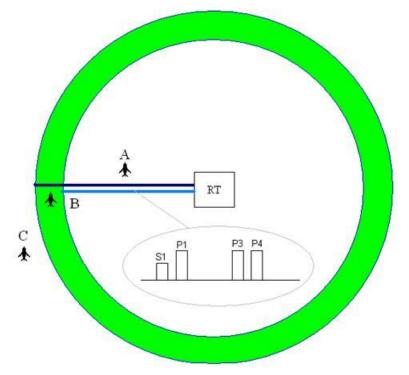
## Oneida County WAM Whisper/Shout Setup

The Whisper / Shout configuration only applies to adapted RTs. Whisper / Shout refers to an interrogation technique that was initially designed for use with the Traffic Collision Avoidance System (TCAS) that is now required on all commercial aircraft. The MLAT system uses the Whisper / Shout technique to interrogation ATCRBS targets. Since ROs do not transmit interrogations, this configuration does not apply to ROs. The Whisper / Shout technique is used to limit the number of targets that respond to each transmitted ATCRBS interrogation. Each Whisper / Shout step is an ATCRBS interrogation.

The Whisper / Shout parameters consists of three things: the number of interrogation steps, the power level of the interrogation pulses (P1, P3, and P4), and the power of the suppression pulse (S1). Each step can use its own interrogation and suppression pulse power level. The complete set of steps is executed each time the RT in question is commanded to perform an ATCRBS (or W/S) interrogation.

ATCRBS interrogations use a simple encoding technique based on the amount of elapsed time between the first and second pulses detected by the target. Normally the P1 and P3 pulses are separated by 8 or 21 microseconds (to elicit Mode A and Mode C responses respectively). If a second pulse is detected with 2 microseconds of the first pulse, the target's transponder does not respond at all. This is called being "suppressed". The MLAT system, by transmitting a suppression pulse (S1) at a lower power level 2 microseconds before the first interrogation pulse (P1), can effectively limit the number of targets that respond to individual interrogations. In the figure below, a single Whisper / Shout step is depicted. In this case, the interrogation pulses (P1, P3, and P4) are strong enough to reach the outer edge of the green ring (shown by the dark blue line). The suppression pulse (S1), which uses slightly less power, is only detected as far away as the inside of the green ring (shown by the light blue line). This step results in only those targets inside the green ring responding. Target A detects the interrogation pulse, but also detects the suppression pulse. Target C is too far away, and does not detect either pulse. Only Target B detects the interrogation step. Note the P4 pulse is only used to suppress Mode S transponders from responding to W/S interrogations. ATCRBS transponders do not process the P4 pulse.

The goal of a Whisper / Shout configuration is to shift the power levels so that sufficient responses are elicited from all of the targets of interest.



Whisper Shout Interrogation & Suppression Power Levels

RU Selection Control					RT Whis	Der	Shout Setup					
-RT: rul (KRHE ATCT) -RT: ru2 (JPJ)	Max Steps	14		Int	Sup			Int Sup				
-RT: ru3 (Steuben)							Int Sup	IIIC Sup				
-RT: ru4 (911 Call Ctr) -RT: ru5 (Kirkland) -RT: ru6 (Florence)	Step 1 (dbm)	48 <u>(</u> ▼	Step 1	51	▲ 47 <u>′</u>	Ť	Step 12 29 🔺 25 🔺					
-KI, I'do (I'lorence/	Delta Int (dbm)	-1į́ 🔺	Step 2	49	▲ 45ĭ	A	Step 13 27 1 23 1					
	Delta Sup (dbm)	-2 A	Step 3	47	▲ 43		Step 14 25 A 0 A					
	斑	1=	Step 4	45	▲ 41į							
			Step 5	43	▲ 39ĭ	<b>A</b> <b>V</b>						
			Step 6	41	▲ ▼ 37]	A						
			Step 7	<b>39</b>	▲ ▼ 35	Å						
I RU			Step 8	37	▲ <u>33</u>							
lete RU			JCOP U		<b>V</b>	T						
hange Nane			Step 9	35	▲ ▼ 31į́	×						
			Step 10	33	▲ ▼ 29j	×						
			Step 11	31	▲ ▼ 26	×						

