

## Appendix B

# COMPARISON OF ICOM AND NON-ICOM RADIOS

This Appendix compares and contrasts the functions, capabilities, and switchology of ICOM and non-ICOM SINCGARS radios.

**Table B-1. Common Fill Devices Used With SINCGARS**

Device	SINCGARS Radio					
	RT-1523	RT-1523A	RT-1523B	RT-1439	ARC-201	ARC-201A
<b>FILL COMSEC (EMBEDDED OR EXTERNAL DEVICE) [KY-57/-58]</b>						
1. AN/CYZ-10	Yes	Yes	Yes	Yes	Yes	Yes
2. KYK-13	Yes	Yes	Yes	Yes	Yes	Yes
3. KYX-15	Yes	Yes	Yes	Yes	Yes	Yes
<b>FILL FH DATA</b>						
1. AN/CYZ-10	Yes	Yes	Yes	Yes	Yes	Yes
2. MX-18290	Yes	Yes	Yes	Yes	Yes	Yes
3. MX-10579	No	No	No	Yes	Yes	No
<b>FILL SYNC TIME</b>						
1. AN/CYZ-10	No	Yes	Yes	No	No	No
2. AN/PSN-11 (PLGR)	No	Yes	Yes	No	No	No
<b>FILL COMSEC/FH (EMBEDDED/EXTERNAL COMSEC) [KY-57/-58]</b>						
AN/CYZ-10	Yes	Yes	Yes	Yes	Yes	Yes
<b>FILL COMSEC/FH DATA/SYNC TIME</b>						
AN/CYZ-10	No	Yes	Yes	No	No	No

**Table B-2. SINCGARS Keyboard/Functional Control Switches**

FUNCTION SWITCH	RT-1523 (ICOM)	RT-1439 (Non-ICOM)	ARC-201A (ICOM)	ARC-201 (Non-ICOM)
OFF	X	X	X	X
Z-FH	X	N/A	N/A	N/A
Z-A	N/A	X	X	X
REM	X	X	N/A	N/A
RXMT	X	X	X	X
SQ OFF	X	X	X	X
SQ ON	X	X	X	X
LD	X	X	X	X
LD-V	N/A	X	N/A	X
TST	X	X	N/A	N/A
TEST	N/A	N/A	X	X
STW	N/A	X	N/A	N/A
STOW	N/A	N/A	X	X
STBY	X	N/A	N/A	N/A

- OFF (RT-1523)** Turns off all power to the RT, including hub. Clears all memory after 5 seconds. Used when RT is taken completely out of action.
- OFF (RT-1439/ARC-201)** Turns off primary power to RT, hub remains operational. In OFF, RT draws hub power to maintain memory.
- Z-FH (Zero FH), Z-A (Zero All)** When FCTN is set to this position, all FH data is cleared in 5 seconds.
- REM (Remote)** Disables RT front panel controls. Used for control monitor (CM) operation with the RT 1523 and RT 1439. Used for remote control unit (RCU) with the RT 1523 only.
- RXMT (Retransmit)** Puts RT into retransmit mode of operation.
- SQ OFF (Squelch Off)** Puts RT into operation without squelch. Used in SC communications with radios having different squelch systems.
- SQ ON (Squelch ON)** Puts RT into operation and for communication with similar radios. Prevents rushing noise in handset, headset or loudspeaker.
- LD (Load)** Used for loading SC frequencies, FH data, COMSEC key data and to receive and store electronic remote fill (ERF) of FH data.
- LD-V (Load Variable)** Used for loading TRANSEC variable in NON-ICOM radios only.
- TST/(TEST)** Performs radio self-test. RT display shows results. When RCU is used with the RT 1523, performs self-test on RCU and RT. RCU display shows results.
- STW/(STOW)** Turns off all power to the RT, including hub. Clears all memory after 5 seconds. Used when RT is taken completely out of action.
- STBY/(Standby)** Turns off primary power to the RT, hub remains operational to maintain memory.

**Table B-3. SINGARS Mode Switches**

MODE SWITCH	RT-1523	RT-1439	ARC-201/A
SC	X	X	X
FH	X	X	X
FH-M	X	X	X
HOM (HOMING)	N/A	N/A	X

SC  
(Single channel) Put RT into SC mode.

