



Tomorrow's Telemetry Today!

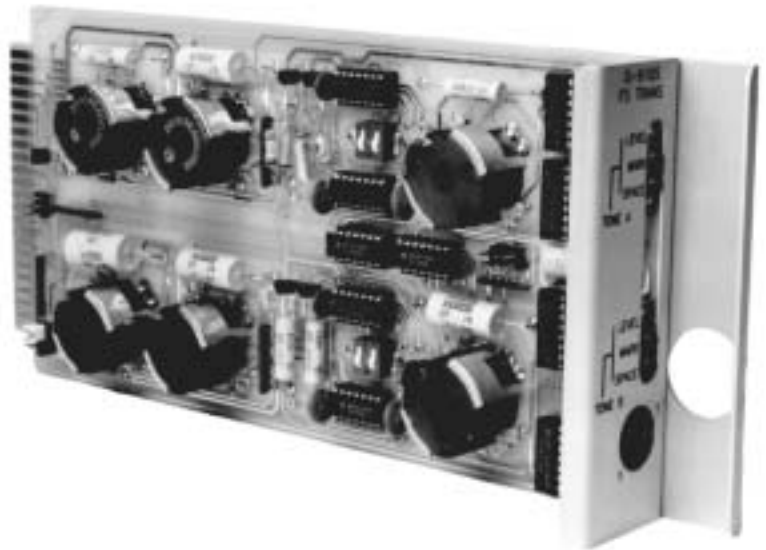
Da-Tel Research Company, Inc.
932 N. Park Avenue
Montrose, Colorado 81402
www.da-telresearch.com

Phone: (970) 249-6129
Fax: (970) 249-8919

Email: info@da-telresearch.com

G-9105 DUAL FS TRANSMITTER INSTRUCTION INFORMATION

- **CMOS INPUTS**
- **2F, 3F, AND SAMPLER OPERATION**
- **SQUELCH INPUTS**
- **FIELD SELECTABLE LOGIC**
- **PLUG-IN FILTER, G-9080**



GENERAL DESCRIPTION

The G-9105 Dual FS Transmitter is a frequency-shift transmitter with field selectable features. Each tone transmitter generates tone signals between 420 Hz and 30 kHz with bandwidths ranging from 2% to 15%. A switch allows use of a divider circuit to reduce jitter on low frequency, high bandwidth channel frequencies.

Each transmitter provides a mark, space and squelch input. The squelch inputs are configured such that +12 Vdc turns the tone off. The mark and space inputs can be field configured for either keyed to common, low, or keyed to +12 Vdc, high and can have either 22K pull-up, 22K pull-down, or neither. Each transmitter has a sampler that can alternately key mark and space when both are keyed simultaneously. This sampler frequency is set to approximately 20 Hz, but can be changed with a single capacitor.

Each tone transmitter can be configured for either 2-frequency (2F) or 3-frequency (3F) operation. The transmitter output levels are adjusted with a front-panel trimmer for a maximum of +3 dBm. The transmitter outputs exhibit a rising impedance out of band characteristic for frequency multiplexing of channels.

Each transmitter's mark and space inputs consist of a CMOS gate that can be jumper configured for high or low key. Jumper arrangements also configure the pull-downs and pull-ups on each input. A sampler circuit is enabled by J7 on transmitter A and J14 on transmitter B. The front panel red LED's indicate when the input is keyed to mark or space for both channels. When the transmitter is in sampling for both mark and space keyed, the LED's will flash to indicate the output is sampling.

Each transmitter consists of a pump oscillator driving an L-C tank that oscillates at the mark, high, frequency with no shift capacitors present. The input logic on the mark input is inverted such that when mark is not keyed, C5 is across the tank and causes the L-C to resonate at the center frequency. When mark is keyed, the logic removes C5 and allows the L-C oscillator to resonate at the highest frequency which is mark. When keyed to space, an additional capacitor, C4, is placed across the tank and moves the resonate frequency to space, the lowest frequency. The C4 and C5 capacitors are factory selected to align the frequencies to within 2 hertz of the specified frequency. The inductor L3 has an adjustment slug that provides approximately 2% adjustment in the output frequency.

A divider is provided, U2, that allows the L-C oscillator to be 16 times greater than the desired frequency thereby reducing jitter and improving data rates through the transmitter. This is usually incorporated only with higher bandwidths and low frequencies, such as $f_0 = 1860$ Hz, $BW = 480$ Hz. The output of either the divider or the L-C oscillator is selectively driven to the output stage by S11. The output into 600 ohms may be set by adjusting the front panel trimmer. This tone is then driven out through an impedance matching filter that attenuates harmonics by a minimum of 40 dB.

The test points from the front panel socket are as follows:

TP1	Mark Input, Channel A
TP2	Space Input, Channel A
TP3	Mark Input, Channel B
TP4	Space Input, Channel B
TP5	FSK Out, Channel A
TP6	FSK Out, Channel B
TP7	Common

SPECIFICATIONS

FS Center Frequency and Bandwidth: Center frequencies from 420 Hz to 30 kHz, bandwidths from 2% to 15%.

