



Department of consumer and corporate affairs / Ministère de la consommation et des corporations



STANDARDS BRANCH - DIRECTION DES NORMES

**NOTICE OF APPROVAL
AVIS D'APPROBATION**

G-100

OTTAWA October 3, 1973

**BRISTOL "METAMETER", PULSE-DURATION,
TELEMETERING AND RECORDING, GAS FLOW MEASURING
SYSTEM**

APPARATUS

TRANSMITTER*

Differential Pressure:

American, Series "FS"(DRI-FLO) D/P Unit and Bristol Series 500 Case

Differential pressure ranges 0-20, 0-50, 0-100, 0-200 inches W.C.

Maximum working pressures 1,000, 2,000 and 5,000 psig

Static Pressure:

Bristol Helical Elements

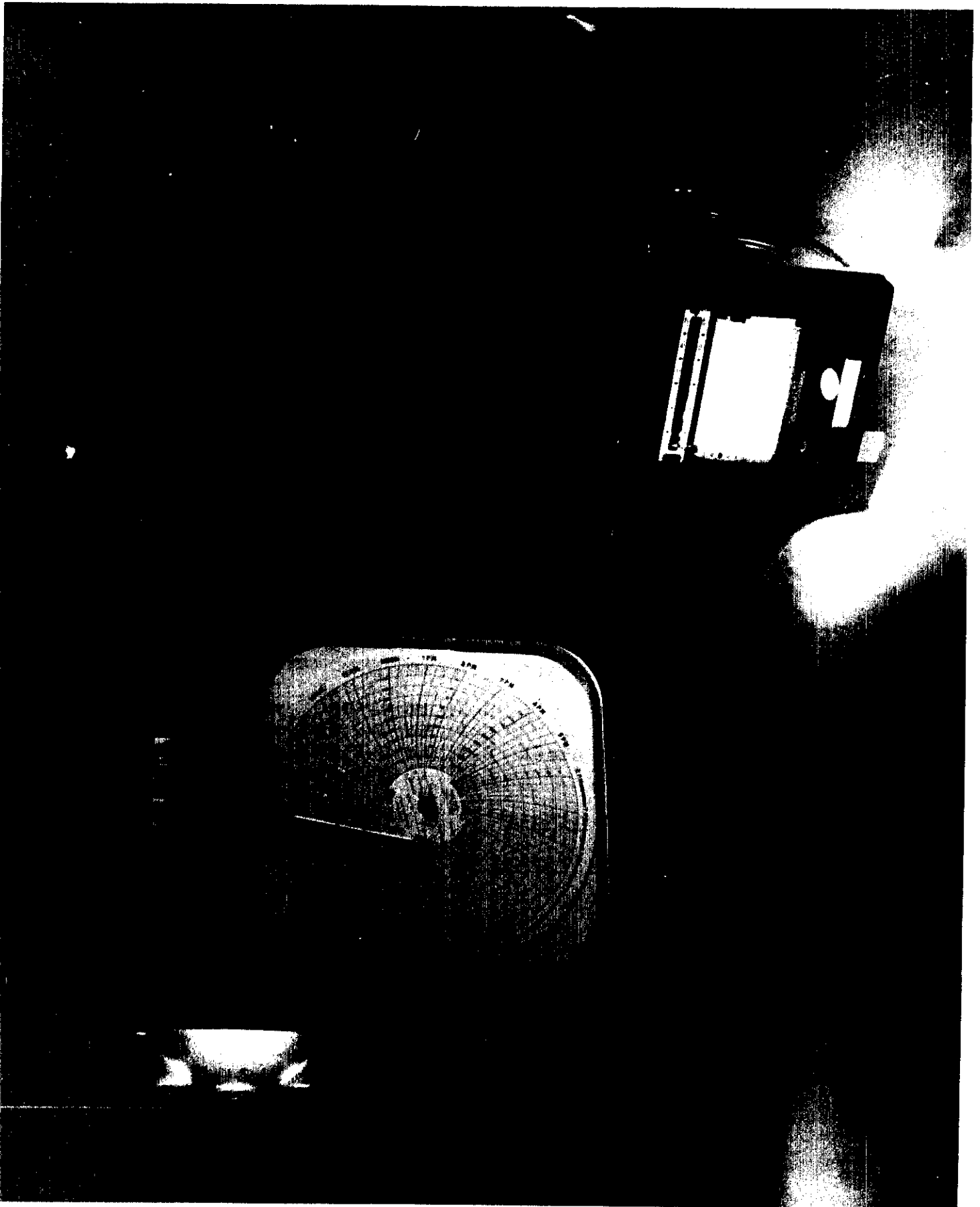
Trumpet metal	0-31 to 0-500	psig
Beryllium copper	0-31 to 0-5,000	psig
Type 316 stainless steel	0-31 to 0-5,000	psig
Nl-Span C	0-31 to 0-5,000	psig

