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**DEPARTMENT OF THE ARMY TECHNICAL BULLETIN**


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**OPERATION OF SECURE NET RADIO  
INTERFACE UNIT TSEC/KY-90 WITH  
SINGGARS GROUND RADIO SETS**


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Headquarters, Department of the Army, Washington, DC

 1 APRIL 1993
 

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1. **Purpose.** This technical bulletin provides the information and procedures for operating the Secure Net Radio Interface Unit TSEC/KY-90 (KY-90) with the SINGGARS family of ground radios. It is necessary that the operator be properly trained in the operation of the KY-90 and SINGGARS. This technical bulletin is a supplement for the purpose of interoperability.
2. **Application - Radio Sets.** The radio sets covered by this technical bulletin are AN/VRC-87, AN/VRC-87A, 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, and AN/VRC-92A.
3. **References.** Refer to the following technical publications for normal operation and maintenance of the equipment:

<u>PUBLICATION NUMBER</u>	<u>DATE</u>	<u>TITLE</u>
TM 11-5810-349-10	Dec 1987	Operator's Manual for TSEC/KY-90, Secure Digital Radio Interface Unit
TM 11-5820-890-10-1	1 September 1992	SINGGARS ICOM Ground Combat Net Radio
TM 11-5820-890-10-3	1 September 1992	SINGGARS NON-ICOM Ground Combat Net Radio

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4. **Equipment Setup/Operation.** Assemble and install the radio set and KY-90 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 KY-90 to the radio set. Once voice communication has been established, connect the KY-90 as described in the following paragraph.

5. **Cabling Instructions.** The following figure illustrates the typical configuration for the connection between the radio set and the KY-90.

Refer to Figure 1; then perform the following cabling procedure:

- Connect interface cable connector P3 to RT AUD/DATA connector.
- Connect interface cable connector P2 to RT RXMT connector.
- Connect interface cable connector P1 to KY-90 RADIO J2 connector.
- Figure shows KY-90 connected to lower radio (RT-A).
- KY-90 may be connected to upper radio (RT-B) if desired.

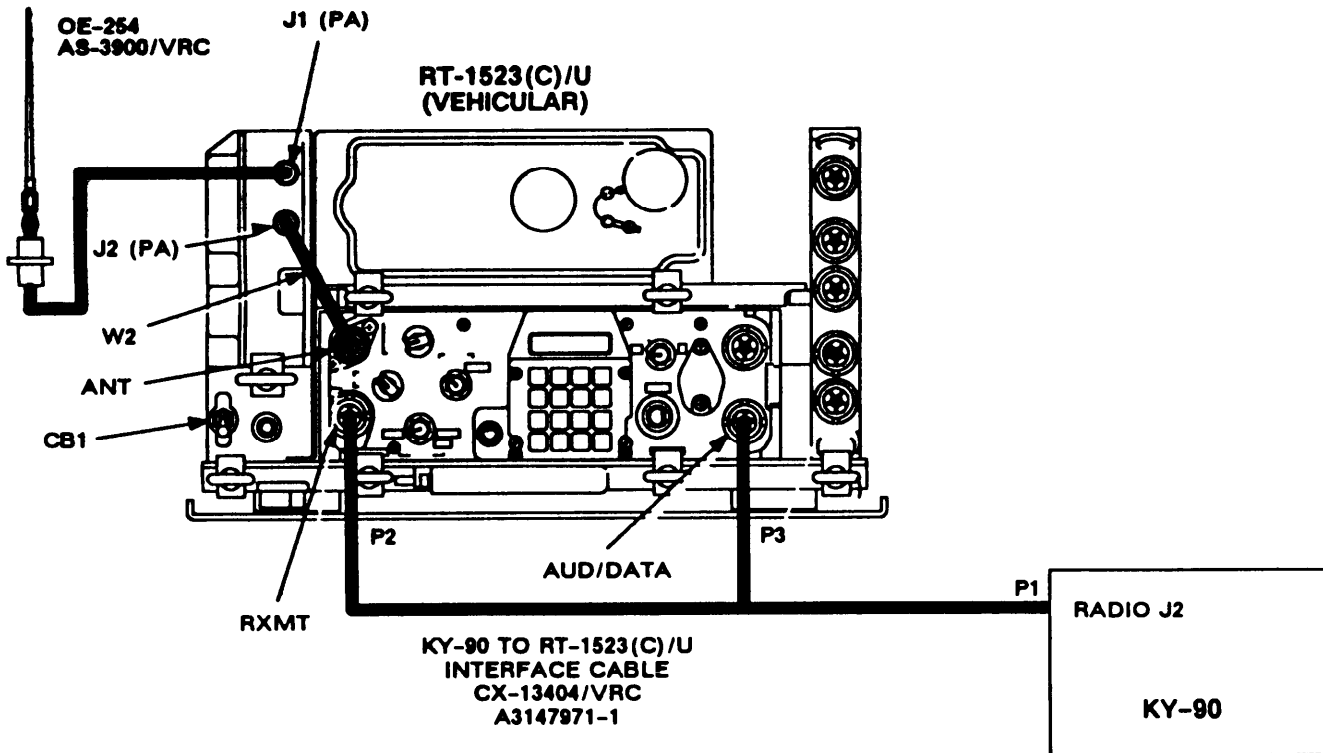


Figure 1. Cabling for KY-90 to SINCGARS Radio Set

6. **Switch Settings and Initialization.** The following tables provide the necessary switch settings and communication parameters for interoperability. The switch settings for the local RT (connected to the KY-90) and the distant RT are different. RT switch settings should be according to Tables 6-1 and 6-2 for distant and local radios respectively. Initialize the KY-90 for communication as shown in Table 6-3. Verify all settings for both the distant and local radios and the KY-90, then establish communication on the net.

**NOTE**

If operating in Plain Text, distant RT goes to PT, local radio is set to SQ ON, and KY-90 goes to PLAIN. Distant radio should wait 5 seconds after keying before speaking.

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

Table 6-1. SINCGARS Distant Radio Set

SWITCH	ICOM RADIO	NON-ICOM RADIO
FUNCTION	RXMT	RXMT
MODE	SC or FH	SC or FH
DATA	OFF	OFF
COMSEC	PT	(TSEC/KY-57) OFF PT
*	OFF	N/A

Table 6-2. SINCGARS Local Radio Set

<b>MS/RATE</b>	<b>S-16</b>
<b>COMSEC Mode</b>	<b>2B</b>
<b>Interface</b>	<b>1A</b>
<b>Radio/Ext Audio Delay</b>	<b>8</b>
<b>Radio Cypher/Plain</b>	<b>Cypher</b>

**Table 6-3. Secure Net Radio Interface Unit**

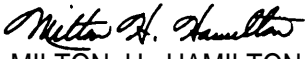
7. **System Troubleshooting Procedures.** These steps will assist you in isolating faulty system components when you have a problem communicating in a net using data transmission. These procedures assume that the net and secure FH voice communication has been established. If you are unable to communicate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

- **CHECK LOCAL RADIO.** Use the data radio 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 KY-90 switch settings, etc.
- **NOTIFY MAINTENANCE.** If the problem cannot be isolated, notify unit maintenance personnel and inform your NCS of your communication problem.

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