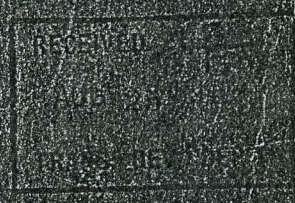


Marconi

WORLDWIDE



INSTALLING & OPERATING
INSTRUCTIONS

1842

FOLDER 95309
CARRIER SIGNALLING EQUIPMENT
DEVELOPED AND MANUFACTURED FOR
CANADIAN WESTINGHOUSE COMPANY, LTD
BY CANADIAN MARCONI COMPANY

CANADIAN MARCONI COMPANY
MARCONI BUILDING, MONTREAL
BRANCHES
VANCOUVER, WINNIPEG, TORONTO, MONTREAL, ST. JOHN'S, N.S.

DESCRIPTION, INSTALLING & OPERATING INSTRUCTIONS

CARRIER SIGNALLING EQUIPMENT

DEVELOPED & MANUFACTURED

for

CANADIAN WESTINGHOUSE COMPANY LIMITED

by

CANADIAN MARCONI COMPANY

FOR HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO.
BEAUHARNOIS LIGHT AND POWER COMPANY.

CARRIER SIGNALLING EQUIPMENT

(1) PURPOSE

The complete equipment provides for voice-operated simplex telephony using carrier frequencies on the high-voltage transmission lines as transmission medium. In addition, the equipment allows the use of up to three separate audio frequencies above the speech range for modulated carrier relaying purposes. Equipment is included for two of these frequencies (3000, and 4000 or 5000 cycles) and the transmitter proper also carries the necessary facilities for the third frequency in readiness for future extension.

(2) INCLUDED UNITS

Three separate equipments are presently supplied for installation at Beauharnois, Leaside, and Chats Falls, as follows:

Beauharnois

- (1) Transmitter unit 95520, complete with set of valves and two quartz crystals for 172 kc.
- (2) Antenna tuning unit 95521, "single" type, for coupling to one transmission line.
- (3) Control cabinet 95526, including a set of valves, and including facilities for transmission and reception of signalling tones of 3000 and 5000 cycles, together with telephone handset and patch cords.
- (4) Calling loudspeaker 95527.
- (5) Test meter.

Leaside

- (1) Transmitter unit 95520, complete with set of valves and two quartz crystals for 172 kc.
- (2) Antenna tuning unit 95522, "double" type, for coupling to one or two transmission lines.
- (3) Control cabinet 95525, including a set of valves, and including facilities for transmission and reception of signalling tones of 3000 and 4000 cycles, together with telephone handset and patch cords.
- (4) Calling loudspeaker 95527.
- (5) Test meter.

Chats Falls

- (1) Transmitter unit 95520, complete with set of valves and two quartz crystals for 172 kc.
- (2) Antenna tuning unit 95522, "double" type, for coupling to one or two transmission lines.
- (3) Control cabinet 95524, including a set of valves, and including facilities for transmission and reception of signalling tones of 4000 and 5000 cycles, together with handset and patch cords.
- (4) Calling loudspeaker 95527.
- (5) Test meter.

The equipment below is required to complete the installation at each terminal, but is not supplied with the present equipment.

- (1) Coupling capacitor or capacitors, with grounding switch, drainage coil, etc.
- (2) Line traps.
- (3) Mountings for antenna tuning unit.
- (4) Wiring material, conduit, etc.
- (5) Radio-frequency transmission cable.

(3) MOUNTING

The antenna-tuning unit is mounted out of doors adjacent to the 25-cycle line. It mounts at convenient height on a small angle iron frame, or on brackets, on a tower or switching structure. These mountings are not supplied.

The transmitter mounts indoors in the power station building. Radio-frequency energy is conveyed to the antenna-tuning unit by means of a low-impedance rubber-insulated concentric transmission line. The control cabinet may be mounted adjacent to the transmitter or in the control room adjacent to the telephone switchboard. The loudspeaker is designed for wall or table mounting as dictated by circumstances.

(4) APPROXIMATE DIMENSIONS of the various units are as follows:

Transmitter 72" high, 30" wide, 24" deep. Weight 1400 lbs.

Antenna-tuning unit ("double" type) 33" high, 44" wide, 23" deep. Weight 250 lbs.

Antenna-tuning unit ("single" type) 33" high, 22" wide, 23" deep. Weight 150 lbs.

Control cabinet 85" high, 22" wide, 18" deep. Weight 700 lbs.

(5) POWER DEMAND

For the transmitter in the "standby" condition approximately 1350 voltamperes is required. On full power with signalling tone modulation the demand is approximately 2500 voltamperes. The power factor is approximately 88%. When used for telephony the demand varies with the power adjustment and will lie between the above figures.

For the control cabinet with full equipment for three modulating tones the demand is approximately 380 voltamperes when on "standby" or when in use for telephony or relay signalling. The power factor is approximately 90%.

The whole equipment is designed for a 110-volt 60-cycle single-phase supply and is completely a-c operated. By means of taps on power transformers, any line voltage between 108 and 123 volts of frequency 60 to 65 cycles may be employed without materially affecting performance. No use is made of any other a-c or d-c supply which may be at the station, and the 60-cycle supply need not be in synchronism at any station.

For use from a 25-cycle or a d-c source, a suitable motor alternator would be required having reasonably good waveform, 3.5 kva capacity, and regulation preferably not over 5% from quarter to full load.

(6) POWER OUTPUT

The transmitter is capable of delivering at least 400 watts of r-f energy, which can be modulated at least 90%, to a load of nominal value of 70 ohms. In this instance, this figure is the characteristic impedance of the recommended radio-frequency transmission cable. The actual power into the "antenna" - in this case one conductor of the 3-phase 25-cycle line - is dependent on the load resistance presented by the transmission line, on the losses in the coupling capacitor, drainage coil, and wave trap, and on the length and character of the radio-frequency transmission cable.

(7) ANTENNA

The "antenna" consists of the phase wire itself, and energy is coupled thereto by means of a coupling capacitor. A wave trap is also recommended tuned to the operating carrier frequency. These units are not supplied. The recommended coupling capacitor is 0.001 uf, although the circuits in the antenna-tuning unit permit tuning out the capacitive reactance presented by any coupling capacitor of 0.00085 to 0.001 uf. In this