Model Designation of Transmitters

<u>Recorded and Transmitted Parameter</u>	<u>Model Designation</u>
(i) Differential Pressure	1ER500M - 18
(ii) Static Pressure	1G500M - 14
(iii) Differential and Static Pressure	2ER1AX500MM-14-18

*NOTE: Two Metameter transmitting units, one for the differential and the other for static pressure, may be incorporated in the Bristol, Series 500, 12 inch recording case to form a complete, two parameter transmitter. Single parameter transmitters are also approved.

BRISTOL METAMETER GAS FLOW MEASURING SYSTEM



RECEIVER

Bristol, Series 670 Recording "Metameter" Receivers

<u>Recorded Parameters</u>	<u>Model Designiation</u>
(I) One-pen, static pressure	1M1M 670-14
(II) One-pen, differential pressure	1M1M 670-18
(III) Two-pen, static and differential	2M1M 670-14-18
Recorder scales Charts	horizontal, 4-inch calibrated width rectilinear co-ordinates, 4 inch calibrated width, 65 feet long.
Chart drives-standard speeds Inking	1, 2 or 3 inches per hour capillary pens with removable plastic reservoirs
Power supply Impulse cycle	120 volts A.C., 50 or 60 Hz 15 seconds standard, pulse duration signal varies from 3 to 12 seconds for full scale span; 5 seconds cycle also available

EXTERNAL POWER SUPPLY

Bristol, Model 9J1 Metameter Power Supply

Power supply (input)	120 volts, 50 or 60 Hz
D.C. output (max.)	120 volts, 60 mA
Standard operating current, adjustable to transmission line resistance	45mA
Transmission line max. loop resistance	2000ohms
Milliammeter range	0-60 mA

