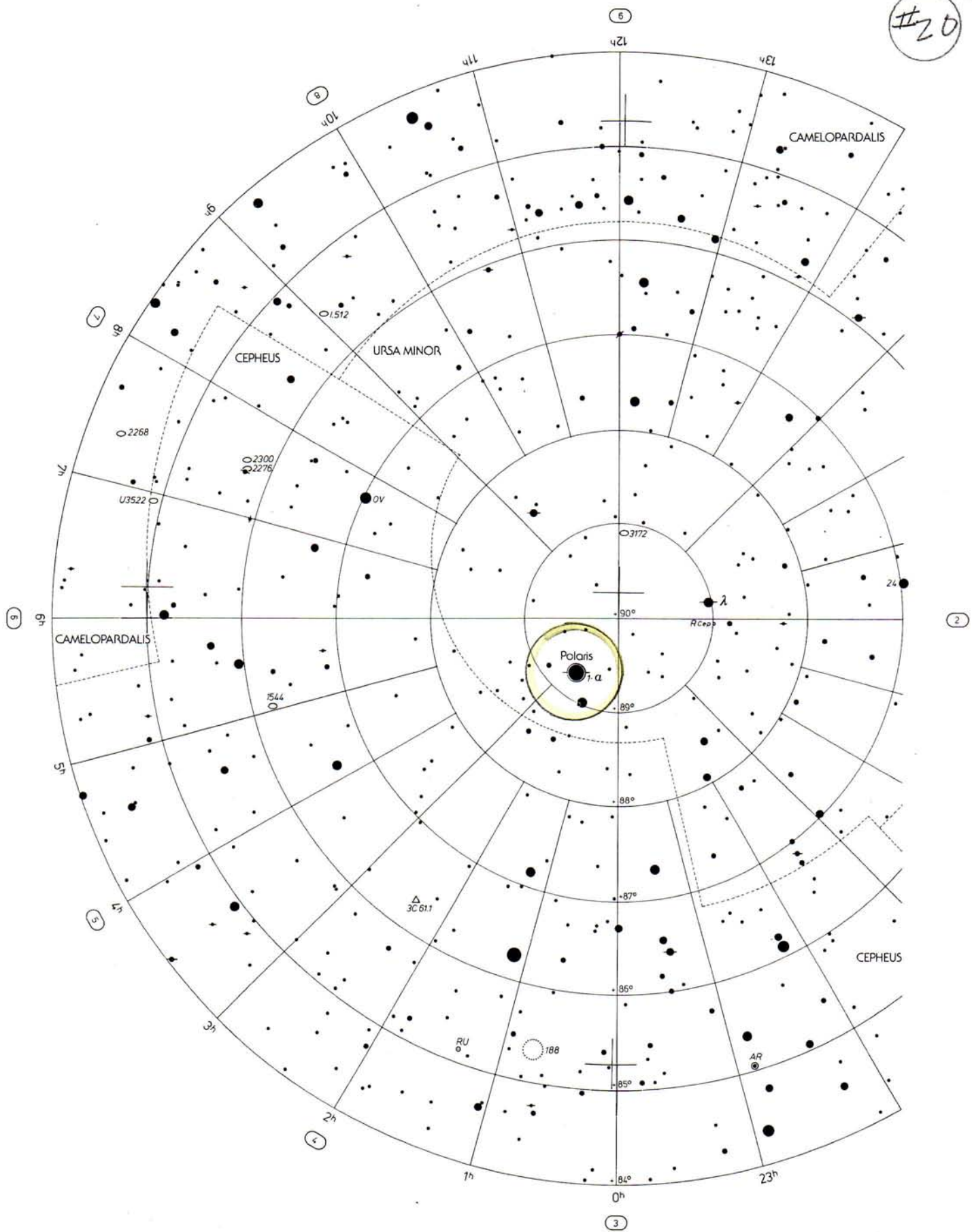
The Great Atlas of the Sky
Jubilee Edition
400th Anniversary of Telescope Astronomy
Piotr Brych - 2009
Epoch of coordinate J2000.0



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STELLAR MAGNITUDES 	DOUBLE OR MULTIPLE STARS 	OPEN STAR CLUSTERS 	GLOBULAR STAR CLUSTERS 	PLANETARY NEBULAE 	BRIGHT NEBULAE 	DARK NEBULAE 	GALAXIES 	QUASAR
-1 0 1 2 3 4 5 6 7 8 9 >9.5	VARIABLE STARS 	to scale < 5'	to scale < 5'	> 120" 120" - 60" 60" - 30" < 30"	to scale 10' - 5' < 5'	to scale 10' - 5' < 5'	to scale < 5'	RADIO SOURCE X-RAY SOURCE

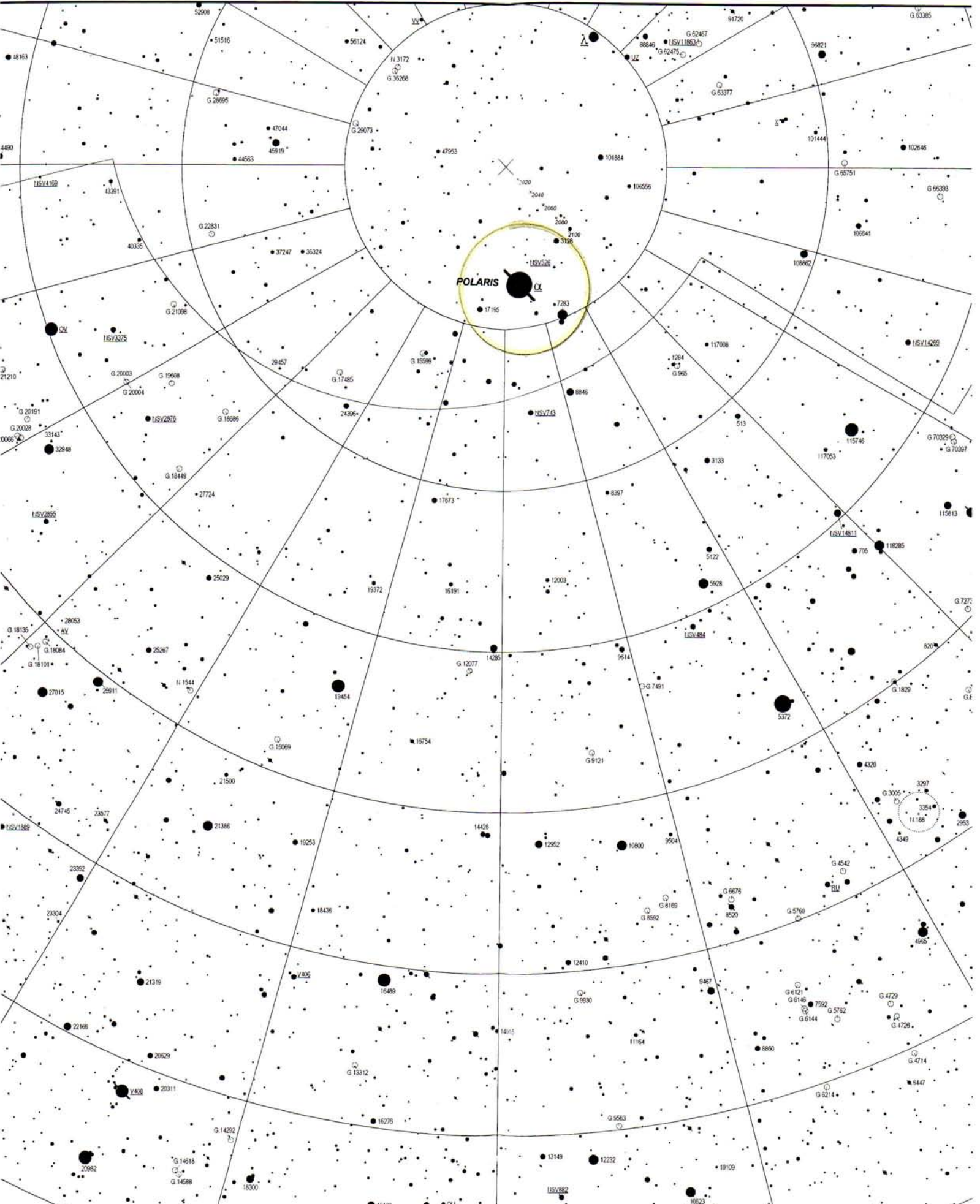
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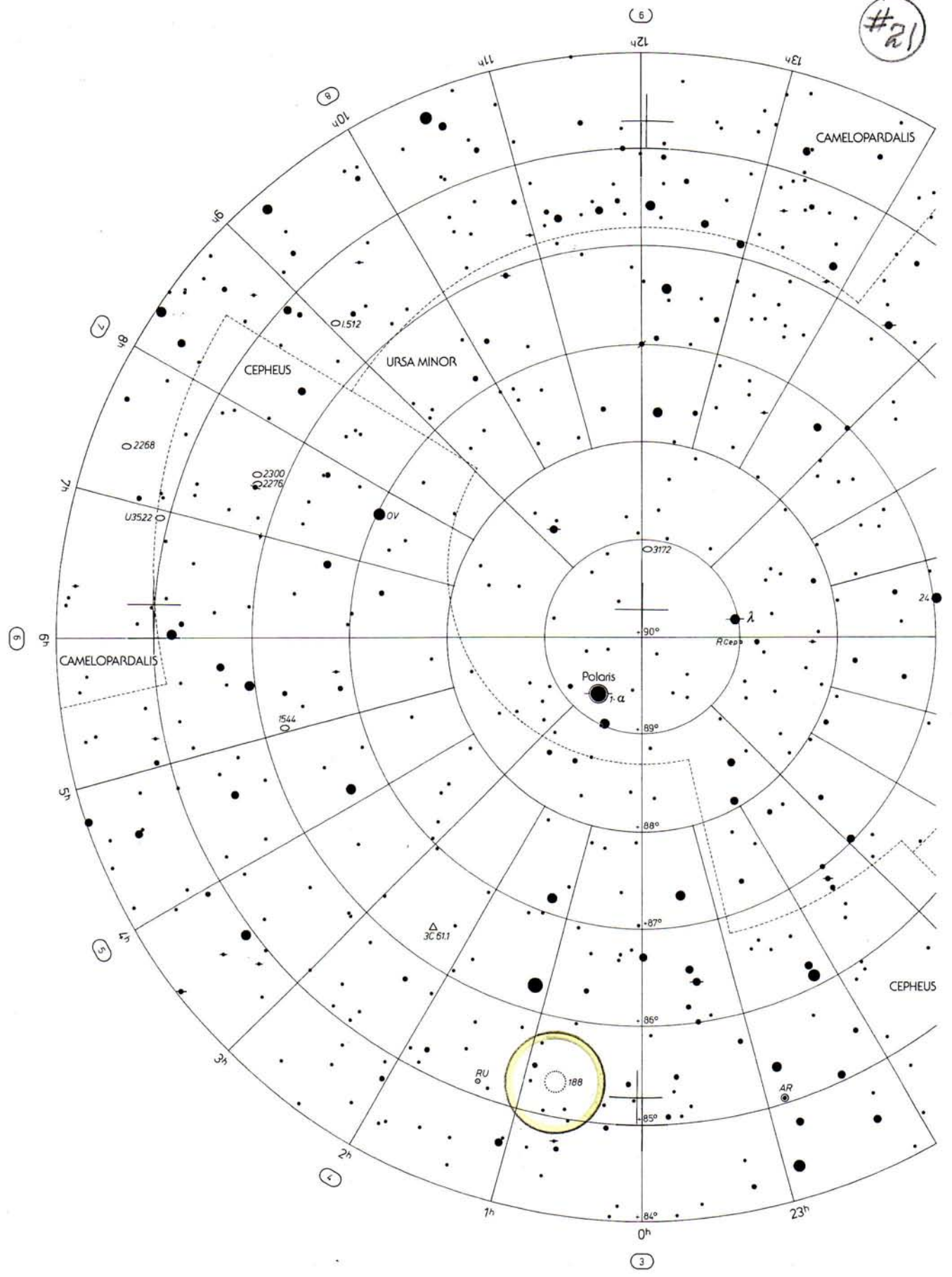
©1987 WILLMANN-BELL, INC.

