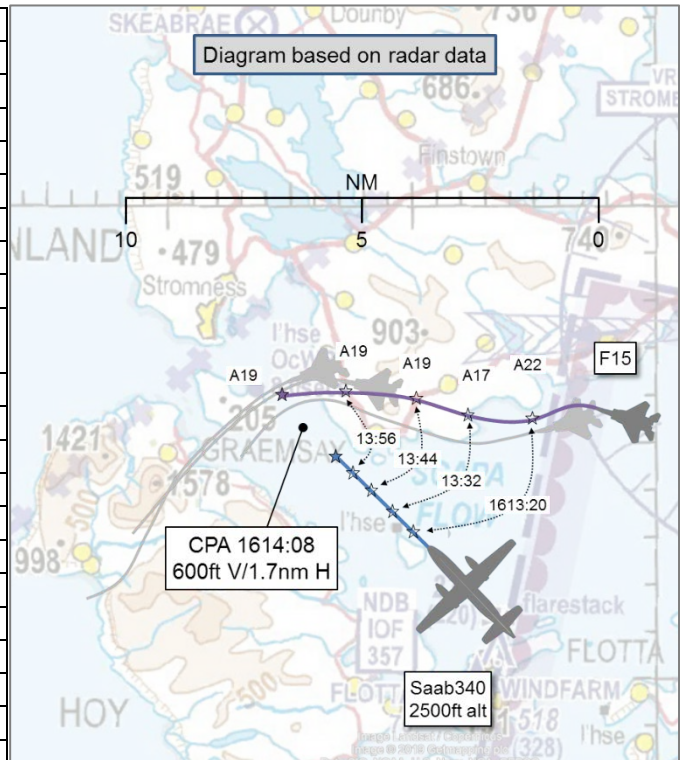


**AIRPROX REPORT No 2019085**

Date: 18 Mar 2019 Time: 1614Z Position: 5855N 00315W Location: 8.5nm SW KWL

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

Recorded	Aircraft 1	Aircraft 2
Aircraft	S340	F15x4
Operator	CAT	Foreign Mil
Airspace	Scottish FIR	Scottish FIR
Class	G	G
Rules	IFR	VFR
Service	Procedural <sup>1</sup>	Traffic
Provider	Kirkwall	Swanwick Mil
Altitude/FL	FL23	FL16
Transponder	A,C,S	A,C (S was turned off)
Reported		
Colours	Company	Dark grey
Lighting	Nav	Anti-coll, position
Conditions	VMC	VMC
Visibility	40km	50km
Altitude/FL	2400ft	1000ft
Altimeter	QNH (1016hPa)	QNH (1016hPa)
Heading	330°	270°
Speed	210kt	400kt
ACAS/TAS	TCAS II	Not fitted
Alert	TA	N/A
Separation		
Reported	800ft V/2nm H	1000ft V/2nm H
Recorded	600ft V/1.7nm H	



**THE SAAB 340 PILOT** reports that during descent into Kirkwall they were advised by Scottish Control of 2 fast-jet military aircraft routing from Wick to Kirkwall. They arranged that the FO (who was pilot flying) would listen out on the Scottish frequency for updates as necessary, whilst the Captain would talk to Kirkwall Approach. The crew elected to fly the ARC Procedure on RW09 to avoid potential conflict on a visual approach. On turning onto the ARC Procedure RW09, 2 jets flew behind them descending down to approximately 1600ft, flew towards the airport, then made a left turn around the coast back towards them. They were visual with the aircraft and it appeared that there were actually 4 jets, which crossed right-to-left within 2nm of them. ‘Traffic’ caution on TCAS appeared. The crew manoeuvred visually off the ARC to avoid the traffic and position to land. Upon speaking to the Scottish controller on the return flight, it was agreed to file a report due to the proximity of the jets and the extra workload involved to maintain separation. There was very high workload due to trying to maintain visual contact with all 4 aircraft, communicate with 2 different ATC services, and descend the aircraft and fly a non-procedural approach.

He assessed the risk of collision as ‘Medium’.

