Revolutionary DDS principle for local oscillator
- Dual-stage tuning front end easily handles high signal levels
- High-performance “Advanced DGL” FM detector
- DS-DC achieves ideal stereo demodulation with DSP technology
- FREQ.TRIM function reduces adjacent station interference
- 32 station memories also store reception settings
- Pulse tuning principle
- Digital output connector
- Balanced outputs
- Supplied remote control
Witness the DDS revolution – Advanced RF technology and latest digital know-how join forces in this ultimate FM stereo tuner. The front end easily handles even very high signal levels. An “Advanced DGL” Detector delivers high performance and is fully adjustment-free. DS-DC based on digital signal processing assures ideal stereo demodulation performance. Choose between manually operated pulse tuning and 32-station memory. Explore the many other impressive features.

The range of available program sources is getting ever more varied: SA-CD, CD, DVD, net-based music distribution, to name but a few. But FM broadcasts still have a special role to play, since they cover the entire spectrum from live performances of time-honored classical works to the latest hits. The FM band provides a rich choice of music all day long. In recent years, many local stations have come onto the scene, covering community events and using the live broadcast medium to its best advantage.

Many audiophiles and music lovers were wishing for the re-appearance of a truly high-class tuner to complement a modern-day audio system and provide the means to enjoy FM broadcasts with optimum sound quality. By developing new circuit components and applying its innovative thinking to circuit topology, Accuphase has created a product that meets and exceeds these expectations. The T-1000 is an FM stereo tuner of the highest order. It represents a bold fusion of advanced RF technology with latest digital finesse.

The newly developed front end employs the revolutionary DDS (Direct Digital Synthesis) principle in the local oscillator. In addition, the DS-DC type stereo demodulator performs all necessary operations through software-based arithmetic processing in a DSP microprocessor. This radically new approach to circuit design results in amazing S/N ratio and channel separation, elevating FM tuner performance to a new level. Convenient features such as a 32-station memory, digital output, and balanced output circuitry are further advantages that ensure pure signal transmission without any sound quality degradation. The T-1000 is the ultimate luxury-class FM tuner representing a successful blend of sound quality, performance, and ergonomics.

Dual-stage tuning front end easily deals with very high signal levels

- Double-tuned antenna circuit prevents cross modulation interference at high input levels.
- FET-based RF amplifier is configured as a cascode circuit with low feedback.
- Input gate features an attenuator that prevents overload even in close proximity of strong transmitters.

Revolutionary DDS principle in local oscillator achieves exceptional S/N ratio

An FM tuner amplifies the signal from the antenna input in an RF amplifier and then mixes it with the signal from a local oscillator for conversion into the intermediate frequency (IF). In the T-1000, the local oscillator is a highly advanced DDS (Direct Digital Synthesis) circuit. Unlike conventional PLL circuits, DDS does not use feedback, allowing it to produce an output signal whose frequency accuracy is exactly the same as that of the quartz oscillator itself. Because no unwanted frequency modulation components are present in the IF stage, the Super Heterodyne front end achieves drastically improved S/N ratio.

DDS (Direct Digital Synthesis)

The output of the quartz oscillator is supplied to the frequency divider to create the timing (in other words the sampling frequency) with which the sine wave data are read out. Using this sampling frequency, the sine wave data are read in the D/A converter to create the analog waveform output.

Because there is no feedback loop, the frequency purity of the D/A converter output can be kept identical to that of the quartz oscillator.

The (frequency modulation) detector is a so-called Advanced DGL (Differential Gain Linear) detector developed by Accuphase. This circuit delivers superb performance (minimal distortion, high S/N ratio) while requiring absolutely no adjustment, assuring optimum reliability.

As shown in the diagram at right, the input stage employs a high-speed comparator in the 2.5 MHz wide-band amplifier, to eliminate beat interference. The delay circuit achieves outstanding stability through the use of 24 high-speed C-MOS ICs.
DS-DC principle with DSP ensures ideal stereo demodulation for amazing channel separation

The stereo demodulator in the T-1000 features another Accuphase innovation called DS-DC (Direct Synthesis - Double Cancellation). The demodulator comprises the two technologies described at right. Since all operations are carried out through software-based arithmetic in a DSP (Digital Signal Processor), ideal demodulation performance can be achieved, resulting in previously unheard-of channel separation.