STELLAR MAGNITUDES 	DOUBLE OR MULTIPLE STARS 	OPEN STAR CLUSTERS 	GLOBULAR STAR CLUSTERS 	PLANETARY NEBULAE 	BRIGHT NEBULAE 	DARK NEBULAE 	GALAXIES 	QUASAR ⊠ RADIO SOURCE △ X-RAY SOURCE ×
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+87° +88° +89° +88° +87°

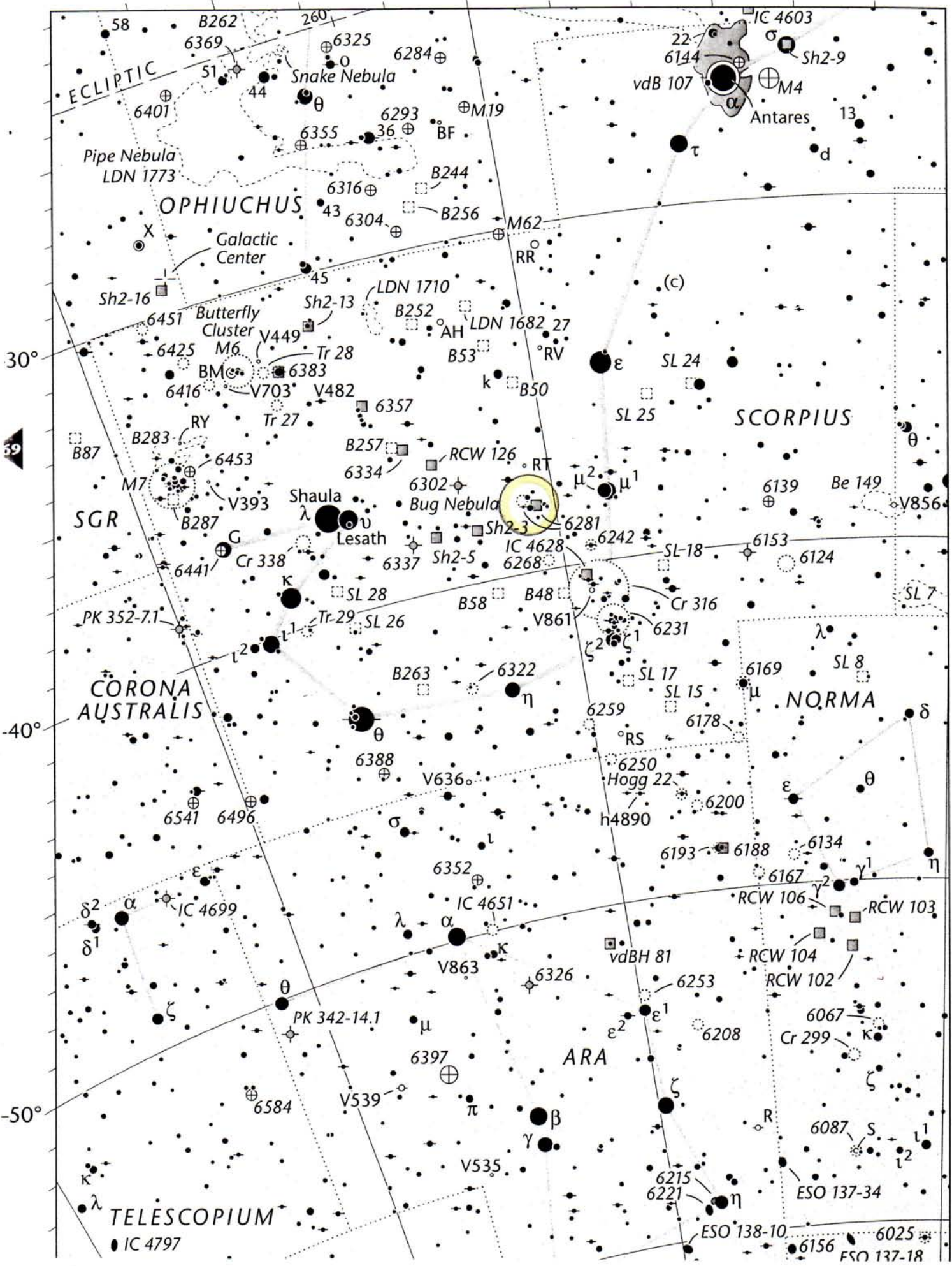


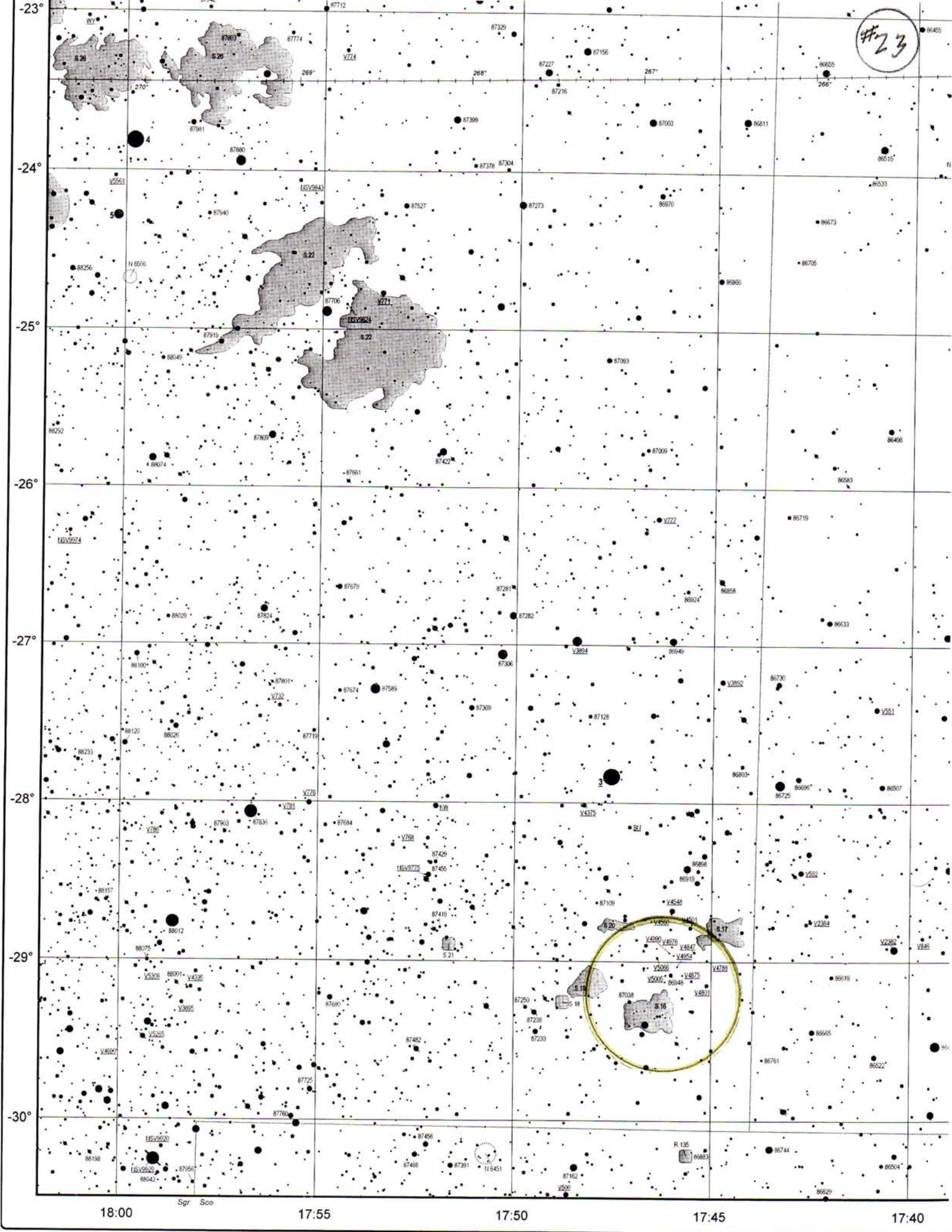
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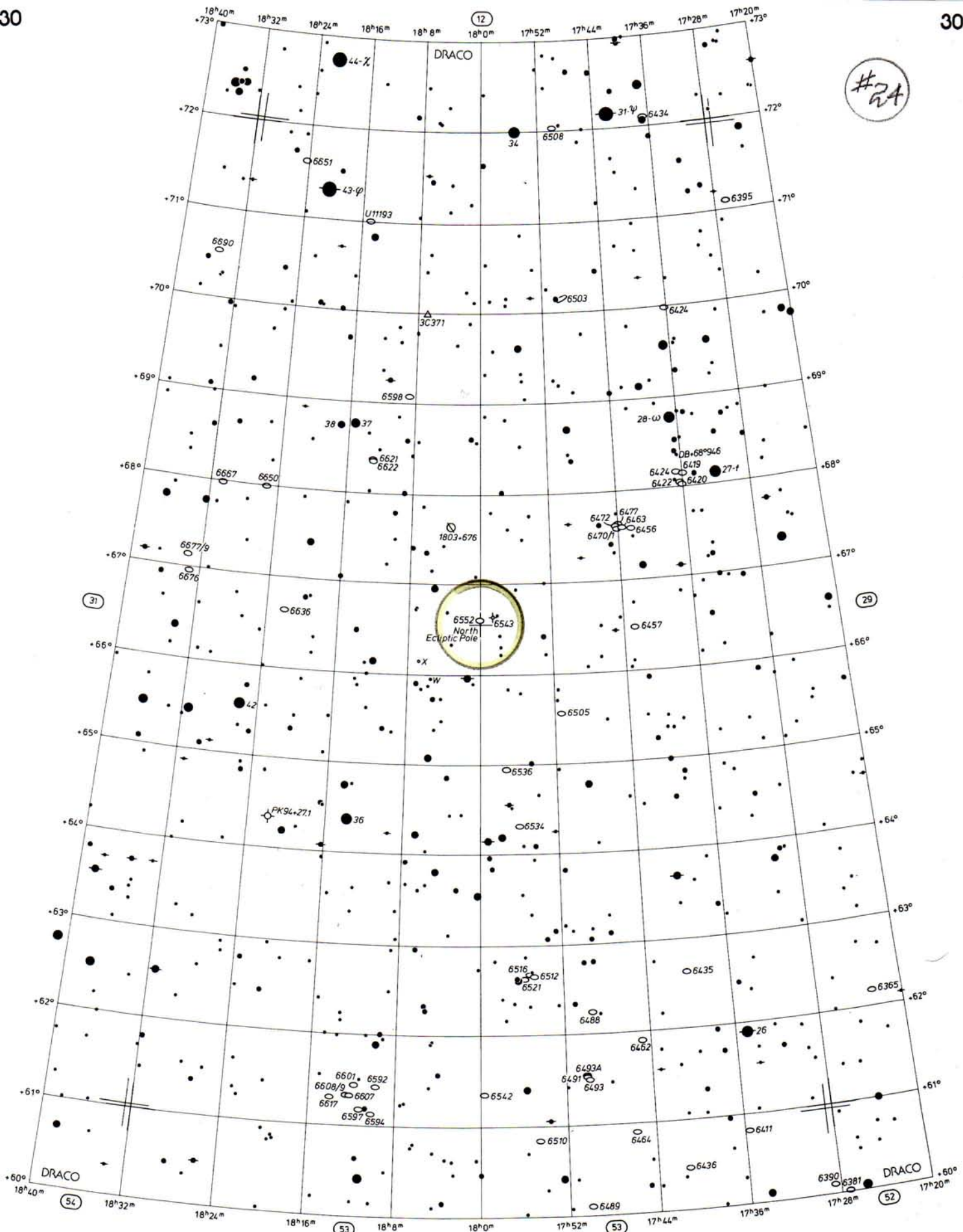
©1987 WILLMANN-BELL, INC.

STELLAR MAGNITUDES 	DOUBLE OR MULTIPLE STARS 	OPEN STAR CLUSTERS 	GLOBULAR STAR CLUSTERS 	PLANETARY NEBULAE 	BRIGHT NEBULAE 	DARK NEBULAE 	GALAXIES 	QUASAR 	RADIO SOURCE 	X-RAY SOURCE
-1 0 1 2 3 4 5 6 7 8 9 >9.5	VARIABLE STARS 	to scale <5'	to scale <5'	>120" 120"-60" 60"-30" <30"	to scale 10'-5' <5'	to scale 10'-5' <5'	to scale <5'	to scale <5'	to scale <5'	





