

05

2023

# DIVERSION DIGEST

## Upstream IED Prevention

Countering the illicit proliferation and diversion of materials used in the production of improvised explosive devices (IEDs).

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Front cover image: Captured IED components in the custody of Iraqi security forces in Al Arij, south of Mosul, Iraq, March 2017.

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## ABBREVIATIONS

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<b>AQAP</b> Al Qaeda in the Arabian Peninsula	<b>STM</b> STMicroelectronics
<b>CCW</b> Convention on Certain Conventional Weapons	<b>UNGA</b> United Nations General Assembly
<b>EFP</b> explosively formed projectile	<b>UNOCT</b> United Nations Office of Counter-Terrorism
<b>HME</b> homemade explosives	<b>UNODA</b> United Nations Office of Disarmament Affairs
<b>IED</b> improvised explosive devices	<b>UNSC</b> United Nations Security Council
<b>IDF</b> Israel Defence Forces	<b>USDOD</b> United States Department of Defense
<b>RCIED</b> radio-controlled improvised explosive device	

# INTRODUCTION

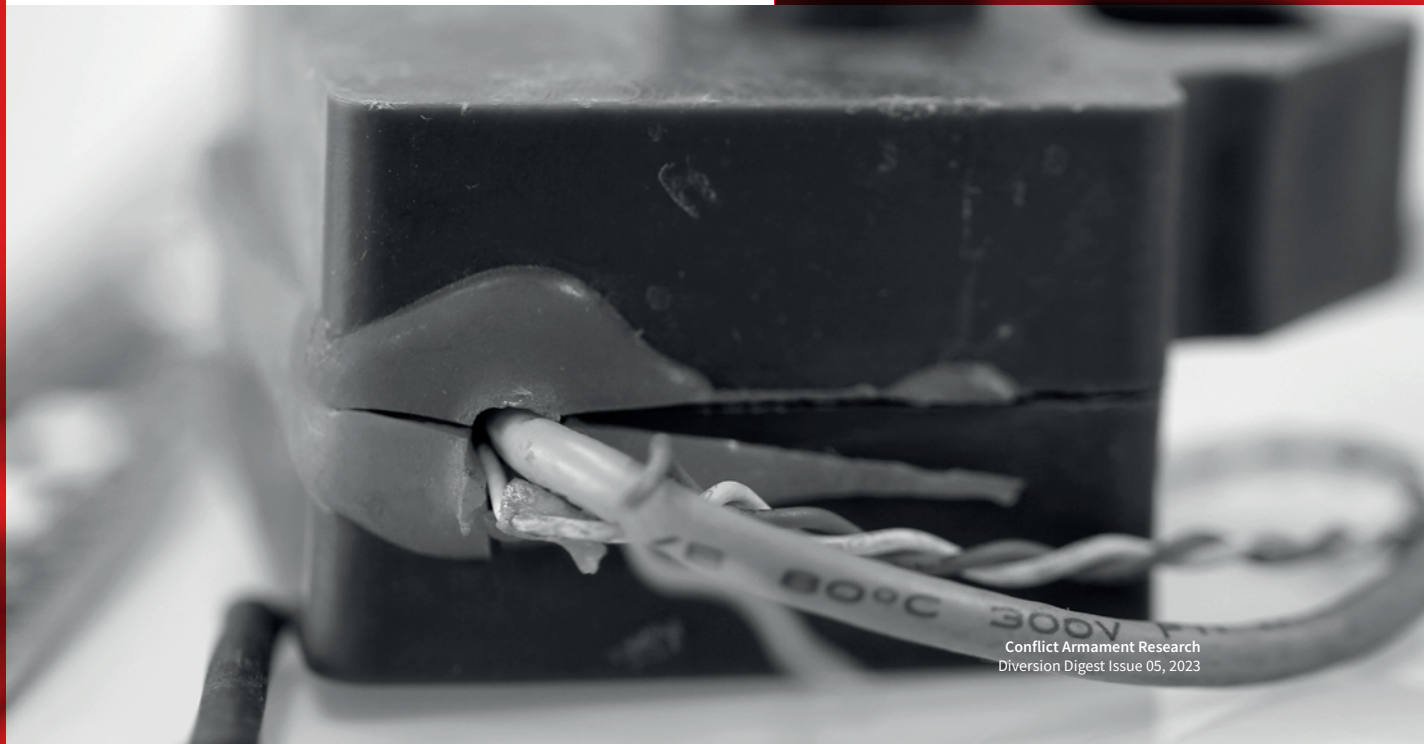
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A wide range of materials can be used to create improvised explosive devices (IEDs), including many commercially available products. The United Nations General Assembly (UNGA) has repeatedly stressed the urgent need to prevent illicit actors from obtaining and using materials to produce IEDs, detailing—in a resolution passed in December 2020 for example—a range of both upstream and downstream measures to tackle the production of IEDs, such as strengthening the management of national ammunition stockpiles to prevent diversion and increasing prevention efforts to combat illicit procurement of IED components, explosives, and materials. (UNGA, 2020).<sup>1</sup>

Measures that can be taken to counter the IED threat can be broadly classified as being either upstream or downstream.<sup>2</sup> Upstream measures are those that are focused on prevention. They include anything from developing national policies, legislation, and technical standards to conducting intelligence-led counter-IED operations. Collectively, these measures are focused on stopping illicit actors from acquiring IED components. Downstream measures, by contrast, are responsive. They are introduced and implemented after an IED event and primarily relate to exploitation of IEDs and of IED scenes, development of technical countermeasures, and criminal justice processes.



**UPSTREAM MEASURES INCLUDE DEVELOPMENT OF NATIONAL POLICIES, LEGISLATION, AND TECHNICAL STANDARDS TO CONDUCTING INTELLIGENCE-LED COUNTER-IED OPERATIONS.**





Conflict Armament Research (CAR) investigators have been working to document and trace electronic components, military-grade explosives and homemade explosive (HME) precursor materials that can be used to create IEDs. This work has been supported by the European Commission. Since 2018, investigators have documented and traced IED-related materials in a number of conflict-affected locations including Afghanistan, Bahrain, Burkina Faso, Iraq, Mali, Niger, Syria, and Yemen. CAR's investigations generate evidence on the diversion of materials that can be used to create IEDs; this evidence can support governments and the private sector in effectively preventing illicit actors from accessing IED components and precursors.

