

Identifying & Tracing the FN Herstal FAL Rifle:

Documenting signs of diversion in Syria & beyond

N.R. Jenzen-Jones & Damien Spleeters

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Cover image: A Syrian rebel fighter with an FN Herstal FAL 50.00 rifle (photo copyright: Mohammed Al-Khatib).

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Remember, all arms and munitions are dangerous. Treat all firearms as if they are loaded, and all munitions as if they are live, until you have personally confirmed otherwise. If you do not have specialist knowledge, never assume that arms or munitions are safe to handle until they have been inspected by a subject matter specialist. You should not approach, handle, move, operate, or modify arms and munitions unless explicitly trained to do so. If you encounter any unexploded ordnance (UXO) or explosive remnants of war (ERW), always remember the 'ARMS' acronym:

AVOID the area

RECORD all relevant information

MARK the area to warn others

SEEK assistance from the relevant authorities

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The tool is available at: http://www.armamentresearch.com/tools/faldate

The user simply needs to input an FAL serial number and will be given a year of production and an interpolated estimate of month of production with error bounds.



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Abbreviations and Acronyms

FAL Fusil Automatique Léger ('light automatic rifle') [French]

FALO Fusil Automatique Lourd ('heavy automatic rifle') [French]

FNH Fabrique Nationale de Herstal ('National Factory of Herstal') [French]

IS Islamic State

MAG Mitrailleuse d'Appui Général ('general-purpose machine gun') [French]

MENA Middle East and North Africa

NATO North Atlantic Treaty Organisation

SAA Syrian Arab Army

UAE United Arab Emirates



Introduction

Documenting a specific weapon system not only supports investigation into possible cases of arms diversion, but often shed light on the broader arms and munitions aspects of a conflict. In that regard, the Belgian-made *Fusil Automatique Léger* (FAL) self-loading rifle is a weapon system that is particularly suitable for arms diversion research. It is possible to identify the time of production of some FAL rifles with a relatively high level of precision, which allows an identification of possible diversion platforms. This identification methodology, which relies only on publicly-available source material and a current understanding of FAL rifle production, is here applied to Belgian FAL rifles documented in the Syrian conflict. The more data that investigators pool and share, the more complete the picture will become. The presence of Belgian FAL rifles in the ongoing Syrian conflict, although limited when compared to other small arms and light weapons, offers an interesting case study and allows for the demonstration of the identification and tracing methodology outlined herein. It should be stressed that in order to understand the full chain of custody of a rifle – that is, all licensed and unlicensed users – further field work and formal tracing requests are likely to be necessary.

The FAL Rifle



Photo 1: A Belgian FN Herstal FAL rifle (photo credit: Small Arms Survey).

The FAL rifle is an iconic product of the Cold war. Nicknamed 'The Right Arm of the Free World,' the weapon was designed and first manufactured at *Fabrique Nationale d'Armes de Guerre Herstal*¹, or FN Herstal (FNH), in Belgium (Stevens and Rutten, 1981). The FAL was introduced in 1953, and chambered for the new 7.62 x 51 mm NATO cartridge. The FAL is a short-stroke gas operated selective-fire rifle, utilising a tilting breechblock locking system and firing from the closed bolt. By late 1972, more than one million rifles had been produced. Dieudonné Saive's original design underwent several changes throughout its production history, some of which can be diagnostic for identification purposes (see below). The FAL was adopted by more than 90 countries and produced under license by at least 15 different nations (Emerson, 2009; Johnston & Nelson, 2010; Stevens and Van Rutten, 1981). Several countries, the United Kingdom and some Commonwealth countries included, adopted FAL rifles manufactured to imperial specifications, commonly referred to as the 'inch pattern' FAL. Contemporary research indicates that some 5.5 million FAL type rifles have been produced by various manufacturers to date (ARES, 2015).

¹ From 1973 the factory has been known simply as *Fabrique Nationale de Herstal* (Stevens, 1990).



P.O. Box 2178 Churchlands WA 6018 AUSTRALIA The FAL rifle is particularly noteworthy as it is easily recognisable in the field, and useful records of production and export exist. Depending on the conflict and the region, the rifle is often popular enough to provide a good research sample, but remains likely to have been produced in far fewer countries than several other common self-loading rifles. The *Avtomat Kalashnikov* (AK), for example, is believed to have spawned some 200 variants, copies, and derivatives, making identification and data collection in the field a somewhat more difficult proposition (Ferguson & Jenzen-Jones, 2014). Further, in the case of the FAL, records which assist in identifying and tracing these rifles are relatively accessible and of sufficient detail to frequently prove useful to investigators.

FAL rifles produced by FNH in Belgium have very particular features that make partial tracing possible without the assistance of the manufacturer or relevant governments, if necessary, which is not the case for most small arms and light weapons.

Belgian Exports of FAL rifles to Syria

Records of Belgian arms export for the years 1969-1974 and 1980-2003 are kept at the Belgian National Archives and remain accessible to the public². There are no records of FAL rifles being exported to Syria from Belgium after 1969. One Mitrailleuse d'Appui Général (MAG) general-purpose machine gun was licensed for export to Syria in 1980 (Belgium, 2013). Although the records for the years 1975-1979 have been destroyed by the administration³, the ammunition export pattern tends to support the hypothesis that no FAL rifles were exported to Syria after 1969. Indeed, it appears that Syria did not replenish its stock of 7.62 x 51 mm NATO ammunition produced in Belgium. It should be noted that Syria has produced 7.62 x 51 mm ammunition of its own, and is also thought to have purchased this calibre from other sources. The FAL rifle is widely known to constitute a part of the Syrian arsenal (Gander, 2001; Smith & Smith, 1965; Stevens & Van Rutten, 1981). Syria bought its first FAL rifles shortly after they entered production, adopting the rifle for service in 1956. In 1957, 12,000 FAL rifles were to be exported to Syria (see Annexe 2). During the course of the Syrian conflict, ARES has documented FAL type rifles in service with the Syrian Arab Army (SAA), forces of the Islamic State (IS), as well as various rebel groups, including Kurdish forces. Whilst this report deals only with Belgian-produced FAL rifles, licensed copies from other countries including Israel and variants such as the FALO have also been documented in Syria (Ferguson & Holtom, 2015).

