



COMPACT HF/SSB RADIO SYSTEM

- For flexible operation · As manpack
- As vehicle station
- As base station

25 WATT MANPACK

The new NO/PRC-111 is the answer to the most stringent military requirements for a lightweight professional and technically advanced manpack. Among its main advantages you will find:

- Full 1.5 MHz to 30 MHz coverage frequency synthesized in 100 Hz steps.
- Capability to transmit voice, telegraphy and data communications.
- Compact and lightweight design. Only 4.97 kg less battery and accessories.
- Extensively proven field performance by the Norwegian Army.
- Simple human engineered controls.
- 100% dependable operations thanks to extremely rugged model.
- Simple single hand controlled antenna tuning. Silent tuning possible.
- Separate RF gain and AF volume controls.
- Low power consumption. High and low RF output power.
- Flexibility of operational modes.
- Modular construction for easier field maintenance.
- Availability of versatile accessories.

The controls are easy to use and require minimal instruction. Frequency selection is made by means of 6 push-buttons with incremental steps of 100 Hz. The single handed one-control antenna tuning is the only tuning required. Built-in antenna coupler can tune whip, long-wire and dipole antennas. A 50 ohm broad band output is available for external linear amplifiers. The audio volume control gives output level 8 in steps. RF gain control reduces receiver sensitivity from its maximum in 8 steps. This unique feature reduces interference and background noise in order to make the received signal more readable.

Through the system connector, the radio set may be operated from an external power supply. Modulation input key and audio output signals are available for remote control and data transmission.

In the receive mode, the front panel meter reads the AGC level and may be used as S-meter and for silent tuning.

In the transmit mode, the meter indicates power output and minimum SWR, and is used for antenna tuning and to check the output power during transmission. By depressing the push-button for the 100 Hz frequency setting half way down, the frequency display is illuminated and the battery voltage can be read both in the receive and the transmit mode on the instrument.

The armed forces have standardized on USB. To prevent any confusion on the operators side, concerning which mode to use, LSB and AM have been deleted. The transceiver is powered by a 4-ampere hour rechargeable battery containing 20 matched nickel cadmium (NiCd) «D» - cells in a hermetically sealed box. This box mounts on the side of the transceiver



by means of «snap-on» concealed clamps. Transceiver and battery box connect through spring-loaded contacts. Further, the battery has a multi-plug for connection to charger, a fuse and a safety pressure valve. A separate power cable with built-in polarity and overvoltage protection as well as current limitation can be used to power the set from any 24 V dc source.

A battery charger designed for field use will automatically charge two 4Ah NiCd batteries simultaneously to full capacity in five hours. This unique charger is temperature and current controlled. When batteries are ready to be used, the charging current is automatically switched to trickle charge. During extremely cold weather or long range missions, a high capacity lithium disposable battery with hermetically sealed cells can be included as part of the set.

The radio set is designed and tested according to NATO recommendations using the most advanced technology including large scale integration (LSI) to ensure reliability and easy maintenance. The design is based on the modular principle to allow speedy replacements and easy maintenance under field conditions. High MTBF assures reliable and trouble-free operation under severe combat conditions.

25 WATT VEHICLE AND B

Fitted into the vehicle mount AM-100N, the manpack is part of an extremely flexible and versatile NO/GRC-112 system. The radio set and the amplifier mount are building blocks used to form configurations to satisfy any customer requirements. You simply add the desired components and accessories to build your own special system.

The NO/GRC-112 system fitted with the vehicle mount AM-100N offers the following basic advantages:

- Audio amplifier, loudspeaker and battery charger.
- 12V, 24V dc vehicle battery system or 230V ac from a generating set or mains.
- Fits into shock mount MT-1029/VRC.
- Batteries are automatically charged. Your manpack is ready for use at all times.
- Easy and trouble-free conversion between vehicle and manpack configurations. No tools are necessary.
- Manpack antenna coupler tunes vehicle whip, dipole and long wire antennas.

