AOR®

Authority On Radio Communications

SINCE 1978

AR5700D

DIGITAL COMMUNICATIONS RECEIVER

TETRA   DMR   NXDN   D-STAR   DPMR
APCO 25   YAESU   ALINCO   D-CR

Quality Made in Japan!

- ● 9kHz - 3.7GHz
- ● Analog + digital modes
  (TETRA, DMR, NXDN, D-STAR, DPMR, APCO 25, YAESU, ALINCO, D-CR)
- ● 0.01ppm frequency stability with optional GPS unit
- ● Digital I/Q output & AR-IQ-III software comes standard
- ● High performance spectrum scope via PC
- ● 15MHz wide IF output to connect to external IF recorders, signal and spectrum analyzers
- ● 10MHz reference input
- ● Full control command set for system integrators
- ● Optional Ethernet controller

A HIGH-PERFORMANCE COMMUNICATIONS RECEIVER FOR COMMERCIAL AND GOVERNMENTAL APPLICATIONS.

Your wide-band signal detection, monitoring, voice decoding, recording and playback solution!
The AR5700D is a super wideband 9 kHz to 3.7 GHz digital communications receiver that enables you to hear a wide variety of digital and analog signals. Not only does it decode more digital signals than any competing product, but also the unique 3 cores FPGA processing technology implemented provides powerful processing of digital demodulation.
With its I/Q output and AR-IQ-III software supplied as standard, besides PC control you can also record and playback a full 0.9MHz of bandwidth, with no loss of quality!

Outstanding Performance

9 kHz to 3.7 GHz Super Wideband Coverage

The AR5700D decodes many digital protocol signals such as TETRA, DMR, NXDN, D-STAR, DPMR, APCO 25, YAESU, ALINCO, D-CR, and of course receives traditional analog signals such as FM, FM-stereo, AM, synchronous AM, USB, LSB, CW, analog I/Q and FM video, in tuning steps from 1Hz to 999.999kHz.

A power house of CPUs, DSPs and FPGAs!

The AR5700D is fitted with no less than four RENESAS SH2 CPUs, three ANALOG DEVICES Blackfin DSPs, one ANALOG DEVICES ADSP-2185 DSP, and four INTEL (ALTERA) Cyclon FPGAs for powerful signal processing, demodulation and decoding. Direct conversion HF signals and intermediate frequency signals are digitized by a 14-bit A/D converter and sent to the FPGA and DSP units for fast and accurate processing. The high-rate 63/65 MHz sampling frequencies used for the A/D converter offer superior aliasing and image reduction.

| ×2 | ×3 | ×1 | ×2 | ×2 |
| SH2 CPU by Renesas | Blackfin DSP by Analog Devices | ADSP-2185 DSP by Analog Devices | Cyclone IV FPGA by Intel | Cyclone III FPGA by Intel |

Accurate Signal Strength Indicator & Carrying handle

Accurate Signal Strength Indicator

The AR5700D shows very accurate signal strength values, in S-units, dBm and dBuv units. As it is measured at the antenna input, the displayed level does not change when the attenuator or AMP is used. AR5700D also features a high-quality and easy to read traditional "analog" S-meter.

Carrying handle

With its low weight of 5kg and its robust carrying handle, AR5700D is fully transportable.
The handle can easily be mounted on either side of the receiver, or unscrewed if the receiver is to be rack mounted.

Robust Receiver Performance

The AR5700D has a total of 33 bandpass filters to let only the desired signal pass, while blocking other unwanted strong interference signals. The AR5700D provides +20 dBm IIP3 at 14.1 MHz. IIP3 performance is +6 dBm at 50 MHz and +5 dBm at 620 MHz.

Numerous and Flexible Memory Channels

The AR5700D has 2000 memory channels (50 channels x 40 banks), 40 search banks, a whopping 1230 pass frequencies and 100 select channels. You can even customize the size of each bank from 5 to 95 channels.

Variety of Scan Functions

The typical scanning speed is 100 channels per second. Several different scan functions are provided to fit your specific needs:

■ **Scan mode:**

Searches the memory channels previously registered in a memory bank. Up to 20 separate scan "groups" can also be created to scan a group of linked memory banks.

■ **Search mode:**

Tunes the receiver through all frequencies between two specified frequency limits. 40 different search banks can be programmed. Up to 20 search groups can be created to search a group of linked search banks.

■ **Cyber search mode:**

Uses FFT technology to achieve faster search speeds by looking simultaneously at all frequencies between LOW and HIGH, with a signal level above the set squelch level.

■ **VFO search mode:**

Quick and convenient way to search frequencies between two VFOs.