Identifying Features

Arms tracing relies first on the identification of the weapon in question, specifically the type and model, manufacturer, and country of origin. This identification is based on markings, physical characteristics, or a combination thereof (Jenzen-Jones, 2015). The FAL rifle can be readily identified through a combination of factory markings and physical characteristics. It should be noted that whilst some of the information below is applicable to FAL rifles produced in countries other than Belgium, all markings and characteristics included in this report, and the year estimation by serial number methodology, apply only to Belgian-produced FAL rifles.

³ Interview with Belgian National Archives' archivist, 2013: Due to the sheer volume of documents being transferred by the Belgian administration to the National Archives, a small number get discarded and destroyed by mistake.



² Further, the authors have copies of the archives for 1969-1974 and 1980-2003. They may be contacted at: ArmsID@armamentresearch.com

Factory Markings

Factory markings, most commonly located on a rifle's receiver are strong indicators of a weapon's country of manufacture. If a positively identified manufacturer marking is consistent with the overall physical features of a weapon, the rifle may be considered tentatively identified (Jenzen-Jones, 2015).

Although factory markings, located on the right-hand side of the Belgian FAL, do not explicitly refer to the weapons' date of manufacture, they do provide relevant information. Original research conducted in the Belgian National Archives shows that between November and December 1971, FN Herstal amended its factory marking from 'Fabrique Nationale d'Armes de Guerre Herstal Belgique' to 'Fabrique Nationale Herstal Belgique'. Observing the former factory name marked on a rifle would thus indicate a date of manufacture preceding the November–December 1971 date (see Photo 2). Factory markings with the latter name, on the other hand, would indicate a manufacturing date after this change (see Photo 3) (Spleeters, 2013). Some FAL rifles exported from Belgium have been documented marked 'Fabrique Nationale Herstal Belgium' (see Photo 4). The year in which this marking practice was introduced is unclear, though it seems probable this marking style was introduced after the change in marking of November–December 1971, given that the factory name is rendered 'Fabrique Nationale Herstal', rather than 'Fabrique Nationale d'Armes de Guerre Herstal'. These marking do appear on Type II receivers, however, and so must have been introduced prior to the end of 1973. It is likely that the style of marking varies with export client and other factors.

Other markings, such as proof marks, rear sight markings, and fire selector markings, may also assist in the determination of a rifle's provenance. Such markings may also be useful for authorities seeking to trace the weapon or its components with a higher degree of accuracy. However, it should be noted that some of these markings are on components which require the disassembly of the rifle in order to document them. This should only be attempted by qualified armourers after making a full and informed appraisal of the security situation. Markings may also be applied to magazines, and these should also be documented where possible.



Photo 2: Factory marking reflecting manufacture prior to November–December 1971. Marked: 'FABRIQUE NATIONALE D'ARMES DE GUERRE–HERSTAL–BELGIQUE'





Photo 3: Factory marking reflecting manufacture after November–December 1971. Marked: 'FABRIQUE NATIONALE HERSTAL BELGIQUE'



Photo 4: Factory marking reflecting manufacture for export⁴.

Marked: 'FABRIQUE NATIONALE HERSTAL BELGIUM'

Serial Numbers

Serial numbers on FAL rifles may be found on one or both sides of the receiver. They generally appear on the upper rather than on the lower receiver (see Photos 5 and 6). Rifles produced before 1972 all appear to bear a single serial number on the left side (Stevens and Rutten, 1981). This marking indicates the total number of rifles manufactured for a particular country. Thus an FAL rifle marked with serial number 123456 on the left side can be identified as the 123,456th rifle manufactured for the purchasing country. As a result of this marking system, rifles made for different countries may bear the same serial number. Some pre-1972 FN FAL rifles are marked with another serial number in the magazine well that may reflect the total number of FN FAL produced to date of manufacture, however this does not appear to be standard on all rifles (see Photo7). It is not clear when this marking practice was introduced, or precisely which rifles it was applied to.

In 1972, Belgian authorities expressed concern regarding this duplication of serial numbers, and FN Herstal quickly introduced an additional serial number marking (Stevens and Rutten, 1981). This second serial number is located on the right-hand side of the upper receiver, and reflects the

⁴ Exact dates unknown, see text above.



P.O. Box 2178 Churchlands WA 6018 AUSTRALIA cumulative production of FAL rifles to the date of manufacture. Thus, on rifles produced from 1972 and bearing two serial number markings, the serial number on the left-hand side indicates the rifle's numerical place in a country-specific numbering scheme, whilst the serial number on the right-hand side indicates the rifle's place within the total FAL rifle production of FNH (Spleeters, 2013). Some post-1972 FN FAL rifles only bear a serial number on the right-hand side of the receiver. FN Herstal is believed to have produced FAL rifles up until the late 1980s (Johnston & Nelson, 2010).



Photo 5: Serial number on the right-hand side of the upper receiver of an FAL rifle (photo credit: Damien Spleeters/diagram credit: ARES).



Photo 6: Serial numbers on left-hand side of an FN Herstal FAL rifle. Note that the serial number is repeated on both the upper and lower receivers of the rifle.



Photo 7: Serial number marked on the inside right-hand side of the magazine well of an FAL rifle.