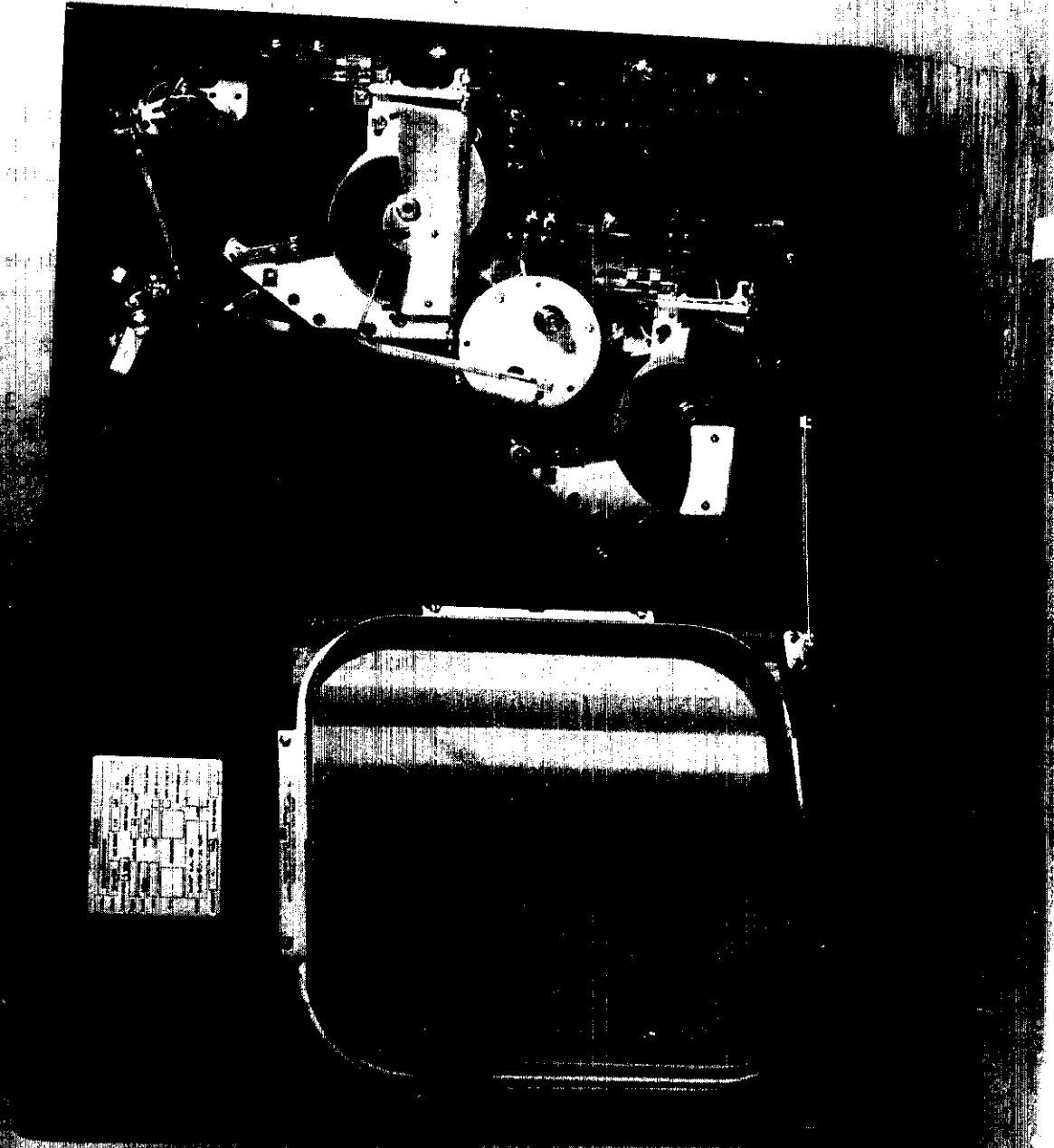
Description

The Bristol, Metameter telemetering system comprises three basic components, namely the recording transmitter, the remote recording receiver and the power supply.

The Metameter transmitting system utilizes the pulse-duration principle in which the duration of a pulse corresponds to the measurand.

The Metameter transmitter is located in a conventional recorder case where the primary measuring element may be either the differential or the static pressure element, or both. The element is linked to the cam follower of the transmitter.

METAMETER TRANSMITTER



The transmitting unit consists of a continuously rotating cam, a synchronous motor, a cam follower and a magnetic-type mercury-switch assembly. The cam rotates continuously in a counter clockwise direction, making one complete revolution every 15 or 5 seconds, depending on the impulse cycle of the unit. At zero pressure the cam follower is near the cam center and at maximum pressure the follower is near the cam periphery. The mercury-switch is open when the rider is on the cam and closed when the rider is off the cam. This system transmits a D.C. signal (pulse) as a function of time and is independent of electrical magnitudes.

The Metameter Receiver consists essentially of two differential mechanisms which are driven continuously by a constant-speed motor. Hairsprings attached to the shafts of the differential units hold the free ends of the differential units against fixed stops. The free ends of the units drive their respective braking disks according to whether the electromagnet is energized or de-energized.

