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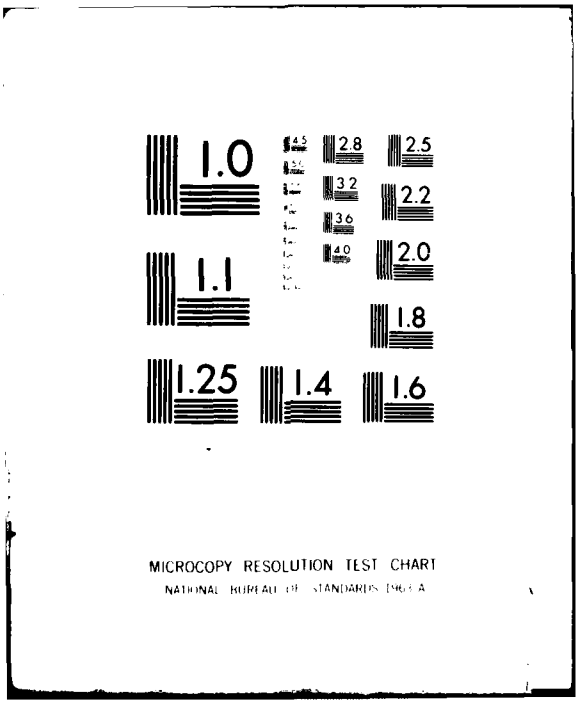
PULSE COUNTER.(U)
FEB 81 Y S DOBLEVICH, L A DUBITSKIY
UNCLASSIFIED FTD-ID(RS)T-1924-80 NL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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963-A

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FOREIGN TECHNOLOGY DIVISION

PULSE COUNTER

by

Ya. G. Doblevich, L. A. Dubitskiy, et al.

EDITED TRANSLATION

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MICROFICHE NR: FTD-81-C-000104

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By Ya. G. Doblevich, L. A. Dubitskiy, [redacted]al.

English pages: 4

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U. S. BOARD ON GEOGRAPHIC NAMES TRANSLITERATION SYSTEM

Block	Italic	Transliteration	Block	Italic	Transliteration
А а	*А а*	A, a	Р р	*Р р*	R, r
Б б	*Б б*	B, b	С с	*С с*	S, s
В в	*В в*	V, v	Т т	*Т т*	T, t
Г г	*Г г*	G, g	У у	*У у*	U, u
Д д	*Д д*	D, d	Ф ф	*Ф ф*	F, f
Е е	*Е е*	Ye, ye; E, e*	Х х	*Х х*	Kh, kh
Ж ж	*Ж ж*	Zh, zh	Ц ц	*Ц ц*	Ts, ts
З з	*З з*	Z, z	Ч ч	*Ч ч*	Ch, ch
И и	*И и*	I, i	Ш ш	*Ш ш*	Sh, sh
Й й	*Й й*	Y, y	Щ щ	*Щ щ*	Shch, shch
К к	*К к*	K, k	Ъ ъ	*Ъ ъ*	"
Л л	*Л л*	L, l	Ы ы	*Ы ы*	Y, y
М м	*М м*	M, m	Ь ь	*Ь ь*	'
Н н	*Н н*	N, n	Э э	*Э э*	E, e
О о	*О о*	O, o	Ю ю	*Ю ю*	Yu, yu
П п	*П п*	P, p	Я я	*Я я*	Ya, ya

*ye initially, after vowels, and after ъ, ь; e elsewhere.
When written as ë in Russian, transliterate as yë or ë.

RUSSIAN AND ENGLISH TRIGONOMETRIC FUNCTIONS

Russian	English	Russian	English	Russian	English
sin	sin	sh	sinh	arc sh	sinh^{-1}
cos	cos	ch	cosh	arc ch	cosh^{-1}
tg	tan	th	tanh	arc th	tanh^{-1}
ctg	cot	cth	coth	arc cth	coth^{-1}
sec	sec	sch	sech	arc sch	sech^{-1}
cosec	csc	csch	csch	arc csch	csch^{-1}

Russian	English
rot	curl
lg	log

PULSE COUNTER

Ya. G. Doblevich, L. A. Dubitskiy,
Yu. I. Kuzmin, Ya. I. Pilyavskiy,
and Yu. M. Sikorskiy

This invention pertains to the computer technology and is intended for use in counting the number of pulses, dividing the sequence frequency of pulses, and, in particular, in the electron-counting frequency meters.

There are pulse counters of the cumulative type, which consist of an input clipping amplifier whose output is connected to the base of a linearizing transistor through the series-connected proportioning capacitor and diode, while a storing capacitor is connected to a discharge device through a comparator.

The counter being proposed is different from those above in that it has two back-to-back diodes between the output of the clipping amplifier and the point at which the storage capacitor is connected to the comparator, the common point of the diodes is connected with the collector of the linearizing transistor whose emitter is connected through the resistor to the point at which the proportioning capacitor is connected to the diode, while the base is connected to the power bus.

