

**Shesh Kenafayim (שש  
כנפים, "Six Wings"); also  
known as Kanfei  
Nesharim**

Wings of Eagles

*(c. 1365)*

by R. Immanuel ben Jacob Bonfils of Tarascon (active 14th century,  
Provence)

Translation by Scott Weisman



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Translator Version beta

Upright reason dictates that the recipients of the good, of whatever type and level of beneficence it may be, must show gratitude and blessing to the beneficent person in every way possible, commensurate with the value of the beneficence. And one who has benefited all the people of the world — for example, one who invented a new instrument for the good of the world, or a good book — it is fitting for every discerning person, out of the obligation of love of fellow beings, to at least purchase it, so that the man will profit and his heart will be encouraged thereby to invent yet more good instruments in the world. And similarly, all other wise-hearted people will likewise strive and exert themselves to invent good things and instruments needed for the repair of the world and its perfection.

And therefore, whoever says: "What do I need this new instrument for?" — he does not act well towards the world. For if not for the man who invented it, where would you be? And what would your city do? And more than this, if the man did not exert himself, what would the world do?

— R. Pinchas Eliyahu Hurwitz, *Sefer HaBrit HaShalem* (1797)

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## A note on the work

One of the most widely copied Hebrew astronomical handbooks of the late Middle Ages, composed around 1365 in Provence. Its six sets of tables — the "wings" that give the work its name — let the user compute the positions of the sun and moon, predict eclipses, and convert between calendars, each with brief instructions for use. It employs a decimal notation for astronomical fractions long before such methods spread through European mathematics, and was later translated into Greek and Latin. This English version is drawn from an Italian manuscript copy made in 1509.

## A note on the translation process

This translation was produced with the [translation-pipeline](#). See the linked repository for details on the process.

*This text is the product of a highly refined automated translation process. It has undergone only cursory human review and should not be treated as an authoritative or scholarly rendering. It is offered solely as a reference and reading aid — a way to make an otherwise inaccessible work approachable — and any passage of real consequence should be checked against the original source.*

## Acknowledgements

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## Shesh Kenafayim ("Six Wings") — Immanuel [ben Jacob]

The proem is a rhymed introduction; each verse closes on the rhyme-syllable *-im*. The layout is two-column (a hemistich on the right, its rhyming partner on the left). I render the couplets as lines of English verse, hemistich by hemistich.

Indeed, today I have found those who purify [the science] — and I have been sought out at the request of friends [חברים] to find the path and the reckoning of their [the luminaries'] courses — without toil and without length of words. [They are found] in other composed treatises [?] — and in the decrees and the determinations of the luminaries [המאורים]. I sought it out and found it, to [my] wonder — with much precision [בדקדוק רב] and in brief lines ["short routes," וברכים קצרים]. And these are six wings [כנפים], wings of [?] — luminous in their motion [?], and they resemble [?] wings in number [כנפים במספר] — like [?] and they were given to cover [להבו? לחסות] beneath my wings [תחת כנפי] — [?] they will know, and not [?] — they will fly and not [?] and the way [ודרך] by which she [it] walks [?] in its rising [?] — it will be healed [וירפא] in [?] and the upright [שש כנפי עשורים], those who ascend [?] words [דברים] — for this [לזה] I have set out [?]

[The lower proem (page 1, middle-third, right column) is genuinely abraded; several hemistichs survive only in fragments. Words marked [?] are individually uncertain glyphs on an abraded leaf, not a downsampling artifact.]

[The left-column rhyme-partners, page 1 top/middle, are mostly legible:] — and I have been sought out at the request of friends [ונמצאתי לבקשת חברים] — without toil and not the length of speech [בלא טרח ולא אורך דברים] — and in the decrees [וגזרות] of the luminaries [המאורים] — with much precision and short routes [בדקדוק רב וברכים קצרים] — [?] luminous in their motion, those who shine [מאירים] — like [?] — they will fly [ויעופו] and not weary [ולא ייעפו], the youths [נעורים] — and [it] will be healed [וירפא] by their wings [בכנפיה] for those who pass [לעוברים] — and to this [ולזה] the matter is named [?]; for they are six wings [שש כנפי עשורים] [./ כנפים].

[Display initial: אמר] Said [...]

Said [given name — abraded [?]] **ben Jacob** [בן יעקב] [...] —

[The author here names himself "[given name] ben Jacob." The given name is abraded and I cannot read it letter by letter; flagged [?]. Per the dispatch I do not supply it from the external attribution.]

[given name [?]] ben Jacob, in all six wings [בכל כנפים] [...] for the upright [למישר] [...] and the youths [ינערי] of Israel [ישראל] I expounded [דרשתי] — to one who studies [שעוסק] my treatise [חבורי], and to do good [להמיטיב] — to reckon [לחשוב] the conjunctions [המולדות] and the [...] the books [הספרים] and their decrees [וגזרותיהם], the way of all [דרך כל], and [...] [?] with much precision [בדקדוק רב], as [...] and [?] — for it was [...] and it was a [...]

[Display initial: ואלה] And these [...]

**And these** are the matters [?] [...] for one who shall reckon [?] [...] to reckon [לחשוב] the positions [תקופות] of the luminaries [המאורות] [...] neither by computation [מחשבה] nor by ratio [ערך], neither by fraction [חלק] nor by sight [מראה] [...] [?] has set [ערב] thus [...] and everything [וכל] is set in order [מתוקן], much [רב] [...]

[Display initial — abraded] [...]

[A further display-initial section opens at the foot of page 1. The enlarged opening word is abraded and I cannot resolve it: candidates ראש ("the chief/first") or האחר. The following lines name "the reckonings" (החשבונות) and "a treatise" (מאמר).]

[opening word [?]] [...] the reckonings [החשבונות] [...] [?] which I have already explained [שכבר ביארתי] [...] and may God help [והאל יעזרני / וחכל וזל] [...]

שער החשבונות — The Gate of the Reckonings [the Canons]

**The Gate of the Reckonings** [שער החשבונות], to subtract [לגרוע] [...]:

I have set [שמתי / דמיתי] in this reckoning [בזה החשבון] [...] to add [להוסיף] as that which I left over [שבארתי] in [...] the deficiency [החלואה] will be precious [יקרה] to those who study [לפעמים / לעמלים] [...] the reckonings [חשבונות], and between this and that reckoning [ובין זה החשבון] [...] the whole sum [כל סך] of the value [ערך] of the deficiency [החלואה], the [...] for already [שכבר] the plain meaning of the practice [פשט המנהג] [...] to support [לסמוך] in all their reckonings [בכל חשבונותיהם] [...]

[Display initial: הראשון] The First [canon]

**The First.** [...] to know the value [לדעת ערך] of the deficiency [החלואה], from the time of the conjunction [מזמן המולד] or the [...] the reckoning [החשבון], and to it [belong] great [reasons] [גדולה]; for in truth it is fitting [כי באמת ראוי] that I explained [שבארתי] in the latter treatise [במאמר המאוחר] — it is to me [לי] the



[Table check: no ruled numerical tables appear on these two leaves — both are continuous prose (proem, preface, canon openings). The tabulated "six wings" begin later in the work.]

*Immanuel Bonfils, "Six Wings." 1509 Italian copy, UPenn LJS 204. Small Italian Hebrew semicursive, a single primary hand. Display headings are written in an enlarged book-hand in the same dark brown ink as the body — no red rubrication on these folios; the colored bands at the page edges are the marbled binding, not ink. Folio numbers not marked; tracked by PDF page. Continuation of the canons (gate of the reckonings) — the conjunction-equation discussion and the programmatic table-of-contents of the six wings, ending at the canon of the First Wing.*

there is no difference of time between the [true] conjunction [מולד] and the mean conjunction [הנגור השוה — the mean syzygy], or between the...[?] And the difference between the mean conjunction and the [true] conjunction — that is, the surplus [המוסף] — and likewise [?]. . . in their cycle, this happens by reason of [?] their elevation, and the difference [החליה]; from this...[?] . . . by the reckoning, and between this reckoning [as] from the firmament [?] . . . just like a thin difference [?]. [The line-ends here are faintly abraded; readable but uncertain at the margins.]

**And when** [ובאשר — display-rubric paragraph opener, enlarged initial] you wish to know all these differences [החלופים], the...[?] of the reasons we have mentioned, it would be precious [i.e. take long] to...[?] the difference between [one] reckoning and another — that is, the reckoning of the position [המכון] and the...[?] hour, quarter, and second; and as for all these reasons we have mentioned, it [would be] better and more precise to reckon from the position [מהמכון] and from the...[?].

**It is a duty** [וחובה — display rubric] upon every learned man — in order that his reckoning be more precise and that he be wary [ויזהר] of error in the reckoning — [to attend] to this: the reckoning, in the manner we shall set out [?].

These [tables], being most precise [מדויקדקות], and the...[?] in them [?] — and by these [?] . . . [a few words abraded at the line-ends]. [On] the line [טור] of the established [reckonings — אמורי] in the rows [בקדרות] of the months of the moon and the sun [ירחי וחי שמשי], [the matter is set in order].

in the columns, to verify [להבחין] upon the way we explained; and if [the calculator] should err [?] . . . the difference [החלופי]; and if he is wary [?] of error he shall...[?] go straight [?]. And if you go astray [?] . . . we have already explained [וכבר

ביארנו] and we shall set out[?]...the small[er] [reckoning?], and the...[?] in the matter[?]...the [reckonings?] will be set in order and will go straight to the rows[?]. And if there is for me[?] in this a marvel[?] [from the columns?], a difference[?]...[the running argument: the tables, used per the canon, keep the calculator from error].

you go straight, since the reasons[?] that there is no[?] in them[?]...[recte: uncertain]. **I have composed** [וחברתי] — display rubric] in it [in this book] **six tables** [שש לוחות], new ones [חדשים], **the Six**

**Wings** [the rubricated display words read as inked *בתי בשירים*; in this work כנף = "wing" (a table-set), so this is the title-echo "the Wings"] —

for the practiced [למפותרים] in the craft [המלאכה] and those light [וקלים] — for whom it is easy] in it[?], [so that] one may[?] reckon a short [reckoning], by it, up to...[?]...and the calculator shall go up[?]...

upon them [עליהם] the manner [the procedure that]...[?]...the peoples [העמים], as Ptolemy [כטלמיוס = Ptolemy][?]...

**The First** [הראשון] — display rubric; first table-of-contents entry] — to know in it the [true] conjunctions [המולדות] and the...[?] the years[?] and the months[?]...

[The remainder below this point is blank ruled folio — the text-block ends mid-page.]

the surfaces [השמים] and the position [ומקום] of the luminaries [המאורות][?]...at the time of the [true] conjunction [בעת המולד], or the mean conjunction [הנגור {הש}וה][?]...the equation [התקון] of the...third[?], to establish [לתקן] by it the reckoning[?]...and the true conjunctions [והנגורים האמתים] and to know[?]...the rule [חק] of the moon and the rule of the sun [חקה הלבנה וחק החמה] in a quarter [ברבע][?].

**The Second Wing** [body heading; inked *הכבת השני*] — to establish [לתקן] by it the reckoning [of] the conjunctions [המולדות], to know the true positions [האמתיים], and the moment of the luminaries [לעת המאורות], and to establish [reckoning] in it...[?] — the quarter [הרבע] of the [true] conjunction [המולד], or the mean conjunction, [and] the true [position] [האמתי].

**The Third Wing** [body heading; inked *הכבת השלישי*] — to know in it the position of the hours of half the day [שעות חצי היום] of this[?]...the gnomon[?], and the rows[?] of the cities [הקדריות][?].

**The Fourth Wing** [body heading; inked *הכבת הרביעי*] — to know in it the size [שעור] of the cities [קדרות] and of the moon [והלבנה], and the surfaces [והשאים] [?].

**The Fifth Wing** [body heading; inked *הכבת החמישי*] — the distance [the parallax — מרחק] that is seen...[?]. here the sun [החמה] in this[?], the height [הגבה], and the difference[?] of the gnomon[?]...[?].

**The Sixth Wing** [body heading; inked *הכבת הששי*] — to know in it the size [שעור] of the eclipse[?] of the sun [החמה] and its hidings [ועתותיו] — its eclipses[?].

**And now I shall begin to explain** [ומעתה אתחיל לבאר] — display rubric; opening of the running canon proper, after the table-of-contents] — for I have already mentioned[?]...[a few words abraded].

Most of the difference [רוב המחלי], said[?]...[?] as Ptolemy[?] [טרסקון][?] mentioned[?]...[a clause abraded at the right edge]; and every[?] thing is required [נדרש], in order[?]...the distance [רחוק] of the rising [המזרח], the...[?]...and from the row[?] [ומן רקיע], and to know [ולדעת][?]...the elevation [the sphere — מגלות] [?].

**The First** [הראשון] — display rubric within the canon[?] — to the rows[?] [לשורות] and to clarify[?] [ולבהיין] that...[?]...the marvel[?]...the height [מעלה] of the wings[?] [הכנפים] and the gnomon[?]...the surface [מישור], and a difference[?]...

The difference [החלק] from the column[?] of the gnomon[?]...and the difference[?] of the...of the gnomon[?] between the...[?] of the...[?] of the established[?].

better [וטוב]; and you subtract [וגרענו] [?]...the difference [המחלי] as you wish [כשתרצה] to know[?], to clarify[?]...[?].

the courses of the conjunctions[?] [שמרוצי המולדי] [?], or the...[?]...and the rule [וחק] of the sun [חמה] and the rule [וחק] of the moon [לבנה] and the rule [וחק] of the...[?].

**The First Wing** [body heading; inked *הכבת הראשון*] [Margin: חדש — "new" (?), single word set in the right margin opposite the heading]

To know in it...[?] [for] the...[?] of the conjunctions [המולדי][?], or the...[?]...by the [true] conjunction[?]...the surfaces [השויים] and the position [ומקום] of the luminaries [המאורות][?]...the rule [חק] of the moon [לבנה] and the rule [וחק] of the...[?]...all[?]...I shall set out[?] [for] you[?]....

# Shesh Kenafayim (Six Wings) — Immanuel Bonfils

*Italian Hebrew semicursive, small hand, 1509 copy (UPenn LJS 204). Structural rubrics (the wing-headings) are written in heavier/darker ink. The two pages are facing leaves of a single opening: is the left-hand page (gutter at its right edge), is the right-hand page (gutter at its left edge).*

## [conclusion of] The First Wing — its canon (continued)

[The opening words of this page continue the canon of the First Wing begun in the previous batch:]

Note this procedure, and know the number of complete cycles [מחזורים, the 19-year cycles] that have elapsed, together with the number of the [year-]groups [הטונס [?]] — a loanword, perhaps a unit-name; the glyphs read ה-ט-ו-נ-ס] and of the complete [years] that have elapsed but have not yet reached a full cycle.

Then, with attention, take in the next [column] what you find opposite the number of complete cycles that have elapsed — conjunction by conjunction [חבורים לחבור] and [argument by argument, נגזורים לנגזור [?]]. Then take, in the column below it, what you find opposite the number of the [year-]groups [הטעמים [?]] — the same set named above] that have elapsed.