**Pilot Tone Direct Synthesis**
Commonly, an FM tuner employs a PLL circuit to extract the pilot tone and obtain the frequency and phase components from the input signal (stereo-modulated signal). If the level of the pilot tone decreases, noise will be heard and stereo separation becomes extremely poor.
With DS-DC, the waveform of the pilot tone in the input signal is identified as is (✽) and generated directly by the DSP arithmetic. Consequently, the pilot tone can be extracted reliably even when a high level of noise is present. Good stereo separation can be achieved even when the pilot tone level is low.

* Identification here means to analyze the signal and determine similarities.

**Crosstalk Double Cancellation**
After the input signal has been separated into the left and right components, the circuit eliminates crosstalk using a dual approach that also takes phase components into consideration. The result is extremely thorough left/right separation.

Supplied Remote Commander RC-33
Allows tuning, storing and recalling stations, and controlling all other functions of the tuner.
**GUARANTEED SPECIFICATIONS**

**Frequency range and tuning step width**

| Model for Europe | 87.50 MHz - 108.00 MHz (in 50-kHz channel steps) |
| Model for USA   | 87.5 MHz - 108.0 MHz (in 100-kHz channel steps) |
| Model for Japan | 76.0 MHz - 90.0 MHz (in 100-kHz channel steps) |

**Monophonic**

- **Sensitivity**
  - Usable sensitivity: 11 dB (HF)
  - 50 dB quieting sensitivity: 17 dB (HF)
- **S/N ratio** (80 dB input, A-weighted): 90 dB
- **Total harmonic distortion** (80 dB input, ±75 kHz deviation):
  - 20 Hz: 0.02%
  - 1 kHz: 0.02%
  - 10 kHz: 0.02%
- **Intermodulation distortion** (80 dB input, ±75 kHz deviation): 0.01%
- **Frequency response**
  - 10 - 15,000 Hz ± 0.2 dB
- **Alternate channel selectivity (S/N)**
  - 400 kHz: 70 dB
  - 300 kHz: 30 dB
  - 200 kHz: 10 dB

**Stereo**

- **Sensitivity**
  - 40 dB quieting sensitivity: 29 dB (HF)
  - 50 dB quieting sensitivity: 37 dB (HF)
- **S/N ratio** (80 dB input, A-weighted): 85 dB
- **Total harmonic distortion** (80 dB input, ±75 kHz deviation):
  - 20 Hz: 0.04%
  - 1 kHz: 0.04%
  - 10 kHz: 0.04%
- **Intermodulation distortion** (80 dB input, ±75 kHz deviation): 0.03%
- **Frequency response**
  - 10 - 15,000 Hz ± 0.2 dB
- **Stereo separation**
  - 100 Hz: 50 dB
  - 1 kHz: 50 dB
  - 10 kHz: 40 dB
- **Stereo trigger voltage**: 28 dB

**Capture ratio**: 1.5 dB
**RF intermodulation**: 80 dB
**Spurious response rejection**: 120 dB
**Image rejection**: 100 dB
**All suppression (65 dB input)**: 80 dB
**Subcarrier suppression**: 70 dB
**Output voltage (±75 kHz deviation)**: 1.0 V

**Digital output (EIAJ CP-1201)**
- Coaxial: 0.5 Vp-p, 75 ohms
- Sampling frequency: 48 kHz
- **Output impedance**
  - BALANCED (XLR type connector): 200 ohms (100 ohms/100 ohms)
  - UNBALANCED: 200 ohms
- **Meter**: Signal strength
- **Power requirements**
  - AC 120 V/230 V, 50/60 Hz
- **Power consumption**: 17 watts
- **Maximum Dimensions**:
  - Width: 465 mm (18-5/16”)
  - Height: 140 mm (5-11/16”)
  - Depth: 402 mm (15-13/16”)
- **Mass**: 11.8 kg (26.5 lbs) net
- **17.0 kg (37.5 lbs) in shipping carton

**Standing wave ratio**: 1.5
**Tuning principle**: DDS synthesizer tuning
**FM detection principle**: Advanced DGL
**Stereo demodulation principle**: DS-DC
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**Supplied Remote Commander RC-33**
- Remote control principle: Infrared pulse
- **Power supply**: 3 V DC (IEC R6 batteries x 2)
- **Dimensions**: 55 x 194 x 18 mm
- **Weight**: 110 g (including batteries)

**Notes**

- An FM antenna is required to use the T-1000. Please consult your dealer regarding antenna installation.
- In dwellings with shared antenna systems, confirm that the antenna outlet carries FM signals.
- Use a 75-ohm coaxial cable with IEC type or F type plug for the antenna connection.

**Supplied accessories:**
- AC power cord
- Audio cable with plugs
- Remote Commander RC-33

**Specifications and design subject to change without notice for improvements.**

http://www.accuphase.com/