In December 2021, CAR—in cooperation with the Government of Japan—held an online event to discuss ways to better identify and address the risks of diversion of IED materials (CAR, 2021). The expert panellists were:<sup>3</sup>

- » **Daniel Golston**, Policy Analyst and the Chair of the Emerging Threats and Critical Infrastructure Protection Working Group of the United Nations Global Counter-Terrorism Coordination Compact (INTERPOL);
- » **Mike Lewis**, Head of Enhanced Investigations (CAR);
- » **Maiko Takeuchi**, Consulting Fellow (Research Institute of Economy, Trade, and Industry, REITI); and<sup>4</sup>
- » **Leonard Tettey**, National Small Arms and Light Weapons Project Coordinator (Republic of Ghana).

The event was chaired by Ambassador Ichiro Ogasawara, the Permanent Representative of Japan to the Conference on Disarmament. Comments from that discussion included in this report have not been edited and all efforts have been made to accurately report the statements of the event participants.

Following the discussion in this December 2021 event on what measures can be taken to prevent and address the acquisition of IED-related materials, this report presents case studies from CAR's investigations. These cases highlight the importance of field documentation, analysis, and tracing to provide governments, manufacturers, and distributors with verified evidence on patterns of illicit production and procurement of IED materials.

This report was produced with the support of the Government of Japan. Research for the case studies used in this report has been conducted with the financial assistance of the European Union, the Government of Germany, and the European Union's Internal Security Fund – Police.

**“Improvised explosive devices represent one of the primary weapons of choice of illegal armed groups, terrorists, and other illicit actors. The use of IEDs has affected over 50 countries and has resulted in thousands of casualties, both civilian and military [...] Owing to the evolving nature of the material acquisition, IED production, as well as their means of delivery by illicit actors, great challenges remain for States to effectively prevent and deter IED proliferation and use.”**

**Ambassador Ichiro Ogasawara**

*Permanent Representative of Japan to the Conference on Disarmament*

# TRACING IED MATERIALS

CAR traces large quantities of commercial products and dual-use materiel that have been recovered from armed actors in conflict zones. Many of these items are not subject to export controls and fall well outside of the scope of arms control instruments. These products serve legitimate commercial mar-

kets but may be used in the development of IEDs without the knowledge of the parties involved in the transfer chains. Tracing these products when they have been found in the hands of terrorists and other unauthorised users helps to alert companies and governments to their misuse by hostile parties.<sup>5</sup>

## CASE STUDY

1

### Tracing cooperation to identify counterfeit components

In 2017 and 2018, a CAR field investigation team deployed to the Kingdom of Bahrain to document IED-related materiel (Figure 1) that Bahraini national security forces had recovered in the country between 2013 and 2018 (CAR, 2019). 2013 marked a significant change in the sophistication of weapons and related materiel available to militant factions in Bahrain. The groups had

initially—during violent confrontations in 2011 and 2012—targeted Bahraini security forces with crude, domestically manufactured IEDs and improvised weapons. From 2013 onwards, however, Bahraini security forces began to interdict vessels in Bahrain’s territorial waters whose cargoes included pre-configured IED components mixed with conventional military weapons.

FIGURE 1  
EXAMPLES OF IED-RELATED MATERIAL // DOCUMENTED BY CAR  
IN BAHRAIN IN 2017 AND 2018



Military-grade, secondary high-explosives, manufactured in Iran



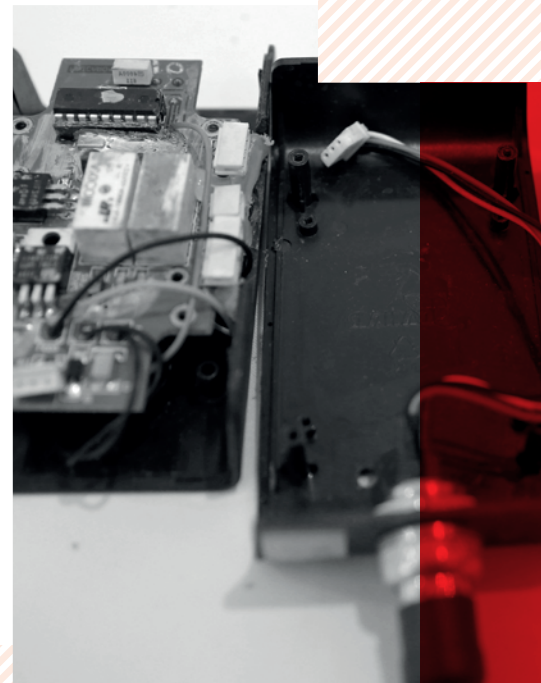
Ammonium nitrate and granular urea, manufactured in Bahrain



Electronic components, including semi-conductors and receivers



Enclosure boxes (used to protect electronics), manufactured by a company headquartered in China



