

Leading Company, ACEWAVETECH

Radar Target Generator



as of Jan. 15. 2013

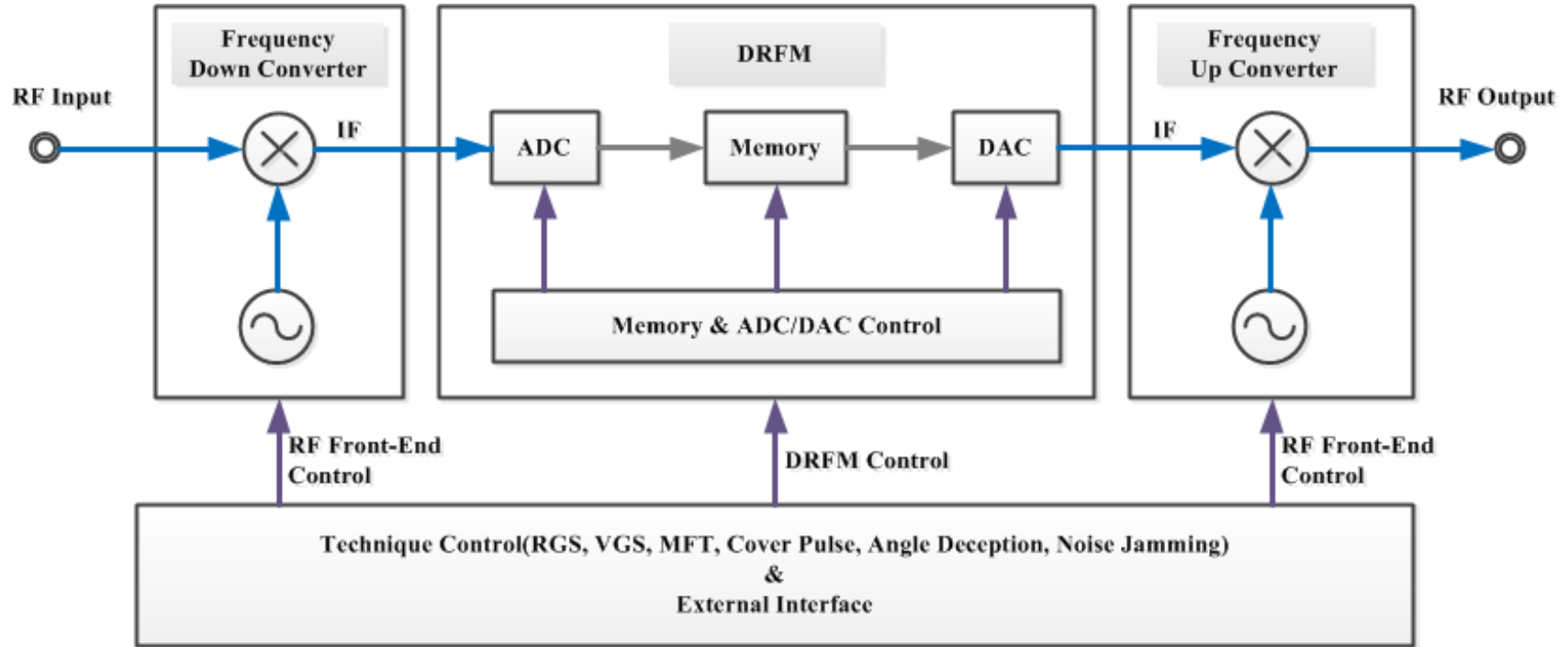
❖ Using Digital RF Memory (DRFM)

DRFM is an electronic method for digitally capturing, storing and regenerating of the receiving Radar Signal(s).

❖ DRFM Technology

- High speed(> 500Ms/sec) A/D, D/A Converter
- Real Time Memory Control
- RF Signal Measurement
- Digital Signal Processing
 - Digital Modulation(Frequency / Amplitude / Phase)
 - Pulse Delay / Stretch / Duplicate

Radar Target Generator Architecture



- * RGS : Range Gate Stretch
- * VGS : Velocity Gate Stretch
- * MFT : Multiple False Target

❖ Advanced Technology using DRFM

- High Sampling Rate / Wide Instantaneous Bandwidth
- Better Spurious Performance
- Real Time Memory Write/Read
- Embedded Technique
- Threat sorting and Pre Programmed Response
- Multiple EA Techniques against Multiple Threats
- Easy Upgrade (Reprogrammable Logic)

❖ Stand Alone EA Capability

- Laboratory / Test Range / Target Simulator...