Again, take in another column beneath it what you find opposite [the corresponding entry]. Now reckon these [values] — its conjunctions [are] here, its [arguments] here, for the ordinary year [פשוטה] and for the leap year [מעוברת]. Combine each kind with its own kind [i.e. add like to like], and there will come out for you the moment [רגע] of the conjunction [המולד]: this is the mean argument [הנגזר [?]] — the derived/extracted table-value; rendered "argument" throughout].

And from [?] the [resulting] argument, [reckon] upon the place of the moon. There will be the [hour] of the conjunction [in] degrees [מעלות] and minutes, and the [position] will be set out for the mean moon [מקום לבנה השוה], [in] degrees [?]. — And this suffices for you in knowing the matter of the First Wing.

## [Red ink: הכנף השני — The Second Wing]

[Red ink / heavier-ink rubric:] **The Second Wing.**

When you wish to know the moment [רגע] of the [true conjunction] — its argument [הנגזר (?)], which I have verified [בדקתי], and the [mean position], and [?] — the true [value, האמתי] at that time: and to set the reckoning [חק, *heq*] for the moon, and the reckoning of the equation [התקון]:

Take the true argument [הנגזר האמתי] for you, [and bring it] to the [mean entry, הכנה השוה (?)], together with the reckoning of the sun [חק חמה], [which is] in your hand [i.e. already computed]. Compose [וּנְקָב, combine] the [entry] up to the reckoning of [the moon]; and the [values] in your hand are coupled together [מעורים (?)]. By the way [you were taught], write down [?] the [degrees], and take, according to that reckoning, the [hours, השעות] and minutes [והדקים] in the column [טור] of [?].

[Add] the argument, and add the operation [הפעולה] to the time of your operation [זמן פעולך — i.e. the epoch / base date of your computation]; [this is] the argument [?]. — In your hand [it will be], and with [?] reckon one day more [?], and the remainder [הנשאר] will be [?] the true argument [הנגזר האמתי].

And after midday [אחר חצי היום], invert [הופך] [the sign] with precision [בדקדוק (?)], in all your operations [בכל דבריך (?)].

### [Red ink: עוד — Again]

[Heavier-ink rubric:] **Again** — take for you, in [?], according to the reckonings [החקים] which are straight [?] in your hand [i.e. as established], [proceed] thus and direct [your steps]; [these are] reliable for you [?] in truth [?], to add to them and to subtract [from them] the value [העולה], upon the place [על מקום] [?].

[The canon continues onto the facing page:]

[set out] straight, in your hand; and upon every reckoning subtract from it [תגרע ממנו], and another [value] from the remainder [מאלו (?)] [is] the [residue]. The remainder [השאר (?)] is for setting the equations [המאורות] / [?] [the luminaries"] at the [moment of the] conjunction [בעת המולד].

[I have verified, האמתי (?):] and [?] reckon upon every reckoning of the [entry] [in] your hand; again you must repeat [תריך עוד תריך (?)]. This [is] what [will be] by day, the [reigning value, המלך (?)]; or the [argument] — the true [value] precedes [קודם] [it]: [namely] the [mean] argument [השוה], and afterward [the value] less [פחות] by [a certain] amount [כדי (?)]; [for] the hours [שעות] you shall add [תוסיף (?)].

[For] minutes [?]: if there be [?] — and with [?] the [equation] is set out, the true [value] precedes for you [קודם לאמתי]; and [in] this set the equation [התקון] and perform it [נעשה לו].

Upon every reckoning — [add] one day, twelve hours [י"ב שעות]; the [excess, תוספת] [is] upon the [entry, התקן] [in] your hand, [namely] the [moon, לבנה]; and [also] the [conjunction, המולד] precedes for the true [value, לאמתי].

Upon every one of these [add] up to twelve hours [י"ב שעות]; the [excess] [is] upon the [entry] [in] your hand: two minutes [ב' דקים]. The true [value] is its [computation, תעשה [?]] — in this manner [בהפך, "by inversion"], that is to say, the [seven, שבעה [?]].

And [the value] will come out by the [entry] [in] your hand, or [by] the [reckonings]; and [the value] will come out [?]: [namely] the [moon, לבנה]. And when you have repeated [the operation] to set the reckoning for the moon, know it [for] you [דע לך]:

[the value] straight, between the [conjunction, המולד] or the [argument, הנגזר] — the [mean, השוה] — and between the conjunction. [The] true [value] and [its] arrangement [וערוך]: the hours [השעות] [are] here, upon [?] minutes [?] [in] your hand; and combine [והבר] [for] the moon, straight, by the way [you were taught], that there is [?]:

[namely] the conjunction [in] your hand. [The value] will be the conjunction or the [argument]; the [argument] [is] the [mean, השוה], or [the difference, תגרע] [is] the [resulting value, העולה] — reckon [it, מחק] by the way [you were taught], that there is [?] the conjunction [in] your hand: the true [value] is the argument [or] the [argument] [in] the [mean] and [arising] value [והעולה], and afterward the [excess, התוספת] or [the difference, תגרען [?]].

[For] the moon, [in] the time of the conjunction, [is] the [argument] — the true [value] — and this [?]: [namely] the [entry] [in] your hand, the [small, הקטן]; the [second, השני]; and afterward [add] one more [value] [נמצא יותר נשוה [?]].

[Add] the reckoning of the moon — know it [for] you [דע לך]; and the number of the hours [מספר השעות] and the minutes [והדקים] [are] [either] of the [argument] — the [mean, השוה] — or between the conjunction or the [argument], [in] the [?] [way].

[The value], here, [is] the degrees [מעלות], and you shall verify them [ודקדקתם] and you shall take them [or set] them [יקח שני [?]]: [namely] up to the reckoning

of the moon, straight, by the way [you were taught]. If the day be the fifth [day, החמישי (?)]...

another, [it is] the true conjunction. And if [the result] is negative, subtract [it]; and if positive, add it. [?] When you have added the surplus or subtracted [it] [Interlinear / abbreviated: ו'וכו] [from] the conjunction, [?] you have enough, etc.

[Red ink header: הכנת השלישי — **The Third Wing**] [recte: הכנף השלישי — "The Third Wing"; the scribe wrote a clear ב for the expected נ] [?]

[concerning] the conjunction [?] ...

After you know whether it is by day or by night, and whether [it occurs] in the eastern [sky] and its position [is rising] toward sunset or toward the west [?] ... go to this Third Wing, and seek the position [?] of the place [?] ...

at the time you have known, and you wish to know [?] the position of the sun [?] and the moon [?] ...

In this matter [?], if the conjunction occurs by day, then [it is] fitting, etc. [?] ...

by day or by night; and however far [it is] distant [?] ...

and seek [the value] toward [the time] before noon or toward the [time] after [noon] [?] —

[Red ink: ואם — **And if**] [you wish] [?] ...

again it is fitting to compute, in order to take [?] ...

To compute concerning it [the moon], know first that in this Wing [?] ...

[a value] from day to day, after sunrise until [?] ...

[the] setting, there is no [point] fitting to compute at all [?]. And if [?] ...

it falls; and if it is by night, this [is] for [?] ...

by day before noon, and after sunrise [?] —

the rule [?] of the computation: if you find the value [?] of the moon to be less than [?] ...

that it [?] is [?] 18 degrees [מעלות = 'מע, degrees], 22 minutes [דק' = דק', minutes], 30 [seconds] [?] ...

degrees [מעלות], 38 minutes [דק'ים], from what [is] in [?] the degrees ...

38 [?] degrees [מעלות], from minutes [דקלים], from [?] toward computing [?] ...  
concerning the moon; and it is fitting to compute toward it, and proceed [?] ...  
and you shall combine [?] toward [the] matter of the Fourth Wing. [?]

[Red ink header: **ואם תרצה — And if you wish**]

to know whether this conjunction [?] is fitting to compute concerning [an] eclipse  
[?] —

in it, [whether] of the sun [חמה], and [whether] [?] [it is] fitting to compute  
concerning it; know [?] ...

[that] the true [?] conjunction, which [is] computed [?], [if] it [is] [at] midday [?],  
[it is] [the] half-hour [חצי שעה] [?] ...

until midday [or] after sunrise — [then] there is no [point] fitting to compute [?] ...  
the value [?]; and it occurs [?] by day [at] midday and after sunrise [?] ...

[After] sunrise, then [?] you shall know [?]; and if [the value] of the moon  
increases [?] [?] ...

[from] the constellation [מזלות, zodiacal sign] 31 degrees [מעלות], 32 minutes  
[דקלים] [?], until 60 [?] ... from [the] constellation [?] ...

60 [degrees] [?] from the constellation, again [an additional] 76 [?] degrees  
[מעלות], from what [is in] the constellation [?] ...

[?] until 7 [?], and [the] constellation 3, [the] degrees 27 minutes [דקלים] [?], it is not  
fitting [?] ...

[it is] fitting to compute concerning [the] moon [?] in this matter, [for] in this the  
sun [חמה] [?] [is] less [?] than what [?] ...

[it is] fitting to compute concerning it, and [by this] way you shall proceed [?] in  
your inquiries, [as] it [is] explained [?] ...

the fifth [?] and the sixth [?]; and this is enough for you toward [the] knowledge  
[of] the matter. [?]

[Red ink header: **הכנה הרביעי — The Fourth Wing**] [recte: הכנף הרביעי — "The  
Fourth Wing"; scribe wrote ה for the expected ך] — [Red ink, continued?: **כאשר  
תחקור** — "when you inquire"] [?]

[?] [the table-argument: **מהנגזרים / מהנגזרים** — "from the derived [arguments]"]  
[?] [reading of ז/ג/ג still uncertain, per handoff]

concerning them [the eclipses] of the moon. And if you wish to know [?] its  
measure [?] ...

[of] the Wing — the fourth [Wing]; and the Wing [?] in [it] [is] by way of the Wing  
[?] ...

the true conjunction, which [you computed] by your hand, and [from?] the  
proximity [?] [of] the Wing [?] ...

and take the value from [?] its nature [?] [to know] [the] eclipses, [their measure?]  
and [their?] [?] ...

eclipse. [?] Again [?] take for it the surplus [?] [of] the motions and the minutes  
[דקיים] [?] ...

the first time; and if there is [?] [in] the time, [it] will begin to [?] [?] ...

its measure [?] or from its act [?], with [?] [its] end [?]; and if [it goes] toward [the]  
motion [?] ...

and the minutes [?] [?]. From whence [?] [does] [the] eclipse arrive [?]? The  
computation [?] toward [?] —

is the first time; [it] begins [?] [the] eclipse from the beginning [until?] the Wing  
[?] ...

[it] begins, [it] goes out [?] from the beginning [?] until [the] end [of?] [the] eclipse.  
[?]

*[End of batch — canon prose continues into batch 005; no tables reached.]*

**Script:** Small Italian Hebrew semicursive, single hand, brown ink throughout.  
Section headings ("Wing" rubrics) in a larger display brown ink — no red ink on  
this opening. Folios unfoliated; tracked by PDF page. The page is fully written but  
the small hand and some ink-fading make individual words uncertain in places;  
the gutter side of each page is intact.

This batch is canon prose (no number-tables yet): the close of the **Fourth Wing**,  
the whole **Fifth Wing**, and the opening of the **Sixth Wing**, ending with the  
catchword *Chazak* at the foot of p. 10.

and you will find it set down [literally "written"] for you in the table, inscribed over against [i.e., aligned with] the time [?] — the time which is the moment of the entry of the whole Moon into the shadow [the Earth's shadow], in darkness, until [the end of] ...

it would be from mid-eclipse [מהאמצע הלקות] until the beginning of its emergence from the darkness [מהאפלה]; for the true moment [of mid-eclipse] is the moment of greatest [obscuration], and the [moment of] mid-eclipse [?] ...

for you, by knowing the matter of the Fourth Wing [הכנה הרביעי].

**[רביעי] הכבת [Fourth Wing]** [display heading; the scribe's display form reads הכבת for הכנה, "the Wing"]

When you investigate concerning which conjunction [מולד] there will be — one fit to be examined [for an eclipse] in [the table] — you wish [?] to know the true [moment] [?], that it should appear as the true [moment] [המולד האמתי]; on that day or the day after it [ביום הוא מחרין], when it appears, go and look [?] for yourself, and enter [?] with it [as argument] in the zodiacal sign [במזל] in which you found it [בנמצא בו]; [together with] the rows of the table [שני המאורות, "the two luminaries" / the rows for the luminaries] ...

with the [number of] hours [שעות], by the rule [?], for [that is] the [excess of] half a day [חצי היום]; and the breadth [latitude] of the [Wing-table] [וברחב הכנה], according to the rule corrected for the Moon [מתוקן ללבנה], and take [וקח] for yourself ...

the degrees [?] and the minutes [ודקים], and you place [it] over [against] the time of the true conjunction [זמן המולד האמתי]; the [amount of] time [?] is half [its] excess [?] ... from [the moment of] mid-eclipse; should [it] be larger [?], or smaller; and if it comes out [so] [והיוצא], then it is the addition [התוספת] ...

the derived [argument] [נ/ג/ז — הנגור / הנגור still uncertain], as it appears [הנראה]; and it is [והוא] the moment [רגע] of the [eclipse] according to the rule [בלקות] ...

**וכאשר [And when]** you wish to know how much [כמה] half [the obscuration] will be for the Sun [לחמה], know [?] for yourself how much it is [כמה הוא], [whether] before mid-[day] [קודם חצי היום] ...

and return [ושוב] [and] enter with this [בזה] into the Fifth Wing-table [הכנה החמישי], according to the rule, together with [the value] ...

the true conjunction [?] as it appears, [whether] before mid-[day] [קודם חצי היום], [half] the day, or after it [או מחרין] ...

together with the [number of] hours [עם השעות], and [a value] for [?]; — half the day, [whether] before it or after it; and the breadth of the Wing-table [וברחב הכנה] ...

[for] the Moon [?] [ללבנה], within the two [columns?] you give for the Moon [תתן לבנה] ...

and take [ויקח] for yourself, from the degrees and the minutes [ממעלות ודקים], in the table fit [for it] [הראוי], according to [?] ...

the table — to add [להוסיף], and ..., and to subtract [ולגרוע], and [you] place [it] over against [על תתן] the Moon [לבנה] ...

to add [?], from the derived [argument] [מגרעונו? — uncertain]; should there be [something] [מה] to add [or] to subtract [לגרוע], and it comes out [והיוצא] ...

the derived [argument], [if] less [?], you give [תתן] for the Moon [לחמה], and this is sufficient [וזה מספיק] — by knowing the matter of the Fifth Wing [הכנה החמישי].

**[הכנה החמישי] הכנת ה[Fifth Wing]** [display heading; הכנה for הכנה]

[enter] with [it] into the [eclipses] of the Sun [בחמה] ...

[the moment of] the true [conjunction] [?], according to the rule, in the eclipse-tables ...

[before] mid-[day] [קודם חצי], how much [it is]; and go [enter] for yourself into the Fifth Wing-table [הכנה החמישי], [those] of the luminaries [המאורות], and in the breadth of the Wing-table [וברחב הכנה] ...

half the day [?] [חצי היום], [whether] before it or after it [או מחריו]; and take [קח] for yourself the deficit [העולה, "what comes up/results"] from the hours [מהשעות] ...

the true [moment] [האמת] [— how much it was [?], [whether] before [?] ...

how much it was [כמה היה], [whether] before [?] — half the [day?] [חצי] [?] ...

the deficit or the derived [argument] [או הגרעון], from the [Wing-]table [?], according to the rule. And it is the moment [רגע] of the [eclipse] visible in this Wing [רשום בזה הכנה].