The armature of the electromagnet has two brake pads. One brake pad engages one braking disk when the magnet is de-energized, and the other pad engages the other braking disk when the magnet is energized.

Attached to each differential shaft is a lever arm which engages another lever arm fixed to a loosely mounted pinion. Both pinions mesh with a common segment gear. The shaft of the segment gear is connected, through linkage, to the indicating pen arm.

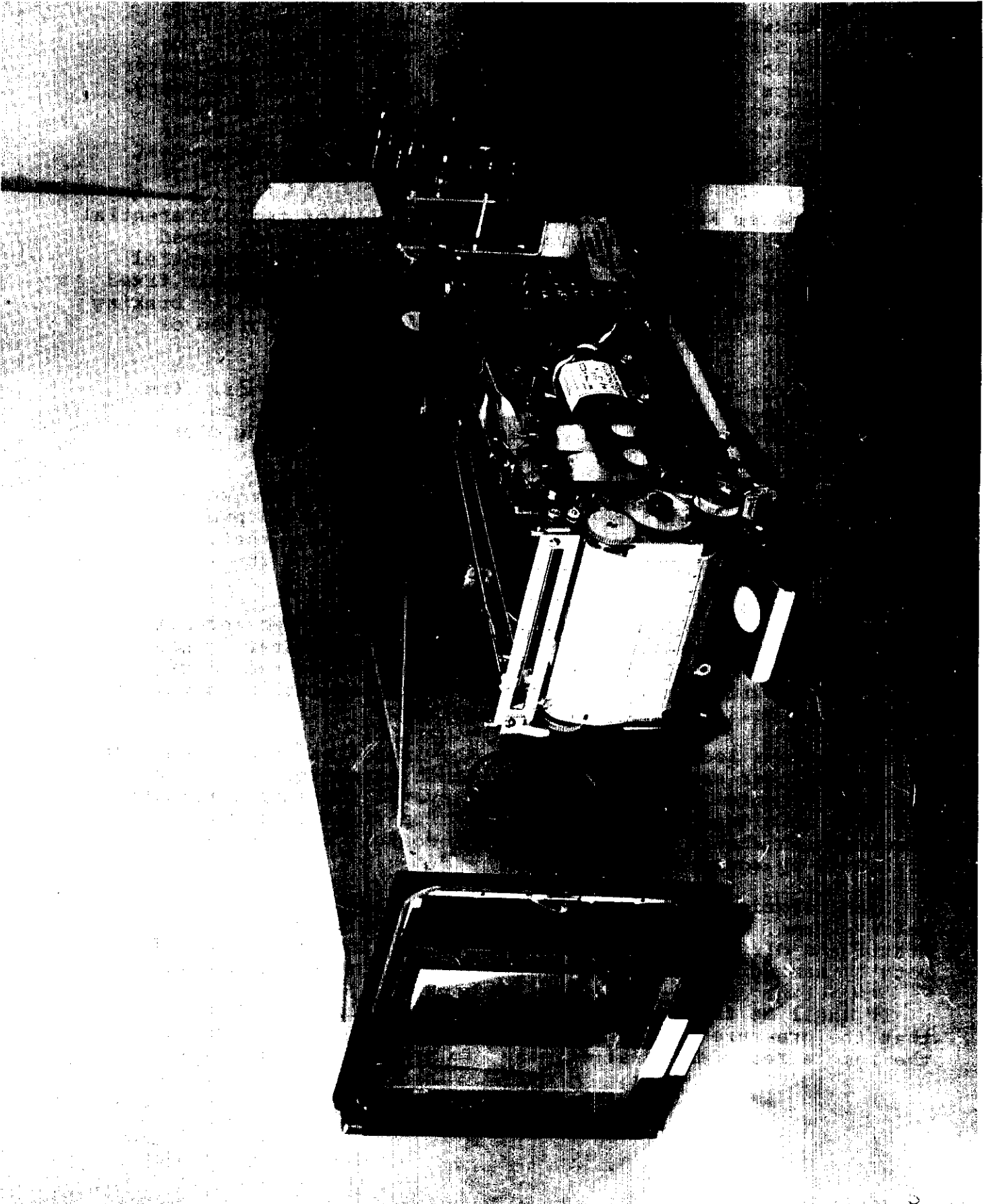
The receiver recorders may have either one or two recording pens depending on whether a single or a two parameter transmitter is used in the telemetering system. These recorders are equipped with either one or two indicating scales, depending on application.

