DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

OPERATION OF MORTAR BALLISTIC COMPUTER M23 WITH SINCGARS GROUND RADIO SETS

Headquarters, Department of the Army, Washington, DC

1 APRIL 1993

REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this technical bulletin. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and blank forms), direct to: Commander, U.S. Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-LC-LM-LT, Fort Monmouth, New Jersey 07703-5007. A reply will be furnished direct to you.

1.   **Purpose.** This technical bulletin provides the information and procedures for operating the M23 (MBC) with the SINCGARS family of ground radios. It is necessary that the operator be properly trained in the operation of the MBC and SINCGARS. This technical bulletin is a supplement for the purpose of interoperability.

2.   **Application - Radio Bets.** The radio sets covered by this technical bulletin are AN/VRC-87, AN/VRC87A, AN/VRC-88, AN/VRC-88A, AN/VRC-89, AN/VRC-89A, AN/VRC-90, AN/VRC-90A, AN/VRC-91, AN/VRC-91A, AN/VRC-92, AN/VRC-92A, AN/PRC-119, and AN/PRC-119A.

3.   **References.** Refer to the following technical publications for normal operation and maintenance of the equipment.

PUBLICATION NUMBER	DATE	TITLE
TM 11-5820-890-10-1	1 September 1992	SINCGARS ICOM Ground Combat Net Radio
TM 11 -5820-890-10-3	1 September 1992	SINCGARS NON-ICOM Ground Combat Net Radio
TM 9-1220-248-12&P	27 August 1985	Mortar Ballistic Computer, M23

4. **Equipment Setup Operation.** Assemble and install the radio set and MBC individually per applicable technical manuals. Perform Preventive Maintenance Checks and Services (PMCS) and/or Built-In-Test (BIT) functions. Load all frequencies, hopsets, and variables into the radio set and establish voice communications before connecting the MBC to the radio set. Once voice communication has been established, connect the MBC as described in the following paragraph.

5. Cable Instructions. The following figure illustrate the typical configuration for the connection between the radio set and the MBC.

● Connect interface cable CX-13308 from MBC J1 connector to RT AUD/DATA connector.

● Connect handset H-250/U to RT AUD/FILL connector.

● Figure shows MBC connected to lower radio (RT-A).

● MBC may be connected to upper radio (RT-B) if desired.

● Connect interface cable CX-13308 from MBC J1 connector to RT AUD/DATA connector for use with ANJPRC-119, 119A.

N O T E

The interface cable CX-13308 must be used. It is identified in the SINCGARS AAL as National Stock Number 5995-01-303-0308. This cable replaces existing MBC cable.
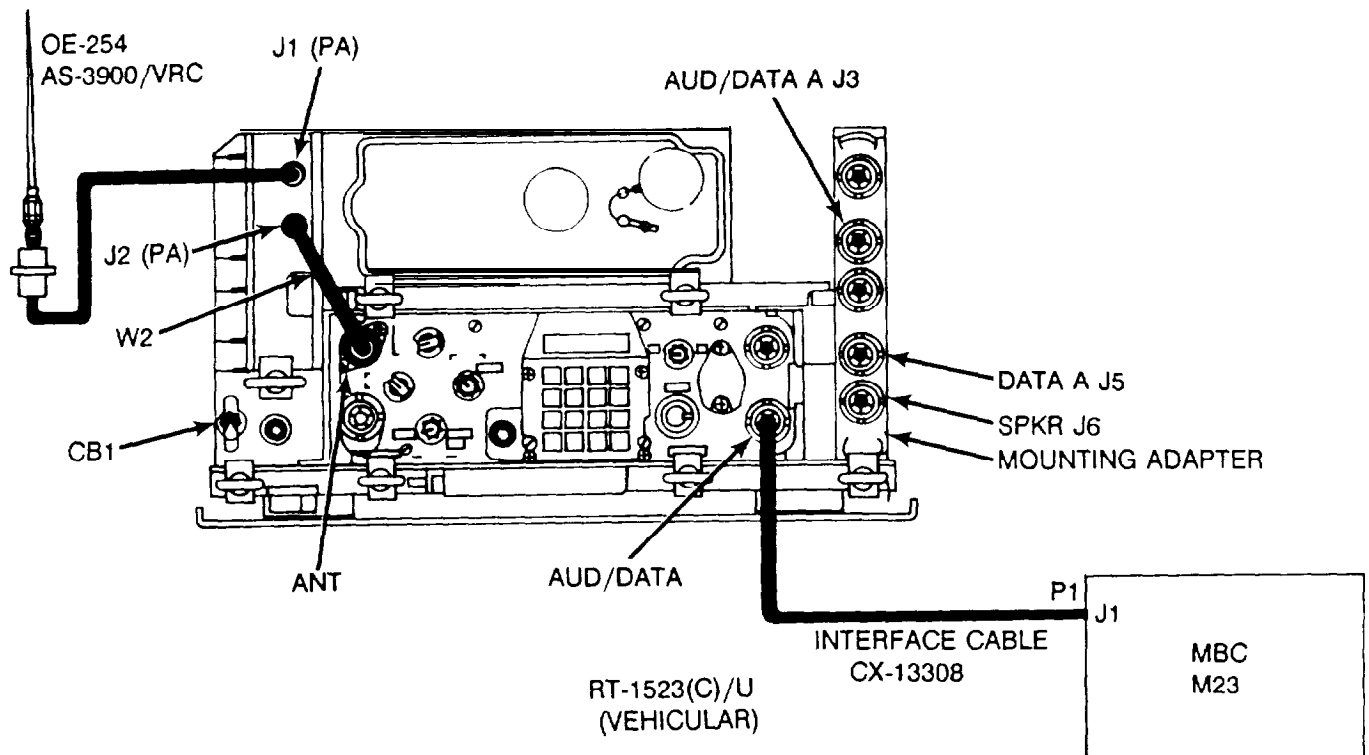

