TECHNICAL DATA

Type of receiver/radar	coherent on receive with MTI
Frequency range	150-170 MHz
Intermediate frequency	10.7 MHz
optionally	21.4 MHz
Noise figure	2.8
Dynamic range	80 dB
Sensitivity	–113.5 dBm for: Pd=0,9 (probability detection) Pfa =10^{-6} (false alarm probability)
COHO	digital, based on phase prediction in processing algorithm
Sampling rate (variable)	32.1 to 80 MSamples/s with resolution of 14 bits
Sampling rate at the digital IF block output	0.8 MSamples/s
IAGC	controllable
Number of DSP processors in digital LF block	5 or using IRITEL FPGA platform
RF protection of receiver	limiter with protector
Intentional and unintentional interference protection	by software reconfiguration
Output signals	linear (LIN) video signal logarithmic (LOG) video signal video trigger pulse

Output signal levels (connection with extractor and video indicator)	
video signals	–0.7 V to 6 V
trigger	0 to 5 V
Selection of digital clutter cancellation type	realized by software reconfiguration with option to turn off MTI function

SOFTRAD

IRITEL FPGA evaluation and development platform upgrade of VHF DR/P-12/18

- PCI 2.2 compatible
- FF1152 Xilinx Virtex-II FPGA, up to eight-million gates
- 2 x 105 MSPS 14-bit A/D converters
- 2 x 150 MSPS 14-bit D/A converters
- Programmable clock solution
- Two expansion 80-pins ports, TI daughter card expansion specification compatible
- DIMM 184 DDR SDRAM slot (up to 1 GB)

Analog block of receiver

SOFTRAD platform

IRITEL BEOGRAD

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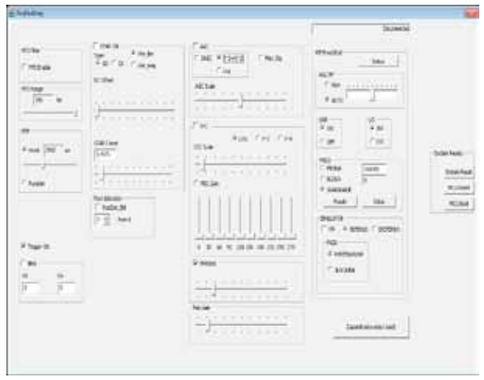
Radio Communications

VHF DR/P-12/18
DIGITAL RADAR RECEIVER

- Reception and processing of radar signals in 150-170 MHz range
- Software reconfiguration of the receiver based on the software radar concept
- Remote control applications
- Universal solution for P-family of radars P12/P14/P15/P18
- IRITEL FPGA platforms upgrades of VHF DR/P-12/18 (SOFTRAD/Virtex II and Spartan 3)
- Keystone for P-family of radars modernization



IRITEL bright connections

TELECOMMUNICATIONS AND ELECTRONICS
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Application

VHF DR/P-12/18 is the digital radar receiver developed for the replacement of existing P-12/18 radar receivers with software defined receiver which has better performances. It is intended for reception and processing of radar signals in 150-170 MHz range.

VHF DR/P-12/18 can be easily adapted for other types of radars by modification of only analog RF block.

Optionally, remote control applications are included:

- Remote control of digital radar receiver VHF DR/P-12/18
- Signals forwarding from receiver VHF DR/P-12/18 to digital indicator on separate location

Remote control of P-12/18 radar shelter (with mounted VHF DR/P-12/18) is realized via the optical cable at distances from 100 to 500 m by using optical line terminals - optical transmitter and receiver of IRITEL production program.

The receiver supports multi static operating mode.

