# ENCODER MODULATOR

## *Model 785*

## Features

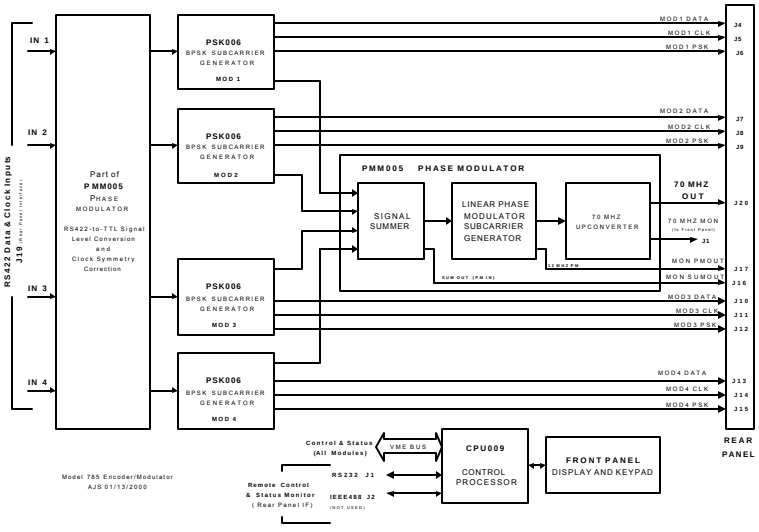
- **70 MHz PM Output**
- **PSK Subcarriers**
  - **4 Channels**
  - **Linear Summation**
  - **Mod Index Control**
  - **RS-422 Inputs**
- **Front Panel Control / Monitor**
  - **VF Display**
  - **Keypad**
- **Remote Control / Monitor**
  - **RS-232**
  - **IEEE-488 Option**

## General Description

The Model 785 Encoder Modulator Unit (EMU) accepts four (4) input channels. Data and clock inputs are RS422 signal levels. The RS422 input signal levels are converted internally to TTL and the clock symmetry corrected for each channel.

The TTL data and clock signals are connected to PSK006 BPSK Subcarrier Generator modules. The data is convolution encoded and a BPSK subcarrier is modulated with the encoded data stream. A selection is provided of an internal PRN data source for BPSK subcarrier modulation. Each modulator output level is adjustable from approximately +2 to +8 dBm into 50 Ohms. Modulation data and clock, and a fixed level modulated subcarrier are also provided as outputs at the rear panel interface. Modulation can be turned off to provide a continuous wave (CW), sinusoidal subcarrier output. The subcarrier modulators can provide BPSK and QPSK modulation, where QPSK is an option.

The RS422 levels of the input clock & data signals are converted to TTL levels suitable for driving the BPSK modulators. In addition, any departure in the input clock duty cycle from the ideal 50%/50% duty cycle is corrected in order to ensure the waveform quality of the convolutionally encoded data. The four (4) BPSK subcarriers are applied to a linear signal Summer. The individual signal amplitudes are controlled to create a composite signal with appropriate component power levels. The composite signal level is adjusted prior to its application to a Phase Modulator. The phase modulation can be turned OFF to provide a 12 MHz CW carrier. The phase modulated carrier is upconverted to 70 MHz. The output level of the 70 MHz IF PM carrier is programmable over a 20 dB range. The 70 MHz output is connected to the rear panel interface. A sample of the 70 MHz output as well as the summed subcarriers are provided as outputs for connection to test points.





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## SPECIFICATIONS

**Modulation Inputs**

**External Data/Clock Input: RS422-Level**

- Input data rates: DC to 6.25 Mbps

**Internal PRN Generator:**

Pattern: Selectable $2^N$-1 (N=7, 9, 11, 15, 20 or 23), 1000, 1010, 1100, zeros, ones, or fully programmable taps.

**Pre-modulation Data Processing**

Input Code conversion:

- NRZ-L/M/S; BiPhase-L/M/S; DM-M/S

Data Randomizer:

- V.35 (CCITT)
- V.35M (Intelsat specified)

Convolutional Encoder

- Rate ½,- k=9 or K=7

**B/QPSK Sub-Carrier Modulator**

Frequency: Tunable 0.00 Hz to 9,999,999.99 Hz

BPSK, QPSK , SQPSK or CW

**PHASE MODULATOR**

**Summer and Phase Modulator**

Summer Inputs- Four (4)

Bandwidth: 100 kHz to 3 MHz

Phase Modulation Index Calibration: 1 V peak per radian. Maximum Phase Modulation Index: 3.0 radians

**UPCONVERTER**

Frequency: 70 MHz.

Frequency Accuracy: +/-2 ppm

Output Level: -10 dBm to +10 dBm into 50 Ohms

Distortion and Spurious: <-45 dBc

VSWR: 1.3:1 max between 66.5 MHz and 73.5 MHz

Output Impedance: 50 Ohms

ON/OFF Control

Automatic 50 Ohm interface terminations

**LOCAL FRONT PANEL CONTROL**

VF Display and Keypad

**REMOTE CONTROL**

RS232 Serial Interface:

IEEE STD 488 GPIB Interface: Option

**MISCELLANEOUS**

**AC Input:** 115 vac, +/- 10%
Single phase, 57-63 Hz
300 watts, max.

**Size:** 10.5" (H) x 22" (D) x 19" (W)

**Weight:** 50 lbs.

**Mounting:** 19 inch EIA rack.

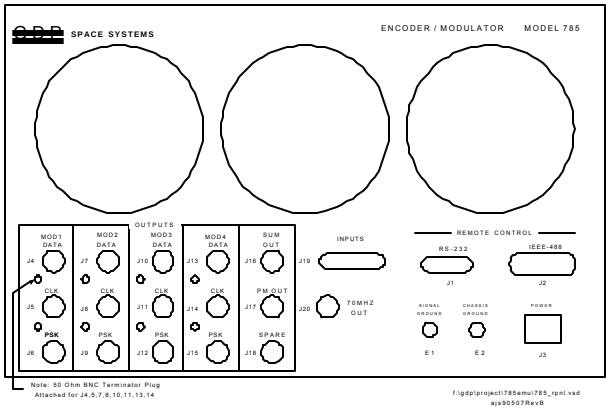
**Environment, Operating:**

Temperature: 0 to +40 °C

Relative Humidity: 15% to 85%,

Altitude: 0 to 10,000 ft.

**Cooling:** Forced air cooling





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