EQUIPMENT NOTES

RATEMETER
TEL-ATOMIC
807E

TEL-Atomic, Incorporated

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TEL 807E

RATEMETER

PURPOSE

The instrument is designed to give a meter indication of count rate from a G.M. tube. Output sockets also enable projection and demonstration meters or chart recorders to be utilized.

APPARATUS DETAIL

This mains operated instrument is housed in a metal case with moulded plastic ends, and is protected by a mains glass fuselink mounted on the internal printed circuit board.

All the controls are situated on the front panel of the instrument.

Six count rates are provided with time constants of 2s on range 1., 1s on range 2 and 0.2s on ranges 3-6. The appropriate range is selected by a six position rotary switch.

Count indication is by a taut band meter of 60mm scale length with dual scales covering 0-100 and 0-300 count ranges. It is necessary to utilize one or other of these two scales with multipliers of 10 and 100.

A screwdriver pre-set variable G.M. VOLT supply provides the h.t. supply for the G.M. tube.

Two input sockets are provided, a P.E.T. socket and a B.N.C. socket for the connection of G.M. tubes.

Audible indication of the count rate is available from a built-in speaker controlled by an ON/OFF slide switch.

A 3.5mm jack socket provides a facility to measure external currents over the range of 0-100μA. This socket is brought into circuit by a three position function switch marked GMV, RATE, 100μA EXT. The GMV position is used to set the GM tube voltage with a screwdriver in the GM VOLT hole (normally sealed with a rubber plug). The G.M. tube voltage is read on the 0-100 scale x 10 vis 0-1000V. The G.M. tube voltage is proportional to the line input voltage. The switch is set to the RATE position for normal 'count' operation.

The sockets marked OUTPUT 0-1V colour coded red and black provide a 0-1V rate output, irrespective of the position of the function switch. This output is suitable for operating demonstration meters, projection meters and chart recorders. It is also suitable for connection to the analogue input port of some microcomputers.

OPERATING PROCEDURE

1 Requirements

The specific requirements in terms of ancillary apparatus will depend upon the particular use to which the instrument is put.

2 G.M. tube operation

2.1 Connect the co-axial cable of the G.M. tube holder to the appropriate G.M. tube socket on the ratemeter.

2.2 Switch the instrument ON and set the function switch to G.M.V. Adjust the G.M. VOLT control with a small screwdriver to the required voltage for the particular tube in use (normally 400V to 420V).

2.3 Set the function switch to RATE and depending on the degree of activity of the source, select the most suitable range to provide a convenient indication on the meter. If an audible indication of the count rate is required switch the LOUDSPEAKER ON.

2.4 If it is required to make a permanent record of the count rate connect a chart recorder, set to its 1V range, to the OUTPUT 0-1V sockets; observing polarity.