1. Specification I

Items		SPEC.	Remark
Bandwidth		• 1,000MHz max	Option : 100MHz, 200MHz, 500MHz
Dynamic Range		• -50 ~ 0 dBm	Input Signal Level
Output Signal Level		• 3 dBm ± 2 dB	
Input PW		• 100 ns ~ 256 us	
Spurious Level		• < 20 dBc	
VSWR		• < 2 : 1	
Delay	Range	• 2 ms	
	Resolution	• 30 ns	* 5ns (optional)
Doppler Freq	Range	• -300 ~ +300 KHz	
	Resolution	• 10 Hz	
Sampling		• Phase Sampling (1 or 4Bits)	*Amplitude Sampling also available
Video Signal		• RF Input Signal • RF Output Signal	

1. DRFM Specification II

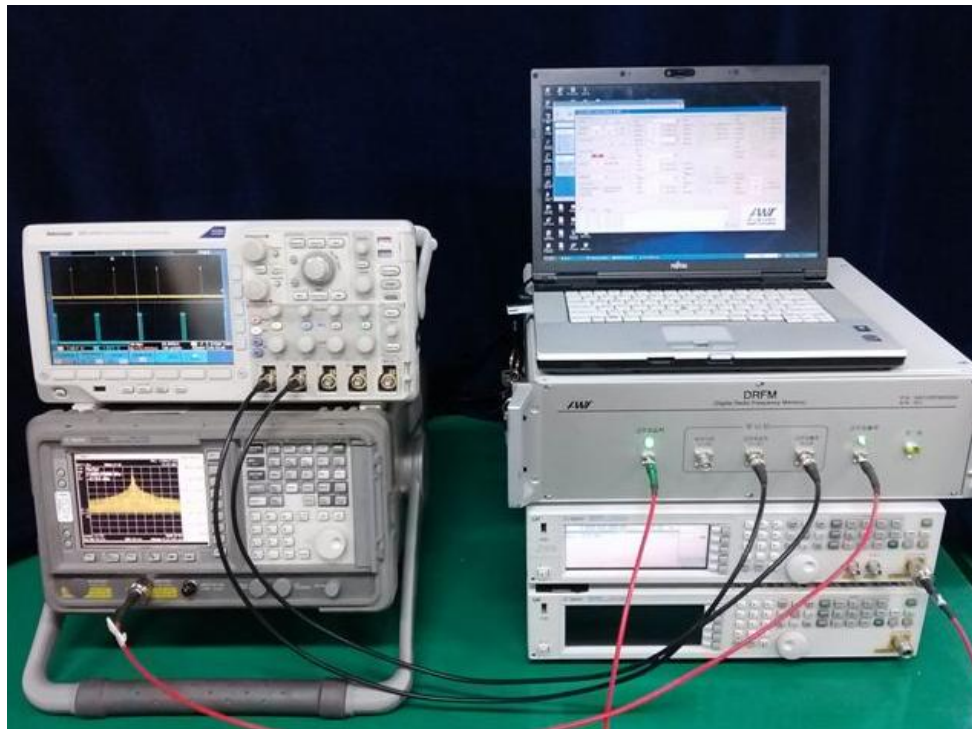
Items		SPEC.	Remark
Operation Mode		<ul style="list-style-type: none"> • Bypass • Stretched • Normal Operation 	
Technique	RGS	<ul style="list-style-type: none"> • RGPO, RGPI, RPGO + RGPI • Keeper 	
	VGS	<ul style="list-style-type: none"> • VGPO, VGPI 	
	MFT	<ul style="list-style-type: none"> • 2 ~ 256 	
	Cover Pulse	<ul style="list-style-type: none"> • 2 ~ 16 Times 	
	Angle Deception	<ul style="list-style-type: none"> • SSR, LFN 	
	Noise Jamming	<ul style="list-style-type: none"> • 8MHz, 16MHz, 32MHz, 128MHz 	optional
External Interface		<ul style="list-style-type: none"> • Serial • Ethernet 	

