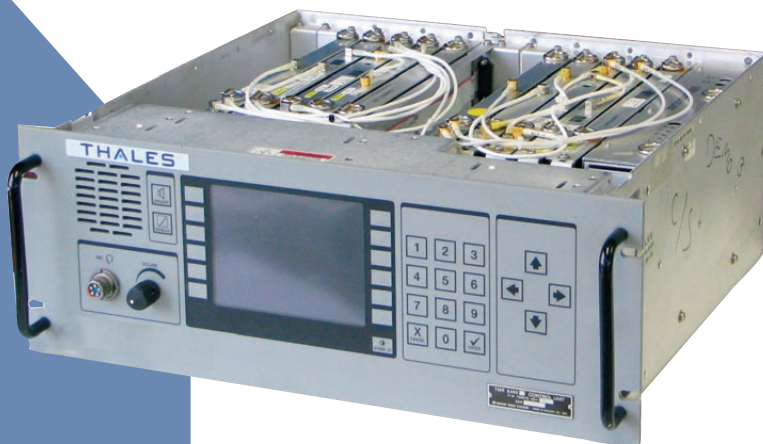




TMR6100

HF Naval Digital Receivers



- Compact Design – Single or Dual Channel High Performance Receiver in a Single 4U/19-Inch Chassis
- Outstanding RF Performance Optimized for Severe Co-site Operation
- Multimode Operation Compatible with All Current Naval Standards
- DSP Technology and Built-in High Selectivity Pre-Selector
- Automatic Scanning of Channels and Frequencies
- Wide Range of Remote Control Facilities
- High MTBF and Comprehensive Bite

Series 6000—High Performance, Compact, Naval HF System Solutions.



TMR6100

HF Naval Digital Receivers

In keeping with all equipment in the Series 6000 HF naval range, the TMR6100 receivers are designed to meet the ship-shore and ship-ship multimode communication requirements of the naval environment.

Ideally suited for use on submarines and on surface ships, from patrol boats to aircraft carriers, TMR6100 receivers can operate independently or within a totally integrated end-to-end naval communications system offering voice, data and facsimile high-speed transfer capability.

STATE-OF-THE-ART TECHNOLOGY

TMR6100 receivers are digital, microprocessor controlled, synthesized units that employ Digital Signal Processing (DSP) technology for cost-effective and highly-flexible solutions in complex HF naval communications systems.

DSP technology offers a flexible, programmable approach to narrow band filtering and baseband signal processing for all modes of operation, including Independent Sideband (ISB).

An embedded agile pre-selector with 25 dB attenuation at $f \pm 5\%$ provides the outstanding RF performance necessary for operation in severe co-site situations.

A MODULAR DESIGN

Series 6000 radio functions (receiver, exciter/receiver, exciter) are based on a common set of modules plugged into a 4U chassis. The chassis can accommodate either a passive front panel or a flexible and user-friendly operator front panel. TMR6100 receivers are available in single or dual configurations (one or two receiver functions in one chassis).

MAINTAINABILITY

All modules are plug-in screened assemblies that can be quickly removed and replaced. Each module contains extensive built-in-test (BIT) circuitry allowing modules to be tested in situ. On-board maintenance consists of simple replacement at module level.

REMOTE CONTROL FACILITIES

Each Series 6000 radio function includes RS-485 and RS-232 interfaces.

The RS-485 bus provides a built-in multi-addressing capability of up to 99 slaved radio functions controlled by (1) the operator front panel of the Series 6000 radio, (2) the Series 6000 remote control unit (identical to the radio front panel), or (3) the Thales PC hosted, PC6000 Control Software.

Additionally each radio function can be connected to and managed by an external ALE/frequency hopping controller.

GENERAL

Frequency Range

- 10 kHz to 30 MHz in 1 Hz steps

Tuning Time

- < 20 ms to within 20 Hz

Frequency Accuracy

- Standard TCXO 3 parts in 10^7 ($0^\circ\text{C} - 35^\circ\text{C}$)
- Optional high stability frequency reference (OCXO) in accordance with STANAG 5511 (Link-11) 10 MHz external frequency standard output
- External frequency input: 0.1, 1, 5 or 10 MHz
- Level between -13 dBm and +13 dBm

Modes of Operation

- CW A1A, A1B
- MCW A2A, A2B
- AM A3E, H3E
- FAX F1C, F3C
- FSK F1A, F1B, F2B
- USB/LSB H2A, H2B, J2A, J2B, J3E, R2A, R2B, R3E
- ISB B7B, B8E, B9W
- MIL-STDs MIL-STD-188-110B, MIL-STD-188-141B (App A), MIL-STD-188-203 (Link-11)
- STANAGs 4197, 4198, 4203, 4285, 4529, 4538, 4539, 5066, 5511, 5514, 5522 compatible

Channel Store

- 1000 channel. Parameters stored in non-volatile memory include frequency, mode, IF filter, AGC and BFO

