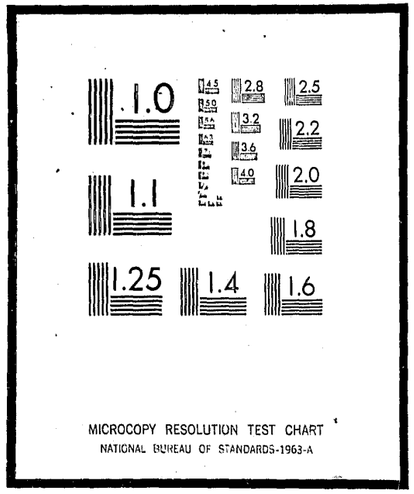

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

NAVELEXSYSENGCEN, San Diego
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SENSOR TEST SUMMARY

"FENCE GARD II"

Model Nr. FGS-5400

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SENSOR TEST

SUMMARY

1.0 BACKGROUND

1.1 In the past few months, NAVELEXSYSENGCEN, San Diego, has been requested to submit Customer Requirement Documents to a variety of military installations for the designing and construction of security systems.

1.2 To arrive at the most cost-effective methods of application of various sensor types, it has become necessary to determine the validity of manufacturers' specifications, installation methods and sensitivity ranges of certain sensors under field conditions.

2.0 DESCRIPTION OF DEVICE UNDER TEST

2.1 The Device Under Test (DUT) is technically a low-level shock detection unit called Fence Gard II, model FGS-5400. Ancillary equipment is a combination processor/annunciator unit, model FGCPR-5600 and appropriate intercabling. Manufacturer (distributor) of this DUT is T.P.S., Inc., 2930 College, Costa Mesa, California 92626. Phone (714) 545-8240. This particular DUT was a hand-fabricated unit, as opposed to a "production" model, and was installed at the test site by the manufacturer's representative. As tested, this DUT consisted of:

3 each Detector Units

1 each Processor/Annunciator

1 set Cables w/connectors

Note: Manufacturer's specifications indicate a typical configuration consists of 10 detector units per channel with typically 3 to 5 channels provided. The

manufacturer currently "customizes" the system for each particular application/installation, with no limitations to the length of fence which may be protected from a single control point.

2.2 For this testing the DUT consisted of three sensor units, mounted on the posts of a standard six foot chain link fence with a three-wire outrigger. The sensors were placed 30 feet apart, approximately four and one half feet above the bottom of the fence. These sensors were wired to respond independently to a processor/annunciator unit located in a guard post approximately 30 feet away from the nearest sensor unit (see sketch, page 6).

2.3 Method of installation of the individual sensor units was by the use of two 6" U-bolts around the posts, clamping the unit directly against the chain link portion of the fence (see sketch, page 6). The manufacturer recommends stud-gun mounting for permanent installation, but the use of this alternate mounting method was not tried. Because the DUT was installed by the manufacturer's representative, it was assumed the placement would result in optimum performance.

3.0 TEST ACTION

3.1 The purpose of this test was to determine if the DUT would detect ALL physical attempts at breeching the protected fence without creating nuisance alarms due to wind, birds, passing vehicles, etc..

3.2 Testing first involved approaching the fence and attempting to scale it (with and without a ladder) as though the "intruder" had no knowledge of the sensors on the fence.

3.3 The second phase of testing was then conducted in a manner that would typify the actions of an intruder (equipped with an eight foot ladder) approaching the fence with full knowledge of its sensorized condition.
Note: The person acting as the "intruder" was knowledgeable in the peculiarities of various sensor types, and used this knowledge in his attempt to defeat the system.

3.4 A third series of tests were then conducted in an attempt to simulate certain actions that have been responsible for nuisance alarms in other installations. These simulated actions consisted of:

a. A large bird alighting on, and taking flight from, different wires of the outrigger.

b. An animal such as a wild burro, rubbing, with varying degrees of force, against the chain link portion of the fence.

c. The effect of high velocity wind; steady and in gusts.

d. The effect of vehicles driving parallel to the fence approximately five feet away. Because of local speed limits, high speed traffic was not observed.