The maximum loop resistance for the transmission line between the transmitter and the receiver of each parameter is 2000 ohms. It is to be noted that the metameter system for each parameter has its individual d-c power supply. The wires used for signal transmission should be installed in a conduit or be similarly protected by adequate shielding.

Each recorder shall have a nameplate which includes maker's name, model and serial number of the instrument, static and differential pressure range and identification of both by naming the corresponding ink color, when applicable.

It shall be the responsibility of the utility to ensure that the pressure registrations are properly transferred to the remote recorder at all times. To prevent unauthorized

METAMETER RECEIVER



persons access to the adjustable components which affect the accuracy of these devices, provisions for sealing or locking shall be provided.

Approval granted to:

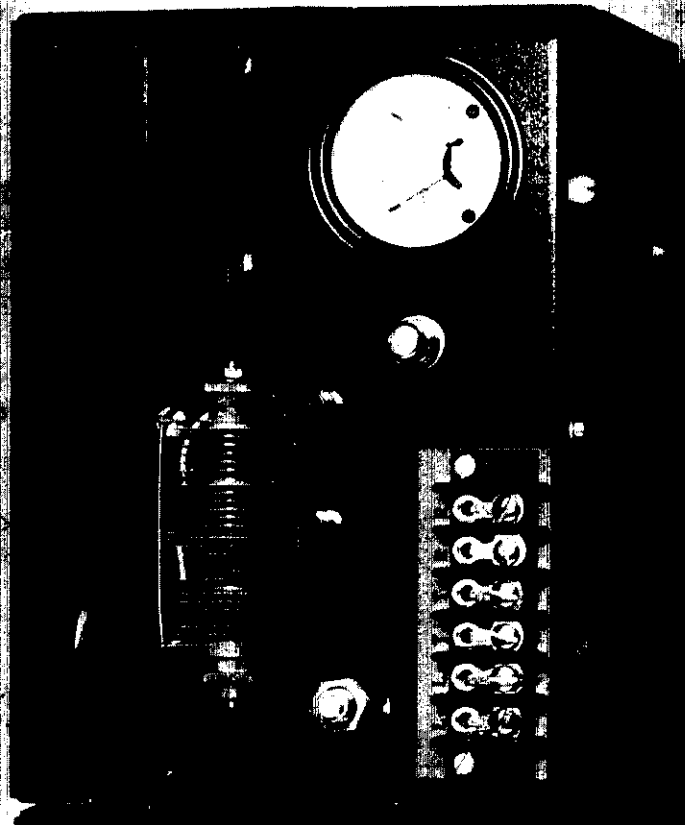
Bristol Company of Canada Ltd.,
Toronto, Ontario.

(for)

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Ref: GL 1147-57/B1-88
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MODEL 9J1 D.C. POWER SUPPLY
 SUPPLY 120 VOLTS 60 CYCLES
 OUTPUT 60 M.A. D.C. MAX.

TRANSDUCER TESTED
 5000 PSI

NOTE: THIS UNIT IS DESIGNED TO OPERATE AT 120 VOLTS, 60 CYCLES. IT IS NOT RECOMMENDED FOR OPERATION AT OTHER VOLTAGES OR FREQUENCIES.

THE BOSTON COMPANY, WILMINGTON, MASS.

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