

Instructions for Generating ADS-B Messages on ATC-5000NG

This app note has been created for the purpose of guiding the user through the steps required to configure the ATC-5000NG to transmit squitter messages to test an ADS-B receiver. The squitters are as defined in the RTCA D0-260B MOPS.

Note: Ports number 1 and number 6 on the back of the unit must be connected together using a BNC to BNC cable for the scenario to run.

Block Scenario:

1. Select to the **"Multi-Receiver"** menu option from the Main Menu.

ATC-5000NG ATC/DMH	TEST SET	Main Menu Local Rende
Part Number:	138156	Multi-Receiver
User Interface Version: Server Version:	22.01.2401 22.01.2401	Transponder 🕨
Receiver DSP Version: Receiver FPGA Version:	B.7 B.4	DME 🕨
Transmitter DSP Version:	B.5	UAT 🕨
Transmitter FPGA Version: Receiver Module #1 FPGA Version:	8.7 A.0	System 🕨
Receiver Module #2 FPGA Version: Transmitter Module #1 FPGA Version:	A.0 A.B	Support
Transmitter Module #2 FPGA Version:	A.B	User's Manual
Antenna Simulator/Switch Assembly FPGA Version:	A.0	
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2. Select the "Scenario" option from the Multi-Receiver Menu



3. Set up 1 Static or Dynamic 1090 target.

Scenario Duration		Dup Toma -	0.0	Multi-Receiver Scenario Menu
1090 Targets	seca		Jecs	Local female
Number of Dynamic Intruders :	0	Dynamic Intruders Enable:	0	
Number of Static Intruders :	1	Static Intruders Enable :	1	Load
1030 Messages	1.4.4			
Number of Messages :	0]		Save
Block Repetition Rate :	100]		Reset
Antenna : Top	Botte	om		1090 Targets
Number of Dynamic UAT :	0	Dynamic UAT Enable :	0	
Number of Static UAT :	0	Static UAT Enable :	0	1030 Messages
Initial MSO Dynamic UAT :	752	MSO Step Dynamic UAT :	2	UAT Targets
Initial MSO Dynamic UAT : Initial MSO Static UAT :	752 755	MSO Step Dynamic UAT : MSO Step Static UAT :	2	Scenario
Inital MSO Dynamic UAT : Inital MSO Static UAT : Scenario Settinos	752 755	MSO Step Dynamic UAT : MSO Step Static UAT :	2	Scenaro Start
Initial MSO Dynamic UAT : Initial MSO Static UAT : Scenario Settings	752 755	MSO Step Dynamic UAT : MSO Step Static UAT : Power Mode : Low Power	2	Scenaro Start Stop
Initial MSO Dynamic UAT : Initial MSO Static UAT : Scenario Settings Capture Squtters and Data L Static Test Node Ø Sant	752 755 ogging Range	MSO Step Dynamic UAT : MSO Step Static UAT : Power Mode : Low Power UAT J/Q Filter Magnitude : 0	2 2 (No Filter)	Scenaro Start Stop

4. Pressing the 1090 Targets button will advance you to the individual target configuration page.

Scenario Duration Scenario Time : 6550.0	secs	Run Time :	0.0 secs	Multi-Receiver Scena Menu	rio	
1090 Targets				Local Rende		
Number of Dynamic Intruders :	0	Dynamic Intruders Enable:	0			
Number of Static Intruders :	0	Static Intruders Enable :	0	Load		
1030 Messages					_	
Number of Messages :	0			Save		
Block Repetition Rate :	100]			-	
Antenna : Too	Bott	070		Reset	4.	4
rangement rop g				1090 Targets	, <i>1</i>	
UAT Targets				1050 hargets		لسی
Number of Dynamic UAT :	0	Dynamic UAT Enable :	0	1030 Messages	•	Pressing the
Number of Static UAT :	0	Static UAT Enable :	0		-	1090 targets
Initial MSO Dynamic UAT :	752	MSO Step Dynamic UAT :	2	UAT Targets	Þ	button will
Initial MSO Static UAT :	755	MSO Step Static UAT :	2	Scenario		allow you to
				Start		get to the next
Scenario Settings						screen
Capture Squitters and Data L	ogging	Power Mode : Low Power		Stop		
📃 Static Test Mode 🛛 🗹 Slant	Range	UAT I/Q Filter Magnitude : 0	(No Filter)			
Re-Compile After Load		UAT Horizontal Spacing : 960	ns			
P 👿 🚿			😻 😂 🕃	2 🔨 i 👆	1	

5. Make sure to select **"Mode S Extended"** Mode, "DO-260B" DO-260 Mode, and modify the message parameters as desired. Press the down arrow one time then select the **"Mode S Squitters"** option from the menu.