FS Frequency Stability: +/- 0.15% from -10 to +55 degrees C. Operating range -10 to +70 degrees C.

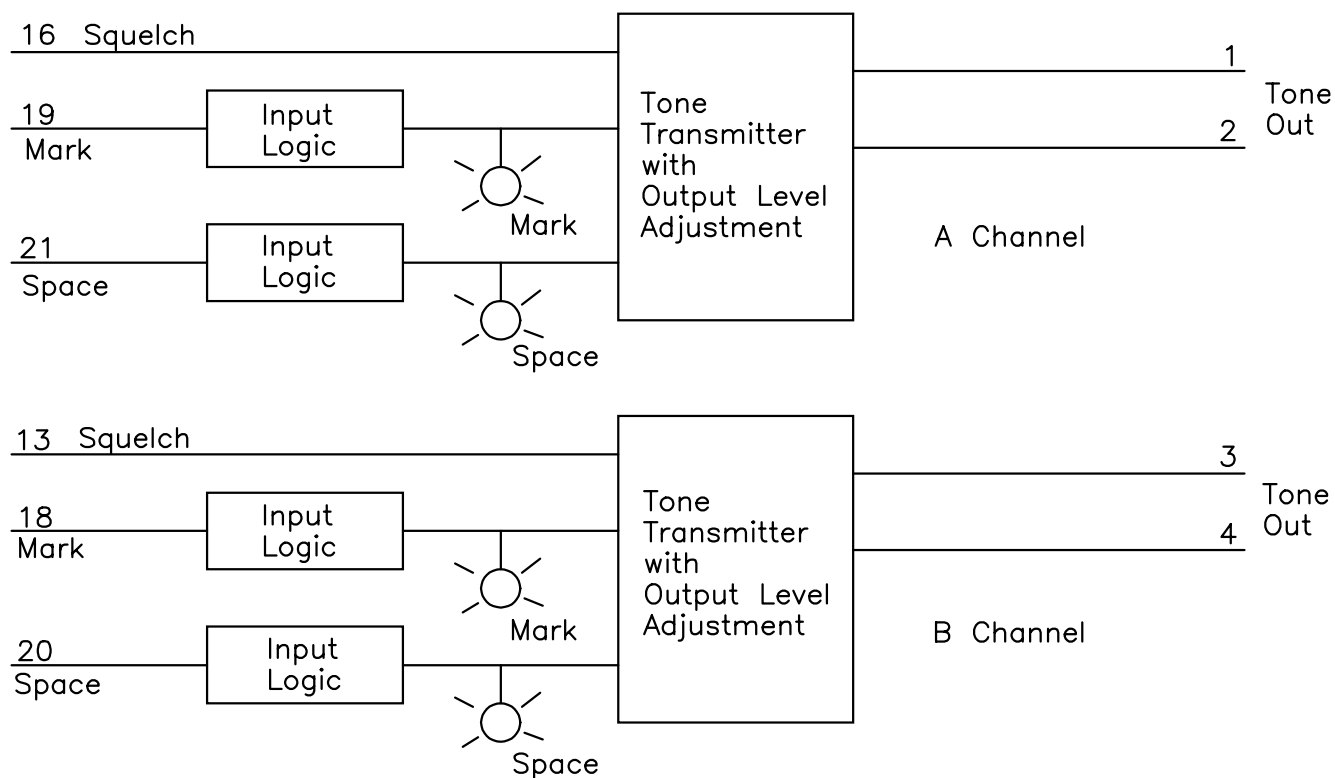
FS Tone Output Level: -30 to +3 dBm.

Filter: 600 ohm nominal with rising impedance out of band. Plug-in G-9080 available for both A and B.

Squelch Input: normally on at 0 V, +12 V in for off.

Mark & Space Inputs: CMOS with 22K pull-up, pull-down or neither, low or high assert field selection.

Power Requirement: 30 mA at 12 Vdc.



G-9105DUAL FS TRANSMITTER



**Equipment and/or components purchased through Da-Tel but manufactured by other companies are covered under the warranties of those manufacturers.*

NOTICE

As of the date of this printing, the specifications for the G-9105 in this Instruction Information sheet apply to all G-9105, except as indicated. Because all Da-Tel products are continually being refined and improved, these specifications are subject to change without notice.

TEST OF THE G-9105 DUAL FS TRANSMITTER

FUNCTIONAL TESTING

Once the jumpers have been set for the desired input configuration, the following functional test may be performed on the appropriate transmitter.

1. Place a 600 ohm load across the output terminals.
2. With mark and space not keyed the output should be the center frequency.
Adjustable from +3 dBm to -30 dBm.
Frequency within 2 Hz of specified.
3. Connect TP1 to the keying potential based on the input configuration.
4. Check the Mark frequency - should be within 2 Hz of specified, Mark LED lighted.
5. Disconnect TP1 and connect TP2 to the keying potential based on the input configuration.
6. Check the Space frequency- should be within 2 Hz of specified, Space LED lighted.
7. Connect the Squelch input to +12 V and the transmitter should turn off.
8. Check 2F operation:
Close S12.
Key Space input and output should be Space frequency.