With respect to rifles produced after 1972, the right-hand side serial number ('primary serial number') is typically the most important characteristic to record for official tracing requests, as it should enable FN Herstal and Belgian authorities to determine the year of manufacture as well as the authorised end user of the rifle. This serial number may allow for an approximation of the year in which the rifle was manufactured, given known FAL production counts from 1953 to 1980 (see Table 1) (Spleeters, 2013).

Table 1: Cumulative production of FAL rifles, 1953–1980

Year	Cumulative production total	Year	Cumulative production total
1953	0	1967	785,620
1954	14,284	1968	835,614
1955	78,562	1969	849,898
1956	214,260	1970	871,324
1957	257,112	1971	907,034
1958	314,248	1972	949,886
1959	357,100	1973	1,042,732
1960	428,520	1974	1,164,146
1961	528,508	1975	1,256,992
1962	557,076	1976	1,364,122
1963	578,502	1977	1,421,258
1964	642,780	1978	1,499,820
1965	692,774	1979	1,514,104
1966	699,916	1980	1,535,530

Source: Spleeters, 2013; Stevens and Rutten, 1981.



ARES has also developed a series of relatively simple mathematical formulae which allow a user to estimate in which month it is likely a given FAL was produced, and to give confidence intervals for that estimate (error bounds). This methodology is more fully elaborated in ARES Research Note No. 9 *Estimating Year of Production for FN Herstal FAL Rifle* and supported by an online tool for estimating the year of production for FN Herstal FAL rifle, available at the ARES website (ARES, n.d.; Elliott & Jenzen-Jones, 2015.

This authors' approach has been validated by the results of successful formal tracing requests. The UN Panel of Experts on Libya traced two Belgian FAL rifles, documented in Mali and on the ship Letfallah II which was believed to be en route to Syria. An FN Herstal FAL rifle with serial number 1252901 was documented in Mali, and found to have originally been part of an order exported from Belgium to Libya in 1975. An FAL rifle with serial number 1531415 was documented in Libya, and found to be part of an order dated 21 December 1979, exported to Qatar (Msan et al., 2014). Using Table 1, production years of late-1975 and late-1979 would be approximated. The UN Panel report allows for a positive verification of this methodology with real world examples (see Table 2). The difference between the results of the Panels' tracing processes and the authors' methodology in some cases is most likely a result of the time elapsed between the date of production and the date of order/date of export. Annexe 4 lists FAL rifle serial numbers documented in the Middle East and North Africa (MENA) region to date.

Table 2: Examples of validated year of production estimates

Rifle serial number	Authors' methodology	UN Panel findings	
	(year of manufacture)	(year of export)	
995754	1972	1973	
1004805	1972	1973	
1232064	1974	1975	
1240363	1974	1975	
1243069	1974	1975	
1252901	1974	1975	
1271182	1975	1975	
1531415	1979	1979	
1731984	Post-1980	1991	

Source: Msan et al., 2014; Raad et al., 2013.



Physical Characteristics

Along with any markings on a given weapon, its physical characteristics can prove indicative or diagnostic in many circumstances. Components such as the buttstock, receiver, rear sight, fore end, barrel (especially barrel length), and muzzle attachments can all aid in the identification process (Jenzen-Jones, 2015). It is important to note that most components from Belgian produced FAL rifles of varying years are interchangeable⁵. Whilst serial numbers and the type of upper receiver on a given rifle (see below) are some of the best diagnostic characteristics available to those examining Belgian FAL rifles, there are other features that may be of use. Given that Belgian export licenses for the years preceding 1969 are not detailed enough to draw definitive conclusions on the type of materiel transferred, Table 3 – listing some of the pertinent physical characteristics of FAL rifles manufactured up to 1965 which were exported to the MENA region – may be of particular value to investigators. Other physical characteristics may be indicative of production during a certain period; for example, the polymer fore end (so-called 'Model B') was introduced in 1973 (Walter, 2006).

Table 3: Physical characteristics of 1953-1965 Belgian FAL rifles exported to the MENA region

Country	Barrel	Muzzle attachment	Bayonet	Extractor	Buttstock	Butt plate	Furniture material	Bipod
Israel	Smooth muzzle	None	Standard	One piece	Without front socket	Without butt trap	Wood	None
Kuwait	Smooth muzzle	None	Standard	Two piece	Without front socket	With butt trap	Wood	None
Libya	Smooth muzzle	None	Standard	Two piece	With front socket	Without butt trap	Polymer	None
Qatar	Smooth muzzle	None	Standard	One or two piece	Without front socket	With butt trap	Wood	None
Syria	Smooth muzzle	None	Standard	One piece	Without front socket	With butt trap	Wood	None

Source: Smith & Smith, 1965

FN Herstal FAL Models

The FAL rifle has been produced in numerous models and variants over time for different battlefield roles and different end users. The most common Belgian FAL model is designated the 50.00, and features a fixed stock and 533 mm (21") barrel. Many variants of this rifle were manufactured with differing physical characteristics, for different clients. For example, fore ends may be of synthetic, metal, or wood construction, and various rear sights, stocks, and muzzle devices may be fitted. Weapons may also be issued with differing accessories, including different models of bayonet or bipod. Annexe 1 contains full technical specifications for the FAL 50.00, drawn from original FN Herstal marketing material. The 50.61 and 50.63 are fitted with side-folding tubular stocks. These models were introduced in the mid-1970s and are found only with synthetic furniture. The 50.63,

⁵ Many components are interchangeable between Belgian and foreign-produced FAL rifles as well, however this is not covered herein.