4.0 OBSERVATIONS AND CONCLUSIONS

4.1 It was observed from the tests performed that this system experienced no false alarms, and the nuisance alarms (birds, wind and rubbing) occurred only as a result of extreme action. No alarms were generated as a result of nearby vehicular traffic. If the intruder made any reasonable physical attack on the fence, such as striking or climbing with or without the aid of a ladder, an alarm was generated. Conclusion: High probability of detection with low (nil) false alarm rate. However, if the intruder is aware of the sensored

condition, the fence could be bridged with a step-ladder, providing the ladder does not make contact with the fence, thereby defeating this sensor system.

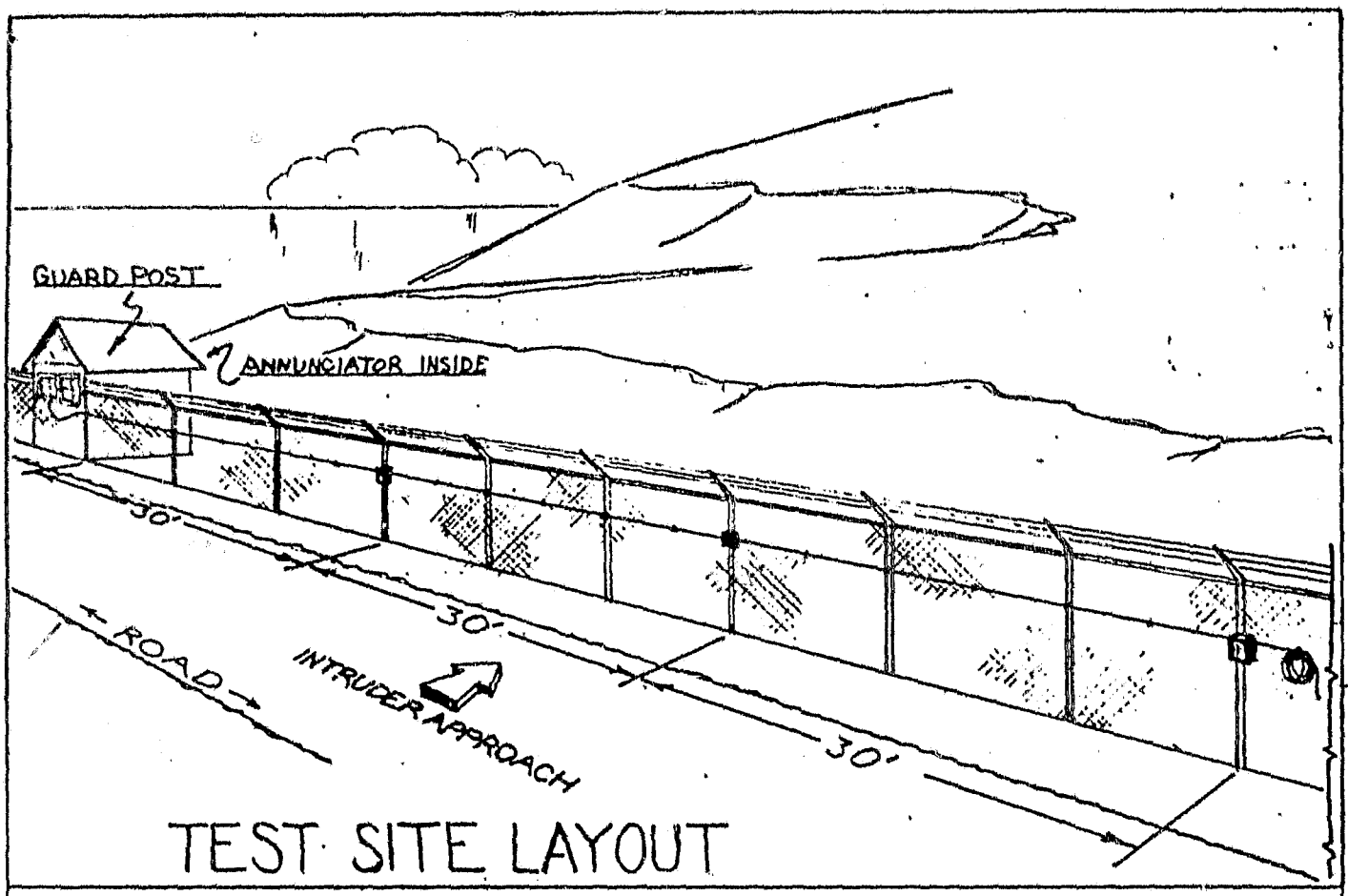
5.0 COMMENTS

5.1 Because this DUT was not government property it was not opened and inspected for internal workmanship or design/packaging methods.

