

Ships and shipment in Minoan Linear A

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The sign *86 is a schematic picture of a ship. It is attested both in Minoan Linear A and Mycenaean Linear B, but it functions in two scripts differently: in Linear A it is always an ideogram, but in Linear B it is always a phonetic sign of unknown value. The sign *188 is attested in Linear A only, where it is frequently combined together with *86 (HT 8b, 26b, KH Wa 2058, 2059, 2061, 2062, 2109, 2117b), being depicted above the ship, making clear that this a schematic drawing of a ship-load. The purpose of the present article is to clarify the functioning of these two signs in the Linear A texts.

First of all, it should be stressed that *86 is attested in two different contexts: in lists of personnel (HT 27a, 45a, 94a,b), where it stands for group of sailors, and in connection with various commodities (HT 11b, 140, KH Wc 2056, 2057) and with the above-mentioned sign for load (*188) standing for actual ships. HT 27a and HT 94a are very similar lists of personnel marked by several variants of the ideogram for man (VIR, VIR+*313b), but on HT 94 the sign *86 is found twice: on obverse as an item in the list of personnel, and on reverse, as a heading introducing two personal names.¹

TABLE 1 (sailors on HT 27a and HT 94)

H	HT 27a	HT 94a	HT 94b
<i>ti-ni-ta</i> *307	]ki-*310	<i>ka-pa</i>	*86
VIR 90 *86 51 RE 20 <i>i-mi-sa-ra</i> 43]QE 21 <i>ki-da</i> []	<i>ku</i> -*305 [] <i>sa-ra-di</i> 5 VIR 42	VIR 62 *86 20 TI+A 7 VIR+*313b 18 TA 4	<i>ra</i> -[ri]- <i>de-me-te</i> 1 *21 ^f - <i>tu</i> -[ne] 1
	<i>ku-ro</i> 355	<i>ku-ro</i> 110	

¹ For an overall structure of HT 94 see A. Uchitel, "HT 94", *Minos* 37/38, 2002/03, pp. 81-88.

As for HT 45a, the sign for ship is found there in front of the sign *305, which is also attested in lists of personnel (HT 89, 100).

TABLE 2 (sign *305 on HT 45, 89, and 100)

HT 45a	HT 45b	HT 89	HT 100
		<i>a-sa-ra</i> ₂ *307	[]
*86 *305 2[*318 *305 2	*318 *305 7	*305 23 *65+*317+QE 22 <i>ma-i-mi</i> 24 VIR+*313a 13 <i>ta-ra</i> 5	VIR+KA 58 *304+PA [4] TI+A 12 KI 2 *305 5 VIR+*313a 16
		<i>ku-ro</i> 87	<i>ku-ro</i> 97

This sigma-like sign (*305) is probably a picture of a double bow, and it appears on HT 45 also twice after the picture of a table (*318), which is also found as a part of the heading on HT 94a. The connections between all these texts are shown on table 3.

TABLE 3 (*86 as a group of personnel)

Text No.	SHIP	TABLE	DOUBLE BOW
HT 27a	*86 51		
HT 45a	*86	*318	*305 2[*305 2
HT 45b		*318	*305 7
HT 94a	*86 20	*318-*306 11	
HT 94b	*86 (2) ²		
HT 89			*305 23
HT 100			*305 5

On HT 94a the table-like sign (*318) is combined with the sign *306, which is probably a gender denominator.³ This probably means that the table stands for female occupation, probably cooks, and “double bow” (*305) possibly indicates an age group.⁴

² The numeral refers to two names written under this heading.

³ For this identification see A. Uchitel, “The Minoan Linear A Sign for ‘Woman’: a tentative identification”, in *Fylo. Engendering Prehistoric “Stratigraphies” in the Ancient Aegean and the Mediterranean*. Proceedings of an International Conference, University of Crete, Rethymno 2-5 June 2005 (ed. K. Kopaka) (Aegacum 30), Liège 2009, pp. 131-137.

⁴ On HT 89 it is found side by side with a word *ma-i-mi*, which can be analysed as an Anatolian passive participle derived from a verb *mai-* “to grow” and meaning “grown-ups”. See M. Finkelberg, “Minoan Inscriptions on Libation Vessels”, *Minos* 25/26, 1990/91, p. 80, note 86; A. Uchitel, “Records of Conscriptio, Taxation and Monthly Rations in Linear A Archives”, *Minos* 29/30, 1994/95”, p. 85, note 24. A. Uchitel, “Listing by Age and Occupation in Minoan Linear A”, *Kadmos* 45, 2006, pp. 73-81.

