



(A) Type MN-20 Loop

(B) MN-52 Azimuth Control

(C) MN-13 Loop Amplifier

## MN-13 DIRECTION FINDER

**General**—The type MN-13 direction finding equipment is designed for use with the Bendix RA-1 receivers but will work satisfactorily with any well-shielded sensitive receiver having a high-impedance input.

The MN-13 amplifier provides for the use of a sense antenna, the output of which is mixed with the signal from the loop to permit uni-directional bearings. The equipment may be used for either bi-lateral or uni-lateral direction finding, with a switch providing the choice. The azimuth control has a specially designed mask which may be used to obtain accurate uni-directional bearings without the necessity of the usual mental calculations.

**Frequency Range**—150-1500 kilocycles; 200-2000 meters.

**Control**—The loop amplifier itself must be locally operated. The direction finding equipment is normally used with a locally controlled receiver. However, the receiver may be remotely controlled and its input switched from the loop amplifier to normal antenna by means of the Bendix MR-27 rotary relay.

**Sensitivity**—Either the 9-inch MN-20 loop or the 18-inch MN-24 loop may be used. They are interchangeable electrically and the choice is solely dependent upon what type of service is desired. Base and mounting dimensions are identical. The larger loop is approximately four times as sensitive as the 9-inch loop and is therefore better suited for long-distance direction finding.

In conjunction with the RA-1 receiver and with the 18-inch loop, a field-strength of 30 microvolts per meter will produce 50 milliwatts output with a 4:1 signal-to-noise power ratio. A 120 microvolt per-meter field will produce the same output with the 9-inch loop. These measurements are made with the loop set at maximum signal.

**Power Requirements**—.35 amperes at 14 volts or .2 amperes at 28 volts; plus .014 amperes at approximately 250 volts.

### Components and Weights—

MN-13 loop amplifier with cable, plug and tube.	4.75 pounds	2.16 kilograms
MN-52 azimuth control with cable plug.	.88 pounds	.4 kilograms
MN-20 9-inch loop antenna	4.6 pounds	2.1 kilograms
or		
MN-24 18-inch loop antenna	8.5 pounds	3.8 kilograms
AA-15410 flexible tuning shaft (15 feet).	3.9 pounds	1.77 kilograms
AC-55300 shielded cable assembly, 15 feet long, plug on both ends. Loop amplifier to power unit.	3.0 pounds	1.36 kilograms
AC-55294 RF transmission line 5 feet long, plug on one end only. Loop amplifier to receiver.	1.0 pounds	.45 kilograms
AA-15469 RF transmission line 14 feet long, plug on both ends. Loop antenna to loop amplifier.	3.5 pounds	1.6 kilograms

**Remarks**—Cable lengths specified are standard but will be supplied in any length to suit customer requirements. It must be pointed out that the MN-13 equipment is not a receiver but merely an accessory for a receiver. A source of power is also required.