**וכאשר [And when]** you wish to know — let [the value] be given [?] [תתן] — how much half [the obscuration] is for the Sun [לחמה], as it appears [?], how much half [it is] [?] ...

and return [and] enter with this [בזה] into the [Fifth Wing-table], according to the rule, together with [?] ...

[the conjunction] as it appears, [whether] before mid-[day], half the day, or after it [או מחריו]; and the breadth of the Wing-table [וברחב הכנה] ...

for nine [?] [degrees of?] longitude [?] [בשני טורין] — uncertain] you give [תתן] for the Moon [לבנה] ...

and take [ויקח] for yourself, from the degrees and the minutes [ממעלות ודקים], in the table fit [for it] [הראוי], according to what is fit [?] [לפי הראוי] ...

to add [?] and to subtract [?] [ולגרוע] and to subtract [?] [ולגרוע] [from] the deficit [?] [העולה], you place [it] for the Moon [על תתן לבנה] ...

[the table tells] you to add [?] [להוסיף], [from] the derived [argument]; [whether] there be [something] to add or to subtract [לגרוע], and it comes out [והיוצא] ...

and [the value comes up?] [תתן לחמה] for the Sun [לחמה], and this is sufficient [וזה מספיק] — by knowing the matter of the Sixth Wing [הכנה הששי].

**[הכנה הששי] [Sixth Wing]** [display heading; הכנה for הכנה]

and you reckon [וחשבת] for the conjunction [?] the [number of] regain [רגעים, 1/76 of a chelek] ...

the minutes [חלקים], and you give for the Sun [ותתן לחמה] ..., [and?] ...

and the rows-of-the-table [ושעותינו] / [ועמודינו?] — uncertain] for you, and go [and] [לזול] [enter?] ...

together with [what] you place for the Sun [תתן לחמה], and this is sufficient [וזה מספיק] [?] ...

by knowing the matter of the Wing [הכנה ענין הכנה] ...

[for] you [?] [לך] [into] the table — out of the [whole] table [?] [מסך מיעב] — uncertain] ...

the measure of the eclipse [שעור הלקות].

**ערך [Compute / set-down]** [display word in the margin/inset; ערך, the imperative "compute, set in order"] ... inscribed over against the time [רשום עליו זמן] ...

[that] which [is] from the beginning of the eclipse [מהתחלת הלקות] until its end [עד סופו] [?]; and this is sufficient [וזה מספיק] ...

and with this it is completed [ובכאן נשלם] [?] ...

my help [?] [עזרתי] until [עד?] ...

and let [it/Him] light up [?] [ויאיר] [?] ... [the line trails off into the gutter].

## חזק

rather than smoothed; this opening is a candidate for a hi-res review on the faded interior lines of both pages.]

## הכנף הראשון — The First Wing

[Red ink header: הכנף הראשון] — *The First Wing*. [Red ink: לחבורים] — *for the conjunctions*. (subtitle beneath the title band)

carries **two stacked, independently ruled tables** running the full width of the spread (read right-to-left across the R and L tile-halves). This structure is confirmed by independent reconciliation: the red argument heading המאורות (with its מכריעות-שלם / שלמים sub-labels) and a fresh רפ...רסט year-run **recur** at the mid-page boundary, and a second set of panel headers appears below — i.e. two tables, not one tall table. The leaf is photographed at a slight rotation; the inner columns run into the gutter; faded brown and red ink throughout. The argument (year-count) column is red and legible in both tables; interior cells are individual sexagesimal gematria digits, read cell-by-cell, with [?] for digits examined but unresolved.

Each value-group is a sexagesimal triple, with red sub-column heads reading **right→left** as **מע'** (degrees, *ma'alot*) · **חלק'** (minutes, *halakim*) · **שנ'** (seconds, *sheniyot*).

### Table 1 (upper block) — המאורות / המחזורים (The Luminaries — cycles)

[Red ink header: המאורות] — *The Luminaries* (red argument column). Argument sub-labels (red): **שלמים** (*complete [years]*) / **מכריעות שלם** (*intercalated, complete*). [Red ink header: המחזורים] — *the cycles*.

Value-groups, right→left: **חק חמה** (reckoning of the Sun) · **חק הזמן** (reckoning of the Time) · **שנה למאורות** / motion-increment group (leftmost, partly into the gutter).

המאורות (arg, yrs)	חק חמה — מע'   'חלק'   שנ	חק הזמן — מע'   'חלק'   שנ	שוה למאורות [?] — מע'   'חלק'   שנ
רסט (269)	•   ר   יד	ב   לז   •	א   א   א
רע (270)	•   טי   יד [?]	לג   •   •	א   ב   א
רעא (271)	•   טי   יד [?]	לג   •   •	א   ב   א
רעב (272)	•   לג   יד	לג   •   •	א   ב   א
רעג (273)	ר   יד   ח	ל   כה [?]   מד [?]	ה   יג [?]   ר
רעד (274)	יד   ט   •	נש   ל [?]   ב   נש	ט   •   לה
רעה (275)	יד   ט   •	יח   ל   •	•   ט [?]   יח
רעו (276)	יד   ט   •	ל   כה [?]   מד [?]	ט [?]   כה [?]   מד [?]
רעז (277)	יד   ט   •	ל   •   כא	•   ל [?]   כא
רעח (278)	יד   ט   •	טז   ל [?]   •	•   טז [?]   •
רעט (279)	יד   ט   •	לב   ל [?]   יח	•   יח [?]   לב
רפ (280)	יד   ח   •	פז   ל [?]   כז [?]   פז	פז   ח [?]   •

Table 2 (lower block) — המאורות / המחזורים

[Red ink header: המאורות] — *The Luminaries* (red argument column, repeated).  
 [Red ink header: המחזורים] — *the cycles*.

Value-groups, right→left: חק הזמן (Sun; data cells rubricated in red) · חק חמה (Time) · חק הלבנה (Moon, leftmost — runs into the gutter).

המאורות (arg, yrs)	חק חמה [Red] — מע'   'חלק'   שנ	חק הזמן — מע'   'חלק'   שנ	חק הלבנה — מע'   'חלק'   שנ
רסט (269)	כח   לז   •	•   ל   ו	א   יב   ב
רע (270)	כח   כז   •	ח   כב [?]   ל	א   יב   ה
רעא (271)	כח   יז [?]   כח	ב   כה   ל	א   כא   ל
רעב (272)	כח   ו [?]   כח	• [?]   ל [?]   מן	א   סע [?]   ו
רעג (273)	כט   שן [?]   כט	• [?]   ל [?]   מן	א   סז [?]   ר
רעד (274)	כט   מד [?]   כט	ל   •   •	א   ח   ל
רעה (275)	כט   לה [?]   כט	ל   •   •	א   ס [?]   ד
רעו (276)	כט   כד [?]   כט	ל   •   •	א   י   ה

המאורות (arg, yrs)	חַק חמה [Red]   מע'   חלק'   שַׁנ'	חַק הזמן — מע'   חלק'   שַׁנ'	חַק הלבנה — מע'   חלק'   שַׁנ'
(277) רעז	ב   יד   יט	ב   •   ל[?]	ח   כה[?]
(278) רעה	ה   יד   סב[?]	ה   •   ל[?]	ט   ב   א
(279) רעט	א   יד   כה[?]	נה   •   ל[?]	ט   י   א
(280) רפ	ל   יד   יחת[?]	ב   •   ל	ט   יח   א

` here marks genuine glyph-loss, not caution. Whole lower-block panel is a further native-res]

### Red argument column (both tables, rightmost — high confidence)

Identical in both tables, top→bottom: , (272) רעב, (271) רעא, (270) רע, (269) רסט רעג (273), רעד (274), רעה (275), רעו (276), רעז (277), רעה (278), רעט (279), רפ (280).

The argument column is the most legible element on the page (red ink, well-ruled) and reads at near-100% in both tables.

*First Wing (כנף ראשון): mean-motion number-tables. Sephardic semicursive, bicolor (black body + red rubrication). Two tables, one per page; both read right-to-left. Each table carries one argument column (page-right edge) and five sexagesimal value-groups, every group ruled into three sub-columns in the written order / מעלות / חלקים / שניות (degrees / minutes / seconds), presented below in logical deg | min | sec order.*

The five value-groups, in their written right→left order, are:

1. [Red ink header: *החבור והשעור*] — "the conjunction and the reckoning" (on page 2 the header is worded [Red ink header: *חבור או שעור*], "conjunction or reckoning")
2. [Red ink header: *שנה לשעורות*] — "the year, for the reckonings"
3. [Red ink header: *חַק חמה*] — "reckoning of the sun"
4. [Red ink header: *חַק לבנה*] — "reckoning of the moon"
5. [Red ink header: *חַק הגבול*] — "reckoning of the boundary"

## First Wing, for the cycle (19-year argument)

[Red ink header (running, top of page): ראשון לשני המחזור — "First: for the years of the cycle"] [The first word is inked כאשון (kaf-form initial) but is certainly ראשון recte ראשון.]

Argument column (rightmost on the page): the cycle-year, serial 1–19 in single-letter gematria (black ink). The markdown below places the argument in the **left-hand** column for readability; on the folio it is the rightmost column.

	ה	ח	ש	ה	ל	ח	ק	ח	ק	ה	ק	ה	ג	ב	ל	
A	בו		ה													
rg	ר		ל			ח										
(c	וה		ש			ק		ח								
yc	ש		עו			ח		ק								
le	עו		רו			מ		לב								
yr	ר		ת			ה		נה								
)	—		—			—		—								
	d	m	s	d	m	s	d	m	s	d	m	s	d	m	s	
1)	א	ר	ח	יב	יא	יט	יג	יא	יט	יז	י	יט	•	שו	ח	ל
(																
2)	ב	א	יג	•	יא	ח	לב	יא	ח	לג	לג	יה	יט	ח	לז	לג
(																
3)	ג	ג	יו	•	יא	כז	נג	יא	כז	נה	יד	כ	יג	ל	כז	יז
(												ה				
4)	ד	ר	כד	כג	יא	יו	[יר	יא	יו	יז	ו	ה	ז	א	ה	ה
(							?]									
5)	ה	ב	ה	לג	יא	ה	ל	יא	ה	[כו	ר	יר	מ	ר	יר	[ל
(							ה			?]			ט			?] ]
6)	ו	א	ו	[נו	יא	לד	נה	יא	כד	מ	ל	[כ	ו	ל	[כ	ז
(				?] ]						ש[		[כ			?] ]	?] ]
7)	ז	ה	ש	בו	יא	יב	יו	יא	יב	ה	כג	יב	ה	כג	יב	ה
(				[?] ]												
8)	ח	ר	יב	ב	טו	א	לר	טו	א	[כ	א	[כ	ט	א	[כ	ט
(				ה[			[?] ]	[?] ]		[?] ]		[?] ]			[?] ]	[?] ]

A rg (c yc le yr )	ה ב ו ר ו ה ש ע ו ר —			ש נ ה ל ש ע ו ר ת —			ה ק ח מ ה —			ה ק ל ב נ ה —			ח ק ה ג ב ו ל —			
	d	m	s	d	m	s	d	m	s	d	m	s	d	m	s	
(			?)			]			]							
ט 9)	טו	ר	בן [? ]	יא	י	ו	יא	י	כ	ט	ר	•	ט	ר	•	
(			]						ט [? ]							
י 1 (0	ה	לד	בב [? ]	יא	כ ח	לב	יא	כ ח	כב	ר	•	ל	ר	•	ל	
יא 1) (1	ב	יב	בו [? ]	יא	יג	מ ט	יא	יג	ל	ה	•	ל	ה	•	ל	
יב 1) (2	ו	כ א	כ ט	יא	ר	•	יא	ר	ו	ה	•	ל	ה	•	ל	
יג 1) (3	ה	יט	ב	יא	כ ה	כ ט	יא	כ ה	יג	ר	י	ב	ר	י	ב	
יד 1) (4	ל	יב	כ ה	יא	יד	יו	יא	יד	לו	ה	ל	ר	ה	ל	ר	
טו 1) (5	ג	יב	•	יא	ר	ל	יא	ר	מ ט	ה	א	לו	ה	א	לו	
טז 1) (6	ב	•	יב	יא	כב	כן [? ]	יא	כב	יא	ר	טו	ל	ר	טו	ל	
יז 1) (7	ל	יט	טו	יא	יא	מ ר [? ]	יא	יא	כן [? ]	ה	כ ח	ל	ה	כ ח	ל	
יח 1) (8	ב	יט	•	טו [? ]	טו	לר [? ]	טו	טו	ל	ו	•	ל	ו	•	ל	

	ה														
	ה			שנ											
A	בו			ה											
rg	ר			ל			ח						ח		
(c	וה			ש			ק			ח			ק		
yc	ש			עו			ח			ק			הג		
le	עו			רו			מ			לב			בו		
yr	ר			ת			ה			נה			ל		
)	—			—			—			—			—		
	d	m	s	d	m	s	d	m	s	d	m	s	d	m	s
1)	יט	ל	יט	•	יא	כ	כ	ל	ה	טו	ל	ה	טו	ל	
(9					ט	כ	ט			[?					
					ט	[?									
							[?								

[The argument column is serial 1–19; single letters in the gutter-side column occasionally blur (ר↔ה, ג↔ה) but the running sequence is unambiguous.]

## First Wing, for the months of the year

[Librarian note: folio number "44" over "65" (later hand, top-right corner).]

[A decorative cross-hatched (X-filled) ruled band runs across the top of the panel above the table.]

[Red ink header (running): ראשון לחדשי השנה — "First: for the months of the year"]

[Red ink: פשוטה — "common (year)", caption above the month-label column.] The caption reads פשוטה ("common/plain year"), yet thirteen month-rows are tabulated, including both אדר (Adar I) and ואדר (Adar II) — an embolismic (leap) layout. Transcribed as written;

Argument column: month names (Tishrei → Elul), repeated as row-labels at both the page-right edge and the page-left (binding) edge.

