CANADA

DEPARTMENT OF TRADE AND COMMERCE

STANDARDS BRANCH

S-EA.628

OTTAWA, October 14, 1964.

TYPE APPROVAL

GENERAL ELECTRIC TYPE "SST-1" SOLID-STATE IMPULSE TOTALIZER

The apparatus specified and illustrated herein has been duly approved by the Standards Branch under the provisions of the Electricity Inspection Act, Chapter 94, R.S. 1952, and may be admitted to verification in Canada.

Apparatus Approved: Type "SST-1" Solid-State Impulse Totalizer, manufactured by General Electric Company, Somersworth, N.H., U.S.A., and distributed in Canada by the Canadian General Electric Company Limited, 1130 Boulevard Cherest, Quebec 8, P.Q.

Rating of Apparatus:

1)	Type of Input	SPDT isolated contact closures
1)	Max. Resistance in Input Circuit	50 ohms or 100 feet max. to source of impulse
2)	Max. Input Pulse Rate Max. Counter Rate	End device "burst rate" x relay ratio 10 per second
2)	Relay Ratio	1:1 or more depending upon number of channels
	Counter Type	Sodeco TCe7E 7-digit, TCe8E 8-digit
3)	Number of Input Channels	2 to 16 or more
	Counter Panel to Module Chassis	Max. 50 feet shielded
2)	Delay Time	$\frac{1}{2} \times \frac{1}{\frac{\text{input}}{\text{output}}}$ or $\frac{1}{\text{burst rate}} \times \frac{1}{\text{relay ratio.}}$ The actual time will be marked on the module.
2)	Max. Exit Pulse Rate	1 to 10 per second
4)	Type of Output	Solid-state SPDT power gate switch
4)	Capacity of Power Gate	0.5 ampere, 120 volts, 60 cycles #
	Power Supply to Totalizer	120 volts, 60 cycles
1)	Telemetering Equipment	Type DC-1 power supply and Type RP-1 polarized relay or tone or microwave systems.

Approved Modules

Identification	Designation	Number	Function
4122575-11	BiAx*	3 or more	Receives input from contact device
4122575-18	OR	1 or more	Channels all input to delay circuit. One module handles six additive channels.

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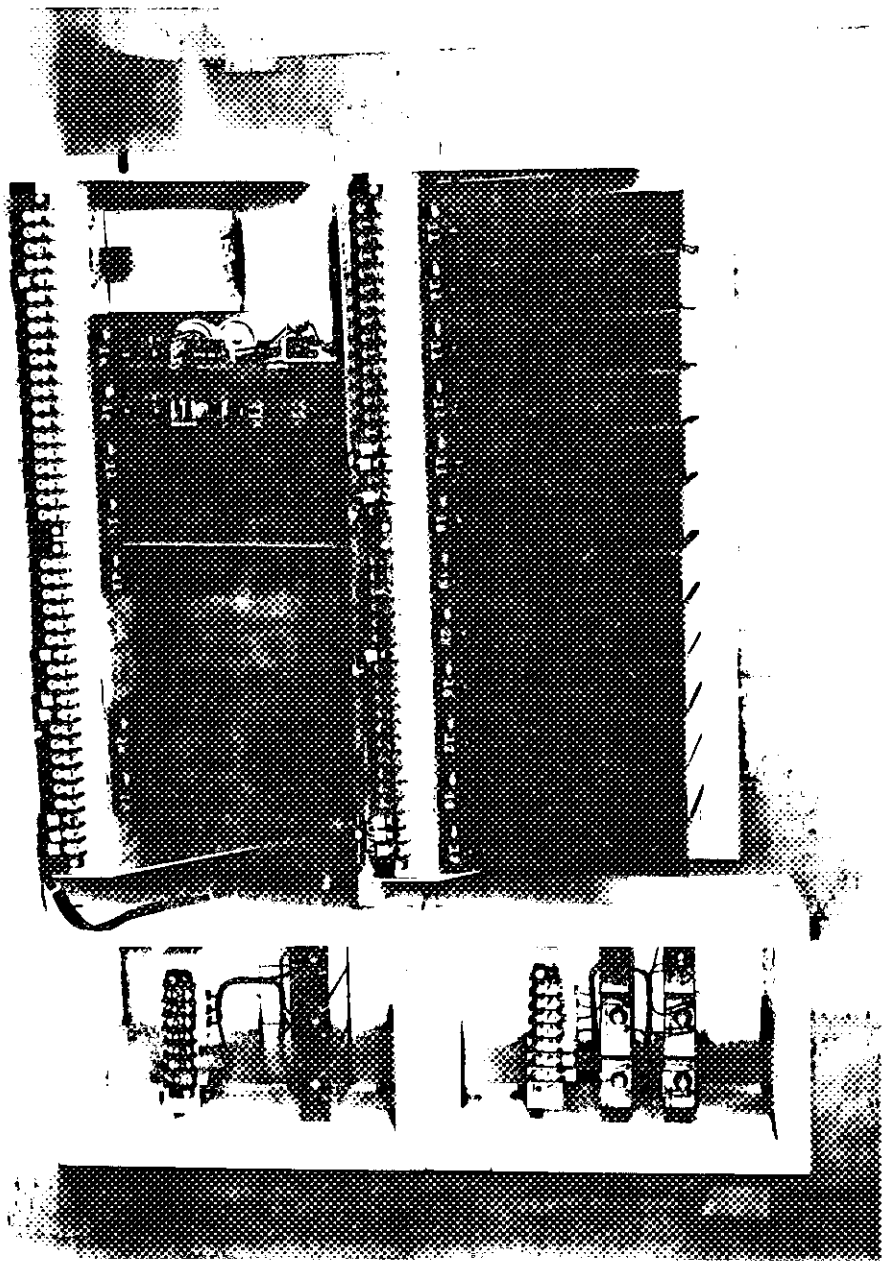

