TECHNIQUE / COUNTER MODULATION GENERATOR

TCMG

The Technique Counter Modulation Generator(TCMG), is meant for generating modulated signals with assorted types of modulations and modulating signals in the frequency range of 1.5 MHz to 30 MHz with a resolution of 1 Hz by taking commands from an external controller unit. The system is developed using state of the art technologies like Direct Digital Synthesizer, Programmable Digital Attenuators, Phase locked Oscillators, high stability OCXOs and Digital Signal Processors. The system has the capability of working as a standalone system when the local mode is selected. The high stability reference oscillator output of the system can be used as external reference input to the other systems. The system features very high stability, resolution and response time.

Unique Features

The Technique Counter Modulation Generator (TCMG) has four basic sub-systems namely Controller Unit, Exciter, Direct Digital Synthesizer and RF sub-system, the basic building blocks of the system. The Controller Unit will be a processor-based module to control the other modules such as DDS, RF Front end, Burst Detection System & Look Through Subsystem (LTS), Display & Keypad. The system will be capable of handling generation and look through functions simultaneously.

Description of Modules

- ***Controller Unit***

  All the subsystems in the TCMG are controlled within by a processor based subsystem. When the system is in standalone mode, it takes commands through keypad, or it takes commands from the systems like Controller Unit (CU). The Controller Unit can take external commands through a parallel interface using pre-defined protocols and commands. The controller unit is interfaced to the keyboard and LCD display for Input / Output operations.

- ***Exciter Unit***

  The exciter is a DSP based modulation generator subsystem capable of generating all forms of AM and FM modulations and CW on a 455 KHz carrier. The exciter takes the commands from Processor Unit and performs the selected modulation (all forms of AM/FM/CW) on the carrier channel (455KHz). Both AM and FM are modulated using either internally generated modulating signals like data (ASK, FSK), noise (white & Pink) and various tones (single, dual, wobble & syllabic rate generator) or external voice input from a microphone, tape recorder or CD Player. If the modulating signal is digital, it is either internally generated PN sequence or external data. The exciter's output goes to the RF sub-system for subsequent frequency translation to the required frequency.

NOTE : The specifications can be changed without notice due to technological advances.

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- ***Direct Digital Synthesizer***

  The synthesizer uses Direct Digital Synthesis Technology for faster switching, reliability and flexibility. It generates frequency within 71.5 MHz to 100 MHz band with a resolution of 1 Hz with the reference clock around 10 MHz. Its stability depends on its reference oscillator. The reference clock can be phase locked to the overall system reference oscillator for higher stability. The switching speed of the synthesizer will be less than 20 microseconds from one frequency to the other frequency in the entire frequency band. The frequency and amplitude are programmable internally by the control interface subsystem.

- ***RF Subsystem***

  The RF Subsystem processes the RF signals intercepted in the 1.5 to 30 MHz for the purpose of burst detection and look through. It will detect the occurrence of Burst signals and communicate to external Controller Sub system. It will also down convert the received RF signal to IF (455 KHz) necessary for look through purposes. The Rf Subsystem will translate the counter modulations generated at 455K Hz to the required frequency in the range of 1.5 to 30 MHz. provide necessary L.O frequencies to all the above mentioned subsystems.

Specifications

- Deployment : Stand alone system or remote controlled
- Technology : DSP based state of the art indigenous Technology
- Capabilities : Capable of generating single/multi Frequencies up to a maximum of 16 selected in TDM manner with a switch over time of less than 20 micro seconds.
- Electrical
  - Display: Output signal parameters LCD display (Back Lit)
  - Keypad: Sliding type functional keypad
  - Reference Oscillator:
    - Frequency: 10 MHz
    - Level: 0dbm ± 3db
    - Stability: 0.001ppm
  - Input:
    - Control: RS422 Parallel
    - Data: RS422 Parallel
    - Voice: 1 V rms (Microphone or Recorder or CD Player)

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- RF Output
  - Frequency range : 1.5 MHz to 30 MHz
  - Resolution : 1Hz
  - Level : -15dbm to +10dbm (programmable) (on 50 ohms load)
- RF Input : Sensitivity -90 dBm for + /- 10KHz IF Bandwidth
- Power Supply : Voltage: 230VAC +/- 10%, 50 Hz +/- 2Hz, 1 Φ
- IF output: Signal : Modulated IF with 455 KHz Centre Frequency
  - Bandwidth : ± 10 KHz
- Operation : Manual (with built in keyboard) as well as remote Using Parallel interface
- Modulations (selectable) :
  - AM (DSB, DSBSC, SSB with LSB and USB)
  - FM (Wide band, Narrow band)
  - CW
- Modulating Signals (selectable): (Internally Generated)
  For data (using internal PN sequence generator)
  - Amplitude Shift Keying & Frequency Shift Keying
- Noise
  - White (Band Limited or Wide Band) Noise, Pink Noise
- Tones
  - Single Tone, Dual Tone, Wobble Tone
- Syllabic Rate generator
- Modulating Signals (acceptable from external sources)
  - For Voice : Microphone Input, Tape Recorder Input, CD recorder / player input
  - For data : Externally generated data
    Storage : 7000 Mtrs (Max)

- ***Mechanical***
  19" Rack Mountable Unit, with 4 U Height, Weight: Not more than 30 kg
- ***VII EMI / EMC***
  MIL-461-C Standards

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