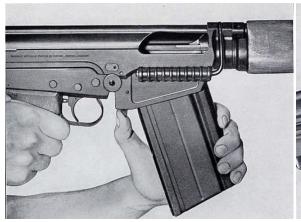
the FAL "Para", features further modifications, including a folding charging handle, lack of a carry handle, a steel trigger guard and a single position rear sight. The 50.64 is visually identical to the 50.61 (although it may be fitted with different features, depending upon configuration) and is distinguished only by its lightweight aluminium alloy ('Hiduminium') lower receiver (FN Herstal, n.d.; Stevens & Van Rutten, 1981). The 50.41 and 50.42 models feature heavy barrels and bipods, amongst other features, and were intended to be used in the automatic rifleman role (Cashner, 2013; Johnston & Nelson, 2010). Other models were also produced⁶. Table 4 and Photo 8 show the salient features of some common models. 10, 20, and 30 round magazines have been produced by FN Herstal; 20 round magazines are by far the most common. Both steel and alloy magazines exist.

Unload and Clear Procedure

Unload and clear procedures—for unloading weapons and rendering them safe to handle—should only be attempted by properly trained personnel. Do not handle firearms unless appropriately trained. Whenever feasible, ask a weapon's owner to unload the weapon for you, and confirm it is unloaded before handling it. If you must unload a weapon yourself, ask the owner's permission before doing so. Always remember to conduct both a visual and tactile inspection to confirm the safety of a weapon.

The FAL features a combined manual safety catch and fire selector on left side of receiver, above trigger. The magazine release catch is located behind the magazine housing, at right.

- 1. Ensure the weapon is pointed in a safe direction, and your finger is outside the trigger guard.
- 2. Engage safety catch by placing it in the 'SAFE' ('S') detent position.
- 3. Remove magazine by depressing magazine release catch with thumb and rocking magazine forward (see figure 1.1).
- 4. Pull back charging handle and engage the bolt hold open device (see figure 1.2).
- 5. Visually inspect chamber through ejection port to ensure weapon is clear.
- 6. Make a tactile inspection through both ejection port and magazine well.



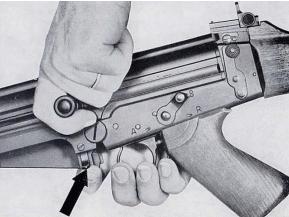


Figure 1.1

Figure 1.2 (bolt hold open marked with arrow)

⁶ Note that several sources reproduce erroneous technical characteristics for FAL rifles, especially models with folding stocks. Statistics for the 50.61, 50.63, and 50.64 are often confused or transposed.



Table 4 – Technical characteristics of select FAL rifle models

Country	Barrel length	Overall length	Weight (unloaded)	Stock type	Furniture material	Charging handle	Carry handle
50.00	533 mm	1090 mm	4.25 kg (synthetic)	Fixed	Either	Standard	Yes
50.61	533 mm	1095 mm	3.9 kg	Folding	Synthetic	Standard	Yes
50.63	436 mm	998 mm	3.75 kg	Folding	Synthetic	Folding	No
50.41	533 mm	1150 mm	5.1 kg	Fixed	Both	Standard	Yes
50.42	533 mm	1150 mm	6.0 kg	Fixed	Wood	Standard	Yes

Sources: FN Herstal, n.d.



Photo 8: FN Herstal FAL type rifles. From top: FAL 50.00; FAL 50.61^7 ; FAL 50.63; FAL 50.41; FAL 50.42 (photo credit: FN Herstal).

⁷ Note that this image shows a model 50.64, however this is visually identical to the 50.61, the only difference being the use of an alloy ('hiduminium') receiver (FN Herstal, n.d.; Stevens & Van Rutten, 1981). The 50.61 is more common.



Types of Receivers

The upper receiver of the FAL is the physical component that, along with the serial number, can provide the most information on the rifle's period of manufacture. The FAL rifle features a 'split receiver' design, hinging on a pin located between the trigger guard and magazine well. FN Herstal developed three main iterations of the FAL upper receiver, each of which has distinctive features. Type I receivers were introduced around 1953–54 and may have been produced as late as 1962. This type is characterized by two bevelled lightening cuts along the bottom edge of the lower receiver behind the magazine well (see Photo 9). In the early 1960s, FN Herstal identified an area of possible weakness in the receiver and reinforced it by truncating the lightening cuts. The resulting Type II receiver was introduced in 1962 and was probably in production through 1973 (see Photo 10). In 1973, facing the need to reduce production costs, FN Herstal introduced the Type III receiver. Single, mean-width planes replaced the earlier lightening cuts (see Photo 11). Just prior to the introduction of the Type III receiver, FN Herstal had produced one million FAL rifles (Stevens and Rutten, 1981).



Photo 9: Type I receiver (photo credit: 'pantadeusz', falfiles.com).



Photo 10: Type II receiver documented in Misrata, Libya, in June 2012.



Photo 11: Type III receiver documented in Misrata, Libya, in June 2012.

Evidence of Diversion

Type III Receivers

A careful examination of the features of the rifles used by rebel fighters in Syria indicate, with some degree of certainty, that those weapons have been diverted from, or by, their original and legitimate end user. Given Syria's purchase of FAL rifles before 1969, rifles which formed a part of the Syrian government's stockpile prior to the war should be recognisable by either a Type I or Type II receiver. The presence of rifles with Type III receivers (see Photo 12) tends to support the hypothesis that at least some of these rifles documented in Syria have been diverted from their original, licensed end user.



Photo 12: FAL rifle with Type III upper receiver documented at a rebel training camp in northern Idlib, Syria, in July 2012.

Supply and Demand

As the Syrian conflict became increasingly violent, the price of an FAL rifle on the black market in Lebanon started to rise (see Chart 1), indicating an increased demand for the weapon, a reduction in the available supply, or a combination of these factors. Meanwhile, the price of 7.62 x 51 mm ammunition remained stable early in the conflict, with demand later exceeding supply, driving the price up sharply between November 2011 and June 2012.

