RACAL COMMUNICATION SYSTEMS LTD
RAICATS OPCARD (for RADIO SYSTEMS with MA4807A/B & MA4808A)
January 1997 Software Issue 1.0

This document provides instructions for use and safety installation instructions for the following RAICATS products:

- MA4807A Image Transmitting Unit Radio (ITU-R)
- MA4807B Image Transmitting Unit Covert (ITU-C)
- MA4808A Image Receiving Unit (IRU)

In the following instructions the term ITU applies to both ITU-R and ITU-C.

All electrical interfaces are SELV, as defined in BS EN60950, and therefore must only be connected to other SELV circuits.

Operating temperature range 0°C to +40°C.
Storage temperature range -10°C to +55°C.

IRU MA4808A

- Only connect the DC input to mains adaptor Racal part number 611647 or a 12V SELV limited power source.
- All interface cables must be screened and have connectors with metal back-shells and the length of the cable connected to the 25-way D-type must not exceed 1 metre.

ITU-R MA4807A

- Only connect the DC input to mains adaptor Racal part number 611647 or a 12V SELV limited power source.
- All interface cables must be screened and have connectors with metal back-shells.

ITU-C MA4807B

- Only connect the DC input to either:
  - A 12V SELV limited power source.
  - A battery supplying 10V which is a limited power source with short circuit protection e.g. Racal Ni-CAD battery part number MA4516W.

To run the RAICATS PC software requires a minimum of a 486 / 66 MHz running under MS DOS (6.2 or higher). For information on installation see the file 'readme.txt' on the installation disk Racal part number P611950.

The Image Receive Unit (IRU) MA4808A has two modes of operation :

- Address mode The IRU will communicate with a single ITU which it has addressed.
- Monitor All mode The IRU will receive images from any ITU with a valid address.

The Image Transmission Unit (ITU) has three modes of operation:

- Standby — The ITU is powered up and waiting for an over air control command, any associated radio is in receive mode.
- Active — The ITU will transmit images.
- Sleep — The ITU is powered down and waiting for a trigger• input to wake up. The radio will be in receive mode. The ITU will not respond to over air commands. It is not possible to enter Sleep mode if either the trigger input is not used or the trigger is active.

The Help screen will be displayed whenever 'H or h' is selected to show the options available for the current mode.

For Half Duplex only :

- A or a : To select a new ITU address or monitor all mode
- C or c : To toggle the display between COLOUR and MONOCHROME
- D or d : To set the Rx / Tx DELAY time
- F or f : To REFRESH the display with a new image (for use in Difference mode *)
- P or p : To set the PREAMBLE time
- T or t : To toggle the TEST PICTURE display on and off
- U or u : To toggle the UPDATE mode (between All and Difference *)
- Z or z : To set the ITU into SLEEP mode
- 0 to 9 : To change the PICTURE ATTRIBUTES **
- + : To INCREASE the DIFFERENCE THRESHOLD value (0-9)
- - : To DECREASE the DIFFERENCE THRESHOLD value (9-0)

For both Half Duplex and Simplex :

- H or h : To display the HELP screen
- M or m : To display the MAIN MENU
- K or k : To SAVE the current IMAGE only
- S or s : To START SAVING multiple IMAGES to disk
- G or g : To STOP SAVING IMAGES to disk
- R or r : To REPLAY IMAGES stored on disk
- L or l : To DELETE IMAGES stored on disk
- @ : To RESET the IRU
- ESC : To QUIT the program and return to DOS

* The Update mode refers to how the video image is refreshed. When set to All the whole image is transmitted and when set to Difference only the areas which have changed from the previous image are transmitted. A range of 0 to 9 is used for the difference threshold value which quantifies the amount of change an image should differ by before it qualifies as a difference and is transmitted.

** The Picture Attribute refers to the size and quality of the displayed image. For attributes in the range 0-4 the image size is 128x128, as the attribute number increases the picture quality improves although the update rate is slower. Attributes in the range 5-9 have a full screen 320x240 image size and as the attribute number increases the picture quality improves although the update rate is slower.

Switches are located on the MA4807A (ITU-R) front panel and rotary switches on the MA4807B (ITU-C) to allow the picture attributes and picture update mode to be set.

On power up the IRU and ITU will read their internal DIL switch settings. In Simplex mode, the ITU will transmit three consecutive images to the IRU and then operate in Sleep or Active mode as controlled by the trigger• input. In Half Duplex mode three consecutive images will be transmitted to the IRU and this sequence will repeat at approximately 1 minute intervals until the ITU is addressed by the IRU from the PC.

Each RAICATS unit have options defined by internal switches which should be set up / checked on installation since they are only read during power up. The following switch settings apply to the ITU (and the IRU where indicated) :

- SW 1.1 ITU unit address bit 0 (1 is ON) LSB
- SW 1.2 ITU unit address bit 1 (1 is ON)
- SW 1.3 ITU unit address bit 2 (1 is ON)
- SW 1.4 ITU unit address bit 3 (1 is ON)
- SW 1.5 ITU unit address bit 4 (1 is ON) MSB
- SW 1.6/7 Communication link data rate (also required for IRU)
  SW 1.6 OFF, SW 1.7 OFF 16 kb/s
  SW 1.6 ON, SW 1.7 OFF 12 kb/s
  SW 1.6 OFF, SW 1.7 ON 8 kb/s
  SW 1.6 ON, SW 1.7 ON 1200 b/s
- SW 1.8 Picture update mode
  SW 1.8 OFF Selects All mode on ITU-C and for ITU-R should always be OFF to give control from front panel switches
  SW 1.8 ON Selects Difference mode on ITU-C
- SW 2.1 Preamble (reversals) time
  SW 2.1 OFF 1.6 kbits/s (ie 100 msecs @ 16 kbits/s)
  SW 2.1 ON 6.4 kbits/s (ie 400 msecs @ 16 kbits/s)
- SW 2.2/3 Receive / transmit delay
  SW 2.2 OFF, SW 2.3 OFF None
  SW 2.2 ON, SW 2.3 OFF 200 msecs (nominal)
  SW 2.2 OFF, SW 2.3 ON 500 msecs (nominal)
  SW 2.2 ON, SW 2.3 ON 2 secs (nominal)
- SW 2.4 Squelch priority (also required for IRU)
  SW 2.4 OFF Disable
  SW 2.4 ON Enable
- SW 2.5 Communication link (also required for IRU)
  SW 2.5 OFF Half Duplex
  SW 2.5 ON Simplex
- SW 2.6 Display colour
  SW 2.6 OFF Colour
  SW 2.6 ON Monochrome

The system may be operated in Simplex or Half Duplex mode as set by DIL SW 2.5. This may be dependent on the radio system being used and must be the same for all units in the system.

- Simplex — In this mode images are displayed at the PC from any transmitting ITU. This mode gives the maximum image update rate. Threshold, picture size and update mode parameters are et on the ITU and may be changed during operation. Both Active and Sleep states are possible and are controlled via the trigger *** input.
- Half Duplex — There are two methods of operation, address and monitor all. In address mode images are displayed at the PC from a selected ITU address, control of the ITU is possible from the PC. In monitor all mode the IRU will listen for any ITU which ransmits an image. An ITU can be in Active, Standby or Sleep mode. When an ITU is put into sleep mode it will only transmit when initiated by the trigger input. The monitor all feature should be used in conjunction with multiple ITU's in sleep mode.

*** Where no trigger switch connections are installed for the ITU-R and ITU-C, the trigger input is considered active. Where the trigger input is connected, it is considered active upon contact closure.