FH  
(Frequency hopping) Puts RT in FH mode.

FH-M  
(Frequency hopping master) Puts RT into frequency hopping master mode. This mode is used only by the net control station (NCS) and alternate NCS. If more than one station uses this position net communication may be lost. **SINGARS OPERATORS: DO NOT USE THIS POSITION!**

HOM  
(homing) Puts the RT in homing mode. In this mode, the RT can receive a homing signal from a ground/airborne station. When set to HOM, the RT is automatically placed in SC mode, the communications antenna is disconnected and the left and right homing antennas are connected. The RT operating frequency is still selected by the PRESET switch. The RT and the homing radio set must be on the same frequency. When a homing signal is received, the homing instruments in the cockpit give the pilot steering, station approach and signal strength information. The RT can be used for SC operation while in HOM.

**Table B-4. SINGARS Channel Switches**

Channel Switch (CHAN)	RT-1523	RT-1439	ARC-201/A
1-6	X	X	X
MANUAL (MAN)	X	X	X
CUE	X	X	X

1-6 Positions of the CHAN switch that may be loaded with one or more of the following: SC frequency, FH data, and COMSEC key.

MAN When loaded with a SC frequency, can be used to communicate in SC and/or to perform Cold Start net opening.

CUE When loaded with the correct CUE frequency, may be used to contact an FH radio net when you are not an active member of that net. CUE may be used in SC mode to communicate in with other SC nets.

**Table B-5. SINGARS RF Power Switches**

RF POWER SWITCH	RT-1523/A/B	RT-1439	ARC-201/A
LO	X	X	N/A
M	X	X	N/A
HI	X	X	N/A
PA	X	X	N/A

LO (low)  
M (medium)  
HI (high)  
PA (power amp)

**Table B-6. Voice Transmission Maximum Planning Ranges**

TYPE RADIO	RF PWR POSITION	PLANNING RANGES*
MANPACK/ VEHICULAR	LO (low)	200 m - 400 m
	MED (medium)	400 m - 5 km
	HI (high)	5 km - 10 km
VEHICULAR ONLY	PA (power amp)	10 km - 40 km

\* Vehicular radios only.

**Table B-7. Data Transmission Maximum Planning Ranges**

TYPE RADIO	DATA RATE	RF PWR	PLANNING RANGES*
MANPACK/ VEHICULAR	600 - 4800 bps	HI	3 km - 5 km
	16000 bps	HI	1 km - 3 km
VEHICULAR ONLY	600 - 2400 bps	PA	5 km - 25 km
	4800 bps	PA	5 km - 22 km
	16000 bps	PA	3 km - 10 km

\* Vehicular radios only.

**Note:** Planning ranges are based upon line of sight and are average for normal conditions. Ranges depends on location, sighting, weather, and surrounding noise level, among other factors. Use of OE-254 antenna will increase ranges for both voice and data transmissions. Enemy jamming and mutual interference conditions will degrade these ranges. In data transmissions, use of lower data rates will increase range.

**Table B-8. Improved Frequency Modulation (IFM) RF Power**

IFM RF POWER SWITCH	RT-1523/A/B	RT-1439	ARC-201/A
OFF	N/A	N/A	X
LO	N/A	N/A	X
NORM	N/A	N/A	X
HI	N/A	N/A	X

IFM (Improved Frequency Modulation) RF PWR This switch is used to remotely control the output power level of the IFM power amplifier. Radio sets that DO NOT have an IFM power amplifier should keep this switch on OFF. Otherwise, RT sidetone is disabled.

OFF The IFM power amplifier is not used and RF output is 10 watts.

LO (low) The IFM power amplifier output is 2.5 watts.

NORM (normal) The IFM power amplifier output is 10 watts.

HI (high) The IFM power amplifier output is 40 watts.

**Table B-9. COMSEC Switch**

COMSEC SWITCH	RT-1523/A/B	RT-1439	ARC-201	ARC-201/A
PT	X	N/A	N/A	N/A
CT	X	N/A	N/A	N/A
TD	X	N/A	N/A	N/A
RV	X	N/A	N/A	N/A
Z	X	N/A	N/A	N/A

PT (plain text) Places RT in plain text (nonsecure) mode.