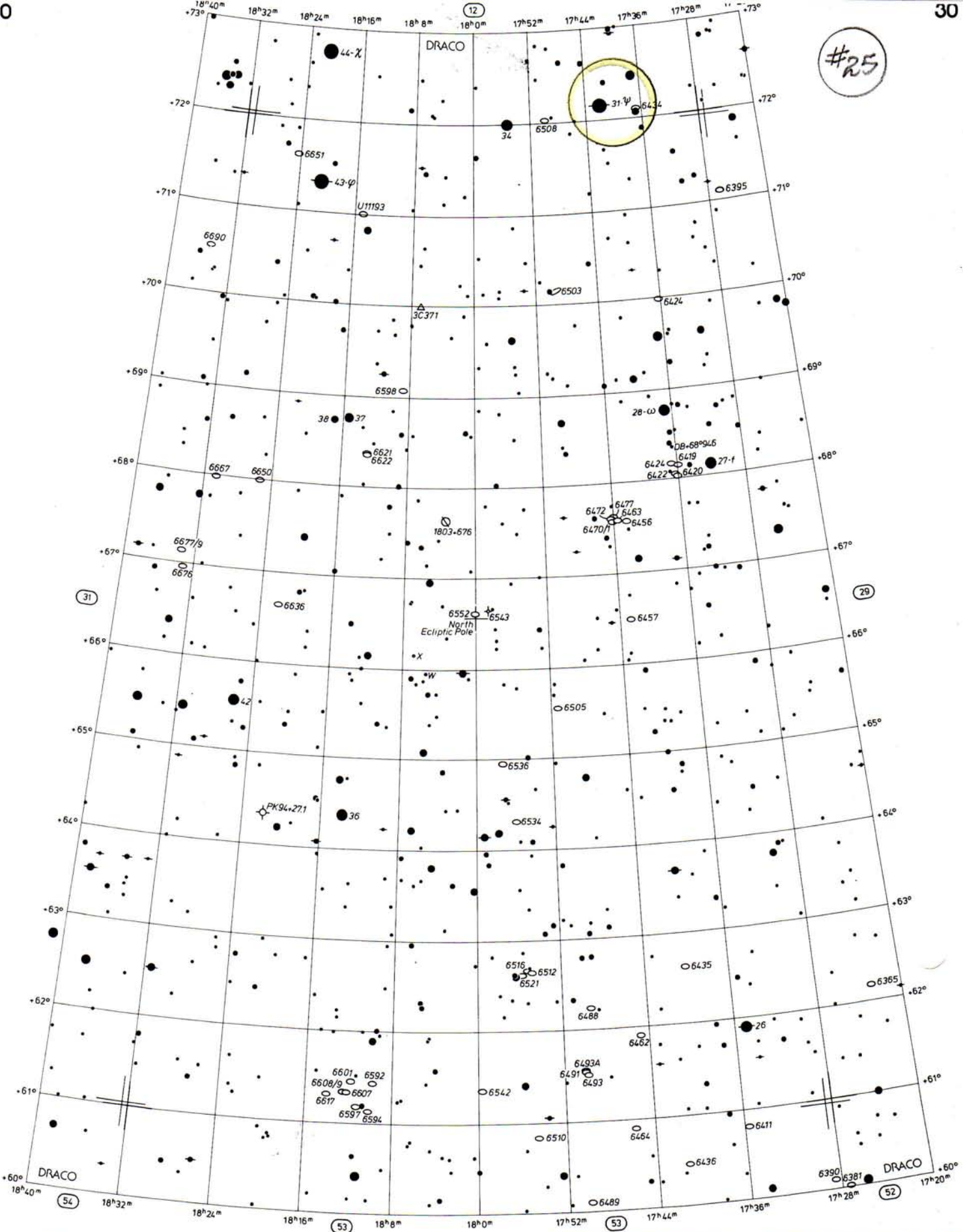
#24



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STELLAR MAGNITUDES	DOUBLE OR MULTIPLE STARS	OPEN STAR CLUSTERS	GLOBULAR STAR CLUSTERS	PLANETARY NEBULAE	BRIGHT NEBULAE	DARK NEBULAE	GALAXIES	QUASAR	RADIO SOURCE	X-RAY SOURCE
 -1 0 1 2 3 4 5 6 7 8 9 >9.5	 VARIABLE STARS 	 to scale <5'	 to scale <5'	 >120" 120"-60" 60"-30" <30"	 to scale 10'-5' <5'	 to scale 10'-5' <5'	 to scale <5'			

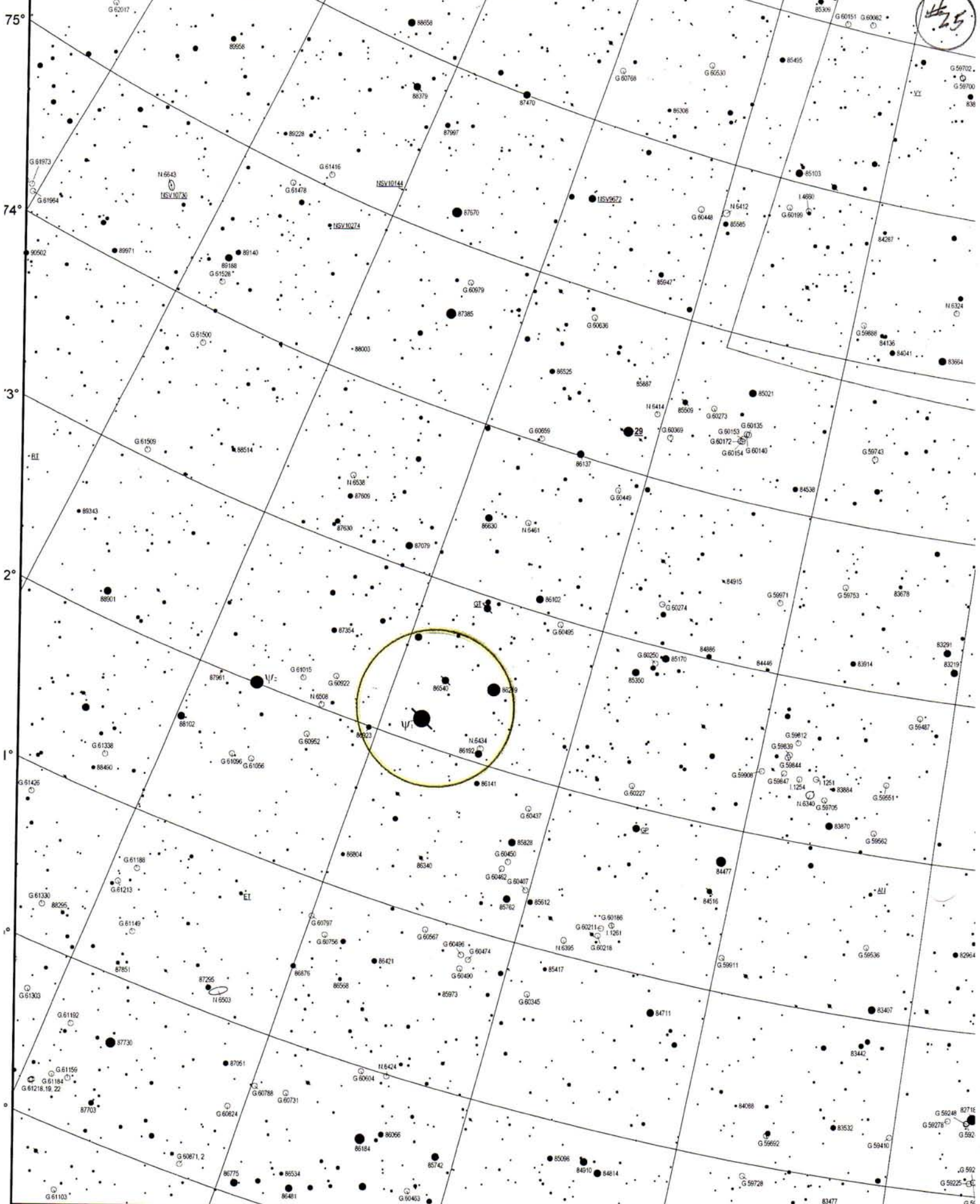
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STELLAR MAGNITUDES 	DOUBLE OR MULTIPLE STARS 	OPEN STAR CLUSTERS 	GLOBULAR STAR CLUSTERS 	PLANETARY NEBULAE 	BRIGHT NEBULAE 	DARK NEBULAE 	GALAXIES 	QUASAR RADIO SOURCE X-RAY SOURCE
	VARIABLE STARS 							

