

8 May 1955

MEMO FOR THE FILES

SUBJECT: Infrared Communications Equipment

PURPOSE: Familiarization and Operational Evaluation of Infrared Long Range Voice Equipment

1. On Thursday, 5 May 1955, a trip was made to [redacted] by the following Agency personnel:

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The purpose of the trip was to operate and evaluate the TSS/ [redacted] developed infrared long range voice communications equipment.

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2. The equipment consisted of two package units. Each package consisting of a complete transmitter, receiver, viewer, powersupply, stand and carrying case. See Attachment A. The equipment when packed weighed 30 pounds per unit. During the tests all members of the party aligned and operated the equipment.

3. Tests began on the morning of arrival at approximately 1100. Two tests were made at this time, two at 1500, and the concluding two tests at 1300. A total of six tests were made over a 12 hour period. The tests were made under the following conditions:

- Diurnal—clear and strong sunlight
- Nocturnal—clear and slightly damp with a full moon for good visibility
- *Distance—6000 feet
- Terrain—over both level earth, and, level earth and concrete

*Although this is long range equipment and is reported to have worked satisfactorily over a distance of 13 miles it was not possible due to line of sight requirements and security considerations to work over a greater distance than 6000 feet.

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4. Tests number 1 and 2. Approximately 15 minutes was spent in setting up the equipment. Contact was then established over earth ten minutes after the setup. The quality of speech was good, with a strong signal and good readability. On test number two the units were disaligned from each other and then attempts were made to realign them and establish contact but without success. The units were then repacked and the next two tests scheduled for the afternoon.

5. Tests 3 and 4. Prior to the tests, the TSS representative explained the electronic and optical operation of the equipment to the other three members of the party. Test number 3 was performed at 1500 over a terrain of both earth and concrete. The quality of speech was poor. A strong signal was present but the readability of the signal was very poor due to high background noise and heat refraction of the modulated signal. In the next test, test number 4, the equipment was moved to a direct over the earth path only. Approximately 45 minutes was spent in trying to establish contact without success. A thorough check of the equipment then showed that in moving it the bellows lock has come loose thereby disaligning and defocusing the beam completely. The bellows was relocked and contact established almost immediately. The quality of speech was good with approximately the same signal strength but a great improvement in the readability of the signal. The test for afternoon conditions was completed; the equipment was repacked.

6. Tests 5 and 6. The final two tests were made at 2300. One unit was set up and contact established for both tests using moonlight for illumination only. The speech and signal quality in both tests were excellent. Absolutely no trouble was found in establishing contact or communications with each other. The units were then repacked and the tests concluded.

7. Upon completion of the tests and analysis of results the deficiencies of the equipment were discussed and the following items recommended for improvement.

I. STAND AND TURNABLE

a. The present tubular legs are to be made solid at the joint location. The slip ring broadened and the tapered part of the leg which goes under the slip ring will be lengthened.

b. The springs holding the legs to the turntable were broken in one case. This was believed due to their having been painted and the action of the paint reducing the elasticity of the spring. All broken springs are to be replaced and tested again.

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c. The turntable yoke will be reduced in size and weight and a scale for calibrated settings placed on it.

d. The present thumb screws holding the unit in the yoke will be replaced by one thumb screw from the yoke side of the equipment.

e. The vertical deflection adjust screw will be changed and a larger knob placed on it.

II. BELLOW'S

a. The bleeder on the bellows will be increased in size.

b. The bellows will be made of a better material than is presently used. The present material has a tendency to billow and fold wrong and under usage would crack open.

c. The braces holding the bellows open will be changed to the sliding type and if possible will have an automatic lock on them.

III. CARRYING CASE.

a. The catches used on the carrying case will be reduced in number and strengthened.

b. The handle of the carrying case will be increased in size.

IV. EQUIPMENT.

a. A front cover for the lead sulphide cell and the viewer will be provided.

b. A recorder jack will be placed in the equipment.

c. A key input whereby the 1000 cycle tone may be Morse keyed when the equipment is in the transmit-find position will be added.

d. A shade or cap will be fitted over the modulation indicator to provide additional security for night operation.

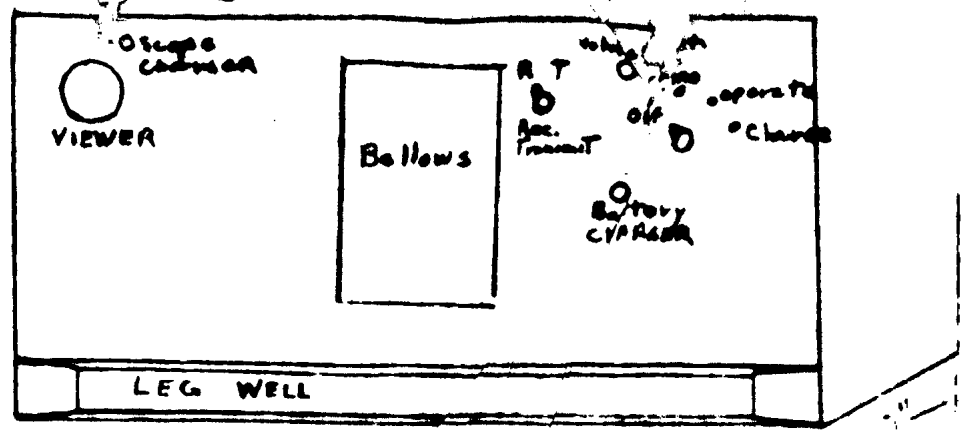
e. The present volume control will be changed from linear to logarithmic taper.

f. A sighting device of some type, either mechanical or optical will be added to the equipment.

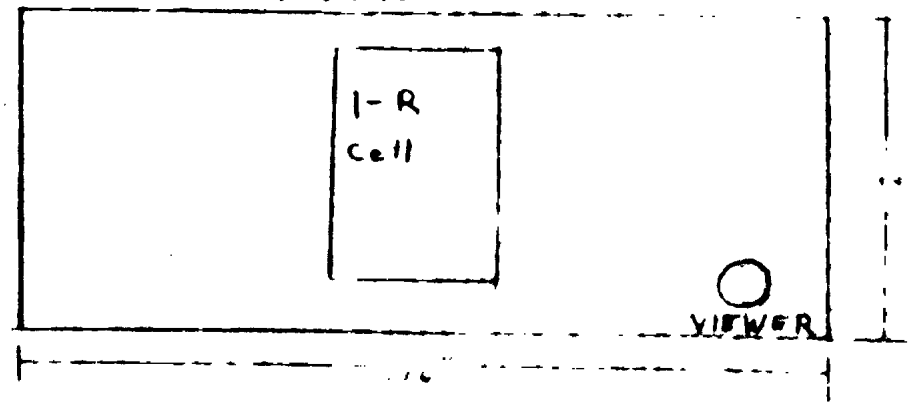
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