SGLS Signal Generator

Model 784

Features

- Accepts Tertiary or Dibit Encoded Data

- Generates Selectable SGLS Tri-Tone Signals

- SGLS Command Rates
  - 1kbps, 2kbps, 5kbps, 10kbps

- Low Phase Noise Digital Frequency Synthesizer

- Selectable Modulations
  - FSK
  - FSK/PM
  - FSK/AM
  - FSK/AM/PM

- Internal PRN Data Generator
  - Selectable Taps

- Remote Control
  - ASCII Commands
  - RS-232, IEEE-488

General Description

The Model 784 SGLS Signal Generator is a high performance FSK/ AM/PM Modulator which produces Space Ground Link System (SGLS) compatible command sub-carriers. A tri-tone Frequency Shift Keyed subcarrier is either output directly or Amplitude Modulated. The resultant FSK or FSK/AM signal may be used to Phase Modulate a second subcarrier. The sub-carrier output power level is adjustable from -30 dBm to +20 dBm, or can be turned off. An adjustable rate clock source drives a selectable tap PRN data generator which is available to be used as a modulation source. Both the clock and PRN data are output to the rear panel. Direct Digital Synthesis is used to generate FSK and PM subcarriers, and the PRN clock.

The Model 784 performs binary (two tone) and ternary (three tone) FSK modulation using either internally generated data or an external data source. The FSK frequencies are selectable as a set of 65 kHz (S), 76 kHz (0), and 95 kHz (1); 355 kHz (S), 366 kHz (0), and 385 kHz (1); or 975 kHz (S), 1024 kHz (0), and 1073 kHz (1). Other frequencies sets can be provided. Ternary FSK requires external data and clock as the modulation source. The format of the data is either frame formatted dibit encoded serial data, or ternary (three signals- S, 0, and 1). For binary FSK , either the internal PRN data generator or the external auxiliary (SERIAL) data and clock input can be used. In binary FSK mode, any two of the three FSK tones can be selected. Internal PRN data rates of 1 kbps, 2 kbps, 5 kbps and 10 kbps are selectable (other rates to 100 kbps are optional).

In addition to FSK modulation, the Model 784 also performs amplitude and phase modulation. The FSK signal can be amplitude modulated by a triangle wave running at one-half the data rate. Fixed data rates of 1 kbps, 2 kbps, 5 kbps and 10 kbps are supported in the AM mode. The PM subcarrier frequency is tunable in discrete steps up to 6 MHz. PM modulation index is adjustable from 0 to 3.14 radians.

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DATA AND CLOCK INPUTS
(TTL levels into 100 Ohms, unbalanced. BNC Connectors

  Selectable Input:

   DiBit Data and Clock
     SGLS defined 48-bit frame

   Ternary Data 1, 0, S and Clock
     1K, 2K, 5K or 10K with AM ON.
     Variable rates up to 100K with AM OFF

   Serial Data and Clock (Binary FSK only)
     (1K, 2K, 5K 10K) -AM ON, +/- 200 ppm
     Variable data rate, up to 100K –AM OFF

   Int Prn Data And Clock (Binary FSK only)
     Pattern: 2047(N=11); taps 2,11
     Data Rates 1K, 2K, 5K or 10K bps

SGLS TERNARY TONE SET FOR 1,0,S :
  95 KHz, 76 KHz, 65 KHz; or
  385 KHz, 366 KHz, 355 KHz; or
  1073 KHz, 1024 KHz, 975 KHz.
  (Other tone-sets can be provided.)
    Frequency Accuracy: +/- 100 ppm,

SIGNALING MODES
  Binary   Selectable: 1-0, 0-S, or S-1
  Force 1 Selectable: 1, 0, or S

AMPLITUDE MODULATION
  AM ON/OFF
    AM Triangular Waveform: 500 Hz, 1000, 2500 Hz and 5000 Hz for 1K, 2K, 5K and 10K bps.
  AM Modulation Index:
    Selectable: 0.33 to 1.00 in 0.01 steps
  AM Synchronization (Sync Delay):
    Selectable: 0.00 to 1.00 in 0.01 steps

PHASE MODULATION
  PM ON/OFF(BYPASS) selectable
    PM Subcarrier Tunable to 6 MHz, 0.01 Hz steps
    Modulation Index: 0.00 to 3.14 radians, 0.01 steps
    Frequency Accuracy: 100 ppm. Optional 1 ppm.
    Phase Imbalance: 0.5 degrees
    Residual AM: -55 dBc
    Un mod. Phase Noise vs. Offset Freq. (5 MHZ):
      Low Phase Noise Option (1 ppm Frequency);
      95 dBc/Hz @ 10 Hz
      105 dBc/Hz @ 100 Hz
      125 dBc/Hz @ 1 KHz
      128 dBc/Hz @ 10 KHz

MODULATOR OUTPUT SIGNAL
  Adjustable Amplitude: -30.0 dBm to +20.0 dBm (75 Ohm), in 0.1 dBm steps
    ON/OFF control

PRN DATA AND CLOCK
  TTL Levels, 50 Ohm drive capability

MODULATOR OUTPUT TEST (FRONT PANEL)
  fixed level at 2 Vpp (75 Ohm) .

LOCAL FRONT PANEL CONTROL
  VF Display and Keypad
    VF display; 2-line by 40-characters.
    Twenty (20) position momentary-action keypad
  Front Panel LED Indicators:
    DIBIT LOCK; POWER

REMOTE CONTROL
  RS232 Serial Interface (Standard):
  IEEE STD 488 GPIB Interface (Optional):

MISCELLANEOUS
  AC Input: 115 VAC, +/- 10%
    Single phase, 57-63 Hz; 100 watts, max.
  Size: 3.5 in. (H) x 20 in. (D) x 19 in. (W)

Ordering Information

MD784-00   Basic Unit
OP784-10   IEEE-488
OP784-11   1ppm

Recognizing that no standard product can meet all the needs of all users, GDP stands ready to provide units tailored to unique applications.