**THE LEAD F15E PILOT** reports that the formation was in contact with Swanwick Mil in the descent into the low-level structure for training. ATC notified them of the civilian traffic directly on the nose at 20nm, in which all 4 pilots of the flight became aware of the traffic that was crossing perpendicular right-to-left and were both radar contact and visual. The traffic proceeded to turn right on a northwesterly heading on final approach to Kirkwall, in which the flight was now in their right apparent. The flight altered their flightpath further to the north to gain more distance from the aircraft because it was inbound for landing. The flight then turned west on course. All aircraft in the flight were visual with the traffic as

<sup>1</sup> They were also listening out on the Scottish Control frequency for any additional warning about the position of the F15s.

well as radar contact when turning westbound with the confidence that there would not be a conflict given the situational awareness and understanding from ATC.

He assessed the risk of collision as 'Low'.

**THE SCOTTISH MORAY-LO TACTICAL/PLANNER** reports the S340 was inbound to Kirkwall on a Traffic Service direct to KOKAL. He noticed at high-level behind the S340 was a formation of military traffic working Swanwick Mil. He called Mil North for information and they advised that the aircraft would be descending low-level. He queried if they would be operating between Wick and Kirkwall and advised them that he would be handing over the S340 to a non-radar unit at Kirkwall for arrival. The military controller said he would point out the traffic. Because of the unusual circumstances, and the potential for things to go wrong quickly, he asked both the S340 crew and Kirkwall Approach if they would prefer for the S340 to listen out on Box 2 for immediate radar-derived Traffic Information if required (instead of the lengthy process via telephone to Kirkwall). He made it clear to all parties that control was always with Kirkwall Approach after handover and he would only call traffic if he thought it absolutely necessary. After transfer he called the military traffic to them because he considered it relevant at approximately 10nm. It would soon pass through the S340's 6 o'clock where sighting would be difficult. The S340 pilot was following the ARC arrival for RW09 and his upcoming right turn, in his opinion, would turn him into confliction with the military traffic. The Short Term Conflicting Alert (STCA) activated shortly afterwards. The military controller telephoned after STCA activation and informed him his jets were visual with his traffic. He informed the S340 pilot of this and to report visual so he could continue with Kirkwall Approach unaided. He informed Kirkwall of the traffic and they advised they could see it from the Tower. Only one military track was squawking, with 3 more in trail. The military aircraft flew close enough to Kirkwall for the Aerodrome controller to report visual and then appeared on radar to fly west, which was almost straight down the localiser which the S340 was soon to become established on. The S340 pilot did eventually report visual with the traffic and landed successfully. The military jets appeared to depart to the west and into the Highland's low-level routes.

**THE SWANWICK MIL SUPERVISOR** reports that he was only advised about the Airprox about 2 months after the initial report was filed by the pilot. He could not recall who was the Tac controller but he did remember an aircraft descending toward Wick while there was some traffic to affect. He was in possession of the reporting pilot's narrative and has used this to recall most of what follows. He recalled a 4-ship of F15s wishing to enter Low-Level in the area of Wick, because this was not a common route for F15s. There was some traffic in the Class E airway. He remembered watching it and probably ensured the Tac called the traffic and confirmed they were VFR in Class E. The pilot's report states he was visual with the conflicting aircraft, which were about 2nm away in the FIR.

He perceived the severity of the incident as 'Low'.

**THE KIRKWALL CONTROLLER** did not provide a report.

## Factual Background

The weather at Kirkwall was recorded as follows:

```
METAR EGPA 181620Z 17009KT 9999 FEW022 07/02 Q1016=
METAR EGPA 181550Z 18010KT 9999 FEW024 07/01 Q1016=
```

## Analysis and Investigation

### Military ATM

The S340 was inbound to Kirkwall and was initially in receipt of a Traffic Service from Prestwick Centre. Shortly before transferring the aircraft to Kirkwall Approach (non-radar), the Prestwick controller noted a flight of fast moving military aircraft (later identified as the F15s) which would possibly affect the S340. Realising the potential for confliction, the Prestwick controller transferred the S340 pilot to Kirkwall but maintained contact with the aircraft (via a second radio) so that Traffic

Information could be passed if necessary. The Prestwick controller stated that Traffic Information was passed to the S340 pilot at a range of 10nm and the Short Term Conflict Alert alarmed shortly afterward.