Handwritten mark: 25



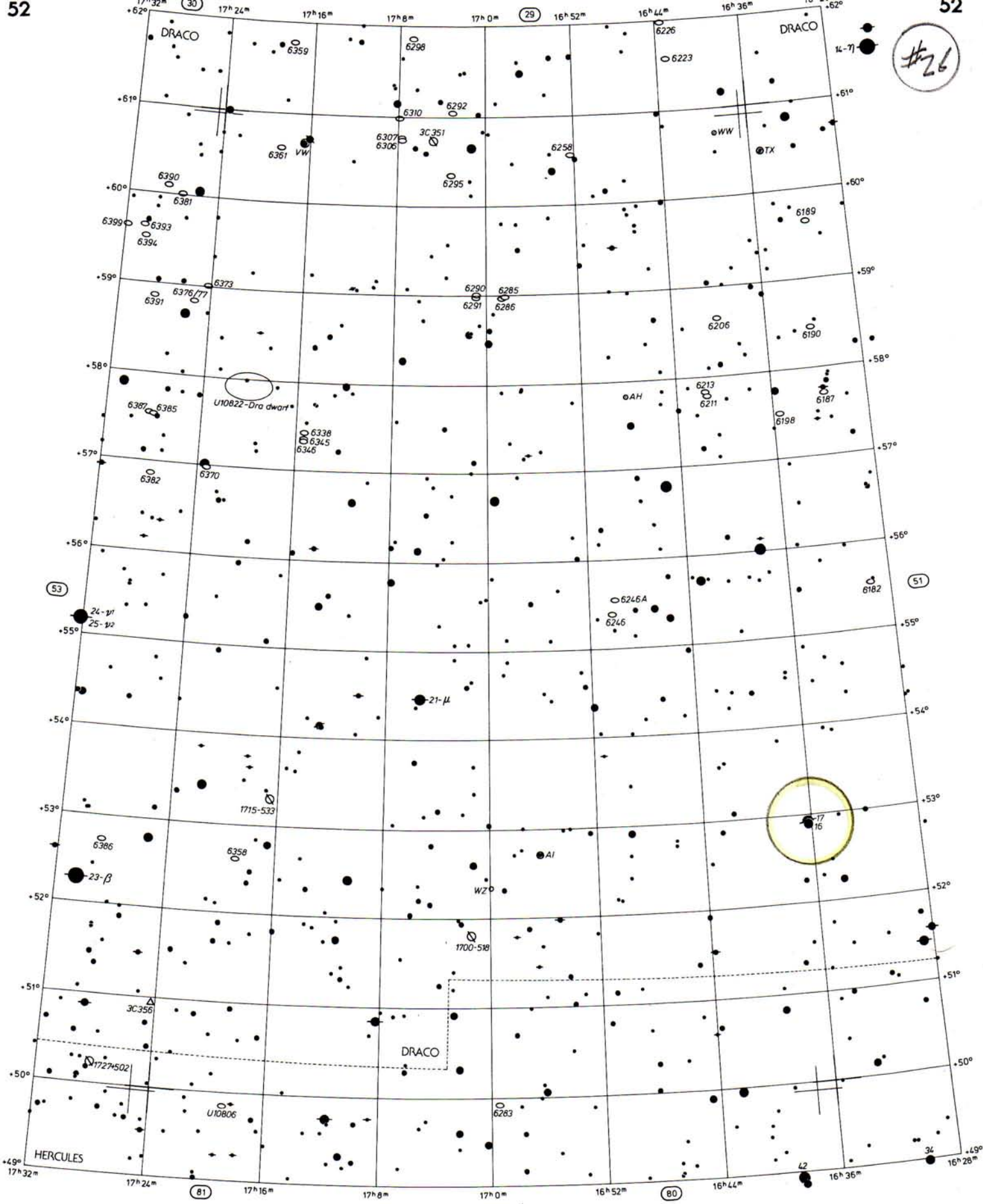
17:45

17:30

17:15

17:00

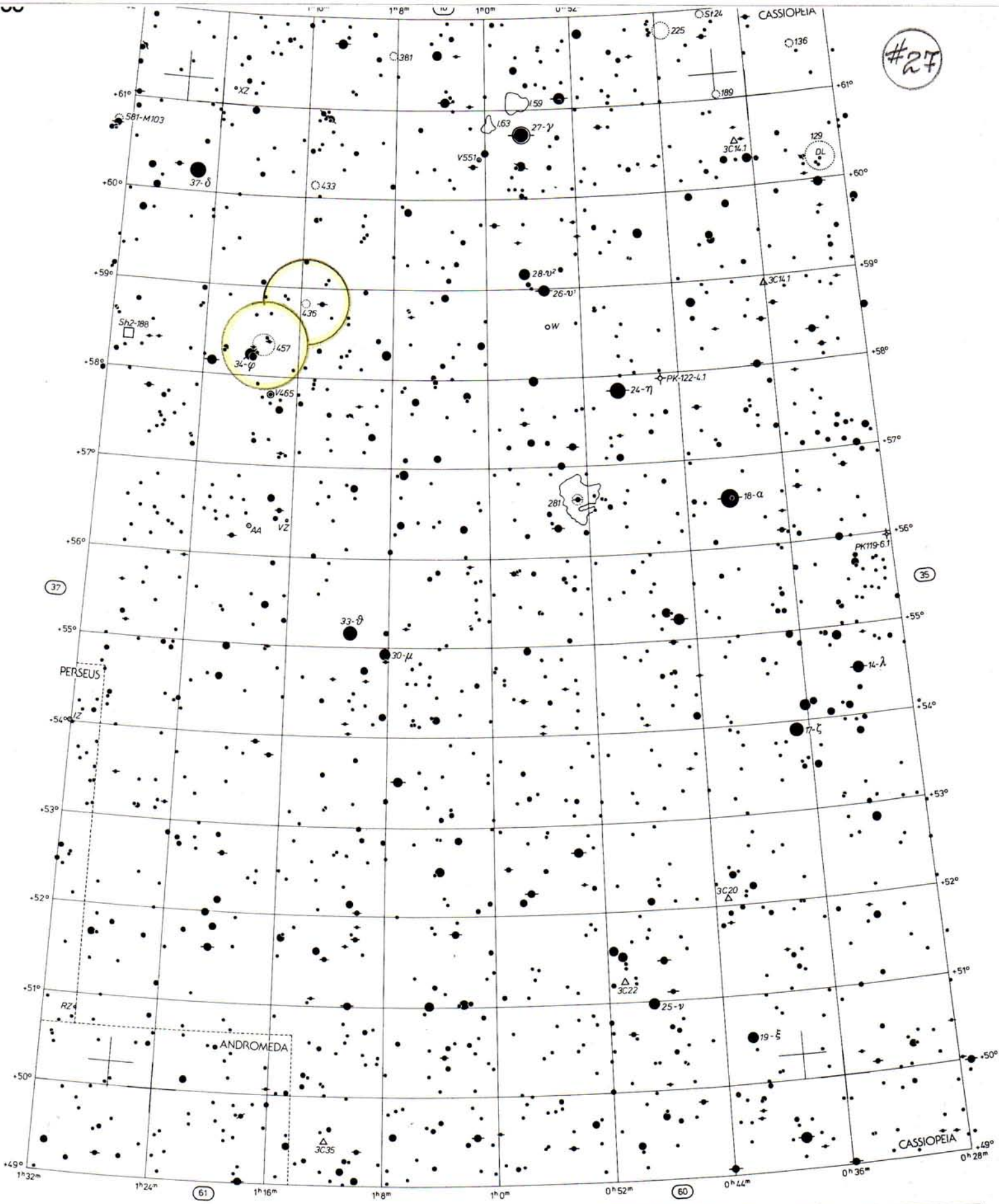
#26



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STELLAR MAGNITUDES <p>3 4 5 6 7 8 9 >9.5</p>	DOUBLE OR MULTIPLE STARS 	OPEN STAR CLUSTERS <p>to scale <5'</p>	GLOBULAR STAR CLUSTERS <p>to scale <5'</p>	PLANETARY NEBULAE <p>>120" 120"-60" 60"-30" <30"</p>	BRIGHT NEBULAE <p>to scale 10'-5' <5'</p>	DARK NEBULAE <p>to scale 10'-5' <5'</p>	GALAXIES <p>to scale <5'</p>	QUASAR	RADIO SOURCE	X-RAY SOURCE
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#27