	ה	ה	שנ	ה	ה	ה	ה	ה	ה	ה	ה	ה	ה	ה	
A	בו	ל	ל	ל	ל	ל	ל	ל	ל	ל	ל	ל	ל	ל	
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(	וה	ש	עו	עו	עו	עו	עו	עו	עו	עו	עו	עו	עו	עו	
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ב			ד									[?			[?
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	d	m	s	d	m	s	d	m	s	d	m	s	d	m	s

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ש	ו	יא	קן[ ?]	ט	לד	כ א	ח	כ א	ס ה[ ?]	טו	א	כל [ ?]	טו	א	כל [ ?]
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א	כ	טו	ד	י	כ ח	ב	טו [ ?]	לב	לג	יב	כג	טו	יב	כג	טו
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וא	ל	יב	ה	יא	א	לר [ ?]	יח	יח	ל ה	ב	כב	א ל[ ?]	ב	כב	א ל[ ?]
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ני	ה	א	לג	ט	כ ט	מ ד	יא	יח	מ ד	לד	יד	ל	לד	יד	ל
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	ה	ה	שנ	ה	ה	ה	ה	ה	ה	ה	ה	ה	ה	ה		
Arg (moment h)	בו	ר	וה	ש	עו	רו	ת	ק	ח	מ	ה	ק	הג	בו		
	d	m	s	d	m	s	d	m	s	d	m	s	d	m	s	
איי (Iyyar)	ו	א	יר [?]	כב	ט	כ	מג	ט	יא	נג	ר	יד	לר [?]	ר	יד	לר [?]
סטיון (Sivann)	א	ל	ג	א	כ	ח	לג [?]	א	יו	נב	ר	•	ה	ר	•	ה
תמוז (Tammuz)	ב	טו	נא	ט	כ	ט	טו [?]	ב	יו	לר [?]	ה	•	יח	ה	•	יח
אב (Av)	ב	טו	רר [?]	ל	כ	כ	לר [?]	ל	טו	•	ל	ב	ו	ל	ב	ו
אלול (E lul)	ה	יט	רר [?]	ר	כ	כ	יל [?]	ר	יר [?]	יו	ר	י	נל [?]	ר	י	נל [?]

` are individual blurred glyphs, not lost columns.]

## The Second Wing — First-Wing mean-motion tables (continued)

**Script:** Sephardic semicursive, small hand, black body ink with red rubrication throughout (column headers, the value-group index letters, and a substantial share of the interior numeral digits are in red). Two full-width tables, one per page, both of the same wide deg | min | sec mean-motion format.

### Table — page 1: First-Wing mean motion (מהלך)

[Red ink header:... מעלות ... לשנה [?] חק לשני משטי [?] — table title row, partly abraded. The legible elements are חק ("reckoning-column"), לשנה ("for the year"), and מעלות ("degrees"), consistent with the running First-Wing mean-motion title established in the preceding batches.

Each value-group column carries the established doublet sub-header, written in two stacked red-ink lines beneath a red gematria group-index letter:

- top line: או / המהלך ("the mean motion / or")
- bottom line: לשנה הפשוטה vs. לשנה העבור ("for the leap year" vs. "for the ordinary year")

and below those, the diagonal-ruled triple sub-column band | מעלות | חלקים | שניות (degrees | minutes | seconds) repeated within each value-group.

The value-group index letters (red, across the top, right→left) read approximately: כר [?], ט, יח, ל [?], יב, כ [?], ג, כג [?], יח, ט, כר [?] — about nine value-groups. Several are abraded or straddle a tile seam and cannot be committed.

The interior deg | min | sec grid is written in alternating red and black digits. At uniform tile resolution the value-groups straddle the tile seams and the page bows toward the gutter, so the full-width degree | minute | second grid cannot be registered cell-by-cell to (group, sub-column, row). Individual glyphs are visible throughout, but committing them to specific cells would be confabulation. The skeleton is therefore given with interior cells as [?].

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המחז ז (ור)	grp כ	grp יב	grp כ[?]	grp ג	grp כג[?]	grp ל[?]	grp יח	grp ט	grp כר[?]
[?]	[?]	[?]	[?]	[?]	[?]	[?]	[?]	[?]	[?]
[?]	[?]	[?]	[?]	[?]	[?]	[?]	[?]	[?]	[?]
[?]	[?]	[?]	[?]	[?]	[?]	[?]	[?]	[?]	[?]

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Table — page 2: First-Wing mean motion (מהלך), continued

[Red ink header:... מעלות ... לשנה. [?] משטי [?] לחק לשני משטי [?] לשנה. ... מעלות] — same title row as page 1, partly abraded; legible: מעלות, חק, לשנה, מעלות.



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המחז	grp		grp	grp	grp	grp	grp	grp	grp
(ור)	א	ג grp	א	יב	א	ט	א	יח	כר[?]
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**First Wing — Moon, mean-motion tables (חק לבנה / מהלך).** This opening is a single wide mean-motion table for the Moon's reckoning, continued across both folio sides. Each page is ruled into an index column at the outer edge plus a series of degree-group columns; every degree-group carries the leap-year / ordinary-year doublet (השנה הפשוטה / לשנה העבור) and is internally divided by a red diagonal slash separating two stacked sub-values per cell. The running structural elements are legible; the dense interior numerals are not registerable to fixed (group, deg/min/sec, row) coordinates at uniform tile resolution — see the readability note and the QA flag below.

Above the table frame, centered, a red catchword / page-mark: ש [?] (single red word, partly trimmed at the head margin).

**Table header (red ink, running across the top of the frame):**

[Red ink header: מעלות חק לבנה משו [?] לשו מעלות ("degrees — Moon reckoning — mean motion [?] / ordinary [?] — degrees")]

**Index column (outer / right edge):**

[Red ink header: מספר שני המחזור] — "cycle index number" (vertical red heading; the column carries red index numerals running, top to bottom across the ruled sections: טו, טו, טו ... then a rule, then א, א, א ... then ב, ב, ב ... — the cycle-year index.)

**Degree-group column headers (red numerals, reading the data columns right→left):** כר, ב, יח, ב, ו, ב, ד, ב ... (the group-degree labels; several straddle tile seams and are given here in the order legible).

**Per-group doublet labels (repeated in each degree-group, red ink):**

- top sub-cell: [Red ink header: המהלך] ("the mean motion")
- mid label: [Red ink header: אן [?]] / [Red ink header: השנה העבור] ("...the leap year")
- lower label: [Red ink header: לשנה הפשוטה] ("for the ordinary year")
- the red diagonal sub-cell legend within each group reads: השנ[ה] [?] / השני [?] (the year-type marker written along the slash, in red).

**Interior data grid (skeleton — values not registerable; see QA flag):**

מספר שני המחזור (index)	group A	group B	group C	group D	group E	group F
טו	[?]	[?]	[?]	[?]	[?]	[?]
טו	[?]	[?]	[?]	[?]	[?]	[?]
טו	[?]	[?]	[?]	[?]	[?]	[?]
(rule)						
א	[?]	[?]	[?]	[?]	[?]	[?]
א	[?]	[?]	[?]	[?]	[?]	[?]
א	[?]	[?]	[?]	[?]	[?]	[?]
ב	[?]	[?]	[?]	[?]	[?]	[?]
ב	[?]	[?]	[?]	[?]	[?]	[?]
ב	[?]	[?]	[?]	[?]	[?]	[?]
...	...	...	...	...	...	...

Above the table frame, centered, a red catchword / page-mark: ש [?] (single red word, partly trimmed at the head margin), matching the recto.

**Table header (red ink, running across the top of the frame):**

[Red ink header: מעלות חק לבנה משו לשו] ("degrees — Moon reckoning — mean motion [?] / ordinary [?]")

**Index column (outer / right edge of this page):**

[Red ink header: מספר שני המחזור] — "cycle index number" (vertical red heading; red index numerals run, top to bottom across the ruled sections: טו, טו, טו, טו, ...)

then a rule, then א ,א ,א ... then a further section beginning ב ,א ... — continuing the cycle-year index from the recto.)

**Degree-group column headers (red numerals, reading the data columns right→left):** יח ,ד ,ב ,יב ,ו ,ד ... (the group-degree labels, in the order legible; several straddle tile seams).

**Per-group doublet labels (repeated in each degree-group, red ink):**

- top sub-cell: [Red ink header: המהלך] ("the mean motion")
- mid label: [Red ink header: או (?)] / [Red ink header: השנה העבור] ("...the leap year")
- lower label: [Red ink header: לשנה הפשוטה] ("for the ordinary year")
- the red diagonal sub-cell legend within each group reads: השנ[ה] [?] / השני [?] (year-type marker along the slash, in red).

**Interior data grid (skeleton — values not registerable; see QA flag):**

מספר שני המחזור (index)	group A	group B	group C	group D	group E	group F
טו	[?]	[?]	[?]	[?]	[?]	[?]
טו	[?]	[?]	[?]	[?]	[?]	[?]
טו	[?]	[?]	[?]	[?]	[?]	[?]
טו	[?]	[?]	[?]	[?]	[?]	[?]
(rule)						
א	[?]	[?]	[?]	[?]	[?]	[?]
א	[?]	[?]	[?]	[?]	[?]	[?]
א	[?]	[?]	[?]	[?]	[?]	[?]
ב	[?]	[?]	[?]	[?]	[?]	[?]
...	...	...	...	...	...	...

## First Wing — Moon mean-motion tables (continuation)

Both folio sides in this batch are ruled astronomical tables of the same design, continuing the First-Wing *Moon reckoning* (חק לבנה) mean-motion (מהלך) tables begun in the previous batch. No running prose appears. Small Italian Hebrew hand; red-ink rubrication for the title line, column-group index numerals, sub-headers, and one of the two paired value-entries per cell.

**Table design (both sides, identical).** Each side is headed by a red-ink title line running across the top of the grid:

[Red ink header: מעלות ...[שנים] משך לבנה חק מהלך חק] — "Mean motion of the Moon-reckoning, span for the years..., degrees."

Beneath the title the grid is organized into repeating column-groups. Each column-group carries:

- a **red-ink index numeral** in its top header cell (the per-column argument/step count — these differ from group to group);
- a **sub-header cell** (red ink) reading [Red ink header: המהלך או הנעוד לשנהם] — "the mean motion, or the addition (הנעוד), for their years"; and an adjacent diagonally-split red label of the form [Red ink header: / אומתי / לשנהם] / [Red ink header: [שנת שלוש פשוטה]] designating the leap-year (לשנה העבור) vs. ordinary-year (השנה הפשוטה) sub-columns;
- **data cells each split by a fine diagonal rule into two stacked sub-values** — one rendered in red, one in black — giving the leap-year and ordinary-year mean-motion increments side by side as sexagesimal letter-groups (מעלות / חלקים / שניות = degrees / minutes / seconds).

The far margin of each side carries the **cycle-index column** (מספר שני המחזור), a single red letter-numeral per row.

[Table: First Wing — Moon mean-motion, p. 19 (verso)]

[Red ink header (title, across top): מעלות ... משך לבנה חק מהלך חק]

[Red ink header (per column-group, sub-header): המהלך או הנעוד לשנהם] — split into leap-year (לשנה העבור) and ordinary-year (השנה הפשוטה) diagonal sub-cells, each marked אומתי / שנת שלוש פ.

Confidently-registerable red column-index numerals (header row, reading right→left across the page): ו [6=], ר [4=], יב [=], [=4 / or ז(?)], כב [22=], ב [2=], ר [2=], [12 — remaining group indices toward the gutter not confidently registerable.

Cycle index (מספר שני המחזור)	leap / ordinary sub-values (deg · min · sec, per column-group)
ט [9=]	[?]
א [1=]	[?]
ב [2=]	[?]
... (rows continuing downward)	[?]

Cycle index (מספר שני המחזור)	leap / ordinary sub-values (deg · min · sec, per column-group)
ה [5=]	[?]
ו [6=]	[?]

### [Table: First Wing — Moon mean-motion, p. 20 (recto)]

[Red ink header (title, across top): מעלות ... משך לבנה]

[Red ink header (per column-group, sub-header): [המהלך או הנעוד לשנהם] — same leap/ordinary diagonal split as p. 19.

Above the grid, in the upper blank margin, a small red-ink jotting: [Red ink: שני] (with a stray red flourish above it) — a catch-label / foliation aid, not part of the table body.

Confidently-registerable red column-index numerals (header row, reading right→left): [ה [5=], ו [6=], ה [5=], יב [12=], ה [5=], יח [18=], כר [=20+] (?) — remaining group indices toward the gutter not confidently registerable.

Cycle index (מספר שני המחזור)	leap / ordinary sub-values (deg · min · sec, per column-group)
ר [=200, used here as a row marker (?)]	[?]
ה [5=]	[?]
ו [6=]	[?]
(rows continuing downward)	[?]

First Wing (כנף ראשון) — continuation of the Moon reckoning (חק לבנה): the mean-motion (מהלך) table for the conjunction (המולד / molad). The opening is a single wide many-column astronomical table of small two-letter sexagesimal value-pairs (degrees / minutes / seconds, שניות / חלקים / מעלות) in alternating red and black ink, with red rubric headers. Script: small Italian Hebrew semicursive. Logical reading is right-to-left across the opening. Both leaves are worn, with gutter-loss along the inner margin and some fading of the red rubric ink.

### left-hand leaf of the opening

[Red ink: page-header rubric שני ("second") at top center.]

**[Red ink header line:** מולד[ות] חק לבנה ... לשנה ועבור — "Conjunction[s], reckoning of the Moon ... for the [ordinary] year and the leap[-year]" (molad / mean-motion table, continuation).

The table is organized into vertical **column-groups**, each headed by:

- a **red index numeral** (the cycle-position argument; the legible header run reads, right-to-left, כר · יח · יו · יב · יו · יו · ט · ו [several uncertain — see QA]);
- a black/red sub-header doublet **לשנה העבור / לשנה המולד או** versus **לשנהם [השנה הפשוטה]** / — "the arguments of the molad: either for the leap year / or for the ordinary year";
- a **red unit row** giving the sub-columns שניות / חלקים / מעלות (degrees / minutes / seconds).

Body rows are successive cycle entries; within each group the sub-columns hold a deg / min (/ sec) pair, red and black alternating by entry. Sexagesimal columns wrap 0–59 normally.

מספר שני המחזור ר (cycle index )	grp (ו)	grp (ו)	grp (יב)	grp (ו)	grp (ט/יח)	grp (ו)	grp (ו)	grp (כר) [innermost / gutter]
א	[?]	[?]	[?]	[?]	[?]	[?]	[?]	[gutter]
ב	[?]	[?]	[?]	[?]	[?]	[?]	[?]	[gutter]
ג	[?]	[?]	[?]	[?]	[?]	[?]	[?]	[gutter]
ד	[?]	[?]	[?]	[?]	[?]	[?]	[?]	[gutter]
...	[?]	[?]	[?]	[?]	[?]	[?]	[?]	[gutter]

(rows continue, ~24 on)

מספר								grp
שני								(כר)
המחזור								[inne
ר								rmos
(cycle								t /
index	grp	grp	grp	grp	grp	grp	grp	gutte
)	(ו)	(ו)	(יב)	(ו)	(ט/יח)	(ו)	(ו)	r]

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## right-hand leaf of the opening

[Red ink: folio numeral (8 =) ח at top center; below it the page-header rubric שני ("second"). A single small red word שע is centered just above the table block — abbreviation, expansion uncertain [?].]

**[Red ink header line:** מולד] חק לבנה ... לשנה לבנה — "Conjunction[s], reckoning of the Moon ... for the lunar year" (molad / mean-motion table; this is the right-hand start of the opening's table).

**Right-hand index column (far-right edge), header reading vertically:** [Red ink header: מספר שני המחזור — "Number of the years of the cycle" (cycle index)], with an adjacent red vertical caption מולד ... מהלך ("mean motion of the conjunction ...") [?].

Same column-group structure as Page 1; the headers are clearer here:

- [Red ink header — column-group index numerals, right-to-left:] ל · א · יג · כר (further groups toward the inner margin; several uncertain).
- [Sub-header doublet, repeated over each group:] **אמרי המולד או / לשנה העבור** (red, leap value) versus **לשנהם** [recte: הפשוטה] (black, ordinary value).
- [Red unit cells, per group:] שניות · חלקים · מעלות (degrees · minutes · seconds).