## CASE STUDY

1

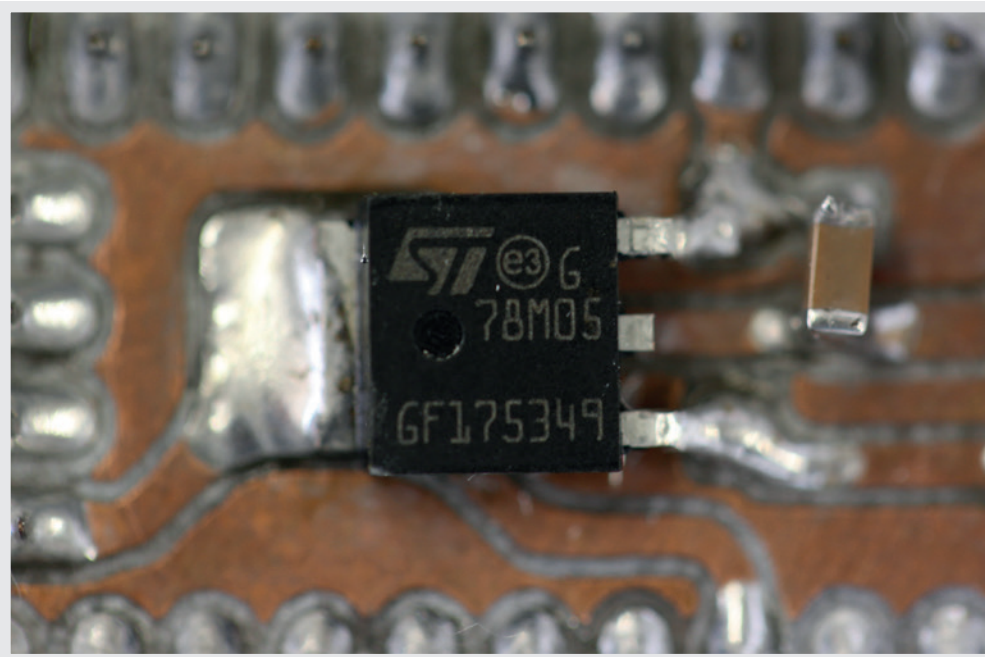
## CONTINUED

Among this material, CAR documented a general voltage regulator—a system designed to automatically manage a consistent voltage in a circuit. Voltage regulators are used in a wide range of electronic products and industrial applications. CAR documented this regulator within a radio-controlled IED (RCIED) component that was seized by Bahraini security forces from a militant group in the country (See Figure 2).

CAR traced the regulator with the manufacturer, STMicroelectronics (STM). On 18 August 2017, STM responded promptly to CAR to confirm that they had manufactured the LM78M05 general voltage regulator that CAR documented in Bahrain and that the regulator had been assembled in November 2013 in China and sold to different distributors in China, Hong Kong, and South Korea.<sup>6</sup>

■ FIGURE 2

**A GENERAL-VOLTAGE REGULATOR PRODUCED BY STMICROELECTRONICS // DOCUMENTED BY CAR INVESTIGATORS IN AN RCIED IN MANAMA, BAHRAIN ON 23 JULY 2017**

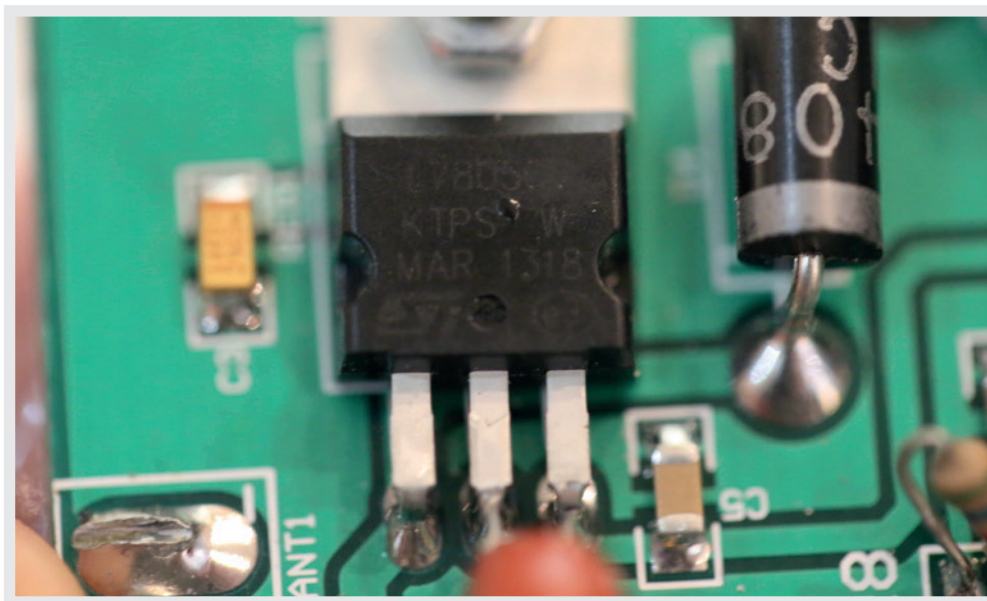


The following year, CAR documented a second STM general voltage regulator from an RCIED receiver board seized in Bahrain during operations against the Al Ashtar Brigades and Bahraini Hezbollah militants between August

2017 and February 2018 (see Figure 3). When CAR traced this item with STM in September 2019, STM were able to inform CAR that the item was in fact counterfeit.<sup>7</sup>

### FIGURE 3

**A COUNTERFEIT REGULATOR** // DOCUMENTED IN AN RCIED KIT IN MANAMA ON 20 APRIL 2018



CAR field investigators previously documented 22 counterfeit STM-labelled transistors in Iraq that Islamic State forces had used in the construction of IEDs (Map 1). All of these items bore alphanumeric codes indicating that they were manufactured in 2013.<sup>8</sup>

In addition, CAR has documented four authentic and three counterfeit STM electronic components in Yemen. All three counterfeit voltage regulators share the same product number and were recovered over several years from three different non-state groups operating in Yemen. In July 2017, CAR documented an STM-labelled voltage regulator that