The F15s were conducting a training sortie with the intent of descending into the low-level system and were in receipt of a Traffic Service from Swanwick (Mil). The F15 report states that they were given Traffic Information on the S340 at a range of 20nm and had both radar and visual contact with the S340 throughout the incident. Because the Airprox was not reported to Swanwick (Mil) for more than a month after the event, the RT recordings were not available and a full radar replay was not made available to this HQ but a short snapshot was provided by the UKAB team.

Figure 1 is taken from the provided radar snapshot and shows that CPA was 1.6nm and 700ft.

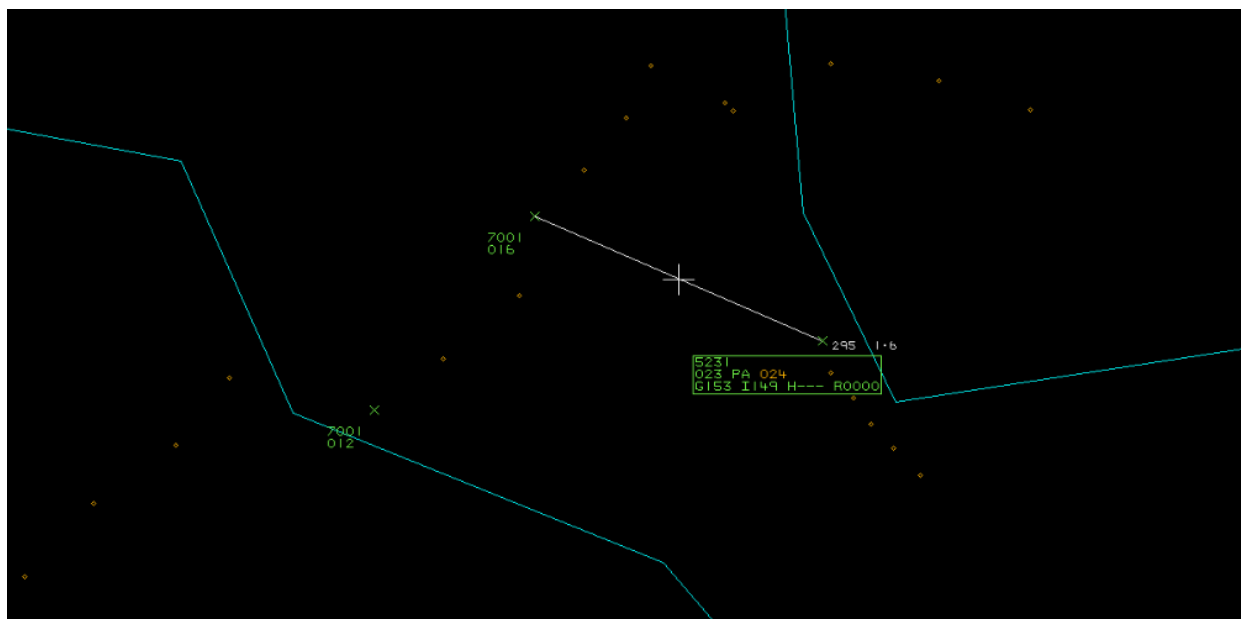


Figure 1 -CPA (S340 5231; F15s 7001)

This investigation was hampered by the lack of a full radar replay and the provision of R/T recordings. However, the F15 report states that Traffic Information was passed at a range of 20nm and the F15s were visual and had radar contact on the S340 throughout the incident. Given this evidence, the Swanwick (Mil) controller discharged their duties appropriately.

### UKAB Secretariat

The S340 and F15 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard<sup>2</sup>. If the incident geometry is considered as converging then the S340 pilot was required to give way to the F15<sup>3</sup>.

### Occurrence Investigation

#### S340 Operating Company Event Progress Report

The aircraft's commander who reported that visual contact with the jets was made shows the estimated routing of the jets in the diagram at Figure 2. The Direct Arrival (ARC Procedure) to RW09 from the south was commenced by the crew with the fast-jet traffic first crossing behind, then back towards their aircraft. A TCAS 'TRAFFIC, TRAFFIC' caution was reported however the crew remained visual with the traffic when they elected to break off the instrument approach and continue visually.

<sup>2</sup> SERA.3205 Proximity. MAA RA 2307 paragraphs 1 and 2.