Between March-April 2012 and May-June 2012, the price of an FAL rifle dropped suddenly, before plummeting June and September 2012. This may reflect a surplus of rifles in neighbouring Syria, leading to a reduction in demand in Lebanese firearms markets. Concurrently, the price of 7.62 x 51 ammunition rose. This inverse relationship may indicate a surge in the use of weapons chambered for this cartridge, and a resultant sudden requirement for increasing quantities of ammunition (Florquin, 2013). This hypothesis is supported by anecdotal evidence indicating the scarcity and high price of 7.62 x 51 mm ammunition. In Atmeh, Syria in September 2012, a single 7.62 x 51 cartridge could sell for as much as USD \$3.00.

Chart 1: FAL and 7.62 x 51 mm ammunition price evolution in Lebanon (Feb 2011 − Sept 2012)⁸

■ FN FAL ■ 7.62 × 51 mm



Source: Florquin, 2013

For the observers of the Syrian conflict, there are signs of FAL rifles being diverted from their intended recipients. It is impossible, however, to document the scale of this illicit activity without significantly more data. The identification and tracing techniques described herein apply only to Belgian rifles, with several other countries having produced FAL rifles under license. Further, the quality of many images available via social and traditional media is insufficient to identify serial numbers and other critical weapon markings. As such, field research is necessary to support the endeavours of organisations observing the conflict from afar.

⁸ A standardised Z score indicates by how many standard deviations an observation is above or below the average. Expressing price values as Z scores preserves the overall trend line and makes it possible to compare the prices of arms with those of ammunition on the same scale.



Identifying Potential Arms Diversion

The empirical methodology employed by the authors to document Belgian FAL rifles, determine their production date, and identify possible licensed end-users is detailed below. This methodology may allow for the identification of the point of diversion under certain circumstances. At a minimum, unless weapons have been deliberately modified or markings abraded, these steps will allow the user to determine whether the weapon observed *in situ* has been subject to diversion (see above).



Photo 13: Belgian-produced FAL rifle documented in the Jebel az-Zawiyah, south of Idlib, Syria, in September 2012.



Photo 14: Detail of Belgian-produced FAL documented in the Jebel az-Zawiyah, south of Idlib, Syria, in September 2012. This image shows the factory marking at left (the primary serial number is also visible).

The rifle in question bears FN Herstal factory markings of 'Fabrique Nationale Herstal Belgique' (see Photo 14). This indicates production after the change in marking practices of November–December 1971. There are no stamps or factory marks indicating a different or secondary manufacturer than FN Herstal on this rifle.





Photo 15: Detail of Belgian-produced FAL documented in the Jebel az-Zawiyah, south of Idlib, Syria, in September 2012. This image shows the primary serial number, marked on the right-hand side of the upper receiver

Photo 15 shows the serial number on the right-hand side of the rifle's upper receiver. The serial number is 1117077, which indicates a production year of 1973 (see Table 1). Using the ARES online *FAL Year of Production Estimator* indicates that the rifle is likely to have been produced in August 1973 (earliest likely month July; latest likely month August) (ARES, n.d.). As described above, there are no records of Belgium having exported FAL rifles to Syria between 1969 and 1974. It seems likely, then, that this rifle has been diverted into the illicit sphere.



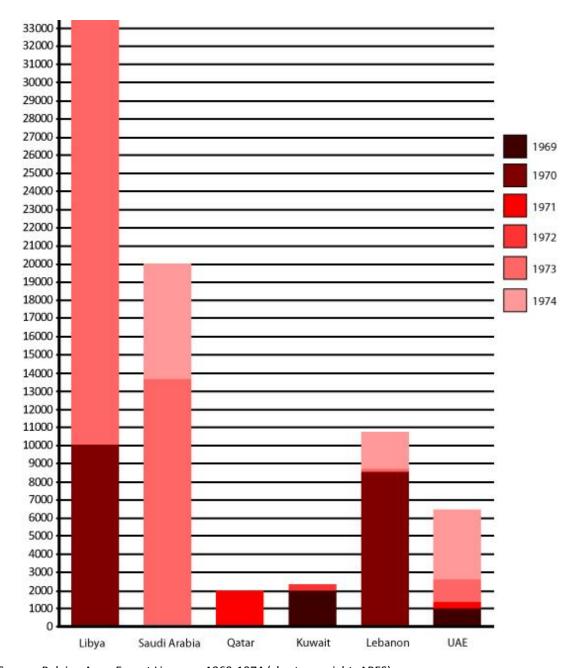
Photo 16: Detail of Belgian-produced FAL documented in the Jebel az-Zawiyah, south of Idlib, Syria, in September 2012. This image shows an additional serial number, typically marked on the left-hand side of the upper-receiver, when present.

Photo 16 shows the secondary serial number present on the left-hand side of this FAL rifle. As described above, this serial number can prove useful in some tracing endeavours. The number, marked on both the upper and lower receivers of this rifle, is 4536. This indicates that in mid-1973 (at the point at which this rifle was produced), the 4,536th rifle was produced for this client. An examination of the export data presented in Chart 2, which shows which shows the number of rifles Belgium authorised for export to countries to countries in the region for the period 1969-1974, reveals that in mid-1973, Libya and Lebanon had both already received stocks of more than 4,536 FAL rifles. No FAL rifles were authorised for export to Qatar in 1973 or 1974, and the exports to Kuwait appear to be too limited in quantity to be the likely end user.



Chart 2: FAL rifles licensed for export from Belgium to Libya, Saudi Arabia, Qatar, Kuwait, Lebanon, and the United Arab Emirates

1969-1974



Source: Belgian Arms Export Licenses, 1969-1974 (chart copyright: ARES).