Type :	Static		Starting at (secs) : 0.0	Enable	Multi-Receiver 10 Targets Menu	90]
Number :	1		Stopping at (secs): 6550.0	Altitude Report	Local famole]
Mode :	Mode S Extended		00-260 Mode: D0-260B	Crossink Capability			1
Tx Channel :	1090 RX1		Mode S Address : 000001	Cround Ground	Mode S Soutters	Г	
Altitude :	1000	ft	Altitude Code Mode		Hode 5 Squitters	Ľ	
Bearing :	3	deg	Binary 🍓 Gilham		Squitter		Pressing the
Range :	2.000	nmi			3		Mode S
Latitude :	45.033306	deg	Mode A Code	STAT001	Off		squitters
Longitude :	-72.997540	deg	0 0 0 0	Type: 4	Attude Report		advance you
Vertical Speed :	0	ft/min	and the second sec				to the squitter
Velocity :	0.0	kts	CA: 0 FS: 0 DB:	0 LIM : 0	Off	_	configuration
Track :	0.0000000	deg	Target State Subtype: 1	AS Subtype: 1	On		page
			SL : No TCAS Sensitivity Leve	el de la constante de la consta	2		
			RI (AQ = 0) : Non on-board	TCAS	Off		
Squitter Power :	-50	dBm	RI (AQ = 1) : No Airspeed				
Squitter Antenna :	Both		RI (DF = 16) : Non on-board	TCAS			
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Name	Frame	Target Mo Squitters	de S Menu
DF11	580000011F1B04	Local Re	mote
Extended Squitter - Airborne Aircraft Operational Status Type 31 Version 2	88000001F8000002004838AAD0CE	Squitter Details	; Þ
Extended Squitter - Airborne Position Type 9 (Even)	88000001480B0205B0F79D48E662	Schedule	Þ
Extended Squitter - Airborne Position Type 9 (Odd)	88000001480B0585975F6F96867F		
Extended Squitter - Aircraft Status Emergency Priority Status Version 2	88000001E100000000000007053F		
Extended Squitter - Identification Type 4	88000001244D4054C30C6054DD60		
Extended Squitter - Target State And Status Type 29 Subtype 1	88000001EA00100C011C00159CC6		
Extended Squitter - Velocity Over Ground Subtype 1	88000001990801002004016BDB19		
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6. Select a message and then press the **"Schedule"** menu option. **Do this for each message**.

7. Make sure all the messages are enabled by toggling the **"Enable"** switch to the **ON** position.



Application Note

8. Go back to the "Multi-receiver Scenario Menu" by pressing the previous page button three times until on the Multi-Receiver Scenario Menu. Toggle the Scenario switch to "Start" the scenario. Note: Changes to the target can be made while the scenario is running but they will not be implemented until the switch is toggled to the "Stop" and then "Start" again.

				Menu
Scenario Time : 6550.0	secs	Run Time :	3.3 secs	
1090 Targets				Local tends
Number of Dynamic Intruders :	0	Dynamic Intruders Enable:	0	
Number of Static Intruders :	1	Static Intruders Enable :	1	Land
1030 Messages				LONG
Number of Messages :	0			Save
Block Repetition Rate :	100			
	-			Reset
Antenna : Top 🃗	Botto	m		Reset
Antenna : Top 🃗	Botto	m		Reset
Antenna : Top	Botto	m Dynamic UAT Enable :	0	Reset
Antenna : Top	Botto 0 0	m Dynamic UAT Enable : Static UAT Enable :	0	Reset 1090 Targets 1030 Messages
Antenna : Top	 Botto 0 0 752 	m Dynamic UAT Enable : Static UAT Enable : MSO Step Dynamic UAT :	0	Reset 1090 Targets 1030 Messages UAT Targets
Antenna : Top	 Botto 0 752 755 	m Dynamic UAT Enable : Static UAT Enable : MSO Step Dynamic UAT : MSO Step Static UAT :	0 0 2 2	Reset 1090 Targets 1030 Messages UAT Targets Scenario
Antenna : Top UAT Targets UAT Targets Number of Dynamic UAT : Initial MSO Dynamic UAT : Initial MSO Static UAT :	Botto 0 752 755	m Dynamic UAT Enable : Static UAT Enable : MSO Step Dynamic UAT : MSO Step Static UAT :	0 0 2 2	Reset
Antenna : Top UAT Targets UAT Targets Number of Dynamic UAT : [Initial MSO Dynamic UAT : [Initial MSO Static UAT : [Scenario Settings	Botto 0 752 755	m Dynamic UAT Enable : Static UAT Enable : MSO Step Dynamic UAT : MSO Step Static UAT :	0 0 2 2	Reset 1090 Targets 1030 Messages UAT Targets Scenario Scenario Start
Antenna : Top UAT Targets Number of Dynamic UAT : [Number of Static UAT : [Initial MSO Dynamic UAT : [Initial MSO Static UAT : [Scenario Settings Capture Squitters and Data Lo	Botto 0 0 752 755 00in0	m Dynamic UAT Enable : Static UAT Enable : MSO Step Dynamic UAT : MSO Step Static UAT : Power Mode : Low Power	0 0 2 2	Reset 1090 Targets 1030 Messages UAT Targets Scenario Scenario Start Stop
Antenna : Top UAT Targets UAT Targets Number of Dynamic UAT : Initial MSO Dynamic UAT : Initial MSO Static UAT : Scenario Settings Capture Squitters and Data Lo Static Test Mode Salar	Botto O O 752 755 00ing Range	m Dynamic UAT Enable : Static UAT Enable : MSO Step Dynamic UAT : MSO Step Static UAT : Power Mode : Low Power UAT I/Q Filter Magnitude : 0	0 0 2 2	Reset