<sup>3</sup> SERA.3210 Right-of-way (c)(2) Converging. MAA RA 2307 paragraph 12.

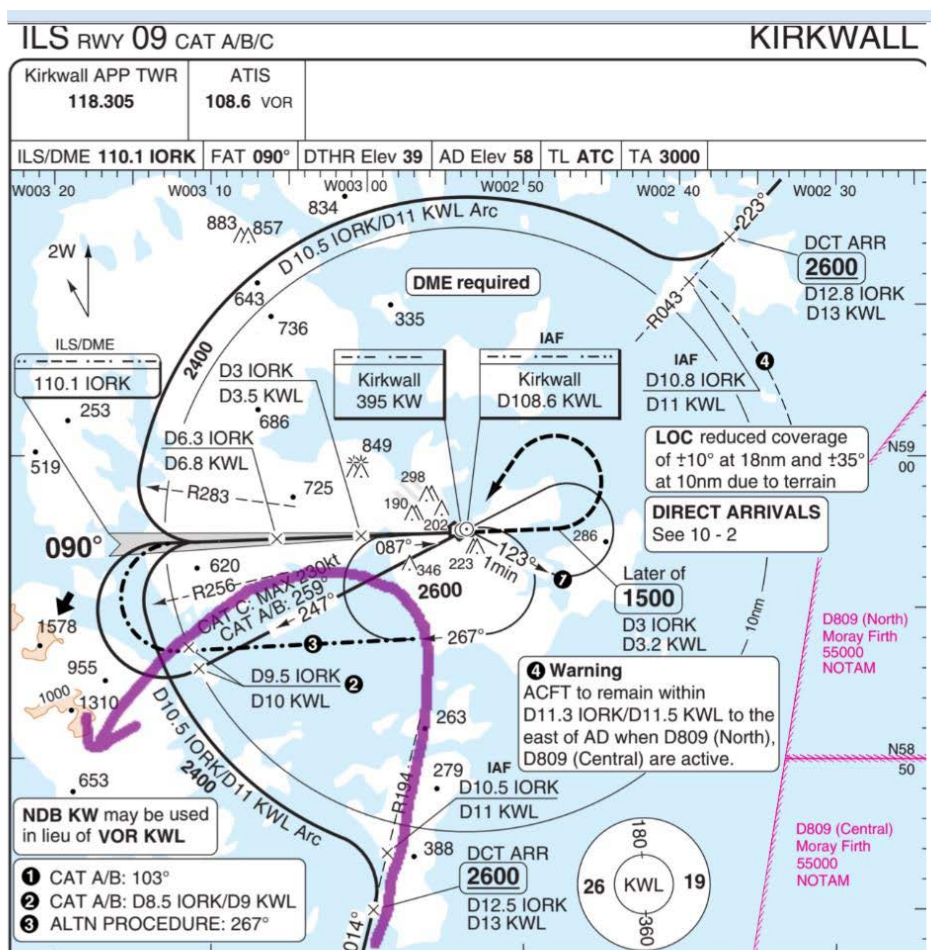


Figure 2 – S340 Pilot’s estimated routing of the fast-jets.

The UK AIP shows that the Airspace surrounding EGPA is Class G therefore aircraft do not require a clearance to fly in this airspace. The commander reported that the fast-jet traffic tracked towards Kirkwall before turning left so this suggested that they avoided the ATZ. Scottish Control were aware of the traffic and reported this to the crew on approach to Kirkwall; however, only passed on that there were 2 fast-jets present and the commander reported getting visual contact with 4 jets. Kirkwall is a non-radar environment and crew would have been provided with a Procedural Service.

The weather at the time of the event suggests the crew would have been able to remain in VMC for the duration of the approach and visual contact with the traffic would have been possible throughout.

The crew reported that upon receiving Traffic Information from Scottish Control that the First Officer (Pilot Flying) would remain on a listening watch on Scottish whilst the Captain (Pilot Monitoring) would contact Kirkwall for the approach. This was a good way to help increase the crew’s situational awareness during a period of increased workload. The commander filed an Airprox Report.

The aircraft is fitted with TCAS 2 System and was the last line of defence for the crew. Not only did it increase the crew’s situational awareness but they elected to act to the ‘TRAFFIC, TRAFFIC’ caution. No avoidance manoeuvres were flown but crew turned off the approach to increase separation and continually visually.