Figure 1Whisper/Shout Setup

File Remote Units MLAT Process	or Site							
		W/S Listen Window Start Delay (ms)	▲ _₹	Interrogation				
Use Interrogation Regional Map Override		W/S Period (s)	3 A	On Ra Interrogation Th	ange j0	Max Interrogatio	n 40.0	
ode A New Track Rate (s)	1.0 Max Mode S	Int. Rate sec)	50			Distance (nni)		
ode C New Track Rate (s)	1.0 Hode A New	Track Priority	Ž	☐ Radar Mode 3 Interroga		⊥ 1090ES Mode C f Interrogati		
ode A Periodic Update Priority 🕱 Mode		Track Priority	ž	☐ Radar Mode C Interroga		⊔ UAT Mode 3 Adju Interrogatio		
ode C Periodic Update Priority	3 W/S Slices	W/S Slices (per sec) Interrogation Slices (per sec)			3 Adjust	_ □ UAT Mode C Adju	Ist	
nterrogation Map Def Z Ht(ft)				Interroga 1090ES Reliable		Interrogatio	n 	
	Retry Prio	rity	0	Code Matches 1090ES Reliable		2	_	
	Max Retrie	s	<u>)</u> 0	Status Time (s) 1090ES Reliable		10.2 11.2	_	
				Status Interrog	ation (s)			
			-		<u>.</u>			
RU1		ru2	_	гиЗ		ru4	NA	
Offset (60ns)	250		500		750		NA	
Type		175	A		AC	185 🔺	None -	

Figure 2 Schedule 1

		MLAI Configuratio	on Ealtor (	SITE: KRME)					
ile Remote Units MLAT Proces	sor Site								
de H Kate (s) \$.1 de C Rate (s) \$.0 Use Interrogation Regional		H/S Listen Hindow Start Delay (ns)		Interrogation Power Options Interrogation Pwr Based On Range					
Map Override		M/5 Period (S)		Interrogation ID	þ	Max Interrogation Distance (nmi)	40.0		
de A New Track Rate (s)		5 Int. Rate r sec)	50						
de C New Track Rate (s)	1.0 Node A New	# Track Priority	2	Radar Mode 3 Adjust Interrogation		☐ 1090ES Mode C Adjust Interrogation			
de A Periodic Update Priority	3 Mode C New	# Track Priority	2	Radar Mode C	Adjust	_ UAT Mode 3 Adjus	t		
de C Periodic Update Priority	3 W/S Slice	W/S Slices (per sec)		Interroga		Interrogation			
terrogation Map Def Z Ht(ft)		tion Slices r sec)	16 Interr		ation	Interrogation			
Retry Pri			0	1090ES Reliable Status Code Matches 1090ES Reliable		2			
	es	<u>)</u> 0	Status Time (s) 1090ES Reliable		10.2				
				Status Interrogation (s)		<b>j1.2</b>			
RU ru5		ru6		rul		ru2	NA		
							NA		
ffset (60ms)	250		500		750		Au		
Type AC -	175 🔺 <u>A</u>		AC -	185	<u>A</u> –		None -		



File Remote Units MLAT Process	or Site									
ode H Rate (s) 3.1 lode C Rate (s) 3.0	-		3 ▲		Interrogation	Pur Based	on Power Options	Power Options		
Use Interrogation Regional Map Override		W/S Period (s)	3	▲ ▼	On Range Interrogation ID		Max Interrogatio Distance (nmi)		¥40.0	
lode A New Track Rate (s)		5 Int. Rate sec)	<b>5</b> 0				Distance (in)	.,		
lode C New Track Rate (s)	1.0 Mode A New	a Track Priority	2		⊥ Radar Mode 3 A Interrogati		☐ 1090ES Mode ( Interroga			
lode A Periodic Update Priority	3 Hode C New	New Track Priority ces (per sec)	2		☐ Radar Mode C Adjust Interrogation		□ UAT Mode 3 Adjust Interrogation			
1ode C Periodic Update Priority	3 W/S Slices		5 1090ES Mode 3 Adjust Interrogation		Adjust	☐ UAT Mode C Adjust Interrogation				
Interrogation Map Def Z Ht(ft)		Interrogation Slices (per sec)			1090ES Reliable Status					
	Retry Prio	ority	)0		Code Matches 1090ES Reliable		2		_	
Max Retrie		es	)0		itatus Time (s) 1090ES Reliable		10.2		_	
					Status Interrogat	LTOU (2)				
RU ru4		ruð			ru5		ru6		NA	
Offset (60ms)	ffset (60ns) 0 250		500			750		X	IA	
Type		175 A -			AC		· 185 🔺		None -	

Figure 4 Schedule 3