As for commodities shipped, textiles, olive oil, olives, figs, wine, and grain are attested among them. The shipment of textiles is attested through combination of a picture of a loom⁵ with the sign for load (*188+*KU*) on HT 16 and HT 20. These two tablets are closely associated with several nodules (HT Wa 1020, 1021bis) and roundels (HT Wc 3013, 3015, 3016, 3017, 3019, 3020) sharing with them their headings (*ka-ku-pa*, *ku-pa*, *qe-ku-re*, *qa-ku-re*), personnel (*di-na-u*, *DI*, *DI**306, *304+*PA*), ideogram for barley (*303), and above mentioned ideograms for loom and load (*188). The cross-references inside this group of texts is shown on table 4.

TABLE 4 (loom and load on Hagia Triada tablets, nodules, and roundels)

Text No.	heading	personnel	BARLEY	LOOM	LOAD
HT 16	<i>ka-ku-pa</i>	<i>di-na-u</i> F		LOOM B	*188+ <i>KU</i> EF
HT Wc 3015	<i>ka-ku-pa</i>		*303		
HT Wc 3016	<i>ka-ku-pa</i>	*304+ <i>PA</i>	*303+D		
HT Wa 1020a	<i>ku-pa</i>	*304+ <i>PA</i>			
HT 20	<i>qe-ku-re</i>	<i>DI</i> J		LOOM E	*188+ <i>KU</i> J
HT Wc 3017	<i>qa-ku-re</i>	<i>DI</i> *306 *304+ <i>PA</i>	*303+D		
HT Wa 1021bis		*304+ <i>PA</i>	*303+D 3		
HT Wc 3013					*188
HT Wc 3019				LOOM E	
HT Wc 3020		*304+ <i>PA</i>	*303+D		*188 <i>DU</i>
HT Wa 1021a					*188 <i>DU</i>

The personnel of “loom texts” included female textile workers in full phonetic writing as *di-na-u*, or in an abbreviated form *DI*, with or without gender denominator *306; and male personnel (probably fullers) qualified as *304+*PA*.⁶ The ideogram for barley (*303) stands probably for their food-rations. Therefore, the commodity loaded (*188) was probably textiles. It may be observed also that a word *je-ta-na* is written on one of the clay nodules associated with this group (HT Wa 1020g). This word should be probably analysed as a 2nd pl. present-future,

⁵ There is no conventional transliteration for this sign, since in *GORILA* it is confused with the syllabic Linear AB 54 (*wa*). See J. Weingarten, “Seal-use at LMIB Ayia Triada: a Minoan Elite in Action, I Administrative Considerations”, *Kadmos* 26, 1987, pp. 27-28.

⁶ The sign *304 stands for an agricultural commodity (HT 14, 18, 21, 28a, 50a, 90, 91, 116a, b, 125b, 129, 131, KH 8, 9), but *304+*PA* stands for a group of personnel (HT 100, KH 7b, 13). See A. Uchitel, “Records of Conscriptio, Taxation and Monthly Rations in Linear A Archives”, *Minos* 29/30, 1994/95, p. 83, note 19.

or 2nd pl. imperative of a Minoan verb “to do” (*a-lja-lje-*),⁷ meaning “you (pl.) will do/you (pl.) are doing/let you (pl.) do”.⁸ Apart of an unprecedented personal remark, this interpretation would indicate a close connection between production of textiles and their shipment. As we shall see this connection is typical for other commodities.

Among agricultural commodities the olive oil (*302) is the best attested in the context of shipment, appearing on three tablets (HT 8, 56, 140). HT 8 consists of four lists divided into two parts written respectively on the obverse and the reverse of the tablet. The first part probably deals with the production of olive oil, being introduced by the heading *je-di*, which should be interpreted as the verbal form “they will do/they are doing”,⁹ and an ideogram for olive oil (*302+*KI*). The second part deals with the shipment of this production, since ideograms for “ship” (*86) and “load” (*188) are repeatedly found there.¹⁰ One can also notice that two second lists both on obverse and on reverse appear under an identical heading *56. HT 56 is a small fragment written on both sides of the original tablet. In contrast to HT 8, the sign for load appears on obverse, and the sign for olive oil (*302+*KI*) on the reverse. HT 140 is a badly damaged tablet written on one side only, but it also consists of two parts, both introduced by the same heading *u-*34-si*. The sign for ship with phonetic and pictorial complements appears in both parts, but a familiar expression *je-di *302-KI* is found also in the first part. The list of shipped commodities in the second part consists of repeated abbreviation *KA* followed by numerals and another variant of the sign for olive oil (*302+*RO*) also with numerals. Ratio of *KA* to olive oil is not constant, it varies from 4:3 to 1:2. Most probably *KA* stands for some container of liquids, possibly *ka-di* attested at Zakro (ZA 15b)¹¹ in connection with wine, or *ka-ro-*56* attested on HT 31.¹² The structure of all three texts is shown on table 5.