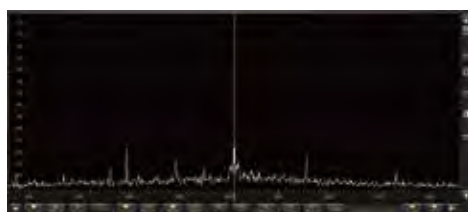■ **Priority reception mode:**

Check for activity on one of the 2000 memory channels, while the receiver continues scanning, searching or monitoring.
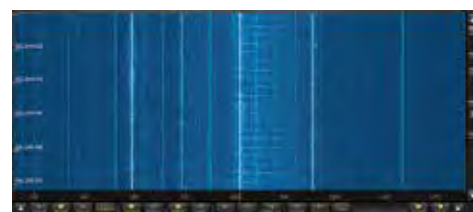
AR-IQ-III software

The AR-IQ-III software allows receiver control, I/Q recording and playback for your AR5700D receiver. The digital I/Q output interface streams I/Q data to the PC through USB2.0 isochronous mode, at 72Mbit/sec with a sampling rate of 1.125Msample/sec. Compared to a regular AF, which only allows recording one frequency at a time, I/Q allows you to store and playback a full 0.9MHz bandwidth with no loss of quality! This 0.9MHz bandwidth can be anywhere within the receiving range of the receiver. Off-line, you can listen and decode within the recorded 0.9MHz range, tuning any frequency as you would in real time. You can even loop a particular time frame to listen repeatedly to a signal received in difficult conditions, or search for and analyze hard to catch signals bursts.

AR-IQ-III interface

Main spectrum view

Waterfall view

SPECIFICATIONS FOR AR5700D COMMUNICATIONS RECEIVER

Frequency range	9kHz～3.7GHz
Operation modes	VFO(A～E),memory channel,memory channel scan,select scan,program search, FFT search (cyber search), analog video demodulation
Analog receive modes	FM,FM-stereo,AM,synchronous AM,USB,LSB,CW,analog I/Q,FM video.
Digital receive modes (encrypted signals not supported)	D-STAR / GMSK / AMBE DV mode only
	YAESU / C4FM / AMBE+2 V/D narrow mode only
	ALINCO / GMSK / AMBE EJ47 (F1E) mode only
	D-CR / C4FM / AMBE+2
	NXDN / C4FM / AMBE+2 6.25kHz mode only
	P25 Phase 1 / C4FM / IMBE Conventional mode only
	dPMR / C4FM / AMBE+2 Tier 1 only
	DMR / C4FMx2 / AMBE+2 Tier 1 and Tier 2 only
	TETRA direct mode (T-DM) / π/4 shift QPSK / ACELP
	TETRA traffic channel (T-TC) / π/4 shift QPSK / ACELP
Memory channels	2000 (50 channels x 40 memory banks). Banks customizable from 5 to 95 channels.
Priority channel	1
Select memory channels	100 (via memory banks)
Search banks	40
Pass frequencies	1230(30 per memory bank + 30 for VFO search)
Typical scanning speed	100 channels / steps per second (for analog modes)
Temperature range	0℃～+50℃ (32°F～122°F)
Frequency stability	0.1ppm (after 5 min. warm-up) or 0.01ppm with optional GPS unit.
Power requirements	DC10.7V～16V (2.0A@12V)
Audio output	>1.5W into 8Ω load
Current consumption	Stand-by: Approx. 200mA, Max. audio: Approx. 1.8A
Dimensions	Approx. 304mm(D)×220mm(W)×97mm(H) (excluding projections)
Weight	Approx. 5kg
Circuit type	9kHz～25MHz: Direct conversion
	25MHz～3.7GHz: Double super heterodyne
Selectivity (typical values)	CW 500Hz 380Hz(>-3dB) 500Hz(<-60dB)
	AM 6kHz 5.5kHz(>-3dB) 6.9kHz(<-60dB)
	SSB 3kHz 2.7kHz(>-3dB) 3.1kHz(<-60dB)
	NFM 15kHz 14.2kHz(>-3dB) 15.6kHz(<-60dB)
	WFM 200kHz 200kHz(>-3dB) 250kHz(<-60dB)
IIP3(typical values)	14.1MHz +20dBm Preselector off
	50MHz +6dBm Preamp off
	620MHz +5dBm Preamp off
	1250MHz +3dBm Preamp off
	2450MHz +3dBm Preamp off
Spurious rejection (typical values)	40kHz～25MHz >60dB Preamp off
	25MHz～2GHz >60dB Preamp off
	2.0GHz～3.7GHz >60dB Preamp off
Noise figure (typical values)	25MHz～1GHz <12dB Preamp off
	1GHz～2.75GHz <16dB Preamp off
	2.75GHz～3.7GHz <16dB Preamp off