Two countries listed in the export records – Saudi Arabia and the United Arab Emirates – appear to have had possessed fewer than 4,536 FAL rifles in 1973. 13,610 rifles were authorised for export to Saudi Arabia in May 1973 (see Annexe 3). Similarly, 700 FAL rifles were authorized for export to the UAE in July 1973 (Belgium, 2013). It is important to note that the exact chain of custody of the rifle cannot be determined from this simple procedure. For example, even if a rifle was delivered originally to country X, it is not possible to state with certainty that the rifle was diverted from the original user directly to its present user. It is also worth noting that the number of rifles licensed does not necessarily indicate the number of rifles produced or exported. In many cases, the manufacturer will ask for a slightly larger number of weapons to be licensed, to account for fluctuations in an order.

Other samples were documented in Syria, including FAL 50.00 rifles captured from Islamic State forces and documented in Kobane, Syria in February 2015 (see Photo 17) (CAR, 2015).



Photo 17: Belgian-made FAL 50.00 rifles documented in Kobane, Syria in February 2015 (photo credit: Conflict Armament Research).

Changes in Popularity of the FAL Rifle in Syria

There is some evidence to suggest that the FNH FAL rifle has become less popular with combatants in Syria since the early months of fighting. Chart 1 shows the increasing cost of 7.62 x 51 mm ammunition, coupled with the decreasing cost of FAL rifles, in neighbouring Lebanon. This may reflect a sudden injection of notable quantities of FAL rifles into Syria, and a corresponding increase in demand for 7.62 x 51 mm ammunition. There are further signs of a shortage of 7.62 x 51 mm ammunition, including the limited examples documented in an assessment of ammunition in Syria covering the period March 2012 – May 2013. This stands in stark contrast to the widespread distribution of a variety of firearms chambered for this cartridge, including the FN Hertsal FAL, Steyr Mannlicher SSG 69, and H&K G3-type rifles and FN Herstal MAG machine guns (Jenzen-Jones, 2014).

A number of videos posted to social media in late 2012 showed rebel fighters in Syria struggling with FAL rifles which repeatedly suffered from failure to fire and failure to extract malfunctions. Such videos often showed combatants manually ejecting cartridge cases, or retreating when their weapon would fail to fire. The use of .308 Winchester ammunition, the commercially available cartridge from which the 7.62 x 51 mm cartridge was closely derived, in firearms chambered for 7.62 x 51 mm may result in weapon malfunctions (Jenzen-Jones, 2014). The FAL rifle includes an adjustable gas system which allows the user to tune the gun to run reliably with whatever ammunition is available. However, this requires user competence and is not conducive to using mixed types of ammunition, as the gas setting proper for one type may not function reliably with other types. There is also a slightly longer headspace present in weapons chambered for 7.62 x 51 mm (see Ferguson, 2015). The ammunition observed might come from vendors selling to the civilian market in neighbouring countries, where such sales are legal.

The use of .308 Winchester ammunition may indicate a more readily available supply of commercial cartridges, and also reflects an ignorance of the potential problems associated with their incorrect use (see below). More broadly speaking, this informs researchers' understanding of the dynamics of the Syrian conflict, and may offer a partial explanation for the decline in the use of the FAL rifle in 2013-2014.



Photo 18 (L): .308 Winchester cartridges manufactured by Sellier & Bellot in 1987 documented in Syria, 2012.

Photo 19 (R): Unmarked 7.62 x 51 mm cartridges documented in Syria, 2012 (photo credits: C.J. Chivers/New York Times).





Photo 20: Mixed 7.62 x 51 mm and .308 Winchester cartridges documented at a Syrian rebel position in Idlib, in 2012 (photo credit: C.J. Chivers/New York Times).

Photo 18 shows .308 Winchester cartridges documented in the magazine of an FAL rifle at a rebel position in Idlib, Syria, in 2012. The headstamps indicates that these cartridges were produced by Sellier & Bellot, in what was then Czechoslovakia. Photo 19 shows an unmarked 7.62 x 51 mm cartridge documented at the same location. This ammunition is of unknown origin, and appeared to be manufactured of brass alloy, with green sealant at the primer annulus and a three square stake primer crimp. Whilst this ammunition exhibits features consistent with Chinese manufacture, its provenance remains unconfirmed (Jenzen-Jones, 2014). Photo 20 shows both types of ammunition at the rebel position mixed together in a container, with rebel fighters making no apparent effort to differentiate between .308 Winchester and 7.62 x 51 mm cartridges. Syria is also known to have manufactured 7.62 x 51 mm ammunition domestically.

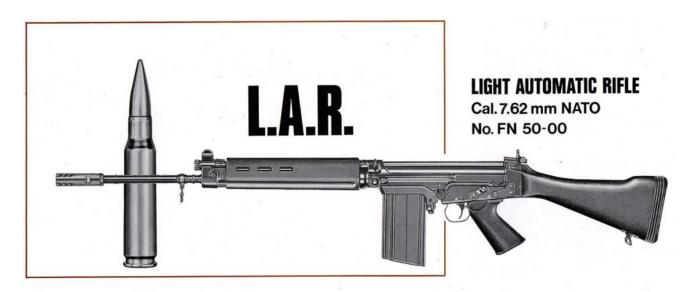
Conclusion

The FN Herstal FAL rifle provides interesting opportunities for studying the dynamics of arms flows and diversion, and can allow researchers insight into some of the mechanics of armed conflicts. Whilst limited in numbers when compared to some of the more prolific small arms and light weapons, Belgian FAL rifles remain widespread throughout the world's conflict zones, and offer an ideal case study for the identification and tracing of illicit firearms. Like most self-loading rifles, the FAL is a highly durable piece of equipment, and these weapons are likely to remain in circulation for decades to come (McCollum, 2014).

