



SECTION I

GENERAL INFORMATION

1. INTRODUCTION.

2. The  $\text{\textcircled{hp}}$  Model 938A Frequency Doubler Set generates signals in the 18- to 26.5-gc range when driven by a 9- to 13.25-gc power source. The set is a broad-band device, and will convert pulsed and swept signals, as well as cw signals, to K-band frequencies. Conversion loss is no greater than 18 db; output power is

typically between 0.5 mw and 1 mw when the driving source is a signal generator such as the  $\text{\textcircled{hp}}$  Model 626A or 686C. The Model 938A output circuit includes a power-monitoring meter and a precision 0- to 100-db attenuator. Input and output connectors are M-band and K-band cover-type flanges. The instrument is available in a cabinet or for rack mounting. The housing of the cabinet model is unusually strong and is designed so the driving source can sit on top of the Model 938A.

3. DESCRIPTION.

4. The Model 938A Frequency Doubler Set includes a harmonic generator, a power-monitoring meter, a K-band filter, and an output attenuator. Arrangement of the set is shown in block diagram form in figure 1, schematically in figure 2.

5. Incoming 9- to 13.25-gc signals are applied to a harmonic generator (the 938A-59A), the main component of which is a crystal diode. The amplitude of the current flowing in the crystal circuit is measured, and is indicated on a front panel meter calibrated in dbm. The output of the crystal is passed

Table 1. Specifications

<b>FREQUENCY RANGE:</b> Input: 9 to 13.25 gc Output: 18 to 26.50 gc	<b>ATTENUATOR RANGE:</b> 100 db
<b>CONVERSION LOSS:</b> Less than 18 db at 10 mw input	<b>OUTPUT SWR:</b> Full output: Approximately 2 Attenuator set for 10 db or more: less than 1.5
<b>OUTPUT POWER:</b> Depends on input power supplied; approximately 0.5 to 1.0 mw when used with typical $\text{\textcircled{hp}}$ Model 626A or 628A Signal Generators.	<b>FLANGES:</b> Input: M-band cover type for WR75 waveguide Output: K-band cover type for WR42 waveguide; equivalent JAN type: UG-595/U
<b>INPUT POWER REQUIRED:</b> Design center is 10 mw	<b>DIMENSIONS:</b> 5-3/8 in. (137 mm) high, 19-1/4 in. (489 mm) wide, 18 in. (457 mm) deep
<b>MAXIMUM INPUT POWER:</b> 100 mw	<b>NET WEIGHT:</b> 20 lb (9 kg)
<b>OUTPUT MONITOR ACCURACY:</b> $\pm 2$ db	<b>ACCESSORIES AVAILABLE:</b> Adapters: MP292B, M-to-P band waveguide MX292B, M-to-X band waveguide 11504A, X-band flexible waveguide 11503A, P-band flexible waveguide Signal Generator: Model 626A Sweep Oscillators: Models 694A, 694B, 695A
<b>OUTPUT ATTENUATOR ACCURACY:</b> $\pm 2\%$ of reading or $\pm 0.2$ db, whichever is greater	

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