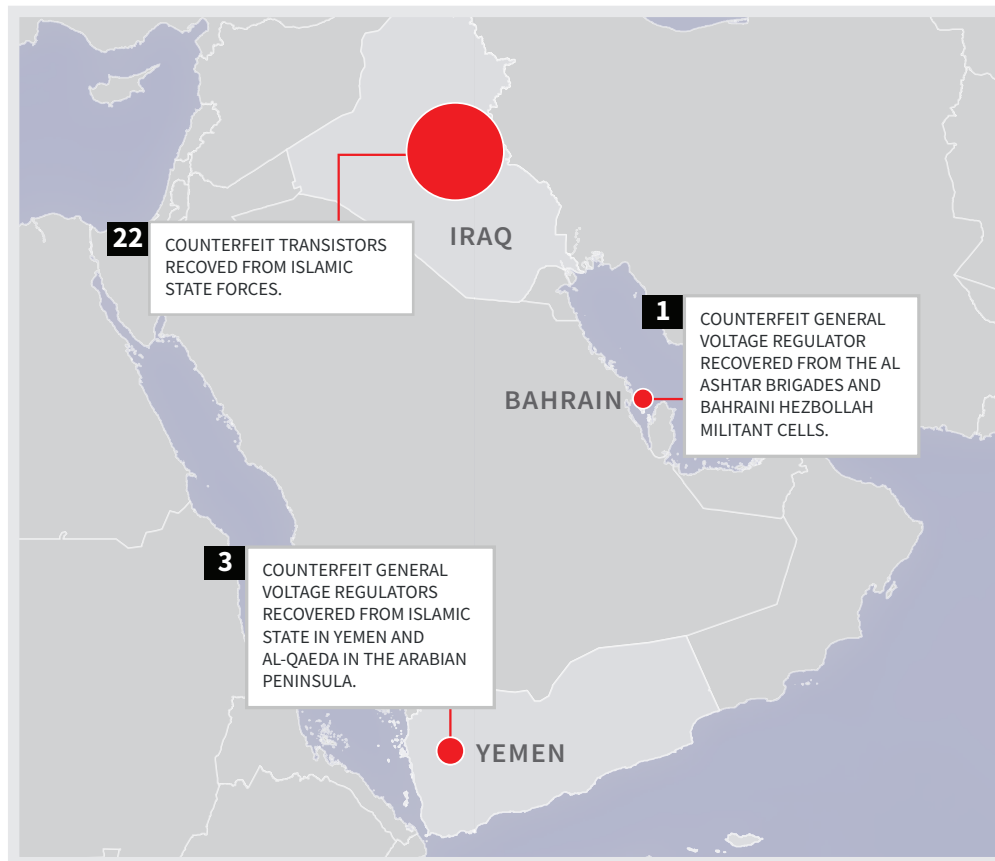
Yemeni counterterrorism forces recovered in an Islamic State in Yemen IED in Aden. STM responded to a formal trace request issued by CAR on 31 January 2018 and confirmed that the component is counterfeit.<sup>9</sup> The following year, CAR documented a second STM general voltage regulator that Saudi-led Arab coalition forces recovered from an Ansar Allah 'Houthi' IED on Yemen's west coast. STM also confirmed this component to be counterfeit.<sup>10</sup> The third regulator was captured in a cache or RCIED components held by Al-Qaeda in the Arabian Peninsula (AQAP) forces in Shabwa Governorate. CAR traced this item with STM in 2020, who confirmed that it was also counterfeit.<sup>11</sup>

## CASE STUDY

1

## CONTINUED

MAP 1  
**CAR DOCUMENTATIONS OF COUNTERFEIT  
 STMICROELECTRONIC COMPONENTS**



The discovery of counterfeited components being used in IED construction by Islamic State forces in Iraq, militants in Bahrain, and by Houthi, Islamic State in Yemen, and AQAP forces in Yemen is a potentially significant one for counter-proliferation and counter-diversion

investigations. Other items captured from militants in Bahrain have originated in Iraq (CAR, 2019, pp. 32-33) suggesting that Iraq itself may be an important conduit for the flow of illicit IED materials into the Gulf.

Tracing is a key factor in identifying the sources of such material, and the entities involved in the supply chain (CAR, 2020a). CAR's tracing of voltage regulators in this case helped to notify a major producer of commercial electronic components firstly that their products were being used in IED

production by several militant groups in the Gulf, and secondly that their products were being actively counterfeited. It is often only because of investigations like this case that manufacturers and distributors of such products have been made aware of their potential uses in offensive operations.

# INVESTIGATING IED SUPPLY CHAINS

CAR's investigative teams work to establish the long-range transnational supply chains behind the supply of IED materials, components, and sub-components. CAR's upstream prevention efforts focus on uncovering how these critical materials reach illicit armed actors, and uncovering the human, financial, and logistics networks behind their supply.<sup>12</sup>



## CASE STUDY

2

### Islamic State procurement networks

**B**etween 2015 and 2017, CAR field investigation teams documented more than a hundred drums of Chinese-manufactured leafing aluminium paste in Iraq. These drums were found at six separate explosive production sites set up by Islamic State (IS) forces, located across central Iraq (see Figure 4). Each of the production sites was at least 70 km apart from the other, suggesting widespread dispersion of the product among IS facilities. IS used aluminium paste to produce HME for IEDs.

CAR investigated the provenance and chain of custody for this aluminium paste—a civilian, commercial good that became an important chemical precursor for IS forces' production of IEDs. All of the drums documented in Iraq had been manufactured by Hefei Sunrise Aluminium Pigments Co Ltd.<sup>13</sup>

Hefei manufactured the paste within an eight-month production period between 9 June 2014 and 18 January 2015. Hefei Sunrise is a Chinese company that produces aluminium powders, pigments, and pastes for use in commercial products like paint. Hefei sells these products to its distributors around the world.

**THESE DRUMS WERE FOUND  
AT SIX SEPARATE EXPLOSIVE  
PRODUCTION SITES SET  
UP BY ISLAMIC STATE (IS)  
FORCES, LOCATED ACROSS  
CENTRAL IRAQ.**



**FIGURE 4**  
**CHINESE-MANUFACTURED LEAFING ALUMINIUM PASTE DRUMS**  
**FROM AN ISTANBUL-BASED DISTRIBUTOR, CAPTURED FROM IS**  
**FORCES** // DOCUMENTED BY A CAR FIELD INVESTIGATION TEAM IN  
 TAL AFAR, IRAQ IN NOVEMBER 2017



All of the drums that CAR documented in Iraq bore labels indicating that a single Istanbul-based chemical distributor had sold them. There is no suggestion that this distributor was in any way complicit in supplying IS forces, or that it engaged in any other wrongdoing. Before 2018, the Istanbul-based distributor did not record sales by lot or batch number. Following its engagement with CAR, the distributor stated that it had introduced batch-level sales tracking (CAR, 2020b).