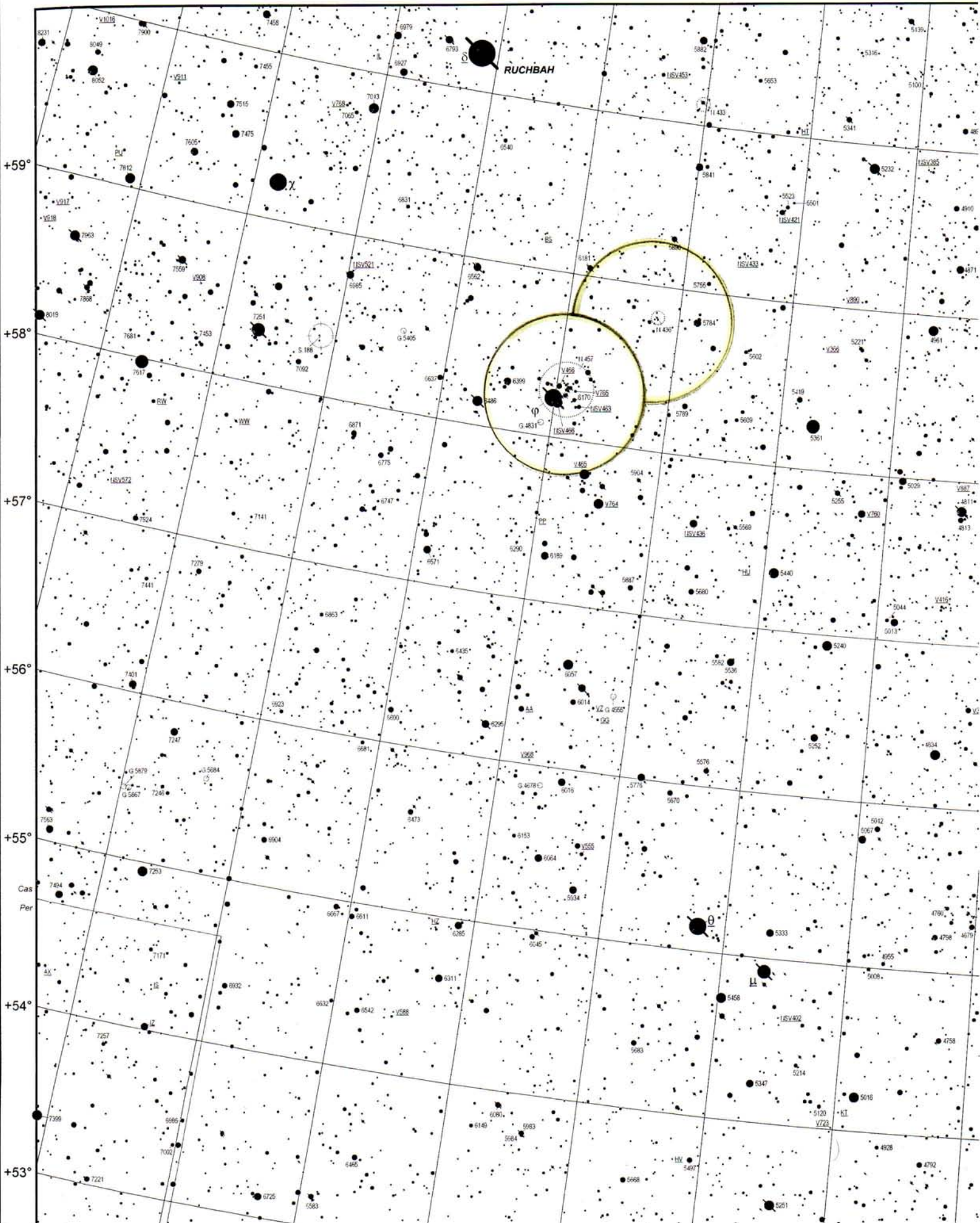


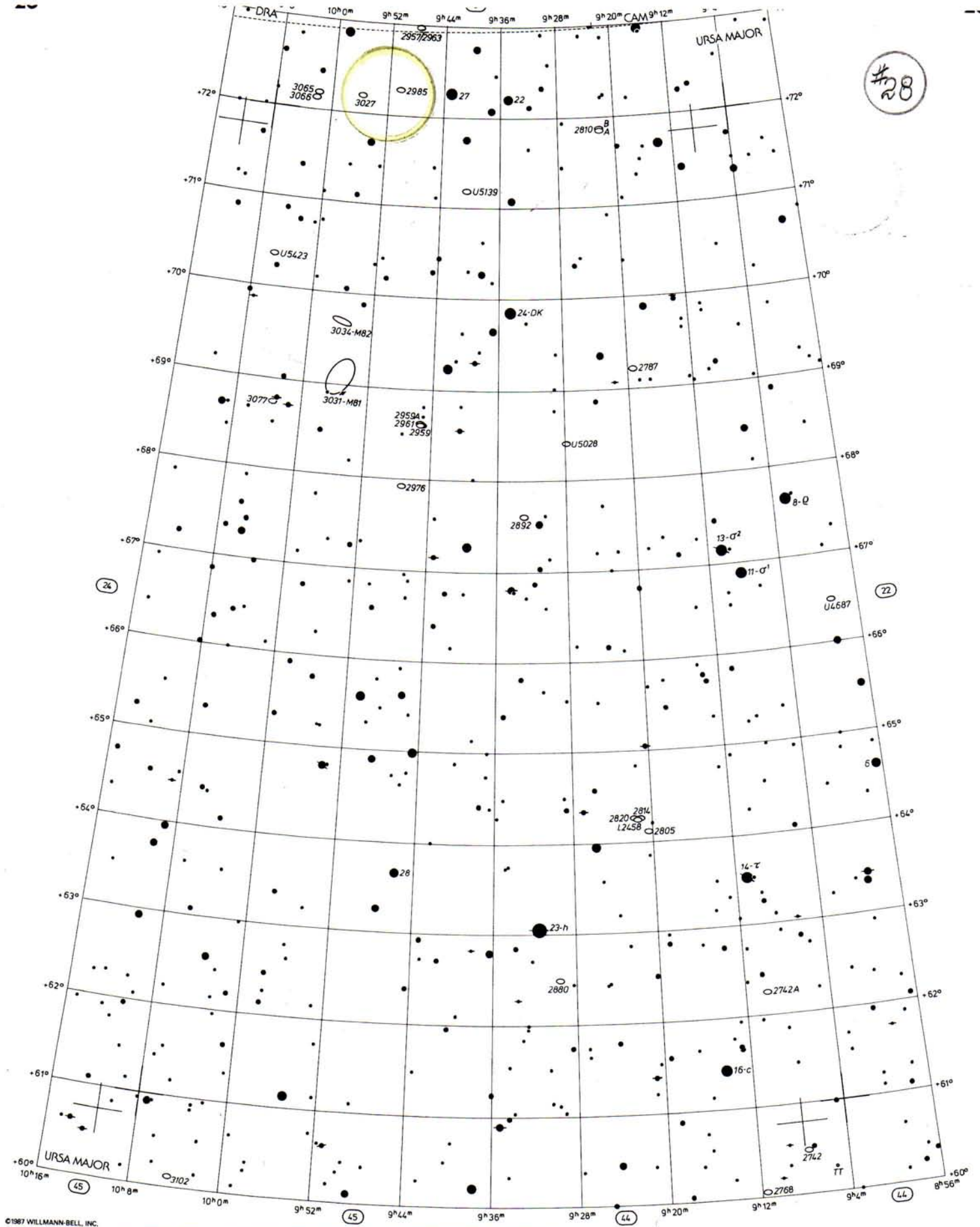
©1987 WILLMANN-BELL, INC.

STELLAR MAGNITUDES 	DOUBLE OR MULTIPLE STARS 	OPEN STAR CLUSTERS 	GLOBULAR STAR CLUSTERS 	PLANETARY NEBULAE 	BRIGHT NEBULAE 	DARK NEBULAE 	GALAXIES 	QUASAR RADIO SOURCE X-RAY SOURCE
-1 0 1 2 3 4 5 6 7 8 9 >9.5	VARIABLE STARS 	to scale < 5'	to scale < 5'	>120" 120"-60" 60"-30" <30"	to scale 10'-5' <5'	to scale 10'-5' <5'	to scale <5'	