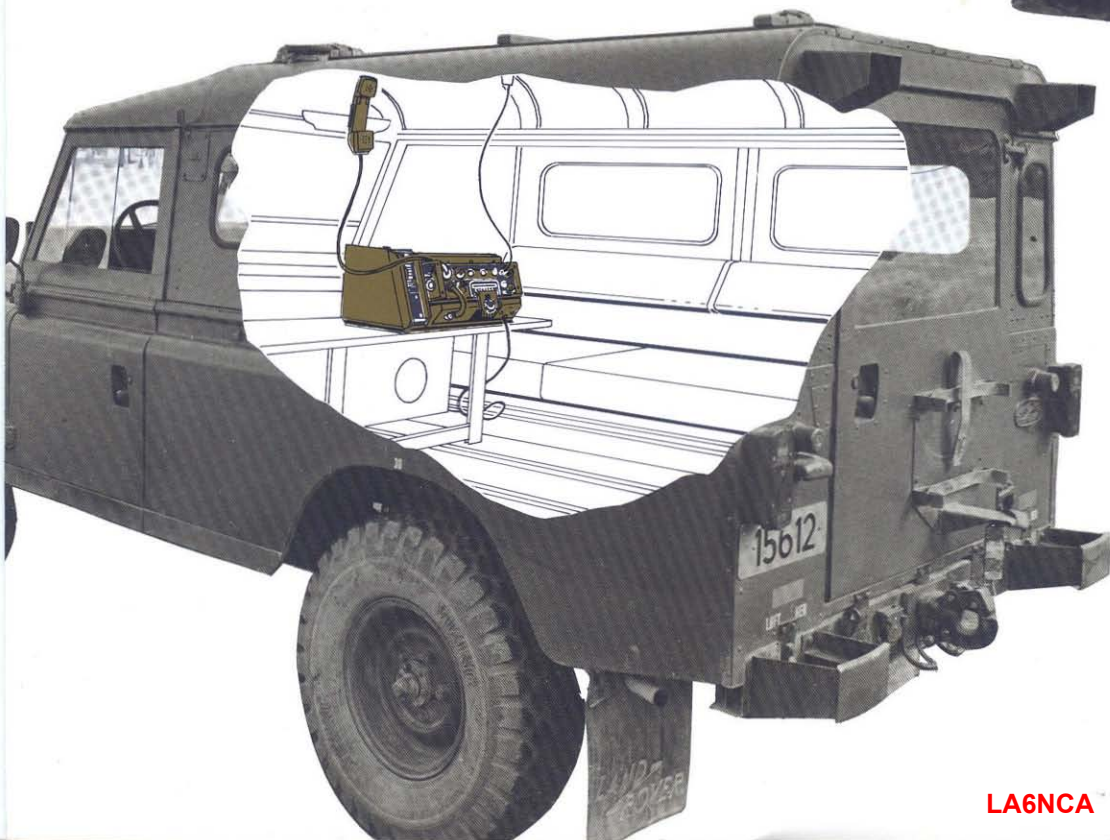
The vehicle mount has two controls only, input voltage selection and volume control. The voltage selector has four positions: Off, 24V, 24V/charge and 12V-230V charge. 10-32V dc voltage is supplied directly

either to AM-100N by a separate cable which plugs or into AM-100N through MT-1029/VCR by cable CX-4720/VCR. 230V ac is supplied directly to the front panel of AM-100N by a fixed cable. Input leads are protected against ripple and transients on the vehicle battery or mains system.

Any external 24V power source will feed the complete installation directly both in the transmit and receive mode. The battery on the radio set is electrically connected to the built-in charger only. In this configuration the user can choose whether or not he wishes to have a battery mounted on the manpack.

The built-in charger will charge the 4Ah NiCd battery on the radio set to full capacity automatically, independent of ambient temperature and residual capacity. The charger is current and temperature controlled. Charging a flat battery to full capacity will take approx. 8 hours. The front panel has three lights to indicate the charged conditions of the battery: off, charge and trickle.

When powered from 12V or 230V, the battery on the radio set is to be used as a buffer during transmission. The built-in power supply current yield is limited in order to make a small, compact and cost effective unit. With a transmit receive ratio of 1:9, the charger will secure sufficient capacity for the battery under normal conditions.



BASE STATION



The audio volume control gives audio output level in seven steps. During transmission the loudspeaker is muted to prevent feedback. The handset is not muted so a normal side-tone can be heard by the operator.

A fixed cable with plug from AM-100N to the system contact on the radio set provides the necessary audio signals and input voltages. The mains cable and the system cable are located at the front of AM-100N and are hidden in a small compartment with locked cover when not in use.

AM-100N with RT-111N can be remotely controlled by a remote control unit of the type AN/GRA-39 or equivalent. AM-100N is designed for use in combat vehicles with intercom installations, AN/VIC-1 or equivalent.

To obtain simultaneous operation when the HF radio set is located in the same vehicle as VHF radio sets, a separate vehicle antenna coupler with attenuation of unwanted RF signals is available.



100 W or 400 W BOOSTER

The manpack and amplifier mount may be used as basis for 100 watt and 400 watt transportable stations by the addition of linear amplifiers.

25, 100 or 400 watt stations use the same components and accessories. Automatic or manual antenna couplers are available when required.

The stations are compatible with most common antennas and can easily be installed in utility vehicles, trucks or shelters.

All maintenance and spare parts have been standardized.