BITE

- Automatic detection to module level

RECEIVER

Sensitivity

- LSB, USB, ISB: A signal of - 113 dBm ($1 \mu\text{EMF}$) in a 3 kHz bandwidth gives an (S+N)/N of 10 dB for the frequency range 0.1-30 MHz. The corresponding noise figure is 16 dB. High sensitivity position also available

AGC

- < 3 dB change in output for input signals between -103 dBm and +13 dBm
- Attack time: 10 ms
- Decay time: fast, medium, slow-compatible with all modes
- Fully compliant with Link-11

IF Filter

- The equipment has digital filters with the following bandwidths (symmetrical or nonsymmetrical) 0.3 kHz, 1.1 kHz, 2.3 kHz, 2.4 kHz, 2.75 kHz, 3.1, kHz, 5 kHz, 6 kHz

BFO/RIT

- BFO Tunable ± 8 kHz in 10 Hz steps
- RIT Tunable ± 3 kHz in 1 Hz steps

In-band Intermodulation Products

- In SSB and in ISB modes, for two 141 mV EMF carriers, resulting in audio outputs at 1100 Hz and 1700 Hz, all intermodulation products and harmonics are 50 dB or more below each tone

Out of Band Intermodulation Products

- Between 1.5 MHz and 30 MHz for two equal signals removed from the tuned frequency by 5 and 10%, the 3rd order intercept point is +55 dBm



Cross Modulation

- A 30% modulated unwanted signal A3 (400) removed by at least 20 kHz from a wanted signal of 1.0 mV EMF can have a level up to 700 mV EMF before 3% cross modulation occurs

Blocking

- A -53 dBm wanted signal is not compressed by more than 1 dB by an interfering carrier of +6 dBm removed by not less than 20 kHz from the tune frequency

IF Rejection

- The rejection of all IF frequencies is 100 dB or more below the wanted signal (1.5 to 30 MHz)

Image Rejection

- The rejection of both the first and second image frequency is >100 dB below the wanted signal

Spurious Rejection

- At frequencies more than 20 kHz from the tuned frequency, the spurious signal rejection is at least 80 dB
- >105 dB at frequencies >5% from the tuned frequency

Internally Generated Spurious

- Fewer than 50, 3 kHz channels have spurious levels above -121 dBm referred to the input in the range 100 kHz to 30 MHz
- No channels have spurious responses above -112 dBm

Mute and Desense

- Typically 126 dB minimum 110 dB of desense is available in less than 2 ms. Resensitization occurs typically in less than 4 ms

Scan Mode

- Channel scan between designated channels with selected dwell time on each channel (0.1 to 9.99 s). Scanning may be stopped on detection of a signal above a programmable threshold. The receiver has a tape recorder activate line when a signal is detected

Metering

- RF level indication available

INTERFACES

(Interfaces with * are duplicated in a dual receiver)

Antenna Input*

- Input impedance: 50 Ohms nominal. No damage is caused by input signals up to 100 V EMF from a 50 Ohms source at any frequency between 60 kHz and 30 MHz with the power supply connected or disconnected

Antenna Radiation

- The level of any discrete frequency component radiated in the range 0 - 100 MHz measured into 50 Ohms does not exceed -87 dBm

IF Output*

- 452.5 kHz IF output with 10 kHz bandwidth

AF Outputs*

- One line output for each sideband. Level adjustable -20 dBm to +10 dBm into 600 Ohms balanced
- User facility to switch the two lines

Sidetone Inputs*

- One line input for each sideband. Level adjustable -20 dBm to +10 dBm into 600 Ohms balanced

Tape Recorder Interface*

- Contact closure when signal exceeds programmed threshold

Remote Control*

- One single RS-485 addressable bus (up to 99 radios or control units)
- Data rate selectable from 300 to 38,400 bits/s Asynchronous interface
- RS-232 serial point-to-point control interface also available

Power Supply

- 85 to 132 V and 170 to 264 VAC, 47 - 63 Hz auto-ranging

MISCELLANEOUS

Temperature Range

- MIL-STD- 810E
- Methods 500.3, 501.3, 502.3
- Operating: -5°C to +50°C
- Storage: -30°C to +70°C

Humidity

- MIL-STD- 810E Method 507.3 88% at 40°C

Vibration

- MIL-STD- 810E cat 9 Random vibration

Shock

- MIL-STD 901D. 30 g, 25 ms

MTBF

- MIL-HDBK-217F at 25°C NS
- >3,800 hrs to 7,600 hrs dependent on configuration

Size

- 7 x 19 x 18 inches (178 H (4U) x 483 W x 460 D mm)

Weight

- 28.6-41.8 lbs. (depending on the configuration) (13 kg-19 kg)

Options

- Single or Dual receivers in 4U chassis
- Operator/Passive Front Panel
- High Stability Frequency Standard





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HF Naval Digital Receivers



Thales Communications, Inc.

22605 Gateway Center Drive, Clarksburg, MD 20871
Toll-Free: 1.800.258.4420 | Phone: 240.864.7000 | Fax: 240.864.7920
E-mail: naval.maritime@thalescomminc.com
Website: www.thalescomminc.com