MAINTENANCE

Fuse Replacement

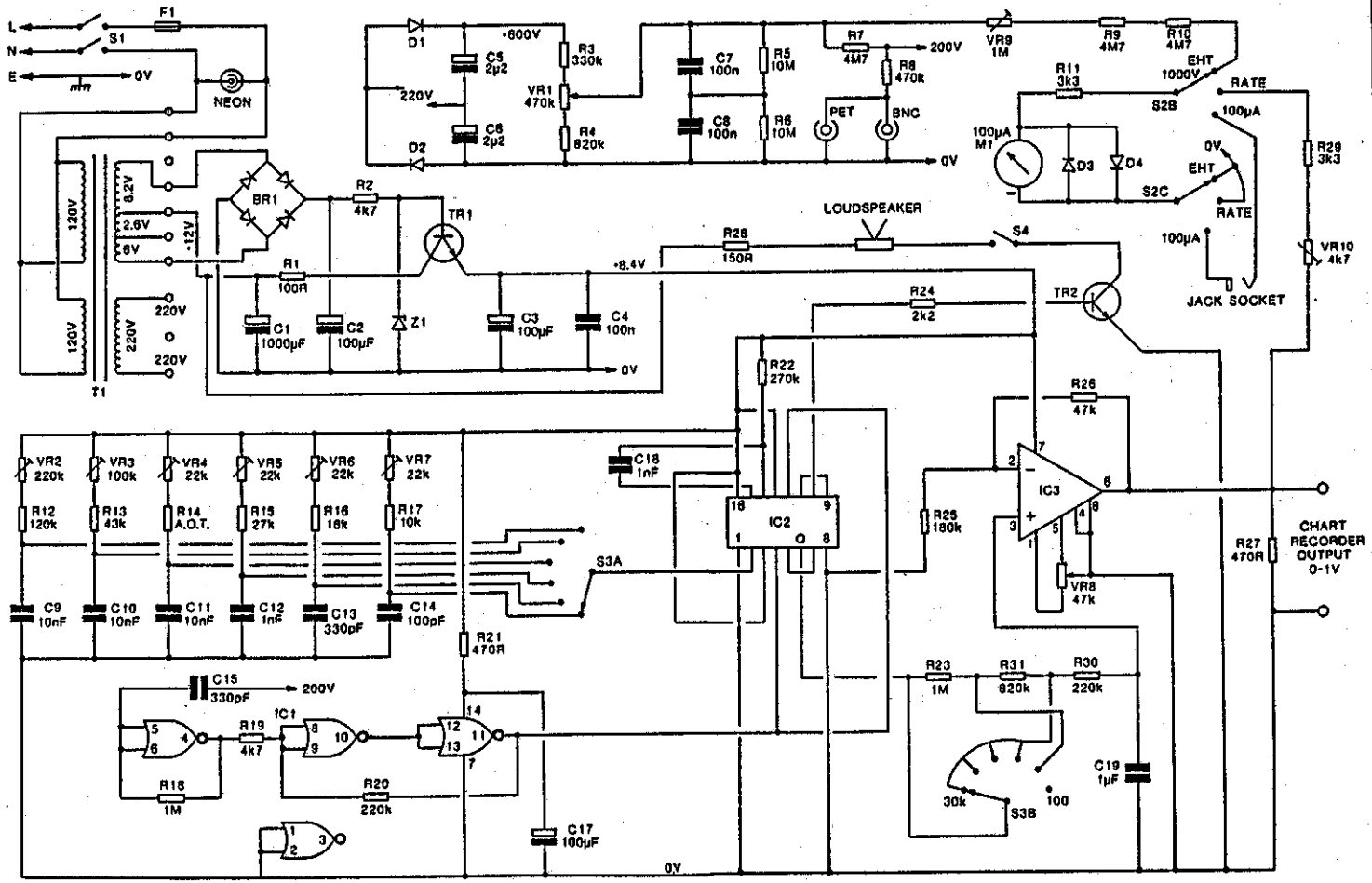
Should it be necessary to replace the internal fuse, disconnect the unit from the power line and remove the moulded end panel, incorporating the line input socket, by removing the two large countersunk screws in the moulding and the two round head self tapping screws on the rear panel adjacent to the moulding. The fuse link is mounted in a fuse holder on the printed circuit board.