מספר						
שני						
המחזור						
(cycle						
index)	grp (ל)	grp (א)	grp (יג)	grp (יב)	grp (יח)	grp (כר)
א	[?]	[?]	[?]	[?]	[?]	[?]
ב	[?]	[?]	[?]	[?]	[?]	[?]

מספר שני המחזור (cycle index)	grp (ל)	grp (א)	grp (יג)	grp (יב)	grp (יח)	grp (כר)
ג	[?]	[?]	[?]	[?]	[?]	[?]
ד	[?]	[?]	[?]	[?]	[?]	[?]
...	[?]	[?]	[?]	[?]	[?]	[?]

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First Wing (כנף): Moon reckoning — conjunction (molad) mean-motion tables.

This spread is a single wide astronomical table laid across two facing folios (folio 72 / עב, folio 73 / עג) The table tabulates the mean motion of the conjunction (המולד) for the cycle, indexed by the cycle-year number (מספר שני המחזור), giving the mean-motion increment in degrees / minutes / seconds (מעלות / חלקים / שניות), with leap-year (לשנה העבור) and ordinary-year (השנה הפשוטה) values paired under each cycle-index heading.

Folio numeral at head of page: [72 =] עב (small black ink, top center).

[Red ink header — table title, top of grid]: המולד · חק לבנה · מהלך אמצעי · לשנים מועלות ("The conjunction: Moon reckoning — mean motion, for [the] years [of the cycle]")

The grid carries, at the right, a vertical index column and an explanatory rubric, then a sequence of major columns each headed by a **red cycle-index letter** (מספר שני המחזור) and a **red two-part sub-header** distinguishing the leap-year and ordinary-year entries.

**Index column / right-margin rubric (vertical, red ink):** מספר שני המחזור ("cycle-year number") with an accompanying rubric phrase (e.g. לחשבון ... למצע, "the mean... for the reckoning") [partly worn].

**Red cycle-index column-letters across the head of page 1 (read RIGHT → LEFT):** כד · ח · יח · יב · [—] · ה · ו · ח · ט · [?] · ...

**Red sub-header under each cycle-index letter (recurring, two lines):** [Red ink header]: לשנה הפשוטה / לשנה העבור או למצע המולד ("mean of the conjunction, either for the leap year / for the ordinary year")

Each indexed major column is then subdivided into a degrees / minutes / seconds triple (מעלות · חלקים · שניות), the entries alternating red and black ink down the rows.

מספר שני המחזור (cycle index) — red column-letter	leap-year / ordinary-year value (מעלות · חלקים · שניות)
--	--

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ט (9)  
ח (8)  
ו (6)  
ה (5)  
יב (12)  
יח (18)  
ח (8)  
כד (?) (24)

Folio numeral at head of page: [73 =] עג (small black ink, top center).

[Red ink header — table title continued, top of grid]: המולד · חק לבנה · מהלך · אמצעי · לשנים מועלות ("The conjunction: Moon reckoning — mean motion, for [the] years")

The same structure continues across this folio: red cycle-index column-letters across the head, with the recurring red two-part leap/ordinary sub-header beneath each, and deg/min/sec value triples filling the body.

**Red cycle-index column-letters across the head of page 2 (read RIGHT → LEFT):** כר · ט (9) · יח (18) · ... · ו (6) · ט (9) · יב (12) · ט (9) · ה (5) [?] ...

**Red sub-header under each cycle-index letter (recurring, two lines):** [Red ink header]: **לשנה הפשוטה / לשנה העבור** / **אמצעי המולד או לשנה העבור** ("mean of the conjunction, either for the leap year / for the ordinary year")

מספר שני המחזור	—	leap-year / ordinary-year value
red column-letter		(מעלות · חלקים · שניות)

---

ה (5)

ט (9)

יב (12)

ט (9)

ו (6)

יח (18)

ט (9)

כר [?]

## First Wing — mean motion of the Moon's reckoning from the conjunction (continued)

Script: Sephardic semicursive, primary hand, with rubricated (red-ink) headers and red/black interleaved numerals throughout the table body. The two facing pages form a single **wide double-page table** of lunar mean motion ("Degrees of the Moon-reckoning"), read across the opening as one grid. The table is bicolor: structural headers and a portion of the data numerals are red, the remainder black.

These small marker glyphs (a numeral over a one- or two-letter word) sit at the head of each page; they appear to be folio/quire-position markers, not body headings. Recorded verbatim; classification deferred to further review.

## Table — Degrees of the Moon-reckoning (lunar mean motion), molad argument

[Red ink header (title band, p. 25): מעלות ... שלש ... לבנה — "Degrees of the Moon-reckoning ... three ... degrees" (mid-line words straddle the gutter and do not register cleanly)]

[Red ink header (title band, p. 26): מעלות ... לבנה — "Degrees of the Moon-reckoning ... degrees"]

[Red ink header (index-column label, p. 26, vertical along the right/gutter edge): מספר שני המחזור — "the number of the years of the cycle" (cycle index)]

Each data column is headed by a red argument numeral and is internally divided by a red rubric into a leap-year entry and an ordinary-year entry, the rubric reading top-to-bottom:

[Red ink header (per-column rubric, repeated across every data column): אומר השער המולד או לשנהם / השער — "It states: the molad; or, for their [leap] year / the gateway-value"]

i.e. under the heading **המולד** (*the molad*, the conjunction), each column gives two stacked sexagesimal entries — one for **לשנה העבור** (the leap year) and one for **השנה הפשוטה / השער** (the ordinary year / the gateway) — each a mean-motion value in degrees · minutes · seconds (מעלות · חלקים · שניות). Sexagesimal values wrap 0–59 normally.

**Column-head argument numerals** (red), reading right→left across the opening, as legibly registerable:

Reading order (RTL)	Column-head numeral	Value
1	ו	6
2	יב	12
3	יח	18
4	כר	24 [?] — 24 = כד expected; final glyph reads ד/ר (ר/ד confusable)
5	יא	11 [?]
6	יב	12
7	יא	11 [?]
8	יח	18
9	כר	24 [?]
10	ט / ש	single letter [?] — may be an abbreviation, not a numeral
...	...	further column

Reading order (RTL)	Column-head numeral	Value
		heads do not register cleanly across the gutter bow

**Index column** (p. 26, rightmost, "מספר שני המחזור"), single small numerals reading downward (cycle-year index, advancing in steps of 6):

(30) ל, [?] (24) כר/כד, (18) יח, (12) יב, (6) ו, [?] ... the sequence then continues with further small numerals (ל, כר, יח, יב, ו, ה, ר, ... ) that partly overlap red offset-staining and the gutter; the individual index values below the first group are not all separately registerable.

### Interior data cells:

The interior of the table is a densely packed grid in which each row-cell of each column carries three to four small two-letter sexagesimal numerals (the degrees/minutes/seconds groups for the leap-year and ordinary-year entries), interleaved in red and black ink. At the available tile resolution these value-groups straddle the ruled column seams, the page bows into the binding gutter (compressing the inner columns — spine at p.25 left, p.26 right, with the marbled binding edge visible), and red offset-transfer / foxing stains overlies several regions of p.26 (rows r2–r3, cols c0–c1). Individual cell values therefore cannot be assigned to specific (row, column, leap/ordinary) positions with citation-grade confidence, and are NOT transcribed here to avoid confabulation. The grid structure, the red headers, the per-column rubric, the column-head argument numerals, and the index column are captured above; the numeric body requires a higher-resolution pass.

Sephardic semicursive hand. Both folio sides of this batch are occupied entirely by a single multi-column astronomical **mean-motion / lunar reckoning table** (no continuous prose, no body heading). The two pages are consecutive panels of the same table type, each headed by an identical rubric line. No wing/section boundary appears in this batch — the First Wing's tables continue.

## Folio

Top-margin page rubric (red ink): [370 =] **שע**, with a small black catchword/foliation mark above it.

[Red ink header — table title line:] **מעלות חק לבנה משש לשש מעלות** ("Degrees: the lunar reckoning-column [חק], from six to six degrees")

This is a wide tabular panel. Reading right→left, the two narrow rightmost columns form the **index**:

- Outer-right index column header (red, vertical): **מספר שני המחזור** [the cycle-index number — *mispar shenei ha-machzor*]
- Inner index column header (red, vertical): **מספר[?]** (a second running-count column; header partly abraded — likely the row counter for the degrees argument)

To the left of the index follow eight **value-group columns**, each carrying a three-tier header:

1. a **red column-letter** at the very top (the column's argument value),
2. **אומ' לשנהם / הנצור** ("the degree, or the measure") with **לשנהם** ("[its] mean for their years / [its] residue for their years") beneath,
3. a **[Red ink header]** unit cell split by a red diagonal: **על שנהם ... חלקים P** (degrees-per-their-years / *chalakim*, marked **P** for *perutot/parts*).

Red column-letters across the eight value columns (read right→left), recorded verbatim — not normalized:

(right most value col)	(leftm ost value col)
ע	כד
ט [?]	ט [?]
ט	ט
ו	יח
ט	ט

### Data grid (folio p. 27)

The grid runs ~22 rows deep. Each value cell holds two or three small numeral-letters in **mixed red and black** ink (sexagesimal sub-fields), and a substantial minority carry interlinear corrections; the panel **bows into the gutter** on the right (index) side. At uniform tile resolution the interior value cells do **not** register cell-for-cell: red and black sub-values overlap within single ruled cells, several cells are crossed by a red foxing/stain blot mid-page, and the gutter-side columns are compressed.

**Index column (rightmost), top→bottom — confidently registerable letters:** א, טו, יב, יג, ו, יד, ו, יב, יח, ה, ו, ז, יב, ה, ז, יח, יד, [?], י, יא, יג, יד, יז, יח, טו [several mid-column entries abraded — [?]]

## Folio

Top-margin page rubric (red ink): **שע / יר** area (small black mark above a red rubric; the visible red reads **שע** continuation).

[Red ink header — table title line:] **מעלות חק [ל]בנה משש לשש מעלות** ("Degrees: the lunar reckoning-column, from six to six degrees") — same table type, continuing from the previous folio.

Identical column scheme to p. 27: two narrow **index** columns at the right (**מספר** and **שני המחזור** and a running counter), then eight **value-group columns** with the same three-tier headers (**המעלה או השעור / אומ' לשנה / הנצור לשנה**) and the red diagonal-split unit cell **על שנהם ... חלקים P**.

Red column-letters across the eight value columns (read right→left), recorded verbatim:

(right most value col)								(leftmost value col)
א	ט	א	ב	ו	א	יח	כב	

## Data grid (folio p. 28)

Same wide red/black split-cell structure, ~24 rows deep. Interior cells again do not register uniformly at tile resolution (mixed-ink sub-fields, interlinear corrections, gutter bow on the right).

**Index column (rightmost), top→bottom — confidently registerable letters:** ט, ו, יב, יח, טו, ה, ו, ח, ב, [?], כט, ו, יב, יח, כד, ל, [?], ו, יב, יח, כד, ל, יא, [?], ז, [?], יב, [?], טו

**Script:** Sephardic semicursive, single primary hand. Bicolor (black body, red rubrication for banner headings, column-group headers, and alternating value cells). Modern pencil foliation "219" in the upper outer margin of p. 29.

Both pages of this opening carry the same wide tabular layout: a lunar mean-motion table for the Moon, computed in six-degree steps. Each page is a single ruled grid — a red banner heading line, a header band of repeated column-group

labels, a narrow index column at the inner edge, and a wide field of paired two-letter (degrees·minutes / minutes·seconds) gematria entries in alternating red and black ink.

**Banner heading (red ink, across the head of the table):**

[Red ink header: מעלות ומעלות משש לשש חק לבנה — *Mean motion: reckoning-column of the Moon, from six to six degrees, and degrees.*

**Header band (per column-group).** Each of the recurring column-groups is headed by a red cycle-index numeral over a two-line black/red sub-label that reads, in full where legible:

[Red ink header: לשנה השעור / לשנה השעור — *the said value of the molad, or — for the leap year / for the year of the cycle.*

The red group-index numerals legible across the top band of this page, reading right→left, are: ט · ב · ו · ב · יב — יב · יח · ב · כ · כב (cycle-index headers; מספר שני המחזור). [?] interspersed where the band is rubbed.

**Index column (inner edge, single letters running downward):** ד, ה, ו, ... (cycle-step index) — partly legible; lower entries crushed into the gutter bow.

**Table — Lunar mean motion, folio 219r**

This is a wide grid of roughly ten paired value-groups spanning the full opening, each group two sub-columns wide (a red sub-column and a black sub-column of two-letter degree·minute / minute·second values), plus the inner index column. The grid bows into the gutter at the inner margin and the column-groups straddle the tile seams; the alternating red/black cells frequently share a single ruled cell split by a red diagonal.

Index	Group headers (red, right→left) → paired deg·min / min·sec value cells
ד / ה / ו ... (downward)	[group ט] · [group ב] · [group ו] · [group ב] · [group יב] · [group יח] · [group ב] · [group כ] · [group כב] · [group כו]

**Banner heading (red ink, across the head of the table):**

[Red ink header: מעלות ומעלות לשש מעלות ומעלות] — *Mean motion: reckoning-column of the Moon, from six to six degrees, and degrees.* (Identical banner to the recto; the table continues.)

**Header band (per column-group):**

[Red ink header: לשנה השעור / לשנה המולד או לשנה השעור] — *the said value of the molad, or — for the leap year / for the year of the cycle.* The far inner column additionally carries a vertical red header: [Red ink header: אמרי לשנה השעור החדש] — *the said value for the year of the cycle / the new [month] [?].*

The red group-index numerals legible across the top band, reading right→left, are: יג · ל · יב · ל · ו ... [?] (cycle-index headers; *מספר שני המחזור*), with several rubbed positions flagged.

**Index column (inner edge, single/double letters running downward):** ו, יב, יח, ... then ל, כד, ... (cycle-step index); partly legible, lower run crushed in the gutter.

**Table — Lunar mean motion, folio 219v (continues from recto)**

Same wide bicolor grid as the recto: roughly ten paired value-groups across the opening, two sub-columns per group, plus the inner index column. The table fills the upper two-thirds of the page and stops mid-page; the lower third of the leaf is blank below the final ruled row.

Index	Group headers (red, right→left) → paired deg·min / min·sec value cells
ל / כד / יח / יב / ו ... (downward)	[group ב] · [group ל] · [group יב] · [group ל] · [group יג] · ... (≥10 groups)

*Immanuel Bonfils, Six Wings (Shesh Kenafayim), UPenn LJS 204.*

Both pages of this batch are facing panels of a single wide tabular spread — a lunar mean-motion / reckoning-column table (כנף = wing of the moon). The page is ruled into many narrow columns of stacked two-letter gematria values (degrees / minutes / seconds), with red rubrication for the column-index letters and for alternate sub-values; the columns straddle the gutter and the leaves bow at the binding, so the table does not register cleanly at uniform tile resolution. Structure, rubricated headers, the column-group heading line, and the recurring

column subhead are captured below; the dense interior numeral mass is flagged for manual review rather than reconstructed.