2. Frequency Up/Down Converter Specification

Items		SPEC.	Remark
Down Converter	Frequency Range	<ul style="list-style-type: none"> • 0.5~ 2GHz • 2 ~ 6 GHz • 6~ 18GHz • 2 ~ 18GHz 	Optional
	Dynamic Range	• - 60 ~ 0dBm	
	IF Bandwidth	• 1,000 MHz	
	Gain	• 10 dB \pm 2 dB	
	Gain Control	• 20 dB \pm 2 dB	
	Image/Spurious Rejection	• < 40dBc (@ IF Bandwidth)	
UP Converter	Frequency Range	<ul style="list-style-type: none"> • 0.5~ 2GHz • 2 ~ 6 GHz • 6~ 18GHz • 2 ~ 18GHz 	Option
	IF Center Frequency	• 1.5 GHz	3GHz(optional)
	IF Bandwidth	• 1,000 MHz	
	Gain	• 5dB \pm 2 dB	
	Image / Spurious Rejection	• < 20dBc	

❖ Laboratory

- Target Generation
- ECM Simulation
- Signal Delay for path modeling



❖ Radar Test Environment Simulator

- Test Environments
 - In Laboratory Evaluation
 - In Anechoic Chamber
 - In Test Ranges
 - Training Operation
- Radar Types
 - Airborne
 - Shipborne
 - Ground Based
 - Missile Seekers
- Providing
 - Target Simulation
 - Electronic Countermeasures

➤ Laboratory Evaluation

- HWIL Simulators
- Radar Development
- Radar Performance Verification
- Radar Testing in Lab.
- Operator Training



➤ Anechoic Chamber

- Radar System Testing
- Missile / Seeker Testing
- Free Space Radiation



➤ Operator Training

- Target Detection and Tracking
- ECM Identification
- ECCM Management
- Threat Assessment and Weapons Management



❖ EW Simulator

- Real-time EW Environment Simulator
- Waveform Modulation Generator
- Digital PDW Emulator
- Jammer
 - RGS
 - VGS
 - MFT
 - Noise
 - Repeater
 - Swept



EW Test System for Test Range

Electronic Warfare Test System

Radar/Target signal

Radar/Jamming signal

EW Signal Gen. / Analysis

Leading Company: ACEWAVETECH

Radar Target Generator GUI (example)

DCS(DRFM Control Software of AWT)

Network & Status

Port No: [] OPEN

Connection: NOT CONNECTED CHECK

Self Test: [-] [-] CHECK

Preset Parameter

SAVE OPEN

Common Command

RF: [-] ON GET

Input Freq: [3000] MHz (Min 100 Hz) SET GET

Collect Count: [64] EA SET GET

Jamming Technique

Range-Gate Stealing Velocity-Gate Stealing

Cover Pulse Angle Deception

False Target

SET GET

RGS (Range-Gate Stealing)

Mode: RGPO

Dwell Time: [1.000] s (0~100s | 2 ms)

Walk Time: [1.000] s (0~100s | 2 ms)

Hold Time: [1.000] s (0~100s | 2 ms)

Walk Type: Linear

Delay Time: [50] ns (~2ms | 50 ns)

Keeper (PI)

ON/OFF: OFF

Count: [1]

Delay: [50] ns (~2ms | 50 ns)

Interval: [50] ns (~2ms | 50 ns)

(PO)

ON/OFF: OFF

Count: [1]

Delay: [50] ns (~2ms | 50 ns)

Interval: [50] ns (~2ms | 50 ns)

SET GET

YGS (Velocity-Gate Stealing)

Mode: YGPO

Doppler Freq.: [20,000] KHz (0~300KHz | 20 Hz)

Dwell Time: [0.000] s (0~100s | 2 ms)

Walk Time: [0.000] s (0~100s | 2 ms)

Hold Time: [0.000] s (0~100s | 2 ms)

Walk Type: Linear

SET GET

Cover Pulse

Count(Multi): [2] (2~32 | 1)

Count (Multi Prev.): [0] (0~5 | 1)

Time: [1000] ns (~200us | 50 ns)

Time(Prev.): [0] ns (0~5us | 50 ns)

Mode: Multiple

Pulse Width: [1000] ns

SET GET

Angle Deception

Width: [0] dB (0~40dB | 1 dB)

Scan Period: [1.000] s (1~100s | 2 ms)

Freq.(Max): [1] Hz (1~500Hz | 1 Hz)

Freq.(Min): [1] Hz (1~500Hz | 1 Hz)

Duty Cycle: [0] % (0~100 | 1)

Type: Square Wave (Time & Atten)

Mode: Mode 1 (Time)

Pulse Count: [1] (1~3 | 1)

Atten Duty: [0] % (0~100 | 1)

SET GET

False Target

Count(Prev.): [0]