In summary, the crew approaching Kirkwall were advised by Scottish Control that there were 2 fast-jets reported routing from Wick-Kirkwall. At the time the crew were getting ready to be handed over to Kirkwall so elected to keep a listening watch on Scottish while the Pilot Monitoring communicated with Kirkwall. The crew decided to fly the DME ARC procedure to RW09, thinking this would reduce the workload, rather than taking the visual approach and avoiding traffic. Having turned onto the DME ARC the crew reported they became visual with 4 fast-jets passing behind. The jets continued towards Kirkwall before turning left back towards the crew. A TCAS ‘Traffic

Traffic' caution sounded and the crew elected to break off the instrument procedure to continue visually. The TCAS system was the last line of defence in this situation and massively increased situational awareness outside CAS. The crew estimated the closest the jets got was between 800-1000ft below and 2nm horizontally.

## Comments

### USAFE

The formation was advised of the civilian traffic during their decent into the low-level structure. All pilots in the flight had the S340 in sight, both visually and on radar. The S340 pilot also had the F15s in sight. It is noted that the F-15 flight altered their path to gain more distance from the aircraft. The F15 pilots maintained visual with the aircraft during the entirety of the incident. With the minimum separation estimated at 2nm and 800-1000ft, safe separation was ensured in Class G airspace by the F15s in accordance with CAP 774/493. A concern USAFE had was that only one squawk was observed in the flight of 4. The unit has been reminded of the proper squawking procedures for operations in the low fly structures. [UKAB note: The Prestwick controller's comment regarding only one aircraft squawking was interpreted to pertain to the time when the F15s were letting down to low-level as a single entity when subordinate elements would be squawking standby. On entering low-level, and at the time of the Airprox, all 4 aircraft were squawking 7001.]

### Summary

An Airprox was reported when a S340 and a F15 flew into proximity near Kirkwall at 1614hrs on Monday 18<sup>th</sup> March 2019. The S340 pilot was operating under IFR in VMC and was in receipt of a Procedural Service from Kirkwall. He was also listening out on the Scottish Control frequency. The F15 pilots, who were operating under VFR in VMC, were in receipt of a Traffic Service from Swanwick Mil.

## **PART B: SUMMARY OF THE BOARD'S DISCUSSIONS**

Information available included reports from the pilots, the Prestwick Centre controller, area radar and RTF recordings and reports from the appropriate ATC and operating authorities. Relevant contributory factors mentioned during the Board's discussions are highlighted within the text in bold, with the numbers referring to the Contributory Factors table displayed in Part C.

The Board first turned their attention to the actions of the four F15 crews. The Board noted that they were routeing from Wick to Kirkwall, descending into the low-level system for training. Although they were entitled to operate in this area some members wondered if their choice of operating area was entirely appropriate given that Kirkwall was a relatively busy airfield that does not have surveillance equipment (**CF1**) and relies on providing a Procedural Service to participating pilots as a means of separating their aircraft. Other members opined that the levels of activity at Kirkwall would only be known through local knowledge and that it was understandable that military crews based in the south of England might not have that level of understanding, simply thinking that Kirkwall was a small airfield with only an ATZ and IAP (feathers) to be avoided, which they did. In that respect, the RAF Low Flying Operations Flight advisor commented that the UKLFH states that pilots operating in the Orkney area should contact Kirkwall and so the information was there to be used albeit, as likely infrequent users of this particular airspace, the F15 crews may not have been aware of the requirement (**CF2**).

Noting that this was the second Airprox involving CAT flights at Kirkwall that had been reviewed in recent months (see also Airprox 2019062), some members wondered whether the levels of activity at Kirkwall merited the establishment of a surveillance capability rather than relying on a non-surveillance-based Procedural Service for commercial operations. On this occasion the S340 crew had only been aware of the F15s' presence because the PC Moray controller had noted them descending from high-level and had decided to keep the S340 crew advised. Had he not done so, their first knowledge of the F15s would have been when they obtained visual contact as they passed close to the southern edge of the Kirkwall ATZ. It was not for the Board to second-guess the risk appetite of the Kirkwall or S340



operating authorities, but it seemed to members that there might be value in reviewing the level of ATS available at Kirkwall for what appeared to be reasonably extensive CAT operations.