Bosny Ruppel & Wil Jirinec

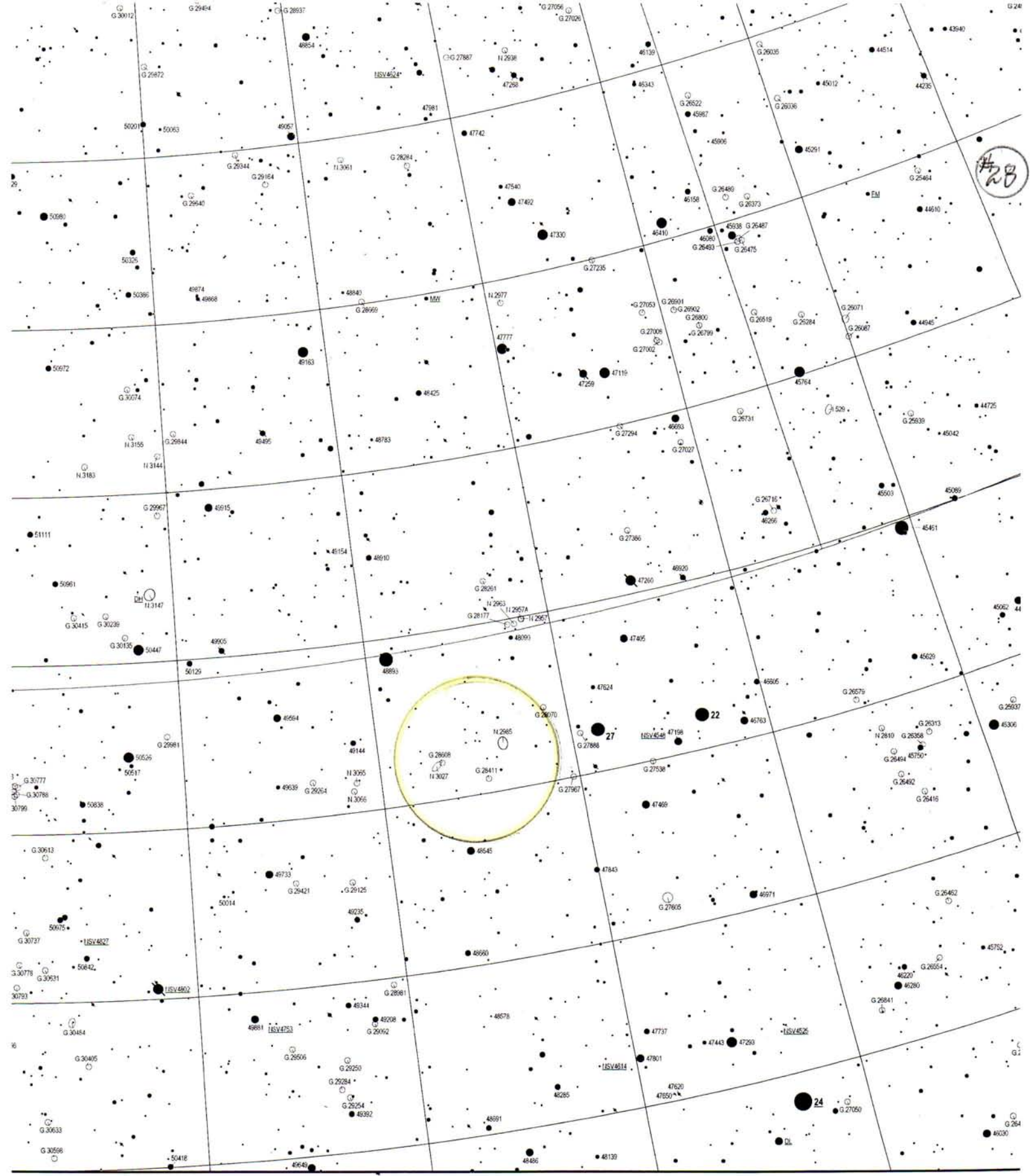
+60° 01:40 01:35 01:30 01:25 01:20 01:15 01:10 01:05





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<p>STELLAR MAGNITUDES</p> <p>● -1 ● 0 ● 1 ● 2</p> <p>● 3 ● 4 ● 5 ● 6 ● 7 ● 8 ● 9 ● >9.5</p>	<p>DOUBLE OR MULTIPLE STARS</p> <p>●-● ●-●</p> <p>VARIABLE STARS</p> <p>● ○ ● ○ ● ○</p>	<p>OPEN STAR CLUSTERS</p> <p>○ ○ ○</p> <p>to scale < 5'</p>	<p>GLOBULAR STAR CLUSTERS</p> <p>⊕ ⊕</p> <p>to scale < 5'</p>	<p>PLANETARY NEBULAE</p> <p>◇ >120"</p> <p>◇ 120"-60"</p> <p>◇ 60"-30"</p> <p>◇ <30"</p>	<p>BRIGHT NEBULAE</p> <p>☁ to scale</p> <p>□ 10'-5'</p> <p>□ <5'</p>	<p>DARK NEBULAE</p> <p>☁ to scale</p> <p>☐ 10'-5'</p> <p>☐ <5'</p>	<p>GALAXIES</p> <p>○ ○ ○</p> <p>to scale < 5'</p>	<p>QUASAR □</p> <p>RADIO SOURCE △</p> <p>X-RAY SOURCE ×</p>
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28

10:15 10:00 09:45 09:30

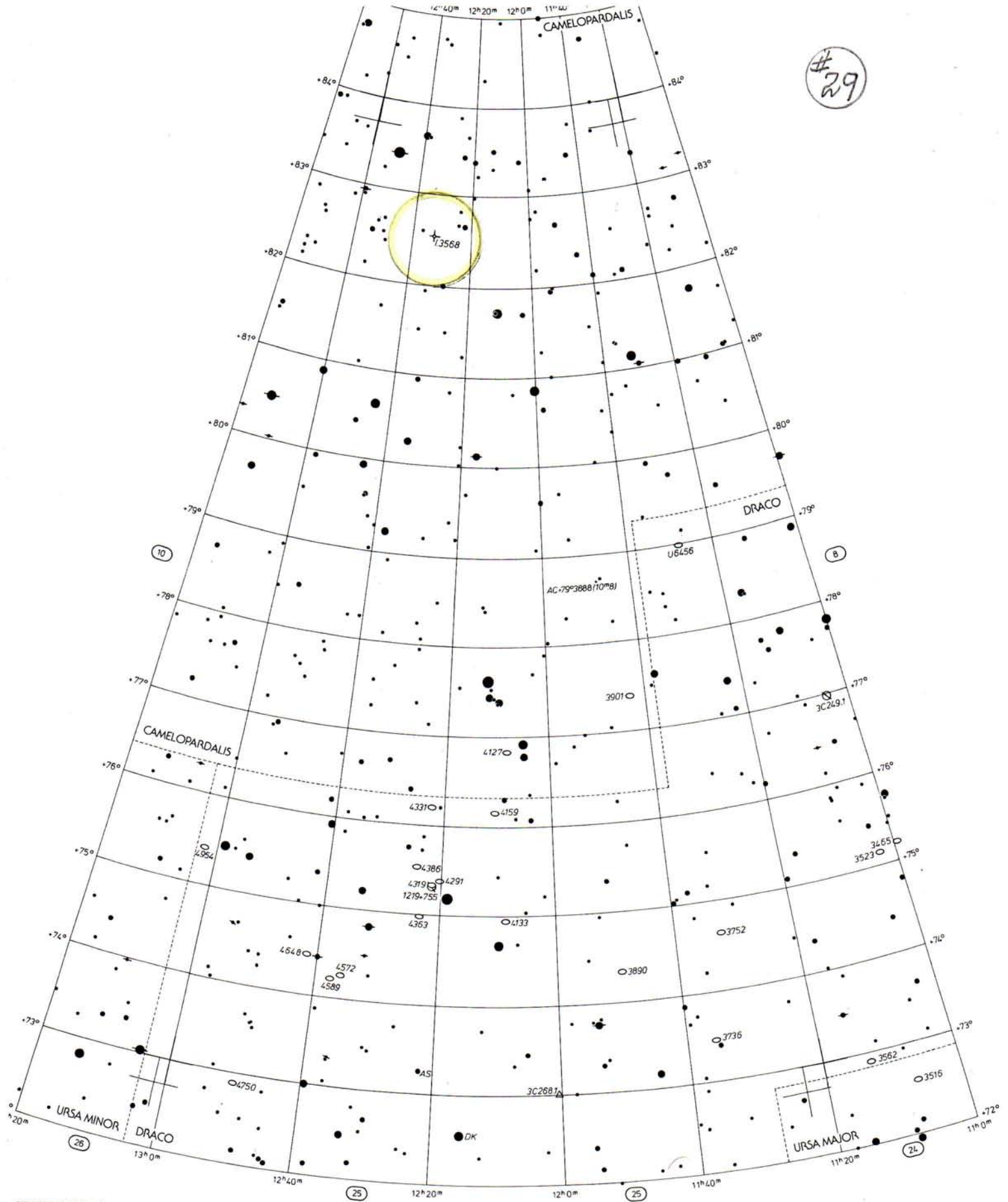
Globular clusters
 Open clusters
 Planetary nebulae
 Bright nebulae

Nonstellar objects are shown to scale if diameter is larger than:
 - 2' for galaxies
 - 5' for other

