NV20

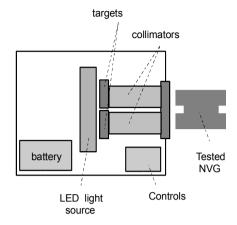## Field tester of binocular night vision goggles

Fig. 1. Photo of the NV20 test station

Fig. 2. Block diagram of NV20 test station

BASIC INFORMATION:

Binocular night vision goggles are the most expensive type of night vision devices. These goggles are typically used to provide night vision capabilities for aviators of helicopter/aircraft and drivers of mechanical vehicles or ships. Proper performance and optimal settings of binocular NVGs are of crucial importance for earlier mentioned users. Military forces, paramilitary organizations, and civilian organizations have suffered heavy losses due to accidents at night conditions. It has been proved that performance defects of the goggles or improper settings are one of main reasons of accidents during night missions. Due to these reasons binocular night vision goggles are often tested at least three levels: a)acceptance level, b)maintenance level, c) mission readiness level.

NV20 station is a test station optimized to carry out basic tests of binocular NVGs before important missions. The task of NV20 station is to to help to optimize focus of oculars and objectives of the night vision goggles, check image resolution and to detect NVGs with serious operational defects that can endanger mission success. The station due to its compact size, small mass, battery power and simple operation can be used at field conditions as part of support equipment for night operations.

TEST CONCEPT

NV20 station works as a dual channel image projector. The station projects an image of a resolution target on an uniform background into direction of tested NVG located opposite to station optics. Light intensity of can be regulated at several steps to simulate typical light conditions that can be met during missions.

The target is typically USAF1951 resolution target recommended by majority of military and civilian standards. However, Snellen scale resolution target (popular at air force community) can optionally replace USAF1951 target.

Step regulation of distance to simulated target is possible. Two distances are typically simulated: optical infinity (distance over 1km) and distance about 20m.

USER TASKS

Typical tasks of user of NV20:
1. to focus properly both objectives and and oculars of tested NVDs,
2. to check if image resolution is better than specified limits at different operational light conditions, including high ligh level conditions,
3. to check if image generated by NVGs is free from operational defects (shading, edge glow, flashing,/flickering/intermittent operation, emission points)

Proper focus – situation when NVGs generate sharp image of all targets located at typical operational range from about 20 m to infinity without necessity to do any refocusing.

● INFRAMET

NV20

Field tester of binocular night vision goggles

VERSIONS

Two basic version of NV20 station of different design and different test capabilities are offered: NV20A and NV20B. Both versions externally look similar. NV20A is a simplified version of NV20B of limited test capabilities. NV20A can be treated as equivalent to simple mission readiness test stations offered on international market. NV20B is a station of performance that significantly exceeds competitors stations at this group.

Table 1. Main design differences

Parameter/feature	NV20A	NV20B
Number of illuminance levels of simulated scenery	two	Four (including bright level 200lx)
Type of simulated scenery	Bright USAF1951 target on black uniform background	Dark USAF1951 target on bright large uniform backgound that fill FOV
Number of simulated distances	One (optical infinity)	Two (optical infinity and about 20 m)

Table 2. Differences in test capabilities

Test capability	NV20A	NV20B
Focusing of objectives and oculars	Yes (but at single distance equal to infinity)	Yes (but for two distances: about 20m and infinity)
Checking center resolution	Yes. Bright resolution target on black background. Negative contrast.	Yes. Dark resolution target on bright background (positive target contrast according to recommendations of most standards)
Checking bright level resolution	No.	Yes. Resolution tests at 200lx background.
Checking operational defects	No. Dark background makes difficult to detect operational defects	Yes. Bright background enables easy detection of operational defects

NV20A SPECIFICATIONS

Modules	Modules: NV20A base block, PS12/3 external AC power supply, battery set, wall adapter, tripod, transport box
Light Source	Monochromatic area LED source calibrated to simulate 2856K color temperature polychromatic light source
Number of optical channels	2 (user can see image in two eyes if using binocular NVGs)
Aperture of built in collimators	at least 35 mm
Collimator resolution	at least 10 lp/mrad
Simulated scenery	Bright USAF1951 target on black background
Spatial frequency range of resolution target	At least from 0.5 lp/mrad to 1.78 lp/mrad
Distance to simulated target	Fixed: optical infinity (distance over 200m)
Simulated illuminance levels	Two switchable levels: Low: 2 mlx, High: 64 mlx
Power	1)Internal battery, 2)230/110 VAC 50/60 Hz
Positioning	NV20A can be located on a table, on tripod or fixed to wall
Operating temperature	-5°C to 40°C
Average life time of LEDs source	>10000 hours
Mass of NV20A base module	<8kg
Dimensions NV20A block	353x195x263mm (without handles)
	401x195x263mm (including handles)

● *INFRAMET*

NV20

_____

Field tester of binocular night vision goggles

NV20B   SPECIFICATIONS

Modules	Modules: NV20B base block, PS12/3 external AC power supply, battery set, wall adapter, tripod, transport box
Light Source	Monochromatic area LED source calibrated to simulate 2856K color temperature polychromatic light source
Number of optical channels	2 (user can see image in two eyes if using binocular NVGs)
Aperture of built in collimators	at least 35 mm
Collimator resolution	at least 10 lp/mrad
Simulated scenery	Dark USAF1951 target on uniform bright background
Spatial frequency range of resolution target	At least from 0.5 lp/mrad to 1.78 lp/mrad
Distance to simulated target	Variable: optical infinity (distance over 2 km) or 20m
Simulated illuminance levels	Four switchable levels: Low: 2 mlx, Medium: 16 mlx, High: 128 mlx, Bright level: 200lx
Power	1)Internal battery, 2)230/110 VAC 50/60 Hz
Positioning	NV20A can be located on a table, on tripod or fixed to wall
Operating temperature	-5°C to 40°C (option -25°C to 40°C)
Average life time of LEDs source	>10000 hours
Mass of NV20B base module	<8kg
Dimensions NV20B block	353x195x263mm (without handles)
	401x195x263mm (including handles)
Accessories	wall adapter, tripod

CALIBRATION

Calibration of NV20 station is done using meters traceable to EU metrology system. Recommended recalibration interval is not later than once per three years.

specifications are subject to change without prior notice

Version 3.3

CONTACT:

Tel: +48 604061817   Fax: +48 22 3987244   Email: info@inframet.com

● *INFRAMET*