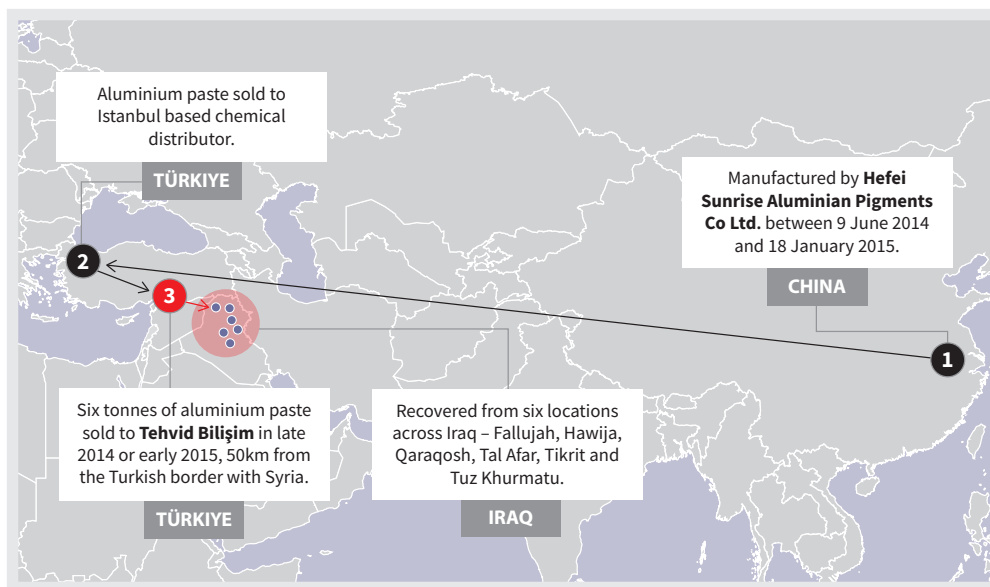
Looking at its list of customers that had purchased aluminium paste since 2013, the distributor noted one particular sale as unusual: a large order in late 2014 or early 2015 for six tonnes of aluminium paste, placed by a trader called Tevhid Bilişim, based in Şanlıurfa, some 50km from the Turkish border with Syria (see Map 2). This was the first and only order that this company placed with the distributor. The value of this sale was estimated by the producer as around USD 18,000.

**THERE IS NO SUGGESTION**  
**THAT THIS DISTRIBUTOR**  
**WAS IN ANY WAY COMPLICIT**  
**IN SUPPLYING IS FORCES,**  
**OR THAT IT ENGAGED IN ANY**  
**OTHER WRONGDOING.**





MAP 2  
**TRACED CHAIN OF CUSTODY FOR ALUMINIUM PASTE DRUMS  
 RECOVERED IN SIX LOCATIONS ACROSS CENTRAL IRAQ**



Tevhid Bilişim listed its business as the import and export of mobile phones and was thus an atypical purchaser for a large and expensive order of leafing aluminium paste.<sup>14</sup> Between 2014 and 2015, Tevhid Bilişim also provided its Şanlıurfa address as the consignee address for international shipments of components for IS forces' weapon programmes, including micro-turbines, motion control units, and rocket altimeters.

For each order, the company representatives instructed the suppliers to send goods to:

- » an individual with the same name and address as the owner of Tevhid Bilişim;
- » an individual sharing the same surname, at the same address in Şanlıurfa; or
- » arranged for a UK employee to collect the goods and then re-dispatch them to the owner of Tevhid Bilişim in Şanlıurfa.

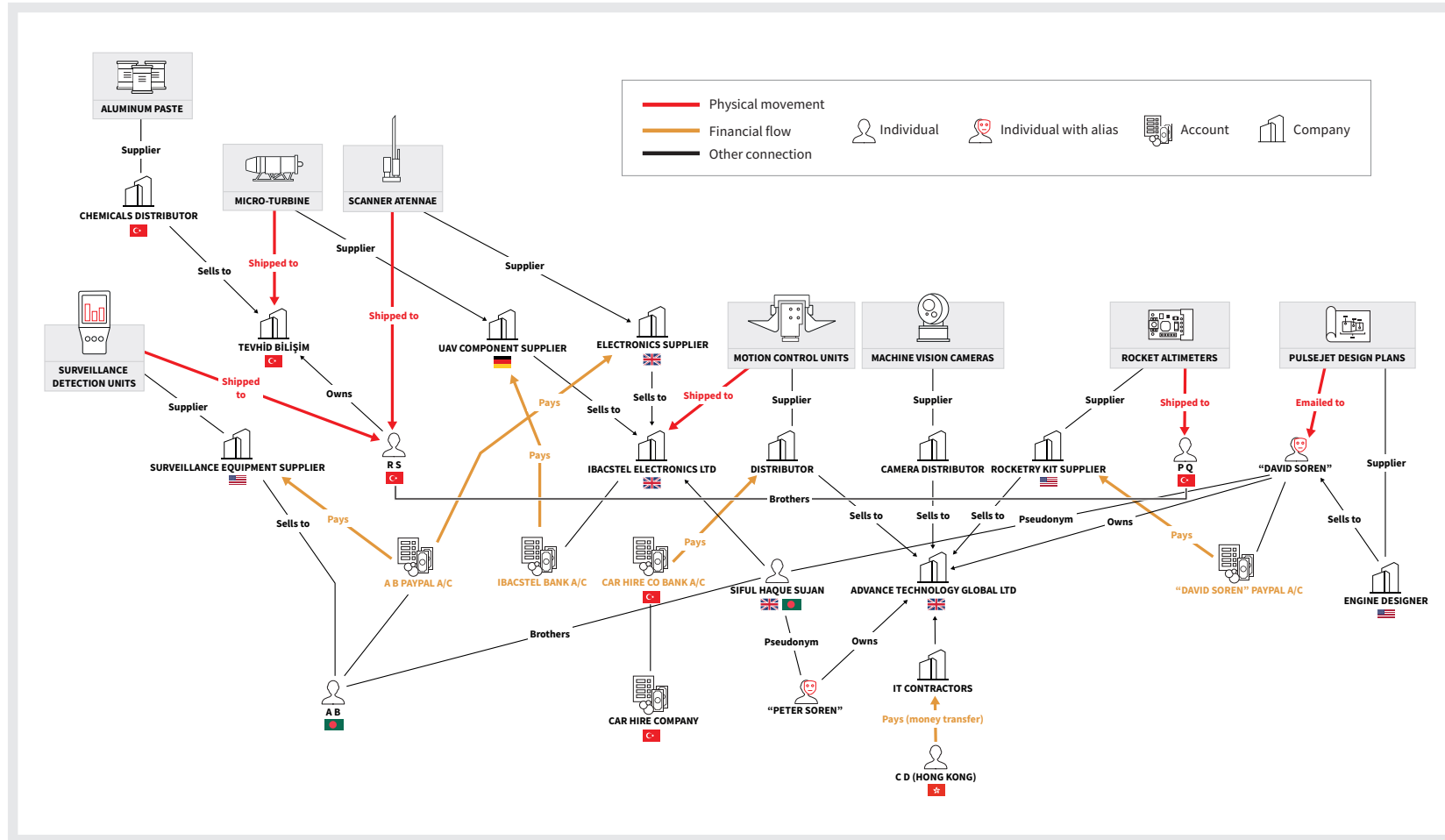
A UK resident called Siful Haque Sujan organised these purchases. Criminal trials in the US and Spain have since established that Sujan was associated with IS forces. The US Air Force claims that a coalition airstrike killed Sujan in Syria on 10 December 2015 (DoD News, 2015).