The Board then turning their attention to the actions of the PC and Swanwick Mil controllers. Members noted that the Swanwick Mil controller had issued Traffic Information to the F15 crews about the S340, which aided them in obtaining visual and radar contact with the aircraft; he had then informed the PC controller that the F15 pilots had visual contact with the S340. For his part, the Moray controller, being concerned about the presence of the F15s, asked Kirkwall Approach and the S340 pilot if they would prefer for the S340 pilot to listen out on his frequency after he had been transferred to Kirkwall. Although stressing that he was no longer in control of the aircraft, he would be able to pass Traffic Information if he considered it appropriate. The Board commended the Moray controller for his proactive decision, which, whilst recognising that it was an unusual method of operation, had provided valuable situational awareness to the S340 crew and Kirkwall. That being said, some members wondered whether this unusual action might have heightened the S340 crew's concerns about the presence of the F15s such that they were preconditioned to become alarmed when they might not needed to have been on receiving the TCAS TA and subsequently acquiring visual contact when the F15s were in fact at some range (CF3, CF4, CF5).

Turning to the risk, members noted that at CPA the aircraft were separated by 700ft vertically and 1.6nm horizontally, that the S340 pilot was visual with the F15s and had decided to continue his approach visually, and that the F15s were also visual with the S340 and had altered their course to the right to increase the separation. In view of this information, The Board agreed that there had been no risk of a collision and that normal safety standards had pertained in Class G airspace. Accordingly, the incident was assessed as risk Category E.

### **PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK**

#### Contributory Factors:

2019085-Barriers.xlsx			
CF	Factor	Description	Amplification
<b>Ground Elements</b>			
<b>• Manning and Equipment</b>			
1	Organisational	• Aerodrome and ATM Equipment	Inadequate or unavailable equipment
<b>Flight Elements</b>			
<b>• Tactical Planning and Execution</b>			
2	Human Factors	• Communications by Flight Crew with ANS	Pilot did not communicate with appropriate airspace controlling authority
<b>• Situational Awareness of the Conflicting Aircraft and Action</b>			
3	Human Factors	• Interpretation of Automation or Flight Deck Information	Pilot was concerned by the proximity of the other aircraft
<b>• Electronic Warning System Operation and Compliance</b>			
4	Contextual	• ACAS/TCAS TA	TCAS TA / CWS indication
<b>• See and Avoid</b>			
5	Human Factors	• Perception of Visual Information	Pilot was concerned by the proximity of the other aircraft

#### Degree of Risk:

E.

Safety Barrier Assessment<sup>4</sup>

In assessing the effectiveness of the safety barriers associated with this incident, the Board concluded that the key factors had been that:

**Flight Elements:**

**Electronic Warning System Operation and Compliance** were assessed as **partially available** because only the S340 was equipped with an electronic warning system.

**See and Avoid** was assessed as **effective** because the F15 pilots had kept visual contact with the S340 throughout the incident and considered that they did not have to take any action to avoid it. The S340 pilot was also visual with the F15s as they passed ahead of and below his aircraft.

Airprox Barrier Assessment: 2019085		Outside Controlled Airspace					
Barrier	Provision	Application	Effectiveness				
			Barrier Weighting				
			0%	5%	10%	15%	20%
Ground Element	Regulations, Processes, Procedures and Compliance	✓	✓				
	Manning & Equipment	✓	✓				
	Situational Awareness of the Confliction & Action	✓	✓				
	Electronic Warning System Operation and Compliance	✓	✓				
Flight Element	Regulations, Processes, Procedures and Compliance	✓	✓				
	Tactical Planning and Execution	✓	✓				
	Situational Awareness of the Conflicting Aircraft & Action	✓	✓				
	Electronic Warning System Operation and Compliance	⚠	✓				
	See & Avoid	✓	✓				
<b>Key:</b>							
	<u>Full</u>	<u>Partial</u>	<u>None</u>	<u>Not Present</u>	<u>Not Used</u>		
Provision	✓	⚠	✗	●	○		
Application	✓	⚠	✗	●	○		
Effectiveness	■	■	■	■	■		

<sup>4</sup> The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](#).