The heading *u-*34-si* is probably somehow associated with shipment, since it introduces also HT 15, which deals with shipment of grain (GRA). The sign for load, however, is used there as a subheading, which introduces the deficit (*ki-ro*)¹³ of 400 measures. The two tablets are compared in table 6.

⁷ For the identification of this verb see A. Uchitel and M. Finkelberg, “Some Possible Identifications in the Headings of the Linear A Archives”, *Studi micenei ed egeo-anatolici* 36, 1995, pp. 32-33.

⁸ For Luwian verbal ending *-tani* see A. Morpurgo Davies, “Dentals, Rhotacism and Verbal Endings in Luwian Languages”, *KZ* 96, 1982/83, pp. 258-259.

⁹ A. Uchitel and M. Finkelberg, “Some Possible Identifications...” (note 6), p. 32.

¹⁰ The transliteration of HT 8 is based upon *GORILA* 5, p. 70 (corrigenda).

¹¹ They are very large: each vessel contains 26 large measures of wine.

¹² Written in small characters above the ideogram. See J. T. Hooker, *Linear B, An Introduction*, Bristol, 1980, pp. 14-15.

¹³ For this interpretation of *ki-ro* see D. Schuerr, “Linear A KI.KI.RA.JA”, *Kadmos* 15, 1976, pp. 31-39.

TABLE 5 (production and shipment of olive oil on HT 8, 56, and 140)

HT 8a				HT 8b			
<i>je-di</i>		*56		<i>su-pu₂</i>		*56	
*302+KI	10	<i>ka-ra-ti</i>	1J	*188	1	*188	2
		<i>PA</i>	3J		5	<i>qa-*310-i</i>	1EF
		<i>te-*301</i>	2			<i>ka-pa</i>	J
		<i>qa-*310-i</i>	JE			<i>pa-ja-re</i>	1F
		<i>si-ki-ra</i>	E			*86+*188	J
		<i>ki-re-ta-na</i>	J				J
HT 56b				HT 56a			
*302+KI 20				*188			
HT 140							
<i>u-*34-si</i>				<i>u-*34-si</i>			
*86 SI		<i>je-di</i>		*86 SI *118			
<i>NI</i>	1[	*302+KI	1J	<i>KA</i>	3		
				<i>KA</i> []		<i>MA</i> []	
				<i>KA</i> []			
				<i>KA</i> []4		*302+RO 3	
				<i>KA</i> 1		*302+RO 1	
				]KA 1		*302+RO 2	
				<i>ka-pa</i>]		[]	
				[]		*302+RO 6J	

TABLE 6 (heading *u-*34-si* on HT 15 and 140)

HT 15			HT 140			
<i>u-*34-si</i>			<i>u-*34-si</i>		<i>u-*34-si</i>	
		*188	*86 SI	<i>je-di</i>	*86 SI *118	
GRA+ <i>u-*123-a</i>	684	<i>ki-ro</i> 400	<i>NI</i> 1[	*302+KI 1J	<i>KA</i>	3
GRA+L ³ L ³	570				<i>KA</i> []	<i>MA</i> []
					<i>KA</i> []	
					<i>KA</i> []4	*302+RO 3
					<i>KA</i> 1	*302+RO 1
					]KA 1	*302+RO 2
					<i>ka-pa</i>]	[]
					[]	*302+RO 6J

One can notice also that a small quantity of figs (*NI*) appears in the first part of HT 140 in the context of shipment. Much larger quantity of this commodity is attested on HT 103 in a similar context. A word *da-ku-se-ne* connects this text with HT 104 (see table 7). This word has a conspicuous Hurrian etymology: *Dakušeni* – “dear brother” – a Hurrian name, which follows a widespread Near Eastern

pattern: Sumerian Šeš-kal-la, Akkadian Ahu-waqar, Aramaic Ahi-qar. Could it be a name of a Hurrian merchant? This would mean that in contrast to Linear B, some of the Linear A tablets might deal with trade activities, not only with administrative transfer of goods.