This setup makes it possible to improve the operating reliability of the counter over a wide range of input frequencies (from low frequencies right up to the resolution of the reset stage of the counter) and temperatures of the ambience.

The essence of the invention is in the separation of the charging circuits of the storage capacity and the circuits closing the reverse current of the linearizing transistor.

The counter being proposed is illustrated in the drawing.

The counter consists of an input clipping amplifier 1 whose output 2 is connected to one of the leads of the proportioning capacitor 3 whose second lead is connected to the emitter of a linearizing transistor 5 through resistor 4. The collector of transistor 5 through diode 6 is connected to output 2 of the output clipping amplifier 1 and, through diode 7, it is connected to storage capacitor 8. The base of transistor 5 is connected to the voltage source and, through diode 9, to the point at which the proportioning capacitor 3 is connected to resistor 4. Through ccmparator 10 the storage capacitor is connected to the input of the discharging device 11.

Operating principle of the pulse counter.

In its initial state the storage capacitor 8 is discharged to zero, while the proportioning capacitor 3 is charged up to the feed voltage −E; the clipping amplifier 1 is closed and the potential at its output 2 is approximately zero. Transistor 5 is also closed, since the potentials of its base and emitter are equal.

With the arrival of the first ccunter pulse at the input of the clipping amplifier 1, the latter opens up up to the point of saturation and the potential at its output 2 becomes approximately equal to −E. As a result, resistor 5 opens up and the proportioning capacitor 3 begins to discharge through the circuit: output 2 of the clipping amplifier 1 – resistor 4 – junction emitter – collector of transistor 5 – diode 7 – capacitor 8.

In the process of the discharge of capacitor 3, capacitor 8 charges up, since virtually the entire discharge current of capacitor 3 flows through the collector junction of transistor 5 and is closed through capacitor 8 to the ground.

During the recharging process of capacitors 3 and 8, diode 7 turns out to be open, while diode 6 is closed, since the potential applied to its anode is more negative than that applied to the cathode.

Upon completion of the action of the input counter pulse, the input clipping amplifier closes and the potential, at its output, becomes

zero. As a result, capacitor 3 is charged from the voltage −E through the circuit: voltage source −E − diode 9 −resistor of load 12 of the input clipping amplifier 1. Transistor 5 closes and, in view of this fact, diode 7 closes, while diode 6 opens up and the resistor of load 12 proves to be connected to the collector of transistor 5.

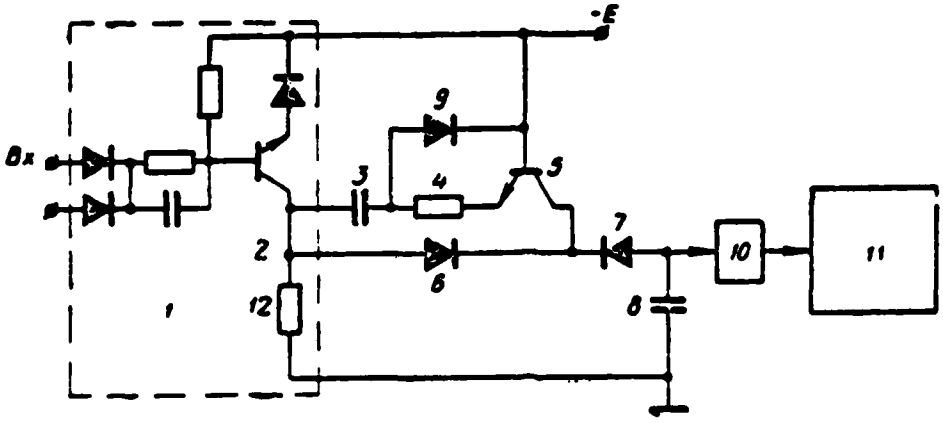
Thus, during the pause between the input counter pulses, the storage capacitor 8 is cut off by diode 7 from the linearizing transistor and the reverse currents of the latter are closed through the resistor of load 12 without causing a significant drop in voltage at this resistance due to its small size.

With the arrival of the next counter pulses at the input of the counter, the process involving the discharge of the proportioning capacitor and charging of the storage capacitor is repeated, and the voltage in the storage capacity rises in stages. When the value of this voltage attains the value of the comparison voltage, comparator 10 opens up and the discharging device 11 operates.

The counter returns to its initial state.

Patent Claims

Storage-type pulse counter, which has an input clipping amplifier whose output is connected with the base of a linearizing transistor through the series-connected proportioning capacitor and diode and the storage capacitor is connected through a comparator to a discharge device, is **distinguished** by the fact that, in order to improve the operating reliability of the counter over a wide range of the input frequencies and temperatures of the ambience, it has two back-to-back diodes between the output of the clipping amplifier and the point at which the storage capacitor is connected to the comparator, and the common point of the diodes is connected to the collector of the linearizing transistor whose emitter is connected through a resistor to the point at which the proportioning capacitor is connected to the diode, while the base is connected to the power bus.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