## right-hand panel of the lunar reckoning-column table

[Red ink header: small centered word above the table — "שט"] [?]

[Red ink header: column-group heading line — "מעלות החק לבנה..." ("Degrees of the reckoning-column [חק] of the Moon")] — followed by a short run of letters reading "ט ש ט ש ט" [?] (appears to be a numeric/parameter string for the group; not registerable with confidence)

[Red ink: vertical title strip in the right (outer) margin — "לקדמת בעל החבור..." ("...of the precedence of the author of the treatise...")] [?] — verbatim reading of the full marginal strip not securely recoverable at this resolution.

**Column structure (read right → left).** Each column is headed by:

- a **red index letter** (the column's argument value), and
- the recurring bipartite subhead, in red:

[Red ink header (per column): "אמצעי / המולד או / העבור לשנהם" — "Mean [motion]: the molad, or the cycle, for their year"] (the wording alternates between "לשנה" / "לשנה הם" / "לשנהם" across columns)

The red index letters visible across the top of this panel, reading right→left, include: כד · ר · יח · ר · יב · ר [?] (several index heads abrade into the gutter or the page bow and are not all securely registerable).

Below the subhead, each column holds a tall stack of cells; every cell carries one or two two-letter gematria numerals (deg/min/sec), with red and black ink alternating by sub-value. The grid runs the full height of the panel and closes at a ruled bottom border.

## left-hand / continuation panel of the lunar reckoning-column table

[Red ink header: small marker above the table — "יח" with "שט" below it] [?]

[Red ink header: column-group heading line — "מעלות חק לבנה..." ("Degrees of the reckoning-column [חק] of the Moon")] [?] (continuation of the same heading as page 1)

[Red ink: vertical title strip in the left margin / inner edge — "...חבור... לקדמת..." ("... treatise... precedence...") [?]] — full reading not securely recoverable.

**Column structure** is identical to page 1: each column headed by a **red index letter** and the recurring red subhead:

[Red ink header (per column): "אמצעי / המולד או / העבור לשנהם" — "Mean [motion]: the molad, or the cycle, for their year"]

The red index letters visible across the top of this panel, reading right→left, include: ה · כד · ה · ש · ה · יח [?] (not all securely registerable; several crowd the gutter).

As on page 1, each column holds a tall stack of cells of two-letter gematria numerals (deg/min/sec) in alternating red/black ink, closing at a ruled bottom border.

**Script:** Sephardic semicursive, single hand throughout; black body ink with red rubrication for headers, index numerals, and alternating numeral entries. No hand changes in this batch.

**Content of the batch:** Both pages are facing panels of a single wide tabular spread — a *molad* (conjunction-reckoning) table. The table tabulates **המולד אן השעור** ("the molad, that is, the hour-reckoning") accumulated **אומ' לשנה** ("cumulative, per year") against the **cycle index** running down each group, with paired sexagesimal entries. Each column-group carries a small **red index number** at its head, then the repeated stacked header block, then a row of diagonally split header cells, and below them many rows of two- and three-letter numeral entries (alternating red and black). This is the same kind of wing-table apparatus seen in the preceding batches of the canons; no new wing/section body heading (כנף / שער / פרק) appears on either page.

## molad table, right-hand panel

**Top of page (above the table frame), red ink:**

- [Red ink: יש] — small marginal/header tick at the top center.
- [Red ink: שנ] — abbreviation immediately below it (apparently a running rubric, plausibly שני / שנה... "year(s)"; abbreviated). [?]

**Table title band (red ink, spanning the head of the grid):**

[Red ink header: מולד חק לבנה שמש לשם מעלות] — the running title of the table. The first word reads מולד ("molad/conjunction"); חק = the reckoning-column; the

band continues...שמש...לבונה ("of the moon [and] sun") and ends...מעלות ("degrees"). Several glyphs in this faded red band are abraded; transcription of the title is secure for מעלות ... חק ... מולד, with the interior words read with lower confidence. [?]

**Per-group stacked column header (recurs across every group), red and black ink:**

Logical header (right→left within a group)	Reading
(group index, red)	a red Hebrew-numeral letter at the head of the group
(diagonal split cell)	[Red ink: שעה] over [שעה] / ק — "hour(s)" / <i>chelek</i> marker
line 1	המולד אן השעור — "the molad, that is, the hour-reckoning"
line 2	אומר/אומ' — abbreviation אומ', here "cumulative" (running total)
line 3	לשנה — "per year"

The diagonal split cells beneath each group index hold the red word שעה ("hour") with a lower marker ק (= *chelek* / *chalakim*, 1/1080 hour); the same split-cell pair recurs in every group across the spread.

**Group index numerals across the head of page 1 (red ink, reading the panel right→left):**

... יח ... כט ... ו ... ב ... (the leftmost group index on this panel reads יב). Several of these red index letters are read with moderate confidence given fading: candidates noted are ו/ז for the second, and the others as given. [?]

**Body of the table (the numeral grid):**

The grid below the headers is a dense field of two- and three-letter sexagesimal entries (alternating red and black), arranged in ≥8 column-groups that straddle the tile seams and the gutter bow, with the diagonal split-cell construction at the head of each group. Representative legible entries confirm the sexagesimal character of the data — e.g. in the right-hand groups the upper rows show paired values such as נד, לד, כה, / יח, כו, / כט, and triplets like נח / מר / כא reading across a group; many cells are clear, but the values do **not** register cleanly column-

against-column across the full width at uniform tile resolution (page bow at the gutter, the diagonal split cells, and the alternating red/black crowding push many interior triplets below reliable discrimination).

## molad table, left-hand panel (continuation of the same spread)

### Top of page (above the table frame), red ink:

- [Red ink: ב] — index/marginal numeral at top center (matching the running group-index series).
- [Red ink: שנו] — the same abbreviated running rubric as on p. 33 ( / שנה / שני..., abbreviated). [?]

### Table title band (red ink, spanning the head of the grid):

[Red ink header: ...מעלות] — the title band continues from the right-hand panel; the same running title (...מעלות ...) is repeated here, partly cut by the gutter at the inner edge. [?]

### Per-group stacked column header (identical structure to p. 33):

Logical header (right→left within a group)

Reading

(group index, red)

red Hebrew-numeral letter

(diagonal split cell)

[Red ink: שעה] / ק — "hour(s)" / *chelek*

line 1

המולד אן השעור

line 2

אומ'

line 3

לשנה

The diagonal split-header cells again carry the red שעה over the ק (*chelek*) marker in every group; the stacked block לשנה / אומ' / השעור אן המולד repeats across the panel.

### Group index numerals across the head of page 2 (red ink, right→left):

יח ... | ... יב ... | ... ב ... (continuing the same running series as p. 33). Read with moderate confidence; the second index is וז/ [?].

### Body of the table (the numeral grid):



Cycle index (group header, red)	Mean-motion entry (deg / min / sec, diagonal-split, red+black)
(p. 1, group 1) [9=] ט	[?]
(p. 1, group 2) [8=] נ	[?]
(p. 1, group 3) [3=] ג	[?]
(p. 1, group 4) [8=] נ	[?]
(p. 1, group 5) [9=] ט	[?]
(p. 1, group 6) [12=] יב	[?]
(p. 1, group 7) [8=] נ	[?]
(p. 1, group 8) [18=] יח	[?]
(p. 1, group 9) [8=] נ	[?]
(p. 1, group 10) [24=] כד	[?]
(p. 2, group 1) [9=] ט	[?]
(p. 2, group 2) ש / ש [?]	[?]
(p. 2, group 3) [9=] ט	[?]
(p. 2, group 4) [6=] ו	[?]
(p. 2, group 5) [18=] יח	[?]
(p. 2, group 6) [12=] יב	[?]
(p. 2, group 7) [9=] ט	[?]
(p. 2, group 8) [9=] ט	[?]
(p. 2, group 9) [24=] כד	[?]

rather than confabulate them. Interior cell values flagged for manual / native-folio review before citation. The cycle-index numerals in some group headers are themselves partially worn; values given are best literal reads, with [?] where genuinely ambiguous.]

This batch is a single **wide double-page astronomical table** spanning the open spread. It tabulates the **mean motion of the Moon** ("degrees of the lunar reckoning, completed"), with the cycle-year index running down the right margin of p. 38 and the value-groups continuing leftward across both halves. No running prose / canon appears on either page — the batch is entirely tabular.

**Table — Mean motion of the Moon (cycle index)**

**Header band (red ink, right-to-left), spanning the spread:**

[Red ink header: מעלות חק לבנה משלם] — "Degrees of the lunar reckoning, completed" (מעלות = degrees; חק = reckoning-column; לבנה = Moon; משלם = completed/whole).

**Index column** (far right vertical red label):

[Red ink header: מספר שני המחזור] — "Number of the years of the cycle" (cycle index). The column below it carries the running index in red: 1 (א), ו, ... descending the page (sexagesimal/serial run; individual index glyphs partly legible — see QA note).

**Per-group column-head cells** (repeating across every value-group, red ink over black):

[Red ink header: השעור / המעלות או] — "the degrees, or / the measure" [Red ink header: אומת לשעה] — "reckoned per hour" (אומת = estimated/reckoned; לשעה = per hour)

Each repeating group thus carries a small two-line caption (degrees-or-measure / reckoned-per-hour) above a column of split data cells. The red diagonal inside each data cell divides it into an upper and a lower sexagesimal value (argument over value, deg/min).

**Structure of the data grid:**

	grou	grou	grou	grou	grou	grou	grou	grou	grou	p.
(cycl e inde x, p.38 right mar gin)	p 1	p 2	p 3	p 4	p 5	p 6	p 7	p 8	p.	37)
1 (א)	[?]	[?]	[?]	[?]	[?]	[?]	[?]	[?]	[?]	...
ו	[?]	[?]	[?]	[?]	[?]	[?]	[?]	[?]	[?]	...
... (≈ 30 rows desc										

...  
(con  
tinu  
es  
left  
war  
d  
onto

(cycl									...
e									(con
inde									tinu
x,									es
p.38									left
right									war
mar	grou	grou	grou	grou	grou	grou	grou	grou	d
gin)	p 1	p 2	p 3	p 4	p 5	p 6	p 7	p 8	onto
endi									p.
ng									37)
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ever									
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-split									
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min									
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es)									

` and flagged for manual high-resolution review before any citation. No values have been reconstructed from arithmetic or pattern.]

This batch is an open spread of **two wide astronomical equation-tables**, one per page, each occupying roughly the upper half of its leaf with blank parchment below. Both pages are entirely tabular — no running prose / canon appears. Each page carries a red running-header rubric at the top edge naming a "wing" (כנף), and a **\*\*new wing boundary opens\*\*** (the verso).

- **\*\* (recto):\*\*** a wide table organized **by zodiac sign** — each column-group is captioned with a sign of the zodiac (Aries, Cancer, Leo, Gemini, Scorpio, ...) under a red gematria column-letter (ג, ב, א, ...). The grid tabulates a correction/equation value against an argument running down the right margin. The table fills the top  $\sim\frac{2}{3}$  of the leaf; the lower third is blank parchment (faint red offset specks only).
- **\*\* (verso):\*\*** a new wing's table, headed in red **"מעלות חק לבנה"** ("degrees of the lunar reckoning") with a sub-caption **"לבנה ודקיק[ה]"** ("the Moon and its minutes"). Again red gematria column-letters (ב, א, ...) head each value-group, with split-diagonal red column-captions ("...the measure / ה"שעור") above dense paired sexagesimal cells. The table fills the top  $\sim\frac{2}{3}$ ; lower third blank.

The sub-columns throughout register as ordinary **sexagesimal** (degrees / minutes, 0–59 wrap) — no decimal/sub-positional notation is in evidence here.

## PDF p. 39 (recto) — Zodiac-argument equation table

**Column structure (red gematria letters heading each zodiac group, right → left):**

The top band carries a row of red column-letters (... ז, ו, ה, ד, ג, ב, א ...) and, beneath each, a red zodiac-sign name captioning that group. Beneath the sign name sits a split-diagonal red caption cell (the recurring "ה"שעור" / "the measure" column-head form seen earlier in this run), then the data column.

Zodiac-sign captions legible across the band (right → left, as the eye reads each group's head):

red col-letter	zodiac caption (verbatim)	identification
ב [?]	סרטן	Cancer (סרטן)
ד [?]	— / סרטן-group	[?]
ה	אריה	Leo (אריה)
ו	טלה	Aries (טלה)
ז	"תאומים" / "ועונים" [?]	Gemini (תאומים)? [?]
ח	"שקרב" / "עקרב" [?]	Scorpio (עקרב)? [?]
(further left)	"גדיים" / [?] "עזונים" [?]	[?]

**Argument index column** (far right margin of p. 39, red letters descending): a serial argument-index runs down the right edge (... א י , ט , ח , ז , ו , ה , ד ... continuing), one row per degree of argument. The upper index glyphs register (-ט י legible); lower rows crowd toward the frame.

**Data grid:**

argu  
ment  
(right

marg in)	grou p 1	grou p 2	grou p 3	grou p 4	grou p 5	grou p 6	grou p 7	...
ט	[?]	[?]	[?]	[?]	[?]	[?]	[?]	...
ה	[?]	[?]	[?]	[?]	[?]	[?]	[?]	...
י	[?]	[?]	[?]	[?]	[?]	[?]	[?]	...

...  
(~30  
rows  
desce  
nding  
;  
table  
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~2/3  
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w)

` and flagged for manual high-resolution review before any citation. No value has been reconstructed from arithmetic or pattern.]

## PDF p. 40 (verso) — The Fourth Wing (new boundary): lunar reckoning table

[Red ink header: מעלות חק לבנה] — "Degrees of the lunar reckoning" (מעלות = degrees; חק = reckoning-column; לבנה = the Moon). Table caption, red square hand, top of the grid.

[Red ink header: [?] לבנה ודקי[ה]ק] — "the Moon and its minutes" (לבנה = Moon; [ה]ק = and its small-parts/minutes). Sub-caption beside the main caption; final letter of דקי[ה]ק uncertain.

**Column structure:** red gematria letters head each value-group (... א, ב ... legible at the right). Each group carries the recurring split-diagonal red column-caption above it (the "...השעור / the measure" + per-hour form of this table-run), then a column whose cells pair two stacked sexagesimal values (deg over min), several cells carrying a small ט / ש marker (likely שניות "seconds" / a sub-unit tick) in the narrow sub-column near the right frame.

**Argument index column** (right margin, red, descending): a serial index runs down the right edge — upper glyphs (... י, ט, ח, ז, ו, ה ...) register; lower rows crowd into the fore-edge.

### Data grid:

index (right margin)	group 1 (א)	group 2 (ב)	group 3	group 4	...
(top)	[?]	[?]	[?]	[?]	...
... (~30 rows; table ends ~ <sup>2</sup> / <sub>3</sub> down the leaf, blank parchme nt below)					

", the red column-letter heads, the split-diagonal column-captions, and the right-margin argument index all register and are transcribed. The interior is a dense grid of paired red/black sexagesimal cells (with a narrow ט/ש sub-column at the

fore-edge) crowding into the binding at the right margin; at uniform 4×4 tile resolution the paired values merge at the diagonals and do not register reliably enough to transcribe per-cell without confabulation. Interior values left [?] and flagged for manual high-resolution review before citation. No values reconstructed from arithmetic or pattern.]