TECHNICAL SPECIFICATIONS



RECEIVER TRANSMITTER RT-111N

General

Frequency range: 1.5 to 29.9999 MHz in 100 Hz steps
 Channels: 285.000
 Frequency stability: ± 1 ppm, -40°C to $+55^{\circ}\text{C}$
 Modes: SSB (A3J), CW (A2J) or data transmission (F2J)
 High or low RF output power

Environmental:

- Temperature: -40°C to $+55^{\circ}\text{C}$ operating
 -55°C to $+70^{\circ}\text{C}$ storage
 - Immersion: Up to 1.5 m in water
 Full specification performance operating up to 2400 m
 - Altitude: DEF 133 L3 and IEC 68
 - Applicable specifications: 24 V dc nominal

Power input:

Full specification performance from 20V to 32V input
 Size: 100 x 300 x 180 mm less battery box
 140 x 300 x 180 mm including battery box

Weight:

Transceiver 4.97 kg
 Battery box including NiCd rechargeable batteries 3.8 kg
 or Lithium disposable batteries 2.3 kg

Battery life with

receive/transmit ratio 9:1 at 25 watt SSB or CW

Nickel Cadmium: 12 hours
 Lithium: 48 hours

Receiver

Sensitivity:

SINAD at 1.4 μV emf
 SSB - 13 dB nominal, 10 dB minimum
 CW - 18 dB nominal, 15 dB minimum

Image rejection:

-60 dB nominal with reference to 1.4 μV emf, -55 dB minimum

Selectivity:

SSB - less than 6 dB, 350 Hz to 2700 Hz; 50 dB minimum, less than -1150 Hz and more than 4200 Hz
 CW - less than 6 dB, 850 Hz to 1150 Hz; 50 dB minimum, less than 250 Hz and more than 1750 Hz

Transmitter

Nominal RF power output: SSB 2.5 W or 25 W pep
 CW 2.5 W or 25 W rms

Intermodulation distortion: -27 dB nominal, -20 dB minimum
 Lower sideband suppression: -45 dB minimum

Harmonic suppression: -35 dB nominal, -30 dB minimum

Carrier suppression: -45 dB nominal, -35 dB minimum

Audio response: 350 Hz to 2700 Hz within 6 dB

Data transmission: 600 Baud maximum by external modem

AMPLIFIER MOUNT AM - 100 N

General

AM - 100N fits into mounting MT-1029/VRC

Environmental

- Temperature: -40°C to $+55^{\circ}\text{C}$ operating
 -55°C to $+70^{\circ}\text{C}$ storage
 - Water: Splash proof
 - Applicable specifications: DEF 133 L3, DEF 5011 and IEC 68
 Power input: Full specification performance for 10 - 32V dc and 230V $\pm 15\%$ - 10% (115V optional)

Ripple and transient

protection:

Electromagnetic pulse protection (EMP):

Provided

Provided

Vehicle intercom:

AM - 100N with MT - 1029 compatible with intercom set AN/VIC-1

Audio Amplifier and Loudspeaker

Audio output power:

2.0 watt ± 1.5 watt into intercom set

Audio frequency response:

300 - 3000 Hz within ± 3 dB

Harmonic distortion:

Less than 7%

Signal-to-noise ratio:

Minimum 40 dB referred to 2.0 watt output

Charger

Charge current:

600 mA

Trickle charge:

100 mA

Automatic charging when cell temperature in the NiCd battery is -30°C to $+42^{\circ}\text{C}$

The current is automatically reduced to 100 mA when the battery has reached full capacity. Reduced charging also when battery voltage exceeds 32 volt and when the cell temperature is higher than 40°C or lower than -30°C .

Audio power output:

40 mV into 150 ohm load nominal (handset)

Power consumption in

receive mode:

150 mA at 24 V maximum
 3 dB increase in audio level for 20 μV to 1000 mV emf input

AGC:

ACCESSORIES



The new NO/GRC-112 radio system can be supplied with a wide range of accessories meeting any requirement. This enabling the user to build tailor made systems by use of the following available components: Nickel Cadmium battery pack, Whip antennas, Dipole

antenna, Headset (one earpiece), Handset, Power Cable 24 V, Counter poise, Packframe with bag, Battery Charger, mini-charger, Microphone, Telegraph key, Dry battery box (lithium), Carry bag with shoulder strap, Vehicle antenna coupler. Remote control unit.

THE MANUFACTURER

A/S Mikro-Elektronikk has developed and is producing the new HF/SSB radio system. AME specializes in micro electronics technology. The company supplies specialized components for military applications such as missiles, laser range finders and communication systems. AME also offers custom-made large scale integrated (LSI) and hybrid circuits based on thin and thickfilm technology.

AME is a subsidiary of Gustav A. Ring A/S which is marketing the radio system. Gustav A. Ring A/S and its associated companies form the international Ring Group with subsidiaries and distributors in more than

40 countries throughout the world. A wholly Norwegian owned concern, the Ring Group develops, manufactures and markets its own products within the telecommunications and data sectors. Among these are RING-MASTER direct speech intercom, GAREX communications control systems, ACD automatic call distribution for telephone systems and SCANRING alarm and surveillance systems. Another Ring Group associate NERION A/S, specializes in turn key projects for military and civilian purposes on the international market.

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