

FIXED DIVIDER UNIT UN17/502

Introduction

The Fixed Divider UN17/502, as used in a drive unit,^{1,2} is fed with a 4.4296875-MHz reference frequency signal. The UN17/502 feeds this signal to a Variable Divider UN17/501 and also divides the frequency by 154. This frequency, 28.7642 kHz, is added to the output frequency of the UN17/501 to produce twice-line frequency square-wave and sine-wave outputs.

The front panel carries monitoring points for *Natlock Osc* input and *2L* output signals.

The UN17/502 is constructed on a CH1/26A chassis with index peg positions 12 and 28.

Circuit Description

The circuit of the UN17/502 is given in Fig. 1.

Input Amplifier

A reference frequency sinewave is fed via pin 2 to a two-stage negative feedback amplifier which includes transistors TR11 and TR12. The output of this amplifier is fed to the Reference Frequency Output Amplifier and to the first of two Schmitt Trigger Circuits.

Reference Frequency Output Amplifier

This amplifier, containing transistors TR13 and TR14, is a variable-gain amplifier with negative feedback. The output impedance is 75 ohms.

Schmitt Trigger Circuits

There are two schmitt trigger circuits in the UN17/502 both of which are used to square their input waveforms for driving a counter chain. They differ from a standard circuit in that there is a small-value capacitor across the common-emitter resistor. The first trigger circuit, which includes transistors TR15 and TR16, drives the divide-by-154 counter

and the second circuit TR9, TR10 is used to drive a divide-by-625 counter in a Picture and Field Unit UN17/503.

Divide-by-154 Counter

The ratio of this counter has the factors 7, 11 and 2. The counter feeds one input of the Modulator.

Modulator

The modulator comprises similar input and output amplifiers and a balanced modulator circuit. The amplifiers comprise a tuned stage feeding an emitter follower. The output of the associated UN17/501 is fed via pin 5 to the input amplifier and the outputs of the divide-by-154 counter are fed to the bases of transistors TR5 and TR6. The output of the modulator (similar in form to that of a ring modulator described in Instruction L.1) is fed to a band-pass filter.

Band-pass Filter

This is a constant-k filter tuned to twice-line transformation³ to reduce the value of inductor L4. transformation⁴ to reduce the value of inductor L4.

Output Amplifier

The band-pass filter feeds a two-stage emitter follower output amplifier which also feeds the second schmitt trigger circuit.

Test Procedure

The UN17/502 is tested as part of its parent equipment.

References

1. Waveform Generator Drive Units GE1/520,A
2. Waveform Generator Drive Unit GE1L/537,A
3. Shea, T.E.; Transmission Networks and Wave Filters; D. Van Nostrand.

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