Count: [3] (1~255 | 1)

Interval: [2000] ns (~2ms | 50 ns)

Pulse Width: [0] ns

SET GET

Log

Time	Message

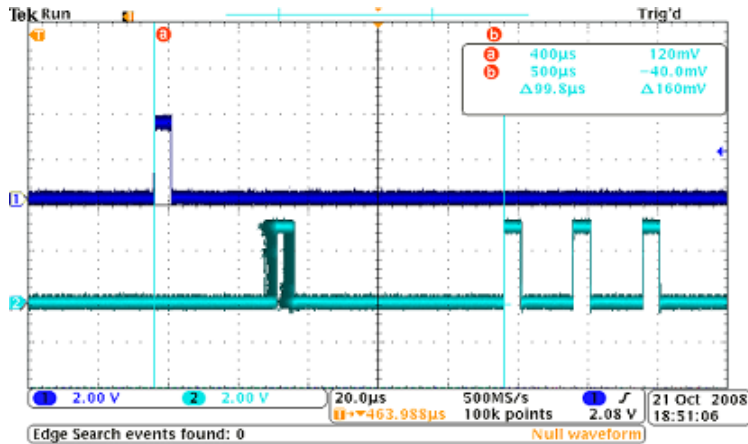
CLEAR

에이스웨이브텍(주)
AWT Co., Ltd.

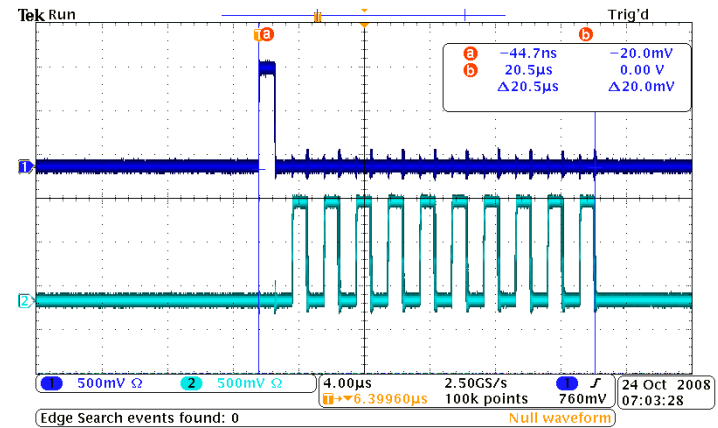
Technique Signal generated by RTS



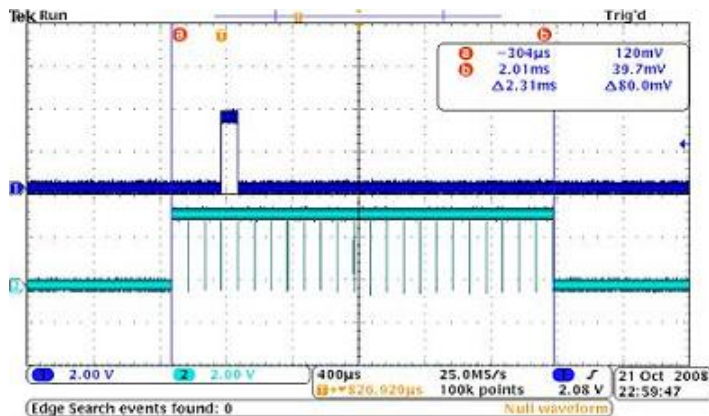
1. RGS



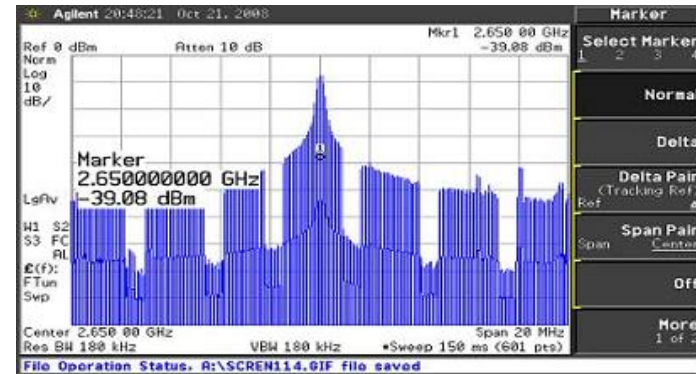
2. MFT



3. Cover Pulse



4. Angle Deception



4. Noise Jamming