TABLE 7 (*da-ku-se-ne* on HT 103 and 104)

HT 103		HT 104	
<i>u-ta₂</i>	*56	<i>ta-pa TE+B</i>	
<i>NI</i> 40	<i>da-ku-se-ne</i> []6 *188 13 <i>da-ku-na</i> 1 <i>da-ku-se-ne</i> 1	<i>da-ku-se-ne-ti</i> 45J <i>i-du-ti</i> 20J <i>pa-da-su-ti</i> 29	
	<i>ki-ro</i> 5J	<i>ku-ro</i> 95	

The shipment of olives and some related product (*308) is attested on HT 123. This beautifully preserved tablet is written on both sides, and, as on HT 8, the shipment is dealt with on the reverse. The obverse is one the most elaborate pieces of calculation in Linear A: three sets of numerals follow ideogram for olives (OLIV), unidentified ideogram *308, and a word for deficit (*ki-ro*) repeatedly after four headings. All three sets are totalled after the fifth heading *ku-ro* (“total”). The ratio between olives and *308 is always 4:1, and it is clear from the total that the deficit should be added to olives in order to reach this ratio (100:25). The reverse consists of two lists. The first one under the heading *188 (“load”) consists of two commodities (*308 and *312), and the sign for load appears twice in the second list with and without a phonetic complement *DU*. The structure of this text is represented in table 8.

TABLE 8 (olives and their shipment on HT 123)

HT 123 a			
heading	OLIV	*308	<i>ki-ro</i>
<i>ki-ta-i</i>	31	8E	X
<i>pu-VIN</i>	31J	8JE	X
<i>sa-ru</i>	16	4A[	JE
<i>da-tu</i>	15	4E	JE
<i>ku-ro</i>	93J	25H	6[

HT 123b	
*188	<i>ti-da-ta</i>
*308 11 *312 1JE	<i>pi-sa</i> 4 *188 1 *188.DU 10 <i>tu-pa-di-da</i> JL ² <i>ka-na</i> [] <i>si-du</i> A <i>du-ma-i-na</i> EF
	<i>ku-ro</i> 20 <i>ki-ro</i> 5[

*308 appears in several lists of agricultural commodities (HT 23a, 32, 35). Could it be salt?

Wine is very poorly attested in the shipment context in comparison with olive oil and related products. It appears only once on a reverse of a badly broken tablet HT 98, whose structure is quite parallel to HT 8 and HT 123 (see table 9).

TABLE 9 (shipment of wine on HT 98)

HT 98a		HT 98b	
[]- <i>de</i>	1	[] *188[
[]- <i>tu</i>	1	VIN	JE
<i>ta-na-ti</i>	JE	<i>da-ru-ne-te</i>	K/B
<i>di-re-di-na</i>	J		
<i>te</i> -*301	JE		
<i>ro-ke</i>	J		
<i>ka-ri</i> -*310- <i>i</i> ¹⁴	E		

Finally, shipment of some unidentified commodities is recorded on two clay tablets (HT 11 and 26). Following the familiar pattern of HT 8, 98, and 140 both tablets are written on two sides and the shipment is dealt with on reverse. Both tablets deal with shipment of vessels: an abbreviation *KA* familiar from HT 140 is repeated five times on HT 11b, and a picture of some vessel (*406^{VAS}) with phonetic complement *KE* written inside serves as a heading of HT 26a and 26b (see table 10),

¹⁴ The proper reading of this word is most probably *ka-we*-*310-*i*, which seems to be the alternative spelling of *qa*-*310-*i*. For reading *we* of AB 53 see M. Finkelberg, "On the Signs AB 41 and AB 53 in the Linear A Syllabary", *Cretan Studies* 9 (Briciaka. A Tribute to W. C. Brice, ed. Y. Duhoux), 2003, pp. 40-42.

TABLE 10 (shipment of uncertain commodities)

HT 11a				HT 26a	
<i>a-ru-ra</i>		<i>a-su-ja</i>		*406 ^{VAS} +KE	
[4+]	3	VIR- <i>i</i>	3	*312- <i>te-te ta-ti</i>	21
<i>ka-ro-na</i>	2	TA ₂	15	<i>mi-ki-se-na</i>	15
*322- <i>ri</i>	1			<i>u</i> -*56-*21 ^f	5
<i>ku-ro</i>	10				
HT 11b				HT 26b	
]- <i>de-nu</i>				*406 ^{VAS} +KE	
<i>sa-ra</i> ₂ *86	KA 40			VIR	9
	KA 30			<i>pa-ro-ni</i>	3
	KA 50			<i>ka-u</i> -*79- <i>ni</i>	4
<i>ru</i> -*79- <i>na</i>	KA 30			KI+MU	12
<i>sa-qe-ri</i>	KA 30			<i>i-ka</i> ¹⁵	2[
				*188-*86	7[
<i>ku-ro</i>	180				

CONCLUSIONS

1. The best attested commodities mentioned in the context of shipment on Minoan Crete are textiles, olive oil and related products (olives and *308).
2. The shipment is usually closely associated with production of the shipped products, which is mentioned through the use of various forms of the Minoan verb “to do” (*je-di, je-ta-na*).
3. The production is usually dealt with on the obverse of the tablet, and the shipment on the reverse.

¹⁵ GORILA reads I-*308, but the second sign is certainly *ka*.