Figure 1. Cabling for MBC to SINCGARS Radio Set

6. **Switch Settings and Initialization.** The following tables provide the necessary switch settings and communication parameters for interoperability. Initialize the MBC for communication as shown in Table 6-2. Verify the switch settings for both the radio and the MBC, then establish communication on the net.

SWITCH	ICOM RADIO	NON-ICOM RADIO
FUNCTION	SQ ON	SQ ON
MODE	SC or FH	SC or FH
DATA	TF	AD2
COMSEC	CT	(TSEC/KY-57) ON CT
*	OFF	N/A

Table 1. SINCGARS Radio Set

XMIT BLOCK:	SINGLE
XMIT RATE:	1200
PREAMBLE:	.7

Table 2. MBC M23

7. **System Troubleshooting Procedures.** These steps will assist you in isolating faulty system components when you have a problem communicating in a net using data transmission. These procedures assume that the net and secure FH voice communication has been established. If you are unable to communicate using data transmission, do the following troubleshooting steps in the order provided.

● **CHECK LOCAL RADIO.** Use the data on the FH voice net to determine that the radio net is operating.

● **CHECK WITH OTHER NET MEMBERS.** Do you have data communication with some stations but not others? The other station may be out of range, temporarily off the air, or has not checked into the net. If data communication can be established with another station, your system is probably OK and the problem may be at the distant net station.

● **CHECK SYSTEM CONFIGURATION.** Verify proper cabling, initialization and subscriber parameters, radio set and MBC switch settings, etc.

● **NOTIFY MAINTENANCE.** If the problem cannot be isolated, notify unit maintenance personnel and inform your NCS of your communication problem.

8.   **Remote Control Operations.** The Remote Control Unit (RCU) C-11561 may be used in place of the RT in a SINCGARS radio system to allow the radio set and antenna to be placed at distances up to 4 km from the local system. Interoperability between the MBC and the RCU is the same when the MBC is connected to an RT. Table 8-1 provides the switch settings for the radio set and the RCU for remote control operation.
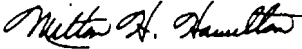
SWITCH	RCU	RADIO SET
FUNCTION	SQ ON	REM
MODE	SC or FH	N/A
DATA	TF	N/A
COMSEC	CT	PT
*	OFF	N/A

Table 3. RCU Settings for Remote Operation

By Order of the Secretary of the Army:

GORDON R. SULLIVAN
Genera/, United States Army
Chief of Staff

Official:

MILTON H. HAMILTON
Administrative Assistant to the
Secretary of the Army
03932

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