CT (cipher text) Places RT in cipher text (secure) mode.

TD (time delay) Places RT in secure mode and to compensate for delays due to distance between communications links.

RV (receive variable) Used when receiving remote fill of COMSEC key mark receive variable (MKRV).

Z (zero) Used to clear COMSEC keys.

**Table B-10. SINGARS Keyboards**

KEYBOARD	RT-1523/A/B	RT-1439	ARC-201	ARC-201/A
0-9	X	X	X	X
FREQ	X	X	X	X
ERF	X	N/A	N/A	X
SEND	N/A	X	X	N/A
OFST	X	X	X	X
TIME	X	X	X	X
BATT	X	X	N/A	N/A
CALL	X	X	N/A	N/A
STO	X	X	X	X
LOAD	X	N/A	N/A	X
H-LD	N/A	X	X	N/A
CLR	X	X	X	X
LOUT	X	N/A	N/A	X
L	N/A	X	X	N/A
CHG	X	X	N/A	H/A
SYNC	X	N/A	N/A	X
LE	N/A	X	X	N/A
DATA	X	N/A	N/A	N/A
CMSC	X	N/A	N/A	N/A

- 0-9                      Used to enter numerical data such as SC frequencies, position in which data is to be stored, battery life condition, etc.
- FREQ (frequency)      Used to check data in RT. Used to load and clear SC frequencies, offset SC frequencies and used in late net entry procedures.
- ERF (electronic remote fill)      Used by NCS only to transmit (send) ERF to net member RTs.
- SEND                    Same as above.
- OFST (offset)              Used to load and /or check SC offset frequencies. Not used in FH operation.
- TIME                      Used to load and check RT FH sync time.
- BATT (battery)              Used to check/set battery life condition on manpack RT.
- CALL                      Used to communicate with RCU. With RT FCTN switch set to REM and call button and handset PTT pressed, RCU displays "CALL" and alarm is heard in RCU and RT handsets.
- STO (store)                Used for loading data. Transfers data from RT holding into permanent memory (like an enter key on PC keyboard).
- LOAD                      Used to load data into holding memory and retrieve data from permanent memory. Used with AN/CYZ 10 to load RT.
- H-LD (hold-load)              Same as above.
- CLR (clear)                Clears data from RT display if an error was made during loading or if data needs to be cleared from RT memory.

**Table B-10. SINCGARS Keyboards (continued)**

LOUT (lockout)	Used by NCS to load lockouts separately.
L (lockout)	Same as above.
CHG (change)	Used with DATA, OFST, or CMSC buttons to change current information to another available selection.
SYNC (synchronize)	Used for FH passive late net entry procedure.
LE (late entry)	Same as above.
Data	Pressing this button displays the operating data rate. Pressing CHG, when data rate is displayed allows selection of a new data rate or data off. Available data rates are (600, 1200, 2400, 4800, 16000, AD1, TF and OFF).
CMSC (COMSEC)	Pressing this button causes the COMSEC key position associated with the operating channel to be displayed.

**Table B-11. SINCGARS Data Switch**

DATA SWITCH	RT-1523/A/B	RT-1439	ARC-201	ARC-201/A
75, 150, 300, 600, 1.2, 2.4, 4.8, 16K	N/A	X	N/A	N/A
AD1	N/A	X	N/A	N/A
TF	N/A	X	N/A	N/A
OFF	N/A	X	N/A	N/A

  

DATA SWITCH	Used to match data rate of RT to external data devices. Data rates 75, 150, 300, and 600 are in bits per second (bps). Data rates 1.2, 2.4, 4.8, and 16 K are in kilobits per second (kbps).
OFF	Used for normal voice communication. Should be used when no data equipment is being used.
AD1	Used with TACFIRE when communicating with stations not using a SINCGARS radio. Also used with non-TACFIRE analog data terminals.
TF	Used with TACFIRE when communicating with stations using a SINCGARS radio in SC or FH mode.

**Note:** For RT-1523A/B, use DATA key plus CHG key to select data rates.