Configuration

Digital radar receiver VHF DR/P-12/18 contains:

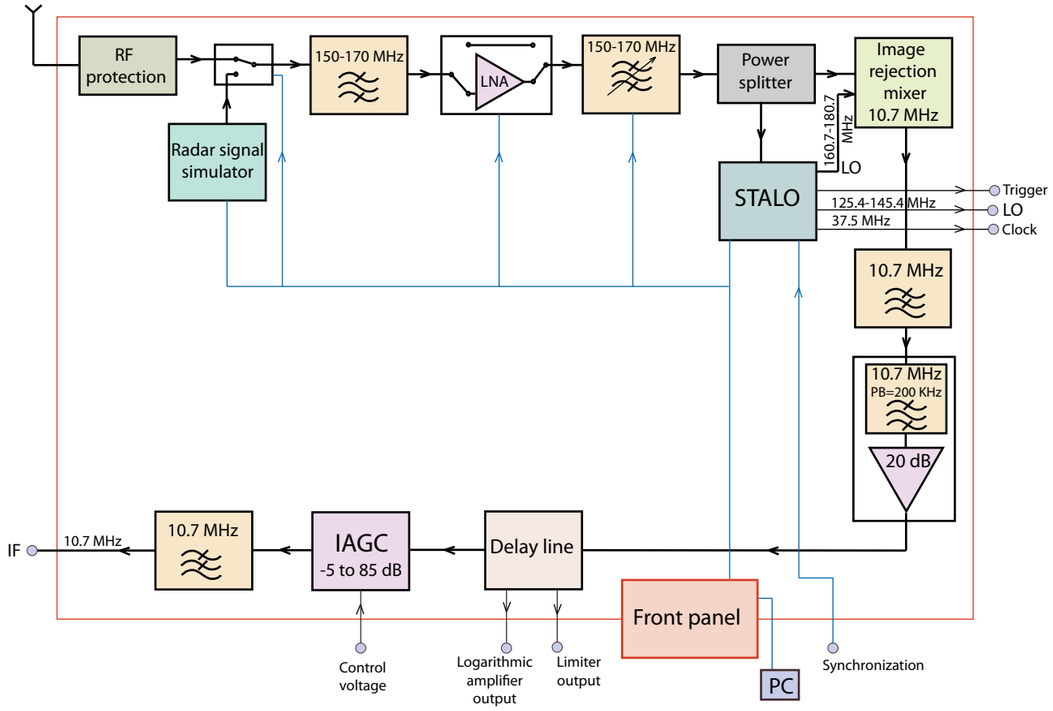
- Analog RF/IF block mounted in rack (width 19" and height 2H) with intelligent front panel (keyboard and display)
- Digital IF/LF block mounted in rugged central computer, type PC ADVANTECH (also in 19" shock-absorbed rack)

Analog block of receiver

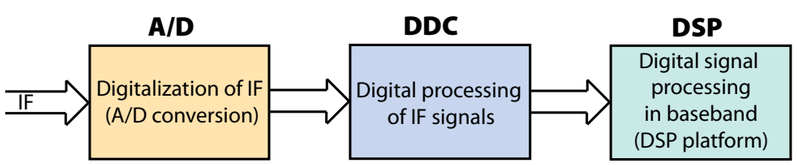
- RF limiter for receiver protection from high level input RF signals during emissions
- RF passband filter for 150-170 MHz

- Low-noise RF amplifier

Analog block of receiver



Digital block of receiver



- Adjustable RF filter RFVAR
- Local oscillator with automatic adjustment to the transmitted signal frequency (STALO)
- Image Rejection Mixer
- IF passband filter at 10.7 MHz

- IAGC amplifier

- Delay line

- Radar signal simulator for receiver testing

Digital block of receiver

A/D Module

- A/D conversion of IF signal

DDC Module

- Extraction of I, Q signal components
- Decimation
  - decrease of sampling rate
  - filtering

DSP Module

- Calculation of radar echoes phase based on the memorized transmitted pulse phase
- Calculation of radar echoes amplitude based on the AGC setting
- Echoes matrix creation of N transmitted pulses
- MTI filter (clutter cancellation)
- CFAR algorithm

Digital radar receiver VHF DR/P-12/18