SPECIFICATION

Count rate indicator :	60mm scale length taut band, dual range meter
Count ranges :	0-100 in sub-divisions of 0.2 time constant 2s 0-300 in sub-divisions of 10 time constant 1s 0-1000 read off 0-100 range by applying a multiplier of 10 time constant 0.2s 0-3000 read off 0-300 range by applying a multiplier of 10 time constant 0.2s 0-10k read off 0-100 range by applying a multiplier of 100 time constant 0.2s 0-30k read off 0-300 range by applying a multiplier of 100 time constant 0.2s
Accuracy :	±2% of f.s.d. on all ranges
G.M. tube supply :	adjustable from 350V to 450V by screwdriver through the hole marked GM VOLT. Indicated on 0-100 range of meter with multiplier of 10 and function switch in GMV position
Inputs :	two parallel G.M. tube sockets, BNC and PET 3.5mm jack to enable external currents of 0-100μA to be read with function switch in 100μA EXT position. Input circuit incorporates diode protection
Output :	0-1V for a counting rate of 0-100% of range selected via colour coded red and black sockets
Audio Output :	built-in loudspeaker controlled by LOUDSPEAKER ON/OFF switch
Controls :	meter function switch; rotary 3-position GMV, RATE, 100μA EXT Range switch; rotary 6 - position Loudspeaker ON/OFF GM volts; screwdriver preset Power ON/OFF
Line Voltage :	110-120V 50/60Hz a.c. detachable line cord 2m long Internal 20mm fuse 500mA
Dimensions :	260 x 160 x 150mm

TEL-Atomic Inc., Jackson, Michigan.

TEL-ATOMIC RATEMETER



RATEMETER

Circuit reference			Part No.
C1	1000µ	25V Electrolytic	204322
C2	100µ	16V Electrolytic	203842
C3	100µ	16V Electrolytic	203842
C4	10µ	16V Electrolytic	203361
C5	100µ	16V Electrolytic	203842
C6	2µ2	450V Electrolytic	203042
C7	2µ2	450V Electrolytic	203042
C8	100p	500V Ceramic	200963
C9	1n	100V Ceramic	201443
C10	1n	100V Ceramic	201443
C11	10n	30V Ceramic	201922
C12	10n	30V Ceramic	201922
R1	820R	0.25W 5% C.F.	212361
R2	3k3	0.25W 5% C.F.	212641
R3	100k	0.25W 5% C.F.	213366
R4	10k	0.25W 5% C.F.	212884
R5	10k	0.25W 5% C.F.	212884
R6	68k	0.25W 5% C.F.	213284
R7	390k	0.25W 5% C.F.	213642
R9	3k3	0.25W 5% C.F.	212641
R10	100k	0.25W 5% C.F.	213366
R11	39k	0.25W 5% C.F.	213163
R12	68k	0.25W 5% C.F.	213284
R13	150R	1W 5% C.F.	212003
R14	39k	0.25W 5% C.F.	213163
R15	15k	0.25W 5% C.F.	212963
R16	560k	0.25W 5% C.F.	213721
R17	4M7	0.5W 5% C.F.	214161
R18	1M	0.5W 5% C.F.	213844
R19	220k	0.5W 5% C.F.	213522
R20	220k	0.5W 5% C.F.	213522
R21	2M2	0.5W 5% C.F.	214002
R22	15k	0.5W 5% C.F.	212963
R23	15k	0.5W 5% C.F.	212963
R24	1M	0.5W 5% C.F.	213844
R25	1k	0.5W 5% C.F.	212405
R26	15k	0.5W 5% C.F.	212963
R27	15k	0.5W 5% C.F.	212963
R28	10k	0.5W 5% C.F.	212884
		C.F. - Carbon Film	
VR1	470k	0.1W Skeleton pre-set	222960
VR2	470k	2W Linear	222941
VR3	470k	0.1W Skeleton pre-set	222960
VR4	10k	0.1W Skeleton pre-set	222100
VR5	220k	0.1W Skeleton pre-set	222780
IC1		LM358	095028
IC2		MC14001	095007
IC3		CA3240E	095049

Circuit reference		Part No.
TR1	BC183LC	094010
TR2	BC213LC	094018
D1-D6	1N4005	105001
Z1	BZY8815V	102005
Z2	BZY885V1	102009
S1	D.P.C.O.	122017
S2	2 pole 6 way	120008
S3	D.P.C.O.	121005
M1	Meter 1mA f.s.d.	065023
T1	Transformer	123470
LS1	Loudspeaker	064008
LF1	Neon (for 110V-120V	045036
	Neon (for 220V-240V	045035
F1	For 110V-120V T500mA	043014
	For 220V-240V T250mA	043010