Sujan and his brother ordered a range of UAV and counter-surveillance components using two UK-registered companies to make the payments (Ibacstel Electronics and Advance Technology Global Ltd). They used fictitious names for the company directors and stakeholders (Figure 5).

**THE COMPANY WAS AN  
 ATYPICAL PURCHASER  
 FOR SUCH A LARGE AND  
 EXPENSIVE ORDER.**



**FIGURE 5**  
**NETWORK DIAGRAM OF ELECTRONICS AND LEAFING ALUMINIUM PASTE PROCUREMENT**



Investigations into the human, financial, and logistics networks behind the sourcing and supply of IED material are a critical approach to upstream IED prevention. There were important red flags in this Tevhid Bilişim case that demonstrate the importance of thorough supply-chain due diligence:

- » Tevhid Bilişim was a new customer;
- » It placed a one-time order for an unusually large purchase; and
- » This order was for a product unrelated to its stated business type.

These irregularities can be seen as 'red flags', meaning warning signs that governments, companies and individuals involved in cross-border supply chains may use to assess the risks that IED-related material might be diverted.

**“We are literally up against a limitless set of highly capable and innovative criminals** who share acts, share information across borders, they communicate with people around the world, and they divert goods from global supply chains. And that makes government action and high-level dialogue on upstream IED threat analysis all the more important.”

**Daniel Golston**

*Interpol*

DECEMBER 2021

**INVESTIGATIONS INTO THE HUMAN, FINANCIAL, AND LOGISTICS NETWORKS BEHIND THE SOURCING AND SUPPLY OF IED MATERIAL ARE A CRITICAL APPROACH TO UPSTREAM IED PREVENTION.**

# DOCUMENTING IED DEVELOPMENT

Upstream IED prevention efforts are closely linked to the monitoring of trends in IED acquisition, design, and development.<sup>15</sup> Evolving trends in the production and delivery of IEDs by illicit actors present a great challenge to States and specialized organiza-

tions working to prevent the illicit proliferation and diversion of IED-related material. By documenting and analysing IEDs recovered from unauthorized actors, CAR's field investigators have been able to identify new developments in the use of IEDs in conflict zones.

## CASE STUDY

3

### Synthetic rock-concealed IEDs in Yemen

Since the start of the conflict in Yemen, Ansar Allah 'Houthi' forces have employed significant number of IEDs against international coalition forces. Between April 2017 and February 2018, CAR field investigation teams conducted six missions to Yemen to document weapons and IEDs seized from Houthi forces, and in that period investigators documented an increase in the number of comparatively more sophisticated IEDs being used in the conflict (CAR, 2018).

CAR documented dozens of explosively formed projectiles (EFPs) in Yemen that had been camouflaged to resemble natural rocks (see Figure 6). These devices are armed by radio control and initiated using passive infrared switches. They can be classified as RCIEDs. Houthi forces emplaced these devices along motorways connecting Mokha and Dhubab, Mokha and Ta'iz, and Mokha and Khawkha.

FIGURE 6  
**ROCK-CONCEALED IEDS**  
// DOCUMENTED BY CAR  
IN YEMEN BETWEEN 2017  
AND 2018

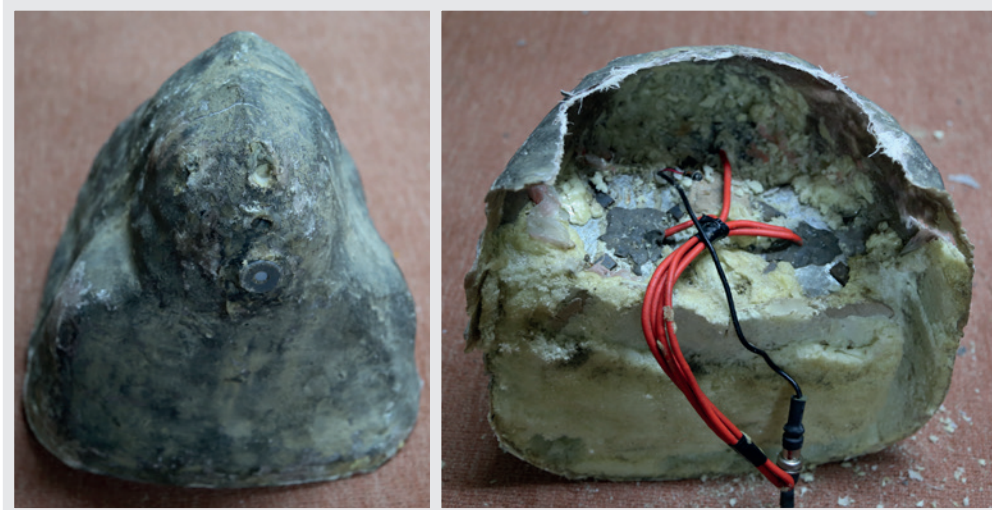


CAR investigated these rock-concealed IEDs and identified that there are three main variants:

- » anti-personnel IEDs containing improvised Claymore mines;
- » IEDs containing a large shaped charge;
- » RCIEDs containing between one and three EFPs.