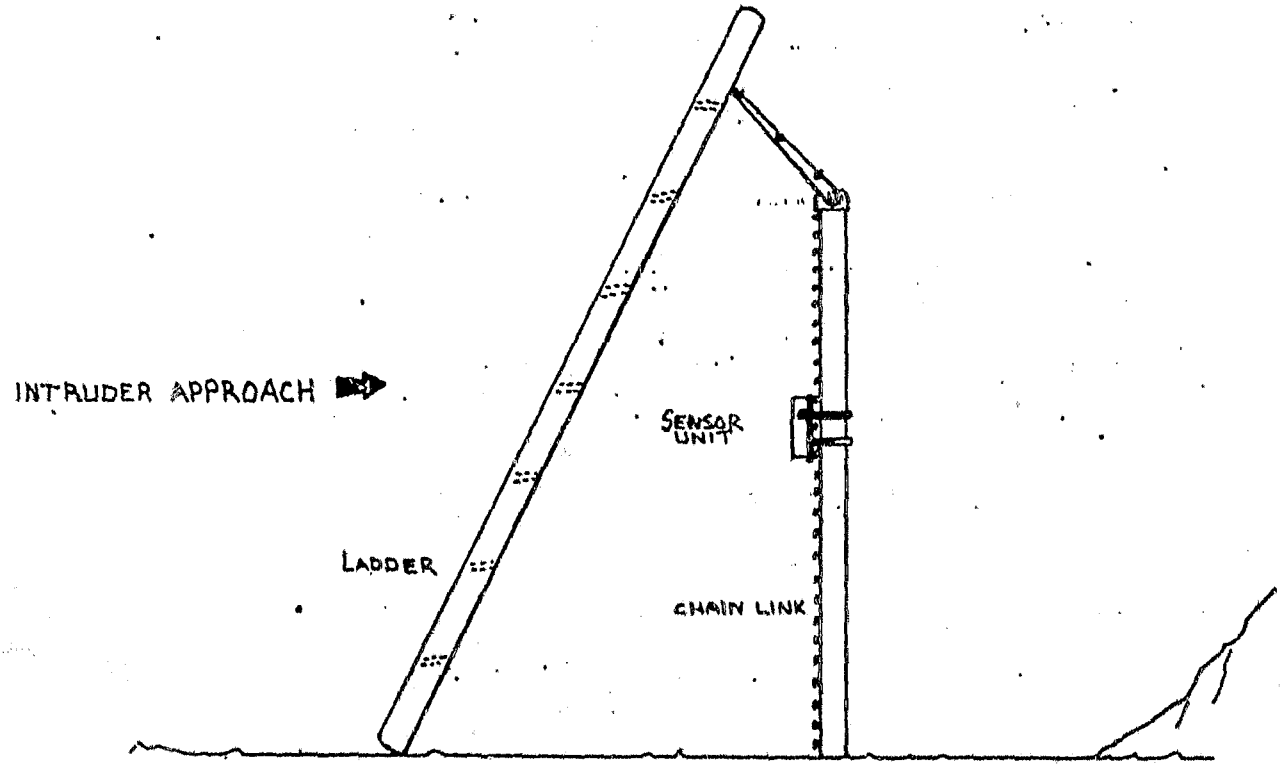
5.2 The size of the individual sensors was observed to be approximately 6" x 6" x 2", consequently the installation of these units on the fence posts is obvious to the casual observer. This fact may be a disadvantage, as a knowledgeable intruder could plan to breech the fence by not touching it. For example: the use of a tall step-ladder; tunneling underneath; vaulting over; etc.. Also, unsophisticated persons, upon observing the sensors, may be tempted to hit or kick the fence just for effect, thereby causing nuisance alarms.

Note: The manufacturer states that if the user desires the sensor units to be undetectable by observers, the following options are available:

1. The sensors can be mounted in metal cylinders inside the fence posts and the wiring strung through the top pipe stringer.
2. The sensors can be mounted below ground level and interconnected with direct burial cable or through rigid conduit. By using rigid conduit, any attempted tunneling underneath would create an alarm condition.



TEST SITE LAYOUT



SENSOR CONFIGURATION