Sensitivity	SSB 10dB S/N 3kHz	AM 10dB S/N 6kHz	NFM 12dB SINAD 15kHz	WFM 12dB SINAD 200kHz
40kHz ～ 50kHz	<6.0μV	<15.0μV		
50kHz ～ 60kHz	<4.0μV	<10.0μV		
60kHz ～ 80kHz	<3.0μV	<7.0μV		
80kHz ～ 100kHz	<1.5μV	<4.0μV		
100kHz ～ 25MHz	<0.7μV	<2.0μV		
25MHz ～ 2.75GHz	<0.5μV	<1.0μV	<0.4μV	<1.5μV
2.75GHz ～ 3.7GHz	<0.7μV	<1.7μV	<0.6μV	<3.5μV

Simultaneous reception:	(analog modes only)
Dual band reception	One frequency below and one above 25MHz.
Offset reception	Main frequency + sub-frequency within +/-5MHz from main frequency. Over 25MHz only.
Triple reception	Combination of one HF frequency + offset reception

Inputs & outputs:	
Antenna inputs(ANT1)	25MHz～3.7GHz N-J socket 50Ω
(ANT2)	9kHz～3.7GHz N-J socket 50Ω
10MHz reference input	SMA-J socket
	Typical input +2dBm, 50Ω
45.05MHz IF output	BNC-J socket, 45.05MHz±7.5MHz
	Typical output: Antenna input + 10dB, 50Ω
Digital I/Q output	0.9MHz bandwidth via USB 2.0 compatible isochronous transfer. Use supplied PC software AR-IQ-III. USB type B socket
Analog I/Q output	12kHz offset output via 3.5mm stereo phone socket Mode: AIQ, via LINE socket
LINE output	3.5mm stereo phone socket. -10dBm (600Ω)
Headphones output	3.5mm stereo phone socket
External speaker output	3.5mm mono phone socket. (8Ω)
(ACC1)	8-pin miniature DIN socket for optional GP5001 GPS receiver unit.
(ACC2)	RJ-45 socket for optional antenna selector
(AUX1)	RS232C, 9-pin D-subminiature (male). For firmware updates and remote control per PC.
(AUX2)	8-pin miniature DIN socket for future applications.
USB	USB 1.1/2.0 compliant, USB type B socket. For remote control per PC.
Analog video out	RCA socket, 75Ω 1V p-p

Supplied accessories:
AC power adapter, SD card, operating manual, PC control software with license dongle, two USB cables.

Specifications are subject to change without notice nor obligation.

OPTIONS

●HRE5001 19inch rack
EIA standard 19-inch rack mount. Front panel fitted with external speaker and handles.

●ARL2300 Ethernet adapter
Remote control the receiver and listen via a network. Java based client software supplied.

●GP5001 GPS receiver
Improves the frequency stability from 0.1ppm to +/- 0.01ppm, by using the GPS pulse signal for an accurate time base of the local oscillator circuit.

●AS5700 Antenna selector
Low loss automatic antenna switch which adds inputs 3 and 4.

FEATURE COMPARISON

	AR-DV1	AR5700D	
FREQUENCY RANGE	100kHz-1.3GHz	9kHz-3.7GHz	
FPGA SIGNAL PROCESSING	1 CORE	3 CORES	Parallel processing of digital demodulation.
DSP	1 CORE	4 CORES	More cores allow faster digital signal detection.
FREQUENCY ACCURACY	2.5ppm	0.1/0.01ppm	0.01ppm with optional GPS unit.
I/Q OUTPUT	×	✓	AR-IQ-III software made by Microtelecom s.r.l. supplied as standard.
ANALOG IF OUTPUT	×	15MHz wide	To connect to external IF recorders, signal and spectrum analyzers.
10MHz REFERENCE INPUT	×	✓	
SIMULTANEOUS RECEPTION	×	3	Dual band, offset and triple reception modes (limitations apply).
REC TO SD	Audio only	Audio + logs	Access logs and playback related audio files with special PC utility
AGC (hardware)	Automatic	×	Not needed as excellent IIP3 figures provide very high linearity.
SIGNAL STRENGTH READING	Only relative values due to AGC	Direct antenna reading	
LOCAL OSCILLATOR	VCO + PLL	DDS	High speed frequency switching thanks to excellent C/N characteristics.

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Specifications and designs are subject to change without notice or obligation.
As per FCC rules, the US consumer versions have cellular frequencies blocked and the analog voice descrambler function deactivated by hardware. These restrictions are final and cannot be reversed by firmware change nor command input.
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