The third variant was the most common that CAR encountered in Yemen during this period. In January 2018, CAR documented and conducted basic exploitation of an RCIED that coalition forces recovered from Houthi forces to the north of Mokha, Yemen. All of the components that made up the RCIED were secured, using expanding foam, within the body of a thin-walled fibreglass resin container. The IED exterior was sculpted and painted to resemble a large rock (see Figure 7).

**FIGURE 7**  
**SYNTHETIC ROCK-CONCEALED RCIED** // EXPLOITED BY A CAR  
 FIELD INVESTIGATION TEAM IN MOKHA, YEMEN, JANUARY 2018



"IED builders have highly sophisticated skills and knowledge, so if we shut down one item, they will find another way."

**Maiko Takeuchi**

*Research Institute of Economy,  
 Trade and Industry*

DECEMBER 2021



CAR extracted an electronics kit from the RCIED, consisting of a power source, a receiver, antenna, and an arming switch with electrical lamp (see Figure 8).

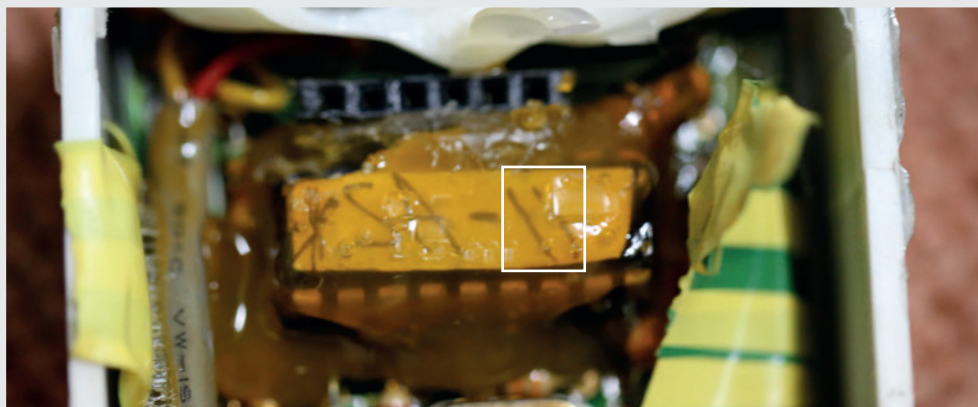
**FIGURE 8**  
**COMPONENTS RECOVERED FROM AN RCIED BEARING THE MARKING SUFFIX '11'** // DOCUMENTED IN MOKHA, YEMEN, IN JANUARY 2018



*An electronics kit*



*An electric lamp, part of the electronics kit*



*A microcontroller inside an RCIED*

Multiple components were annotated with markings that contain the suffix '11'. These included:

- » the power source and RC receiver – marked **'X565-11'**;
- » the electrical lamp from the electronics kit – marked **SA-11**;
- » the microcontroller inside the RC receiver – marked **SA-11**.

The use of EFPs placed within synthetic rocks has strong precedent outside of the Yemen conflict. US forces in Iraq recovered numerous caches of comparable EFPs concealed within synthetic rocks—the components of which they later attributed to Iranian supplies to proxy forces.<sup>16</sup> Hezbollah has consistently employed similar devices against the Israel Defence Forces (IDF) in Israel and southern Lebanon.<sup>17</sup>

In October 2017, CAR obtained images of multiple items, including synthetic rock-concealed IEDs, which the IDF had recovered from Hezbollah forces (see Figure 9). The IEDs were similar in design and construction to those employed by Houthi forces in Yemen in three ways:

- » The devices were constructed from a fibreglass resin body;
- » They were filled with expanding foam; and
- » They contained multiple 120 mm EFPs.

■ **FIGURE 9**

**A SYNTHETIC ROCK-CONCEALED IED** // RECOVERED FROM HEZBOLLAH FORCES BY THE IDF IN SOUTHERN LEBANON, 2006



CONFIDENTIAL SOURCE

The devices recovered from Hezbollah forces also feature a sighting tube, which runs along the top of each charge, and is used for precise

alignment during emplacement of the IED. This is not a feature of the RCIEDs that CAR documented in Yemen in 2017 and 2018.

Through unpacking of evolutions in IED development and use—and therefore building a detailed picture of the IED-related materials most in demand—investigations can play a critical role in international ‘attack the network’ efforts, including

by law enforcement. From a counter-terrorism perspective, these are efforts designed to deprive insurgent and terrorist groups of the resources that sustain their hostile activities.

# CONCLUSION

Upstream IED measures cover a wide range of efforts to prevent and counter the production and development of IEDs. This includes tackling the illicit proliferation and diversion of IED-related materials. The challenges involved are invariably transnational; effective response measures therefore involve cooperation and a 'whole-of-community' approach.

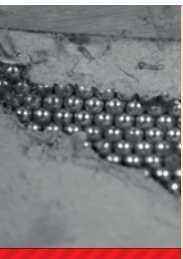
The threat of IEDs is a priority topic in multiple international policy forums, such as the UNGA and the Convention on Certain Conventional Weapons (CCW). Amended Protocol II of the CCW includes prohibitions or restrictions on the use of mines, booby-traps and other devices, and provides one possible framework in which governments can debate and identify ways to tackle the diversion or

## MONITORING AND TRACING ARE BOTH EXAMPLES OF ESSENTIAL PREVENTION TOOLS IN IDENTIFYING THE SOURCES OF IED MATERIALS

illicit use of materials that can be used for IEDs. The 'Declaration on Improvised Explosive Devices', issued at the conclusion of the 23rd Annual Conference of Amended Protocol II to the CCW in 2021—chaired by the Government of Japan—stated an intent to, among other steps: “take all necessary and feasible steps, including where necessary, appropriate stockpile management, to prevent the diversion of precursors, explosive and components that may be used for the manufacture of IED, and to act cooperatively” (UNODA, 2022).