*Bonfils, Shesh Kenafayim (Six Wings), UPenn LJS 204, 1509. Sephardic semicursive hand; astronomical tables in black ink with red rubrication (headers, sub-labels, alternating numeral entries).*

Both folio sides in this batch are **wide, multi-group astronomical tables** — three-column groups (degrees / minutes / seconds) repeated across the full width of the opening, with red diagonal-split column headers and a right-hand index column. They are photographed at a steep oblique angle, with pronounced page bow, gutter intrusion at the spine, marbled binding edges crossing the outer margins, and localized staining. The structure, the rubricated headers and sub-labels, the wing-boundary rubric, and the registerable header cells are transcribed below; the dense interior gematria cells do not register reliably at uniform tile resolution across the bowed surface.

## The Fourth Wing (table)

[Red ink header: הכנף הרביעי] — **The Fourth Wing.**

[Red ink header: חק לחמה מתוקן] — **The corrected reckoning-column [חק] of the mean motion [מהלך] for the sun.**

This is a wide table running across the full width of the opening (the gutter/binding is visible mid-page, with the table continuing onto the conjoined leaf). It comprises several three-column groups, each group headed by a red diagonal-split label reading, in its three sub-columns, **שנ / חל / מע** ([Red ink header: מעלות] degrees / [Red ink header: חלקים] minutes / [Red ink header: שניות] seconds). Each group also carries a red running sub-header above it identifying the argument it tabulates.

- **Index column** (rightmost, runs the height of the table): an ordinal/argument column with single-letter and two-letter entries in alternating black and red ink (e.g. opening entries read in the order ה, ו, ז, ח ... continuing downward). Entries are individually small but the column structure is intact.
- **Group header band** (red, across the top of the grid): the recurring red caption above each three-column group identifying the tabulated quantity;

one early group header band reads in part [Red ink header: לחמה / לחנה] ("for the moon" / "for the sun" — paired argument labels alternating across the band [?]).

- **Data body:** rows of two-letter gematria pairs (a single sexagesimal value per cell), in alternating black/red ink, filling each three-column group. The values run downward as a continuous mean-motion accumulation table.

## The Fifth Wing begins

[Red ink header: הכנף החמשי] — **The Fifth Wing.**

[Black ink, canon line beneath the rubric:] ה[...מקום אורך לשנה ה — "The place [longitude, מקום אורך] for the year ..." [line continues into the gutter; remainder not registerable [?]].

[Red ink header: מהלך חק לבנה מתוקן] — **The corrected reckoning-column [חק] of the mean motion [מהלך] for the moon.**

[recte: the first rubric word is מהלך "motion"; written here with the cursive form that can read מולך, but the parallel Fourth-Wing rubric on p. 41 fixes it as מהלך.]

Like page 1, this is a wide table of repeated three-column groups (degrees / minutes / seconds) running across the opening. Its distinguishing features:

- **Index column** (rightmost): red-ink argument labels at the head — opening entries read [Red ink header: שנים] ("years") then a black [Red ink: לחנה / הוסף] row ("for the moon" / "add" [?]) — followed by an ordinal run of single letters downward (ז, ו, ה, ...).
- **Group headers** (red, diagonal-split): each three-column group again headed **שנ** / **חל** / **מע** (degrees / minutes / seconds), with a red running argument-label above each group.
- **Interspersed red sub-section labels** breaking the body into argument blocks:
  - [Red ink: חצי היום] — "half of the day" (i.e. the half-day / noon argument), appearing twice as a row-band rubric mid-table.
  - [Red ink: השמש] — "the sun" [?] (a sub-argument label) and a partly-legible [Red ink: הנשאר] — "the remainder" [?].
- **Data body:** rows of two-letter gematria pairs in alternating black/red ink, as on page 1.

Both folio sides in this batch carry a single full-page astronomical table of the same design — the *Fifth Wing* (הכנף החמישי) tables for finding the *true position*

(מקום אמת) of the Moon, given for successive hours/instants of the reckoning. The two pages are companion panels: p. 43 for the *beginning* of the relevant hour, p. 44 for the *later* (post-) instant of hour 7. Each is a wide multi-argument grid with red-diagonal split data cells.

## p. 43 (right-hand page)

[Red ink header: חמשי] — "Fifth" (running rubric identifying the Fifth Wing).

### Table header lines (red ink, spanning the table top):

- [Red ink header: תחלה אמת לשעה ה' תחלה] — "True position for hour 5 [or: for the year 5], beginning." (The letter after לשעה is a red ה with a stroke; reading as the hour/argument index "5." [?])
- [Red ink header: מתוקן לבנה חק] — "Degrees — reckoning-column of the corrected Moon."

### Left summary block (two narrow columns at the far left of the panel; red labels):

(value)	label
[Red: שש]	טורי ("my columns" / rows) [?]
הכל	[Red: לבנה] ("Moon")
נרע [?]	[Red: הוסף] ("add" / surplus)

**Column-group headers** (top letter-row, read right→left; black ink with red accents). These index the argument groups of the table:

(far right index )	א	כ	ל	ר	ה	...	ש	ה
-----------------------------	---	---	---	---	---	-----	---	---

**Sub-header numeral row** beneath the letter headers (red): ... .. | ט | ח | י | ש | יא | ו | ש | [?] — the per-group fine argument values.

**Diagonal-split label cells** (the red-diagonal convention): each argument cell is split by a red diagonal stroke, the upper-left and lower-right triangles carrying paired entries. The recurring red label in these split cells reads שונות / עלות [?] (the rising/equation pair); the consistent lower-triangle red letter is ק (= the column-marker, "chelek"/reckoning) [?].

**Far-right index column** (red row-labels, top→bottom), with the special mid-table marker rows:

index label	note
[Red: ה]	
[Red: ר]	
[Red: ל]	
[Red: כ]	
[Red: א]	
[Red: מעלות היום]	"Degrees of the day" — mid-panel divider row
[Red: א ט] [?]	
[Red: א ו]	
[Red: חצי השמים]	"Mid-heaven" (medium coeli) — special divider row, red, centered across the panel
[Red: ה ל] [?]	
[Red: ה ר] [?]	
[Red: ה מ] [?]	(bottom row)

**Registerable interior values (sampling, right→left within the upper data block):** The first data row beneath the headers carries entries of the form (deg/min pairs) כט / א ... , לה / א , מה / א , מה / א , ... rendered in alternating black/red. The index-row labeled א carries the sexagesimal sequence ט / נו , ט / נו , נה / ט ... (a smoothly descending minutes column, consistent with sexagesimal wrap).

## p. 44 (left-hand page) — companion panel

[Red ink header: חמשי] — "Fifth."

### Table header lines (red ink):

- [Red ink header: מאוחר ז' לשעה ז' מאוחר] — "True position for hour 7, later [post-]." (The argument index reads red מאוחר ;"7" ז' = "later/delayed.")
- [Red ink header: מעלות חק לבנה מתוקן] — "Degrees — reckoning-column of the corrected Moon."

**Left summary block** (identical design to p. 43):

(value)	label
[Red: שש]	טורי [?]
הכל	[Red: לבנה]
נרע [?]	[Red: הוסף]

**Column-group headers** (top letter-row, right→left): ה | ר | ל | כ | א | ... — same group structure as p. 43, with the red numeral sub-header row beneath (... | ש | יא | ט | ח | י ...).

**Diagonal-split label cells:** same red-diagonal convention; recurring red label שונות / עלות [?] with the lower-triangle marker ק [?].

**Far-right index column** (red, top→bottom) with the special divider rows:

index label	note
[Red: ש] [?]	
[Red: ה]	
[Red: ל]	
[Red: כ]	
[Red: א]	
[Red: חצי היום] / [Red: חצי השמים] [?]	mid-panel "mid-heaven / mid-day" divider row (red, centered)
[Red: א ט] [?]	
[Red: א ו] [?]	
[Red: חצי השמים]	"Mid-heaven" — second special divider row (red, centered)
[Red: כ]	
[Red: ל]	
[Red: ר]	
[Red: ה]	
[Red: ן] (bottom row)	

**Registerable interior values (sampling):** The upper data block opens with entries לה / א ... , כט, א / מה, א / מח, א / א in the first row (deg/min pairs, alternating black/red). The bottom data row carries a longer red-and-black sexagesimal string ... ס / ור [?] / ורס [?] ... (degrees/minutes near the wrap point).

Both pages of this opening carry the same astronomical-table template — a lunar mean-motion ("reckoning") table — repeated on the recto and verso. The script is Sephardic semicursive; structural headers, the diagonal sub-headers, and many cell entries alternate red and black ink. The running header on the verso reads, in red, **חמישי** ("Fifth").

This is a wide multiplier table: at the right (logical first) edge sits a narrow red-headed argument/index column; across the body run roughly eight multiplier columns headed by the consecutive letters (8-1) **ח ז ה ד ב ג א**, each cell ruled into a degrees/minutes/seconds triple by a red diagonal whose headers read **שניות / דקים / מעלות** (degrees / minutes / seconds, written diagonally in red). At the left edge sit three further index columns headed (in red) **שני / עורי, חמך / לבנה**, and **גרע / הוסף**. Two mid-table red sub-rubrics divide the body: **חצי היום** ("half-day") and **חצי השמש** ("half-sun" / the solar half).

The cells are minute two-letter gematria values, written small and tightly, and a large fraction are crushed at the gutter seam, along the page bow, or under light foxing/stain. The grid does not register cleanly at uniform tile resolution. Per method, the structure, rubrics, red headers, index column, and the registerable cells are transcribed below; the dense interior of each grid is captured as structure with values flagged rather than confabulated.

## PDF p. 45 (recto)

ׁ.]

### Table title (two lines, red and black):

- Line 1: **מקום אורי לשנה הס[?] ל קשת** [Red ink header] — "Position of [Uri / the light] for the year ... of Sagittarius (קשת)" [several words [?]] — faded red rubric]
- Line 2: **מולך חק לבנה מהוקן** [Red ink header] — "Mean reckoning(-motion) of the Moon, corrected" (חק = reckoning-column; לבנה = Moon; מהוקן = corrected/adjusted)

### Table structure:

Index (red)	[= ח	[= ז	[= ו	[= ה	[= ד	[= ג	[= ב	[= א
	8]	7]	6]	5]	4]	3]	2]	1]
<b>(column head</b>	ח	טו	—	ה	ר	ל	א	—

Index (red)	[= ח 8]	[= ז 7]	[= ו 6]	[= ה 5]	[= ד 4]	[= ג 3]	[= ב 2]	[= א 1]
-------------	---------	---------	---------	---------	---------	---------	---------	---------

s,  
blac  
k/red  
)

(sub-head s)	ו	יא	—	ו	ל	ח	יא	—
--------------	---	----	---	---	---	---	----	---

diagonal red sub-head s	מעלו ת/דקי ם/שניו ת	מעלו ת/דקי ם/שניו ת	מעלו ת/דקי ם/שניו ת	מעלו ת/דקי ם/שניו ת	מעלו ת/דקי ם/שניו ת	מעלו ת/דקי ם/שניו ת	מעלו ת/דקי ם/שניו ת	מעלו ת/דקי ם/שניו ת
-------------------------	------------------------------	------------------------------	------------------------------	------------------------------	------------------------------	------------------------------	------------------------------	------------------------------

Argument/index column (rightmost, red), reading down: ה יר / ר / ל / כ / חצי היום [Red ink header] / חצי השמש / ... / א [Red ink header] / ה יר / ה / ר / ל / ב

Registerable interior cells (sampling, where legible): the first body row under the diagonal heads in the א column reads roughly א / כט א [?]; the ב-column reads א [?]; deeper rows in columns ז-ד carry triples such as לג / כו / יד, כט / כט / נש, and red/black pairs (e.g. טלש / טמן / נש / טו) that are individually legible but not reliably alignable to their column at this resolution.

Left index columns (logical last three, red/black), reading down:

- עורי / שני column: top cells יטו / שע then values הוסף / רענ, continuing ... / שו... [most cells [?]]
- חמך / לבנה column: לבנה / חצן, then גרע, continuing down [cells [?]]
- הוסף / גרע column: הוסף rubric, then value cells [?]

[Lower third of the table on this page is blank (ruled but unfilled); faint foxing stains across the lower margin do not obscure text.]

## PDF p. 46 (verso)

Table title (two lines, red and black) — same template:

- Line 1: מקום אורי לשנה הס [Red ink header]

- Line 2: **מולך חק לבנה מהוקן** [Red ink header] — "Mean reckoning(-motion) of the Moon, corrected"

**Table structure:**

Index (red)	[= ח 8]	[= ז 7]	[= ו 6]	[= ה 5]	[= ד 4]	[= ג 3]	[= ב 2]	[= א 1]
<b>(column heads)</b>	ה	טו	—	ה	ר	ל	ב	א
<b>(sub-heads)</b>	ו	יא	—	ו	ח	ל	יא	טו [?]
<b>diagonal red sub-heads</b>	מעלו ת/דקי ם/שניו ת	מעלו ת/דקי ם/שניו ת	מעלו ת/דקי ם/שניו ת	מעלו ת/דקי ם/שניו ת	מעלו ת/דקי ם/שניו ת	מעלו ת/דקי ם/שניו ת	מעלו ת/דקי ם/שניו ת	מעלו ת/דקי ם/שניו ת

**Argument/index column (rightmost, red), reading down:** ר טו / ר / ל / א / חצי **היום** [Red ink header] / א ס / אלצ [?] / חצי **השמש** [Red ink header] / ל / ר / ל / ר / ל

**Registerable interior cells (sampling, where legible):** under the diagonal heads, body rows in columns א-ד carry triples such as **אלה / כב, אכן / טו, אל / יח**; the **חצי היום** rubric row shows **טלא / טלד / טלג** across columns; below **חצי השמש** appear **כנ / כר / כו** then second-line **מן / טמק / טמח** and red entries **שנא / שנ / שנש**. These are individually legible but not reliably column-aligned at this resolution.

**Left index columns (red/black), reading down:**

- עורי / עורי, לבנה, גרע / הוסף** column: **שע / עורי, לבנה, גרע / הוסף**, then value cells [?]
- חמך / לבנה, גרע** column: **חמך / לבנה, גרע**, then cells [?]
- הוסף / גרע** column: **הוסף** rubric, value cells [?]

[Lower portion of the table on this page is blank (ruled but unfilled); light purple foxing across the lower and inner margins does not obscure the ruled cells.]

**The Fifth Wing — eclipse / luminary tables.** Both folio sides in this batch carry the same wide tabular layout, with the red running header **חמשי** ("Fifth") at the

top center of each page. The two pages are facing leaves of one continuous table apparatus (the moon's reckoning-column, *chak la-levanah*, with the solar and daily corrections used in the eclipse computation). There is no body prose in this batch — the pages are entirely ruled table.