The authors' tracing methodology draws on publicly-available records, which can offer an insight into the likely year of production of a given FAL rifle if a primary serial number is present and documented. The examination of a weapon's other markings and physical characteristics may also support the identification process, with certain features proving diagnostic to varying degrees. These approaches are useful, but incomplete, and investigations examining FAL rifles should be supplemented by an official tracing request issued to FN Herstal and the Belgian government, wherever practicable. The primary serial number should provide sufficient information to facilitate such a request, if necessary, although ideally this would be supported by additional information such as any secondary serial number, other markings, and photographs. The best results are likely to be obtained through a combination of field research, open source research and analysis, and formal tracing requests.



Annexe 1 – Technical characteristics of the FN Herstal FAL 50.00



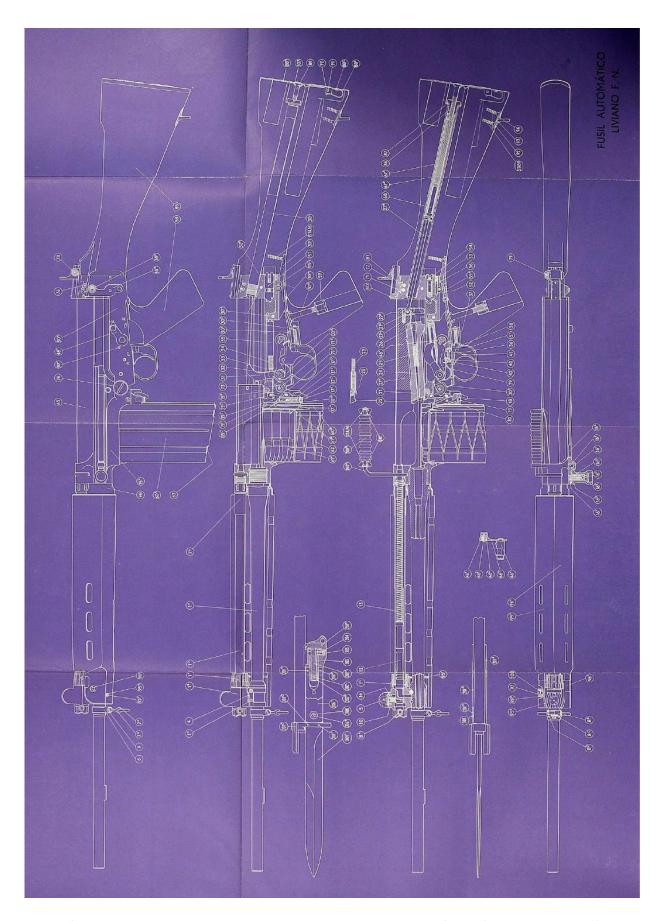
FUNCTIONING

The L.A.R. is an automatic weapon with a fully locked system. It is gas-operated by intake from a point in the barrel, with gas escape regulator and piston.



MAIN FEATURES		SIGHTS		
WEAPON		Length of the line of sight		.553 m
Overall length, without bayonet with bayonet Height, with magazine Weight, without magazine	1.09 m 1.26 m .205 m 4.25 kg	Backsight minimum maximum intermediate graduations for 30	200 (600 (300, 400 and 500 (
BAYONET		Type of fire		
Length	.29 m	automatic semi-automatic		
MAGAZINE		Cyclic rate of fire, in rounds per minute	650	to 700
Capacity	20 rounds	Normal rate of fire, in rounds	000	10 700
Weight	at	per minute		
steel model, empty steel model, filled	.25 kg .73 kg	automatic semi-automatic		120 60
light alloy model, empty light alloy model, filled	.12 kg .6 kg	On request, the L.A.R. can be equi with a change lever which does not permit automatic fire.		
BARREL		Muzzle velocity	840	m/sec.
Overall length	.533 m	Muzzle energy	335	mkg

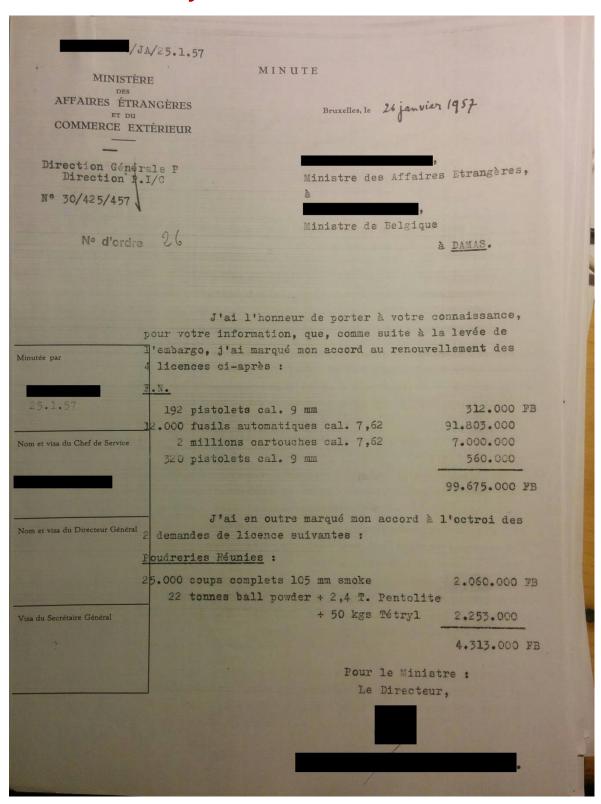
Extract from original FN Herstal marketing material. Note that this brochure features the English language translation of *Fusil Automatique Léger* ('light automatic rifle'), and the weapon's name is hence rendered 'L.A.R.'. ARES may make copies of other marketing material available by request.



Extract from original FN Herstal manual issued by the Peruvian armed forces (printed in Belgium).



Annexe 2 – Belgian diplomatic minutes affirming arms sales to Syria (1957)



Note that the Belgian Ministry of Foreign Affairs requires us to redact the names of the parties involved. Source: Diplomatic Archives of the Belgian Ministry of Foreign Affairs (accessed 2013).