Enhancing supply chain integrity for items such as commercial detonators, or precursor materials such as fertilisers, will be critical in undermining efforts by illicit actors to develop IEDs. CAR's investigations show the importance of effective due diligence across the supply chain in identifying red flags relating to IED material procurement. In some cases, connected networks of purchasers and consignees are only visible at the distributor level, one step down the supply chain from the international producers and suppliers of these goods. It shows the need for upstream IED prevention—in the form of private-sector due diligence and government risk assessments—across the transfer supply chain.

Monitoring and tracing are both examples of essential prevention tools in identifying the sources of IED materials, as well as the networks involved in the supply chain. These help to identify red flags and provide companies and governments with timely alerts regarding the misuse of items intended for legitimate purposes. This information is critical in stemming the flow of these resources and thus decreasing the ability of illicit actors to manufacture IEDs in the future.



“Challenges have been observed in the accurate identification of IED materials; maintaining comprehensive and accessible records; and information sharing and coordination between different national and international stakeholders involved in tracing operations. **Further unique challenges have been identified in conflict-affected settings,** where there may be a lack of dedicated capacity and resources. In addition, emerging technologies and their applicability have represented both challenges and opportunities for countering the threat of IEDs [...].”

**Ambassador Ichiro Ogasawara**

*Permanent Representative of Japan to the Conference on Disarmament*

DECEMBER 2021

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# ENDNOTES

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- 1 — Likewise on 2 August 2017 the United Nations Security Council unanimously adopted Resolution 2370, which — among other things – noted with grave concern the increasing and frequent global use of improvised explosive devices in terrorist attacks, and stressed “the paramount need to prevent illegal armed groups, terrorists and other unauthorized recipients from, and identify the networks that support them in, obtaining, handling, financing, storing, using or seeking access to all types of explosives, whether military or civilian, as well as other military or civilian materials and components that can be used to manufacture improvised explosive devices, including detonators, detonating cords and chemical components [...]” (UNSC, 2370).
- 2 — UNOCT et al (2022, submodule I).
- 3 — The positions and affiliations listed in this publication are those that were held by the panellists at the time of the event.
- 4 — Ms Takeuchi has also served as a member of the Panel of Experts established by the United Nations Security Council pursuant to resolution 1874 (2009).
- 5 — Tracing in isolation may be regarded in isolation as a ‘downstream’ measure (see UNOCT et al, 2022, submodule 3) in that it is typically introduced in response to a particular IED event. Information derived from effective tracing operations, however, informs essential upstream IED prevention efforts such as the strengthening of customs and border controls and information sharing between governments and private sector, including alerting commercial entities who may otherwise be unaware that their products have a dual use in the production of IEDs (submodule 2.6: Control of IED precursors, raw materials, and components; and submodule 2.7: International and regional cooperation, including information-sharing).
- 6 — On 18 August 2017, STMicroelectronics responded promptly to an informal request for information sent by CAR on 17 August 2017. This response confirms that: 1) STMicroelectronics manufactured the LM78M05 general voltage regulator seized from an extremist group in Bahrain; 2) the item was assembled in China, in November 2013; and 3) the item was sold to different distributors in China, Hong Kong and Korea.
- 7 — On 18 October 2019, STMicroelectronics responded to a formal trace request issued by CAR on 23 September 2019. This response confirms that: 1) STMicroelectronics did not manufacture the ST voltage regulator L7808CV, subject to CAR’s trace request; and 2) the trace code, marking layout and marked assembly country code does not follow that of genuine STMicroelectronics manufacture.
- 8 — On 25 August 2016, after consultation via email and a visit by a CAR representative to STMicroelectronics, the company confirmed that the 22 ST-labelled transistors, documented by CAR staff to date, are counterfeit. See CAR (2017, p. 142).
- 9 — On 1 February 2018, STMicroelectronics responded to a formal trace request issued by CAR on 31 January 2018. This response confirms that the STMicroelectronic component with KTPSJ W mark, subject to CAR’s trace request, is counterfeit.
- 10 — On 1 February 2018, STMicroelectronics responded to a formal trace request issued by CAR on 31 January 2018. This response confirms that the STMicroelectronic component with (e3) E710 mark, subject to CAR’s trace request, is counterfeit.
- 11 — On 16 January 2020, STMicroelectronics responded promptly to a formal trace request issued by CAR on 8 January 2020. This response confirms that: 1) STMicroelectronics did not manufacture the ST voltage regulator L7808CV, subject to CAR’s trace request; and 2) the trace code, marking layout and marked assembly country codes do not follow that of genuine STMicroelectronics manufacture.
- 12 — See UNOCT et al (2022, submodule 2.8: Law enforcement intelligence led operations).
- 13 — This case study is featured in more detail in CAR’s 2020 reporting on Islamic State precursor networks. See CAR (2020, b pp. 12-20).

- 14 — The company was dissolved on 21 October 2019. See CAR (2020, b p. 15).
- 15 — See for example UNOCT et al (2022, submodule 2.4: Counter-IED capability development).
- 16 — Confidential report produced for CAR by an independent group of experts with experience in the forensic exploitation of EFPs. See also USDOD (2008) and Ismay (2013).
- 17 — See Blanford (2011, p. 128); Discussions with Israeli officials, October 2017.



CAR'S INVESTIGATIONS  
GENERATE EVIDENCE ON THE  
DIVERSION OF MATERIALS  
THAT MAY BE USED TO CREATE  
IEDS; THIS EVIDENCE CAN  
SUPPORT GOVERNMENTS  
AND THE PRIVATE SECTOR  
IN EFFECTIVELY PREVENTING  
ILLICIT ACTORS FROM  
ACCESSING IED COMPONENTS  
AND PRECURSORS.

*An improvised explosive device found in west Mosul, Iraq on May 2017  
(credit Campbell MacDiarmid)*



**Address**  
CAR Headquarters  
PO Box 74665  
London  
WC1A 9PE  
United Kingdom

**Email**  
[admin@conflictarm.com](mailto:admin@conflictarm.com)

**Twitter**  
[@conflictarm](https://twitter.com/conflictarm)

[www.conflictarm.com](http://www.conflictarm.com)