Both tables share an identical column architecture:

- A wide block of **argument columns** across the center-left, each headed by a small letter-pair (red top letter over a black/red lower letter) and each split by a **red diagonal** into a left **חלקים** (minutes, marked with the red "ק" mortar-glyph) sub-cell and a right **שניות** (seconds) sub-cell. There are roughly eight such argument groups per page, several straddling the column rulings and bowing into the gutter.
- A red-ink **index column** at the right edge of the grid, giving the argument-row values (in red, e.g. ב ל ר, ר, כ, ר ...), read top-to-bottom.
- Two **auxiliary correction columns** at the far left, headed in red / **שורי / הוסף** / **נרע / השן, לכה / שעי** ("to be added / the correction ... for the moon").
- A red title band over the grid: **... מקום אמצעי לשעה** ("mean position for the hour ...") with the value [230 =] **רל** given on p. 48, and below it the red sub-header **מעלות חק לכנה מבקעו** ("degrees of the reckoning-column for the moon, from its ...").
- Each grid is divided vertically by two red section-divider labels spanning the argument block: **חצי השמש** ("half the sun" — the solar semi-diameter) in the upper third, and **חצי היום** ("half the day") lower down.

## recto

[Red ink header: **מעלות חק**] [Red ink header: **... מקום אמצעי לשעה** (title band)] [לכה מבקעו]

**Auxiliary correction columns (far left), red headers, top→bottom:**

שורי / שעי                      השן / לכה                      נרע / הוסף

---

**Argument-column header row (small letter-labels over the diagonal-split cells), reading right→left:** The upper header letters run: א, כ, ל[?], ר, ה (red), with a second sub-label line beneath each (א / י / ע / ח / ז ...). Each column is then split by the red diagonal into **חלקים | שניות** (the "ק" mortar-glyph appears in the lower-left of every split).



Partial registerable readings, for orientation only (do **not** cite without verification):

- Top data band: index-rows in red read ל, ר, ל down the right edge; auxiliary pairs לן, מה/לן legible.
- The band beneath **חצי השמש** carries a long row of repeated לב · ד / כב · ד pairs in alternating red/black across the argument columns.
- Lower band beneath **חצי היום**: index-rows ל, ר, נ ב[?], א, כ, ל, נ ב[?]; interior pairs include נ ע, נ ש near the right, א ה, א ה, כב, כא mid-band.

*Immanuel Bonfils, Shesh Kenafayim ("Six Wings"). Sephardic semicursive hand, red rubrication, bicolor astronomical tables. This batch is a single wide table opening (a two-page spread), part of the Sixth Wing region (the eclipse/syzygy tables near the work's end).*

## The Sixth Wing — wide syzygy/eclipse table (spread across PDF pp. 49–50)

[Red ink header: הכנף הששי — "The Sixth Wing"] (*rubric at the top the recto/right page of the spread*)

The two pages of this batch form **one continuous wide table** read across the opening. is the verso (left) page and the recto (right) page; the gutter and a marbled-endpaper binding edge fall between them, and the paper bows toward the spine on both sides. The table is laid out as a long horizontal series of column-groups, each group carrying:

- a **red-ink header block** at the top — a multi-line caption of the form כדורי חק / חלקי החק / ... ("orb/sphere-positions ... reckoning-column for entering ... position of the apogee for the years ... the parts of the reckoning ..."), repeated with variation across the groups;
- a **diagonal red/brown split cell** below the header (the characteristic split rule of these wing tables), labelled in red מקום השמש ("position of the Sun") and חלקי ... ("parts of ...") on the two halves;
- then a deep stack of **body rows** of sexagesimal entries — degrees/minutes/seconds (מעלות/חלקים/שניות) and reckoning values — alternating red and brown ink.

Within the body, two internal red-ink sub-rubrics divide the panel on the left page:

- [Red ink header: חצי השעות — "halves of the hours" / mid-hour values]

- [Red ink header: חצי השעות — "halves of the hours"] (*a second occurrence, lower the rubric חצי השעות recurs as a band-divider within the panel*)

A further red rubric on the left page reads [Red ink: חשי / חשי היום — "reckoning of the day" (חשבון היום), heading the day-reckoning band].

### Registerable structural cells (read off the tiles):

The right-hand index/label column (the column adjacent to the diagonal split cells) carries a short red-ink Hebrew-letter sequence running down the rows — legible values include: ד, ה (or ר), ב, ד ... and, lower, an א-ב-ג-ד-ה ordinal run used as the row index of the panel. The body of each group is a block of two-to-three stacked sexagesimal figures per cell (red over brown), in the standard wing-table format.

The full interior of this table — the dozens of per-cell sexagesimal values across the ~8+ column-groups — does **not** register to citation accuracy at uniform tile resolution: the groups straddle the page bow and the gutter, the diagonal split cells stack a red and a brown value at a slant, and the small cursive numerals shift baseline across the bow. Capturing structure, red headers, the split-cell labels, and the index column is reliable; committing the individual interior numerals is not.

The lower third of both pages below the ruled table is blank parchment (with light foxing/water-staining and a few ink offsets), not further text.

*Sixth Wing — eclipse / planetary-position tables; closing of the work.*

Script: Sephardic semicursive, single primary hand, brown ink with red rubrication. Folios tracked by PDF page (no marginal foliation legible at the inner-margin gutter, which is tightly bound).

### Closing prose (colophon region)

This page carries continuous prose (no table). It is the closing discussion of the work — a reflection on the author's tables, the science of astronomy, and the accuracy of the computations — followed by a short closing formula. The text is small Sephardic cursive; the line-ends along the inner (left) margin run into the tightly bound gutter and the marbled endpaper, so the final word or two of many lines is lost into the binding. The bottom quarter of the leaf is blank (foxed, water-stained paper) with faint bleed-through of the verso table.

The securely legible substance of the passage:

and behold, this matter [?] has already been clarified [?]. And he said [?]: the reckonings [?] [Interlinear/uncertain] ... in the manner of [?] — moreover this [?]. And the things [?] which [?] ... little [?] and a few [?], and he drew near [?] ... in their root [?] ...

[Several lines whose openings are legible but whose closings run off the right edge or into the gutter:]

the science (החכמה) [?] ... and through the calculation [?] of [?] ... the position (מצב) is established [?] ... and the things which are near [?] to bring the matter close to truth [?] in the science (החכמה) [?] ... and through the labor (טרחה) [?] in arranging [?] ...

and the author (המחבר), of blessed memory (ז"ל) — therefore [?] ... the science [?] [?] only [?] [?] there is a wise man [?] (חכם) and intelligent (ונבון) [?] ...

the tables (הלוחות) which the author arranged (סדרן) [?] from [the work of] the composer [?] (מהמחבר) [?] ... the aforementioned [?] (הנוכח) ... in their truth (אמתיות) [?] ... this [?] from his correcting [?] them [?] ...

[a row of computational reasoning, partly legible:] ... its measure [?] (במדה) ... and the months [?] (חדשים) and we know [?] (ויודען) the science (החכמה) ... as we explained [?] ... in what [?] (במה) ... and the years [?] (השנים) and what [?] (מה) ... and the things [?] (דברים) from [?] ... on a small fraction [?] (קצף) [?] ...

and the things which are accurate [?] (אמתיות) [?] in selecting [?] (בבחירת) ... the table (החכמה?) [?] and the correction [?] ... and the true positions (אמתיות) [?] of the planets [?] ...

[Closing lines, legible in part:]

[red mark] ... blessed [?] (ברוך) ... the world [?] (לעולם) and [?] ... and the author (והמחבר), of blessed memory (ז"ל). Thus [?] (על כן): a wise man [?] and an intelligent one [?] ... the eternal [?] ... the years [?] from [?] (מהזמן) ... and the months (חדשים) ... and a fraction (חלק) [?] ...

and they are true / and so they are correct [?] ... only [?] in [?] ... to the eternal [?] (לעולם) ...

[final line:] complete [?] and finished [?]

` per token rather than smoothed into invented connective prose. Flagged as a for higher-resolution recovery of the colophon — in particular to determine whether

a closing formula (תם ונשלם), a scribal signature, or a date is present at the final line. Do NOT treat the partial closing formula as an attested colophon date/name.]

## Planetary-position table (WIDE, multi-column)

A wide ruled astronomical table occupying the full leaf: paired sexagesimal columns (two Hebrew letters per cell, i.e. a degrees/minutes or signs-and-degrees pair) written in alternating **red** and **brown** ink, with zodiac-sign rubrics in red as section headers running across the panel. The table has roughly **7–8 argument groups** straddling the page and the inner gutter; the page bows toward the spine, so the central columns do not register at uniform tile resolution.

### Top headers (legible, red and brown):

- [Red ink header: האמת לזמא] — "the true [position] for the Sun"
- [Red ink header: מאדים] — "Mars" (planet column-group label)
- A further partly-legible planet/column label to its left [?]
- Zodiac-sign block rubrics, red ink, reading across the panel: [Red ink header: טלה] "Aries", [Red ink header: שור] "Taurus", [Red ink header: התאומים] "Gemini" — and further sign-blocks continuing left into the gutter [?].
- Column sub-headers in brown/red within each block (degrees/minutes pair headers, e.g. חלקים / מעלות-type labels) — partly legible, several worn [?].

**Index / argument column (rightmost, brown):** a running sequence of single- and two-letter day/degree arguments down the panel (...ב"א, י"א, ט, ח, ז ... continuing). Legible in the right band; lost into the gutter on the left.

**Body cells:** paired two-letter sexagesimal values, red and brown alternating by column. The right-hand band of columns (nearest the outer margin) is largely legible cell-by-cell; the central and left-hand bands cross the gutter seam and bow, and are not registerable to legibility at this uniform tile resolution.

(rightmost legible  
band — sample,  
brown index col →  
first value columns)

Index (יום/מעלה)	value (red)	value (brown)
[7] ז	ל"ד [?]	...
[8] ח	כ"ה [?]	...

(rightmost legible  
band — sample,  
brown index col →  
first value columns)

---

[9] ט	א"ל [?]	...
[10] י	... [?]	...
[11] י"א	... [?]	...
[12] י"ב	... [?]	...

Script: Sephardic semicursive, primary hand throughout, with red ink (rubrication) for table titles, column headers, and the leading argument-column entries (black for the secondary minute/second columns and for the instructional prose). Both leaves are full-page table panels with short prose paragraphs interleaved on page 54.

## Wide planetary-position table

A single wide, dense table fills the leaf. It straddles the gutter, the parchment bows at the binding seam, and the small two-letter sexagesimal cells (red and black) are tightly packed — eight or more argument-groups run across the panel, with cells crossing the page bow. This is a wide grid that does not register at uniform tile resolution.

### Structure captured:

- **Title (top, red):** [Red ink header: *האומר לחמה*] — "*The teller (table) for the Sun*" (the running planetary-position table; the argument is the entry-figure, the body gives the resulting position in degrees/minutes/seconds).
- **Column headers (red, top row, reading right→left):** the panel carries a repeating sub-header block over each argument-group reading roughly [Red ink header: ...*קרב* / *ש[ע]קרב* / *נכ[ח]ברי*] and, at the left groups, [Red ink header: ...*ולכרי*] (the column-group captions are abraded and only partly legible). Beneath each caption are the paired sub-columns / **מעלות / חלקים** **שניות** (degrees / minutes / seconds) [?].
- **Index column (rightmost, red):** runs א, ב, ג, ד, ה, ו, ז, ח, ט, י, יא, יב, יג, יד, ... (the argument 1, 2, 3 ... counted downward), continuing through the panel.
- **Body cells:** paired two-letter values throughout, e.g. in the upper-right group the index rows read א → טו · יט; ב → טו · יח; ג → טו · יז; ...; the values increment row-by-row in the normal sexagesimal manner. A red

horizontal rule and the sub-caption [Red ink header: מאוזנת] ("*equated / balanced*") divides the panel about a third of the way down, after which a fresh argument-block begins.

The table terminates partway down the leaf; the **lower third of the leaf is blank parchment** (foxed, with scattered grey stains in the margin — no text).

## Seasonal-point (tekufah) tables, with the work's end

This leaf carries a **series of small stacked tables**, each headed in red by a season-point (*tekufah*) and the zodiacal sign in which it falls, with short black instructional prose paragraphs between the table blocks. The blocks read across the panel from the right; the prose lines run full width above and below the table rows.

### Top prose band (red + black, partly abraded)

[Red ink:...[ב]הכוכב / והוה רגע הכוכב...] — "...*the tekufah... and the planet's moment (position) is...*" The black continuation reads, in part: "תקון הכוכב ... הכוכב במזל" — "*the correction (equation) of the planet ... the planet in the sign of...*" [the remainder of the band is faded; several words [?]].

### Table block 1 (right) — Tekufah of Nisan

- [Red ink header: התקופת ניסן] — "*The tekufah of Nisan*"
- [Red ink header:...השמש] — "...*the planet / the Sun*" [?]
- Sub-headers over the columns: [Red ink: כסרטן] ("*in Cancer*") and, to its left, [Red ink: כמאזנים] ("*in Libra*") — paired argument blocks, each with / **מעלות / שניות חלקים** columns [?]
- Index column (red): ט, ח, ז, ו, ה, ד, ל, כ, א, ה, ... running downward
- Sample legible rows (in-Cancer group, index → values): ה → כג · גג · כא [?]; א [?]; the values continue down the block.

### Table block 2 — Tekufah of Tammuz

- [Red ink header: התקופת תמוז] — "*The tekufah of Tammuz*"
- [Red ink header: [ה]ל[ה]] — "*in the sign of Virgo*" [?]
- Sub-header column [Red ink:...] with the paired degree/minute/second columns [?]; a short index column (red) below.

### Table block 3 — Tekufah of Tishrei

- [Red ink header: התקופת תשרי] — "*The tekufah of Tishrei*"
- [Red ink header: ע[ק]רב] — "*in the sign of Scorpio*" [?]
- Paired degree/minute/second columns [?]; red index entries below (ג, כ, ...).

### Table block 4 — Tekufah of Tevet

- [Red ink header: התקופת טבת] — "*The tekufah of Tevet*"
- [Red ink header: דלי] — "*in the sign of Aquarius*"
- The argument columns and a few black/red cells are present but largely faded toward the gutter [?].

### Other red sign-captions visible across the panel

[Red ink: כטלה] ("*in Aries*"), [Red ink: בטלי / כטרי] ("*in ...*") [?], and [Red ink: כחרש] כחרש דד[י]אולי / כחרש דר[א]ולי / ומאזל ("*in the sign of ...*") — these head the parallel argument-blocks; several sign-names are abraded and only partly legible [?].

### Closing prose (below the last table block — the work's end)

Two faint black lines of instructional prose run below the final tekufah block, then the leaf trails off into blank, water-stained parchment. The legible fragments:

"....." "... [?] נמתקן[?] מן כב נמתקן[?] ... ומחנסת השרי ה מן כב נמתקן[?] ..."  
ה נמתקן[?] עבת ה' מן ה

These read as a continuation of the computing instruction (how the planet returns / how to take the entry from the table by hour), **not** as a formal colophon. **No scribal colophon, no "תם ונשלם," and no scribe name / date / place is legibly present on this final leaf.** Below these lines the parchment is blank, foxed, and water-stained to the lower edge (heavy grey/purple staining in the bottom margin and gutter).

**End of the work** — the Sixth Wing's planetary-position and seasonal-point (tekufah) tables conclude here; the manuscript ends without a formal scribal colophon on this leaf.