Annexe 3 – Belgian export license for Saudi Arabia (1973)

OFFICE CENTRAL DW B	OFFICE CENTRAL DES CONTINGENTS ET LICENCES DW BRUXELLES	JCENCES (CEN	TRANE DIENST VO	CENTRASE DIENST VOOR CONTINGENTEN EN VERGUNNINGEN	SN VERGUNNINGEN
	30986					
OPGAVE Nr			-			
demande de licence	exportation	présentée le22.±±.73		visa du Départer	au visa du Département des Affaires Etrangères	trangères
Vergunningsaanvraag voor	ag voor	voorgelegd op	aar	h het visum van h	an het visum van het Departement van Buitenlandse Zaken Alzemen Directie van de Politiek	Buitenlandse Zaken ek
N° d'ordre Volgnummer	Nom et domicile du demandeur Naam en woonplaats van de aanvrager	Produit Produkt		N° statistique Statistieknummer	Poids net, en kg Nettogewicht in kg	Montant Bedrag
Z0016/1 EABR HERS' Rue 4400	EABRIQUE NATIONALE HERSTAL SA Rue Voie de Liège 4400 HERSTAL.	13.610 fusils automatiques cal. 7.62 mm avec rechanges & access. 15.610 balonnettes pour dito 652 mitrailleuses cal 7.62 mm avec rechanges & accessoires	es cal. access. dito 62 mm ires	930310 930600 732390 732390	192.000KG	247.629.480FB
			Réalis. Realis.	pièces	kg	F.B.
			Date Datum			
Pays d'origine ou provenance Land van oorsprong of herkomst	Pays de destination Lard van bestemming	-	Destinataire Bestemmeling			Validité accordée Toegestane geldigheid
lgique	Arabie Saoudite	Garde Nationale				3
Rem	Remarques érentuelles — Eventue	Eventuele aanmerkingen Vis	sa du Département sum van het Depa	Visa du Département des Affaires Etrangères Visum van het Departement van Buitenlandse Zaken	res dse Zaken	
nouvellement part iel ir relevé 30314	partiel 14		Relations	ACANA BELLES OF THE STATE OF TH	-62	79-72-93
				M + UNITED		

Note that the Belgian Ministry of Foreign Affairs requires us to redact the names of the parties involved. Source: Diplomatic Archives of the Belgian Ministry of Foreign Affairs (accessed 2013).



Annexe 4 – Serial numbers of example FAL rifles documented in the MENA region since 2011

Primary Serial Number	Secondary Serial Number	Year of Manufacture (authors'	Country where documented	Year documented	Source ⁹
(right-hand side) 933680	(left-hand side) 46380	methodology) 1971 ¹⁰	Libya	2012	Damien Spleeters†
995754	None recorded	1972	Libya* ¹¹	2012	Msan et al., 2014
1004805	None recorded	1972	Libya*	2012	Msan et al., 2014
1008183	75250	1972	Libya	2012	Damien Spleeters†
1117077	4536	1973	Syria	2012	Damien Spleeters†
1232064	None recorded	1974	Libya*	2012	Msan et al., 2014
1240363	None recorded	1974	Libya*	2012	Msan et al., 2014
1243069	None recorded	1974	Libya*	2012	Msan et al., 2014
1252901	None recorded	1974	Mali	2012	Msan et al., 2014
1271182	None recorded	1975	Libya*	2012	Msan et al., 2014
1274975	162074	1975	Libya	2012	Damien Spleeters†
1376763	None recorded	1976	Libya	2015	Confidential source†
1435615	None recorded	1977	Syria	2013	Shelly Kittleson†
1435632	None recorded	1977	Syria	2012	C.J. Chivers†
1437753	None recorded	1977	Syria	2012	C.J. Chivers†
1438165	None recorded	1977	Syria	2013	Chivers, 2013

⁹ Sources marked with a dagger symbol (†) are unpublished, and represent personal correspondence with the authors.

¹¹ Where marked with an asterisk (*), the rifle was documented aboard the *Letfallah II*, believed to be en route to Syria (see Msan et al., 2014).



¹⁰ Note that the serial number in question was marked on the rifle's magazine well. Whilst this is thought to represent the total production to date of manufacture (i.e. function as a primary serial number), this is not confirmed.

1461404	None recorded	1977	Libya	2012	Damien Spleeters†
1462215	None recorded	1977	Syria	2012	Damien Spleeters†
1474077	None recorded	1977	Syria	2012	Damien Spleeters†
1514944	21595	1979	Libya	2012	Damien Spleeters†
1527475	None recorded	1979	Syria	2014	CAR, 2015
1531415	None recorded	1979	Libya*	2012	Msan et al., 2014
1557540	None recorded	Post-1980	Syria	2014	CAR, 2015
1731735	None recorded	Post-1980	Libya	2012	Small Arms Survey†
1728804	22032	Post-1980	Syria	2013	Chivers, 2013
1730043	None recorded	Post-1980	Syria	2012	Damien Spleeters†
1731984	None recorded	Post-1980	Libya	2012	Raad et al., 2013
1732382	None recorded	Post-1980	Syria	2012	Damien Spleeters†
	314815	Insufficient data	Libya		Confidential source†
	41805	Insufficient data	Libya	2012	Damien Spleeters†
	7686	Insufficient data	Sudan	2013	Confidential source†
	814318	Insufficient data	Libya	2015	Confidential source†

These serial numbers all reflect FAL rifles which have been diverted into the illicit sphere (having been documented in the hands of non-state armed groups or seized during illegal transit), and have been documented in active or recent conflict zones. Further information on these cases may be available to share with interested parties, on a case-by-case basis. Likewise, the authors would welcome the submission of any further data to: ArmsID@armamentresearch.com

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