Constellations on this map:
 Camelopardalis, Draco, Ursa Major

28

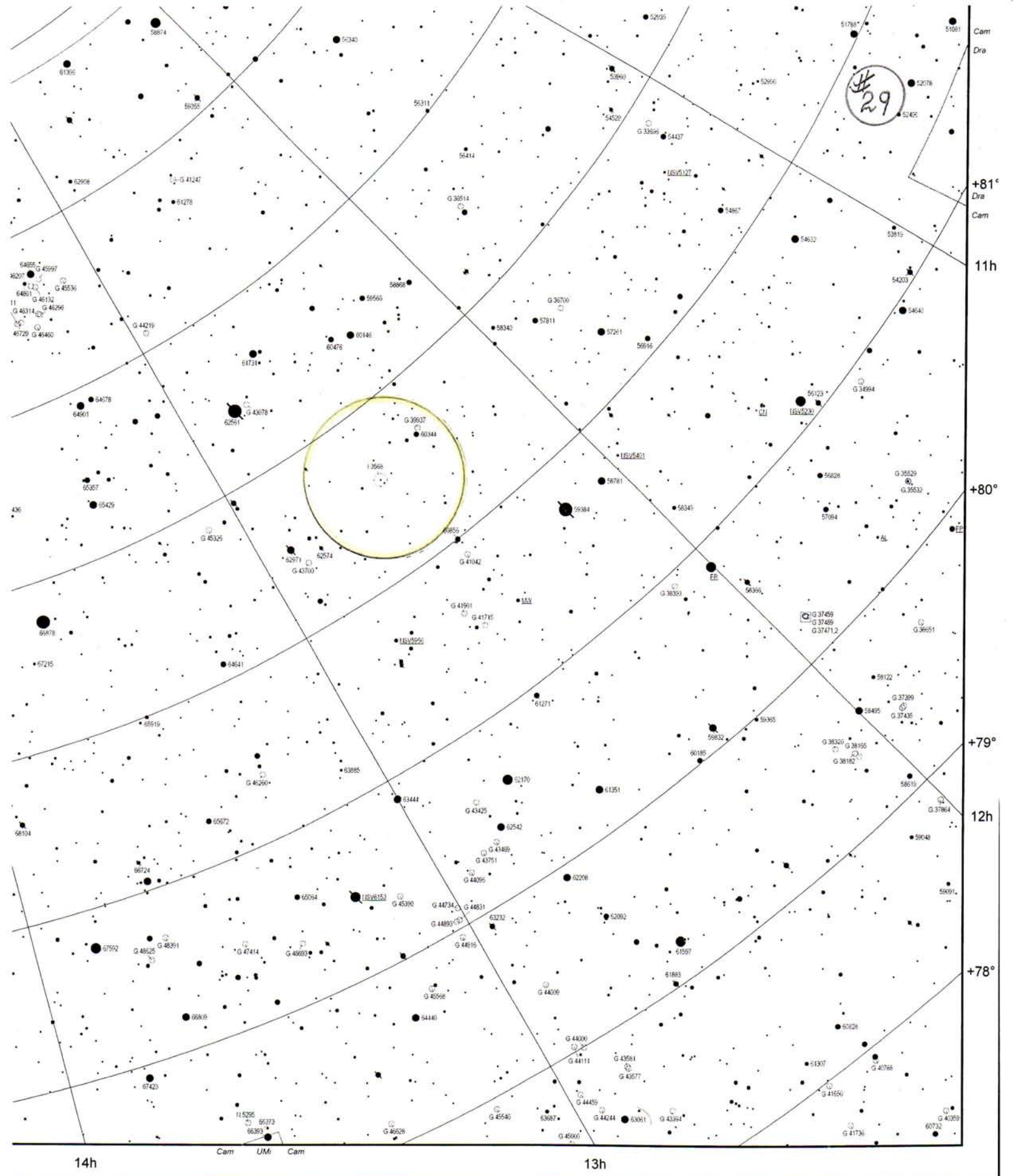
#29



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STELLAR MAGNITUDES 	DOUBLE OR MULTIPLE STARS 	OPEN STAR CLUSTERS 	GLOBULAR STAR CLUSTERS 	PLANETARY NEBULAE 	BRIGHT NEBULAE 	DARK NEBULAE 	GALAXIES 	QUASAR RADIO SOURCE X-RAY SOURCE
-1 0 1 2 3 4 5 6 7 8 9 >9.5	VARIABLE STARS 	to scale < 5'	to scale < 5'	> 120" 120" - 60" 60" - 30" < 30"	to scale 10' - 5' < 5'	to scale 10' - 5' < 5'	to scale < 5'	

Bary Reppert & Will Finon

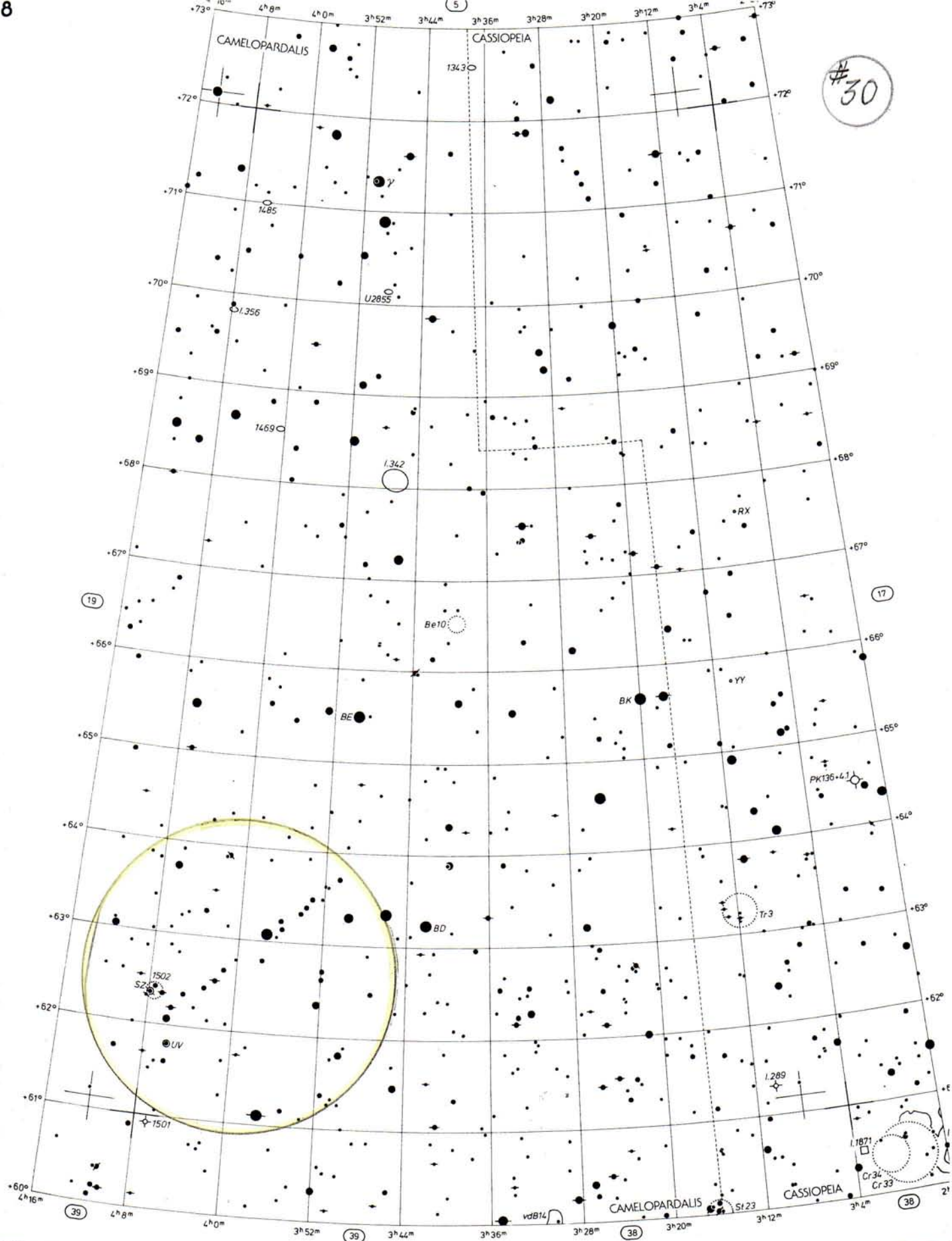


nebulae
 Nonstellar objects are shown to scale if diameter is larger than:
 - 2' for galaxies
 - 5' for other

Constellations on this map:
 Camelopardalis, Cepheus, Draco, Ursa Minor



The Great Atlas of the Sky
 Jubilee Edition
 400th Anniversary of Telescope Astronomy
 Piotr Brych - 2009
 Epoch of coordinate J2000.0



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STELLAR MAGNITUDES	DOUBLE OR MULTIPLE STARS	OPEN STAR CLUSTERS	GLOBULAR STAR CLUSTERS	PLANETARY NEBULAE	BRIGHT NEBULAE	DARK NEBULAE	GALAXIES	QUASA
	VARIABLE STARS	to scale	to scale	>120"	to scale	to scale	to scale	RADIO SOURCES
		<5'	<5'	120"-60"	10'-5'	10'-5'		X-RAY SOURCES
				60"-30"	<5'	<5'		
				<30"				