SST-1 TOTALIZER REAR VIEW

4122575-12	Delay	1	Separates output pulses in time.
122575-20 to 24	BiC (divide by)	1	Sets system input/output ratio.
122575-16	BiD (Power Gate Drive)	1	Control the state of the output solid-state switch.
4122575-17	AC Power Gate	1	Solid-state SPDT switch drives end device.
4122575-26	DC Power Gate	1	Solid-state SPDT switch drives end device. #
4122575-11	BiAx*	Depends on proportion of subtractive pulses to additive pulses.	Receives input from contact device subtractive.

DC values given in Instruction Book GEI-52418

4122575-13	Counter Drive	2 or more	Operates pulse counters. One module can drive 3 pulse counters.
4122575-14	Power Supply	1	Provides +30 volts unregulated DC to regulator and pulse counters.
4122575-15	P.S. Regulator	1	Provides regulated +24 volts DC for all system logic.

*) sub-number (x) denotes channel number

NOTES

1) If the resistance in the input circuit does not exceed 50 ohms, or 100 feet distance the SPDT contacts on the watthour meter may be used to feed the totalizer directly. If the resistance exceeds this amount or if interference exists, it is permissible to use the Type DC-1 power supply adjacent to the sending meter and the Type RC-1 polarized relay adjacent to the totalizer, connected through a 2-wire metallic transmission line.
The DC-1 power supply operates at 120 volts, 60 cycles and produces -65 DC volts and +65 DC volts which, when applied to the SPDT contacts of the transmitting meter, produce in the 2-wire transmission line, a current that changes direction with the contact closures. This reversing current feeds the coil of the type RC-1 polarized relay, the armature of which has a permanent magnet carrying SPDT contacts. The armature thus produces contact closures that are a replica of those on the transmitting meter.
Two 500 ohm current limiting resistors are used as a protection for the DC-1 power supply. They will normally be packaged for protection against physical damage.

2) The maximum input pulse rate is the number of pulses that the totalizer will accept regardless of whether the pulses originate from a single source or are the combined inputs from a number of sources.
The Relay Ratio is chosen so that the output pulses do not exceed in number or rate the capacity of the end device to receive them. The end device could be a pulse-operated demand meter such as the PD-57F. The Relay Ratio is also termed the Input/Output Ratio, and is the ratio between the incoming and outgoing pulses.

