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U. S. ARMY MATERIEL SYSTEMS ANALYSIS AGENCY ACTIVITY
Aberdeen Proving Ground, Maryland 21005

11 FEB 1975

AMXSU-GI

SUBJECT: Comments on USAIB Test Plan for Feasibility Test of Reflex Collimator Sight (RCS), Muzzle Brake Compensator (MBC), and Burst Control Device (BCD) for the M16A1 Rifle

THRU: Commander
USA Test & Evaluation
Command
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TO: President
USA Infantry Board
ATTN: LTC Nowak
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1. Reference is made to:

a. Feasibility Test of Reflex Collimator Sight (RCS), Muzzle Brake Compensator (MBC), and Burst Control Device (BCD) for M16A1 Rifle, Test Plan by LTC D. E. Nowak, December 1974, USATECOM Project No. 8-WE-604-016-003, USAIB Project No. 3442.

b. Military Potential Test of Optical and Low Light Level Sights for Small Arms Rifles, Final Report by CPT L. J. Regan and 1LT J. S. Parker, September 1970, USATECOM Project No. 8-WE-607-000-001, USAIB Project No. 3219.

2. This office has reviewed the subject test plan and it is felt that several comments and/or recommended changes are appropriate.

3. It is stated in paragraphs 1.3.1 and 1.3.2 that the objectives of the test are to provide data on the increased effectiveness of the M16A1 rifle equipped with the Reflex Collimator Sight (RCS), Muzzle Brake Compensator (MBC), and Burst Control Device (BCD) and data on the relative

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contribution of the RCS, MBC, and the BCD with MBC to increased effectiveness. However, the four weapon configurations given in paragraph 1.4.1 are such that data can be obtained for only the effects of the RCS, the BCD with the MBC, and the RCS, BCD and MBC in combination. None of the configurations have the BCD without the MBC or vice versa. Therefore, the effects of these two product improvements cannot be isolated, but must be considered in combination.

4. The standard or control weapons described in 1.4.1a should not be equipped with the promethium sight kits. The promethium sight kit includes a very large (10mm) aperture rear sight to replace the standard battle sight aperture. The large aperture rear sight will degrade the accuracy of the M16A1 rifle for daylight firings as indicated in Table 2-3 of Reference 1b. These data were generated with a promethium sight kit having a 7mm rear sight aperture. The 10mm rear sight aperture should further degrade the accuracy of the system. Note that the analysis of the data referenced above shows that the mean radius of the shot groups for the standard iron sights is significantly smaller (at the 95 percent level) than the mean radius of the shot groups for the promethium sight at both 100 meters and 300 meters.

5. For each of the tests in which data are to be collected automatically, it is strongly recommended that a controlled pilot test exercise be conducted to insure that the instrumentation systems are operating properly. In particular these tests are:

a. Paragraph 2.4 of Reference 1a: Accuracy and Dispersion. In this recommended pilot exercise, the coordinates registered by the ACCUBAR system should be compared to coordinates measured on a target placed in the plane of the ACCUBAR system.

b. Paragraph 2.5 of Reference 1a: Day Defense. This recommended pilot exercise should be conducted to insure that the data collection system is capable of separating the actions of the eight men firing simultaneously, i.e., who fired how many times, hit which target in the array and when? One way to do this is to have the eight men fire simultaneously at separate targets and manually count the rounds fired and the number of hits for comparison with the records from the data collection system. The pilot test should also include verification of the hit recording system on the moving targets.

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c. Paragraph 2.6 of Reference 1a: Quick Fire. This pilot exercise should verify the hit recording system on the moving targets.


d. Paragraph 2.7 of Reference 1a: Low Light Level. This pilot test should be similar to that described for the day defense test.

6. Short exposure time semiautomatic and burst fire subtests should be added to the accuracy and dispersion firings. It is suggested that a pop-up target mechanism be placed behind the ACCUBAR system to measure the effect of short exposure times on accuracy and burst dispersion. The dispersions measured in this subtest should more closely approximate those obtained in the day defense and quick-fire tests.

7. To prepare properly the inputs for the upcoming COEA, AMSAA will require the coordinate data collected during the accuracy and dispersion tests and a summary of all other firings tabulated for each target exposure of each firer.

8. The test design implicit in the methods and the analytical plans for the Day Defense, Quick Fire, and Low Light Level Tests require some reevaluation if it is hoped that the data obtained from these tests will be amenable to analysis to address the stated objectives. Considering the Day Defense test, there are at least two apparent main factors which could influence the test results. These two factors are: weapon configuration, defined to be the physical makeup of the weapon, and mode of fire. There are four weapon configurations and these are described in paragraph 1.4.1. There are three modes of fire for the weapons with the BCD: semiautomatic, trigger manipulated automatic burst, and bursts controlled by the BCD. Only two modes of fire are available for those weapons without the BCD; these are semiautomatic and trigger manipulated automatic bursts. If the firing schedule given in Table 1 is to be used, it appears that the data should be analyzed as two separate two-way classifications, one comparing weapon types A and C in the automatic and semiautomatic mode and one comparing weapon types B and D in the automatic and controlled burst modes. It is pointed out that the firing schedule as given will allow for only the following comparisons: the standard weapon with the three test weapons in the automatic mode only; the standard weapon with type C weapons in the semiautomatic mode; and type B weapons with type D weapons in the controlled burst mode. Another point which should be mentioned is that there are no firings of weapons with the BCD and MBC in the semiautomatic mode.

FOR THE DIRECTOR:


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