



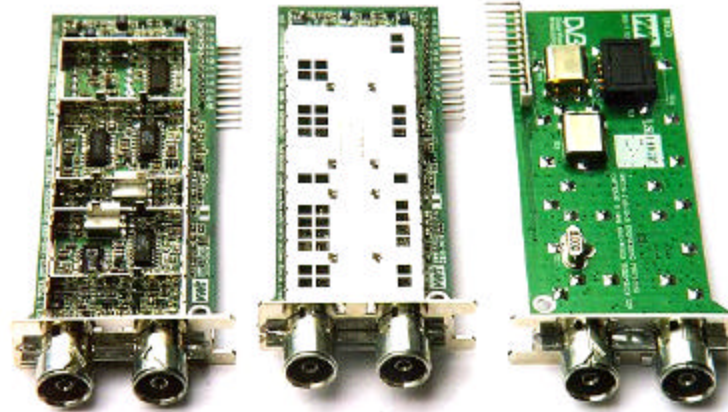
Product design update from RWT for
Cable & Satellite Mediacast, May 1999, London

Release 17th May 1999

Digital Terrestrial Television (DTT/DVB-T) Tuner

RWTUN-2100 series

Vertical mount variant illustrated, horizontal also available



Real-World Technology Ltd., the UK's tuner design specialist, is proud to present the world's first DTT tuner designed for manufacture as an integral component of the digital TV, VCR or Set-Top Box. This triple-superhet design has the supreme advantage of delivering performance exceeding the stringent DVB requirements for 64-QAM 2k/8k COFDM modulation in an adjacent-channel PAL environment, while requiring absolutely zero alignment, all at a parts cost of around \$10.

The **RWTUN-2100** tuner was originally developed under contract to **LSI Logic™** in support of the L64780/81 single-chip COFDM demodulator program, with the assistance of **BBC R & D**. The tuner design is now available for licensing by RWT to receiver manufacturers. Many of the interference and overload problems suffered by existing set-top boxes will be eliminated by use of the RWTUN-2100. In lab and field tests the tuner has consistently outperformed those in current set-top boxes from the major manufacturers, in the key areas of phase noise, sensitivity and adjacent-channel protection ratio.

Performance advantages of RWT-2100 versus off-the-shelf DTT tuners:

- Noise Figure 5dB (typical)
- Sensitivity (64 QAM mode) -80dBm (typical)
- Adjacent-channel PAL protection ratio -43dB (typical)
- 4 MHz tuning step with vernier offset enhances phase noise performance
- Available with 3-wire or I²C serial bus control
- No tracking filter – fixed IF filtering ensures constant flatness and image rejection
- Optional analogue AFC enables adaptive centring of ensemble in channel filter
- On-board NZIF filtering (optional) enhances adjacent-channel NICAM rejection
- Absence of wound inductors from RF circuits effectively eliminates microphony

RWTUN-2100 selected for professional receiver:

- the BBC has chosen the RWT tuner for its RC3S/506A professional DTT monitoring receiver. This is now being manufactured under licence by Broadcast Technology Ltd.

Your products too can have professional performance at a consumer price!

See over for specification ⇒

Call **RWT** at (UK) **01629 815070**, Fax **01629 815071**, Email **mediacast@rwt.co.uk**



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RWT Web site: <http://www.rwt.co.uk>



Principal performance features at a glance: (provisional specification)

Input Frequency Range :	470-860 MHz min
Noise Figure:	5.5 dB max
Input third-order intercept point:	+ 12 dBm min
I.F. Bandwidth	7.61 MHz nominal
Offset support:	± 167 kHz (or will customise)
Output frequency:	4.571 MHz ±10 kHz (AFC off)
Output level:	- 10 dBm into 75Ω (or custom)
AGC range:	70 dB min (external control)
AFC range (optional analogue AFC):	± 100 kHz typ
Image Channel Carrier Rejection:	70 dB min
Adjacent Channel Carrier Rejection ($n\pm 1, f_V, f_S, f_N$):	70 dB min
Adjacent Channel PAL-I(1) Protection Ratio ($n\pm 1$):	- 40 dB min
SSB Phase Noise (overall): at offset	- 80 dBc/Hz max
1 kHz:	- 91 dBc/Hz max
10 kHz:	- 102 dBc/Hz max
100 kHz:	- 102 dBc/Hz max
1 MHz:	- 128 dBc/Hz max
Tuning interface options:	3-wire or I²C bus
Power supply requirement:	+5V 480mA, +28V 2mA typ
Dimensions (over coaxial connectors and front panel, but excluding mounting lugs):	119.00 x 42.70 x 15.24 mm

Advantages of taking out an RWTUN-2100 manufacturing licence:

- Bill-of-Materials cost estimate \$10 (based on 1M units per annum)
- You build it - no dependence on external supplier for tuner module
- Can be built as daughter module or fully integrated into motherboard layout
- Uses conventional 2-layer FR4 PCB - no special substrate required
- Production-ready design - bypasses in-house tuner development process
- Requires no RF lab or previous tuner experience
- Zero-alignment design means tuner meets specification at first switch-on
- Availability of RWT resources for rapid reconfiguration if required by market shifts

About RWT

Real-World Technology has specialised in set-top box tuner design for over 12 years. The company was established in 1978 and incorporated in 1987. Founder and Managing Director **Stephen J Birkill**, with 15 years BBC broadcast experience, was one of the first to demonstrate direct-to-home satellite TV in 1975, using equipment of his own design, and as a consultant went on to influence the adoption of pioneering technologies (block conversion, phase-lock loop demodulation, the 90-degree scalar feed horn) by the newly-emergent US home TVRO industry during 1978 through 1983. Birkill then spent four years as Technical Director of **Satellite TV Antenna Systems Ltd.** (SATVRN), Britain's first commercial satellite TV receiver manufacturer, before leaving to concentrate on RWT.

RWT's first licensed tuner designs were built by **Wolsey Electronics**, for their **BSB** (D-MAC) SMATV unit, and later the *Starlet* Astra receiver. In 1988 RWT began a nine-year relationship with UK receiver manufacturer **Amstrad**, and, working closely with **Sky Television** and **SES Astra**, helped define the specifications of the Astra DTH system with which Sky (now **BSkyB**) launched their service in 1989. The first Astra-specific receivers, Amstrad's **SRX100/200**, and later the first **VideoCrypt** IRD **SRD400**, featured tuners and signal circuitry to RWT's design, helping the Essex-based company achieve over 70% market share during the first few years of the Astra service.

Amstrad's licensed use of RWT designs demonstrated the advantages of in-house tuner manufacture. The tuners were built by Far-Eastern subcontractors, at first in Japan and later in mainland China, for around half the cost of a bought-in tuner, and with improved performance. By the time Amstrad's analogue receiver production ceased in 1997, over **6 million** RWT-designed units had been built. Today RWT's design labs are established in a converted farmhouse in the Derbyshire Dales.

The Licensing Philosophy

The **RWTUN-2100** is RWT's first venture into the **Digital Terrestrial** field. We are exploiting the design using the same business philosophy developed for satellite. RWT will not itself manufacture the tuners, beyond the initial engineering prototypes. Instead we will enter into agreements with receiver manufacturers who wish to build their own tuners, we will customise the designs if necessary and supply complete manufacturing data and such assistance as may be required to initiate the production process, in return for an initial customisation/development fee and a subsequent small royalty or commission payment on every unit sold. Please feel free to contact us also about your satellite or cable tuner requirements.