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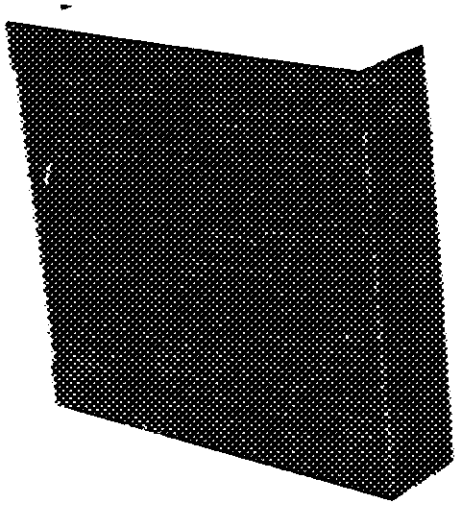

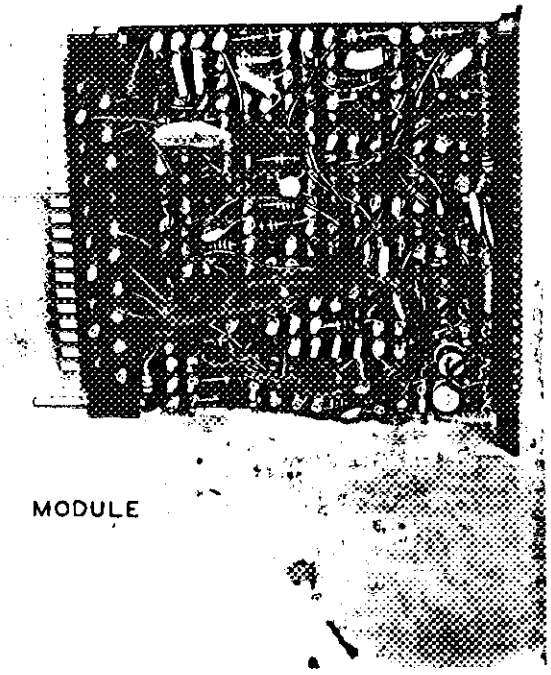

MODULE

The Delay Module spaces the output pulses sufficiently apart in time so that the end device can accept them. It is a factory setting and is normally set at $\frac{1}{4}$ second, but can be made longer or shorter to suit the application. For example, assume 800 pulses per interval are desired on the end device and a maximum of 4000 pulses per interval are transmitted to the totalizer, then the Relay Ratio should be 4000:800 or 5:1 and the value of each output pulse will be 5 times that of each input pulse.

3) The totalizer can be built to accommodate from 2 to 16 input channels, some of which may be subtractive. One chassis is required for 3 input channels, 2 are required for 4 to 10 channels, and 3 for 11 to 16 channels, etc. Chassis are connected with a factory-made cable assembly. There is one counter for each input channel plus an additional counter to record the total.

4) The output of the Totalizer is a solid-state power gate. The AC version has a capacity of 120 volts, 0.5 amperes; and the DC version has capacities ranging from 12 volts, .05 amperes to 150 volts, 0.5 amperes. These power gates cannot be used interchangeably on both types of voltage. The power gate supplies no power to the end device but functions merely as a solid-state SPDT switch.

Description: The SST-1 solid-state impulse totalizer serves as a summational link between several measuring devices and a pulse recorder to form a system suited to revenue billing or telemetering. When applied to kilowatt demand measurement, its speed is compatible with pulse recorders such as the PD-57F and photo-electric impulse generators such as the type D-41.

The output of the SST-1 totalizer is a series of "position changes" of a solid state switch called a "gate" which functions as a SPDT electronic switch.

The incoming pulses must all have the same value but some may be "negative" such as when a certain quantity must be subtracted for station use. As each negative channel can store only one pulse, the system must be tailored so that the positive pulses predominate at all times.

The pulse initiators must be completely isolated, single-pole, double-throw switches.

The input channels are numbered starting from 1, and should be connected so that the incoming channel with the highest pulse rate is connected to the channel with the lowest number. The reason for this is that channel 1 has priority followed by number 2, etc. This is of little consequence at low pulse rates but becomes increasingly important as the pulse rates approach the capacity of the Time Delay.

The Type DC-1 Power Supply and the Type RP-1 Polarized Relay that may be used with the Type SST-1 Totalizer are not end devices, but function merely as links in the telemetering chain and hence do not require approval or verification.

The SST-1 Totalizers are of modular construction with each module in a separate dust-proof housing. The modules are socket-mounted on the chassis and interwired as required for the particular system. The Pulse Counters are mounted on a separate panel for semi-flush mounting on the switchboard face. The module chassis are designed for mounting on a 19-inch relay rack or on the back of a switchboard. Each module has an identification number painted on the top which describes its function.