The target should be squittering the appropriate squitters at this time.

Block Transmission:

9. Select to the **"Multi-Receiver"** menu option from the Main Menu.

ATC-5000NG ATC/DMF	TEST SET	Main Menu Local Remote	
Part Number:	138156	Multi-Receiver	Þ
User Interface Version:	22.01.2401	Transponder	
Server Version:	22.01.2401		
Receiver DSP Version:	B.7	DME	Þ
Receiver FPGA Version:	B.4		
Transmitter DSP Version:	B.5	UAT	٩
Transmitter FPGA Version:	B.7	System	Þ
Receiver Module #1 FPGA Version:	A.0		-
Receiver Module #2 FPGA Version:	A.0	Support	Þ
Transmitter Module #1 FPGA Version:	A.B	User's Manual	▶
Transmitter Module #2 FPGA Version:	A.B		
Transmitter Module #3 FPGA Version:	A.B		
Antenna Simulator/Switch Assembly FPGA Version:	A.0		
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10. Select the **"Block Transmission"** option from the Multi-Receiver Menu.





11. Select the **"Add Message"** option from the Multi-Receiver Block Transmission Menu.

12. Select the "Message Name" from the options available (i.e., DF11).



- 13. For DF17, you will also need to add the following message types:
 - 1. Extended Squitter Identification Type 2
 - 2. Extended Squitter Airborne Position Type 9 (Even)
 - 3. Extended Squitter Airborne Position Type 9 (Odd)
 - 4. Extended Squitter Velocity Over Ground Subtype 1
 - 5. Extended Squitter Aircraft Status Emergency Priority Status Version 2
 - 6. Extended Squitter Target State and Status Tupe 29 Subtype 1

No.	Name	Frame	Power	Time(µs)	Multi-Rx Add Message
1	Extended Squitter - Identification Type 2	880000011000000000000BC6B30	-20	0	Local Remote
2	Extended Squitter - Airborne Position Type 9 (Even)	88000001480000000000087C70A	-20	130	Message Type
3	Extended Squitter - Airborne Position Type 9 (Odd)	8800000148000400000008BEC32	-20	260	Mode S Message
4	Extended Squitter - Velocity Over Ground Subtype 1	88000001990001002004013D3BAD	-20	390	Message Name DF11
5	Extended Squitter - Aircraft Status Emergency Priority Status Version 2	88000001E1000000000000F7053F	-20	520	DF11
6	Extended Squitter - Target State And Status Type 29 Subtype 1	88000001EA000000000008F8DBA	-20	650	• •
7	DF11	580000011F1B04	-20	780	Frame Details
	000001				
		6-1 . 7 ⁻¹			
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14. Alter the message parameters as required by double clicking on the individual messages.

15. Navigate back to the Multi-Receiver Block Transmission Menu and flip the **"Transmission"** switch to the **"Start"** position.

No.	Name	Frame	Power	Time(µs)	Multi-Receiver Block
1	Extended Soutter - Identification Type 2	88000001100000000000000000000000000000	-2:0	0	Transmission Menu Local Rends
2	Extended Soutter - Airborne Position Type 9 (Even)	880000014800000000087C70A	-2:0	130	
3	Extended Soutter - Arborne Position Type 9 (Odd)	85000001450004000000008BEC32	-20	26-0	Load
4	Extended Soutter - Velocity Ower Ground Subtype 1	88000001990001.002004013D3BAD	-20	390	Add Message
5	Extended Squtter - Aircraft Status Emergency Priority Status Version 2	88000001E100000000000F7053F	-20	520	Message Details
6	Extended Soutter - Target State And Status Type 29 Subtype 1	88000001EA000000000008F8D8A	-2:0	65-0	Remove
7	0511	58000001151804	-20	780	Reset
					Start
	-		5		

The target should be squittering the appropriate squitters at this time.



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