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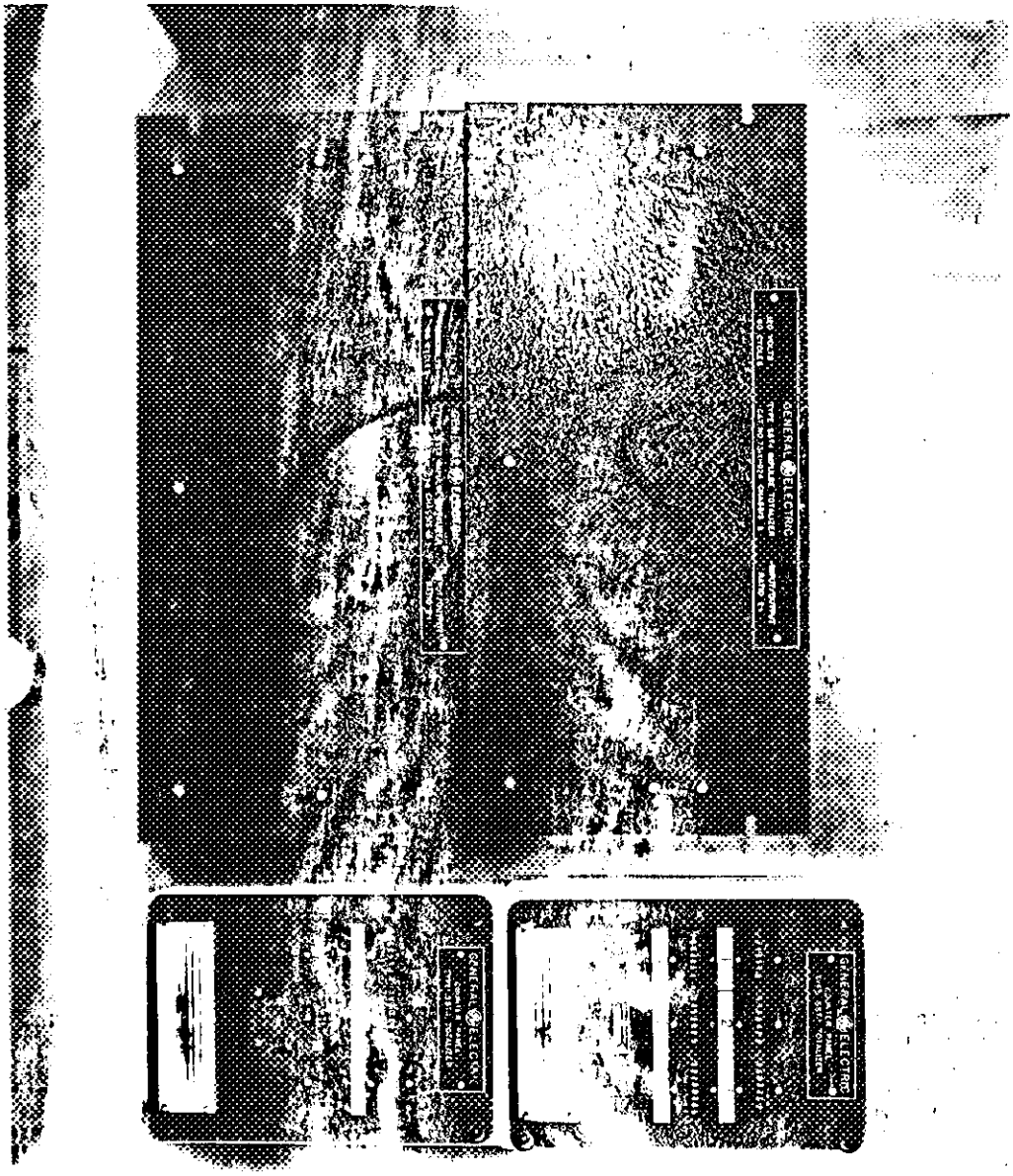

Description (cont'd) The nameplate of the SST-1 Totalizer may take the form of a master nameplate, or subsidiary nameplates on the individual chassis. In either case the number of additive and subtractive channels will be clearly indicated along with the input/output relay ratio.

The counters on the panel will be marked with the number of the channel and a (+) or (-) to indicate whether they are additive or subtractive. Additional space may be provided adjacent to each counter for the customer to inscribe the identity of each and such multiplier(s) as may be used.

The revolutions per impulse of each meter generating pulses that feed into the totalizer should be checked to ensure that all pulses have the same value.

The type SST-1 solid-state totalizer is approved for use unsealed.

W. J. S. Fraser

(for) R. W. MacLean,
Director,
Standards Branch.

C. E. Anderson,
Chief Engineer,
Standards Branch.

Reference: A27A

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