DANIELS™
ELECTRONICS LTD.

MT-3 RADIO SYSTEMS

FREQUENCY SELECT HANDLE INSTRUCTION MANUAL

Covers the following:
Frequency Select Handle portion of
VR-3A130-SYD210 & VT-3A130-SYD410

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Quality Assurance:

Claudia Boorman		
Name	Signature	Date

NOTE:

The user's authority to operate this equipment could be revoked through any changes or modifications not expressly approved by Daniels Electronics Ltd.

The design of this equipment is subject to change due to continuous development. This equipment may incorporate minor changes in detail from the information contained in this manual.

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1 GENERAL

1.1 Introduction

The Frequency Select Handle provides the ability to select and display the operating frequency of the receiver or transmitter on the Front Panel. Power is provided from a regulated +9.5 Vdc supply and draws typically less than 4.0 mA in sleep mode.

1.2 Printed Circuit Board Numbering Convention

To ease troubleshooting and maintenance procedures, Daniels Electronics Limited has adopted a printed circuit board (PCB) numbering convention in which the last two digits of the circuit board number represent the circuit board version. For example:

- PCB number 43-912010 indicates circuit board version 1.0.
- PCB number 50002-02 indicates circuit board version 2.0.

All PCB's manufactured by Daniels Electronics are identified by one of the above conventions.

1.3 Performance Specifications

Temperature Range:	-30°C to +60°C. (Optional -40°C to +60°C)
Supply Voltage:	+9.5 Vdc,
Supply Current:	less 35 mA less 4.0 mA standby mode.

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2 THEORY OF OPERATION

2.1 General

The user interface consists of an 8 digit display and 3 pushbuttons, frequency increase Ø, frequency decrease Œ, and options . . On power up or key press, the synthesizer is interrogated for the current channel number and channel frequency. This information is used to generate the display, and update the synthesizer itself.
The Frequency Select Handle communicates with the synthesizer using a standard 2 wire serial interface (9600 Baud, 8 bits, no parity, 1 stop bit). The command protocols are simple ASCII, both to and from the synthesizer. Another dedicated line allows the handle to temporarily wake up the synthesizer if it has been powered down. (This is currently only used on the transmitters)
The Frequency Select Handle is built around a PIC microcontroller and is powered from regulated 9.5 Vdc.

2.2 Handle Operation.

1) On Power Up the following front panel indications will occur: (in order)

   - Daniels Banner ("Daniels Electronics Ltd") will scroll by.
   - The current Channel Number will be displayed (for about 2 sec).
   - The current Operating Frequency will be displayed (for about 2 sec)
   - The display then does to sleep.

2) To display the Current Frequency:

   a) Press either the Ø (Frequency increase) or Œ (Frequency decrease) buttons
   This will display the current Channel Number (for about 2 sec), then the current frequency (for about 3 sec) The display will then go back to sleep.

   b) To keep the display awake, just press the Ø or Œ buttons again before the display has gone back to sleep. This will display the frequency for another 2-3 sec.

3) To change the Programmable Channel operating frequency (channel 16 only)

   a) Press either Ø or Œ buttons to wake up the display.
   b) Then use Ø or Œ buttons to change the frequency. (Note the buttons must be unlocked to be used. See (4) below.

c) Both the Ø or Œ have two modes of operation.

i. Single press is for small changes. Single button presses corresponds to single channel (25 kHz) steps.

ii. Accelerated is for large steps. After 6 seconds of the button being pressed the frequency will change by8 channels per step (200 kHz). After 9 seconds of the button being pressed the frequency will change by 20 channels per step (500 kHz).

Note: The operating frequency is set to displayed value once the Ø or Œ buttons is released.

4) To Lock / Unlock the Buttons.

a) Press the , button. The display will show the current lock status ("Locked" or "Unlocked")
b) To lock the buttons, press the Ø button (the display will then show "Locked")
c) To unlock the buttons, press the Œ button (the display will then show "Unlocked")

Note: To display the current channel and frequency, the display must be allowed to go to sleep.

3 ALIGNMENT

3.1 General

Under normal circumstances no alignment is required to the Frequency Select Handle.

3.2 Repair Note

The Frequency Select Handle employs a high percentage of surface mount components, which should not be removed or replaced using an ordinary soldering iron. Removal and replacement of surface mount components should be performed only with specifically designed surface mount rework and repair stations complete with Electro Static Dissipative (ESD) protection.

3.3 Recommended Test Equipment

- Power supply - Regulated +9.5 Vdc at 0.1 A. Phillips PM 2811

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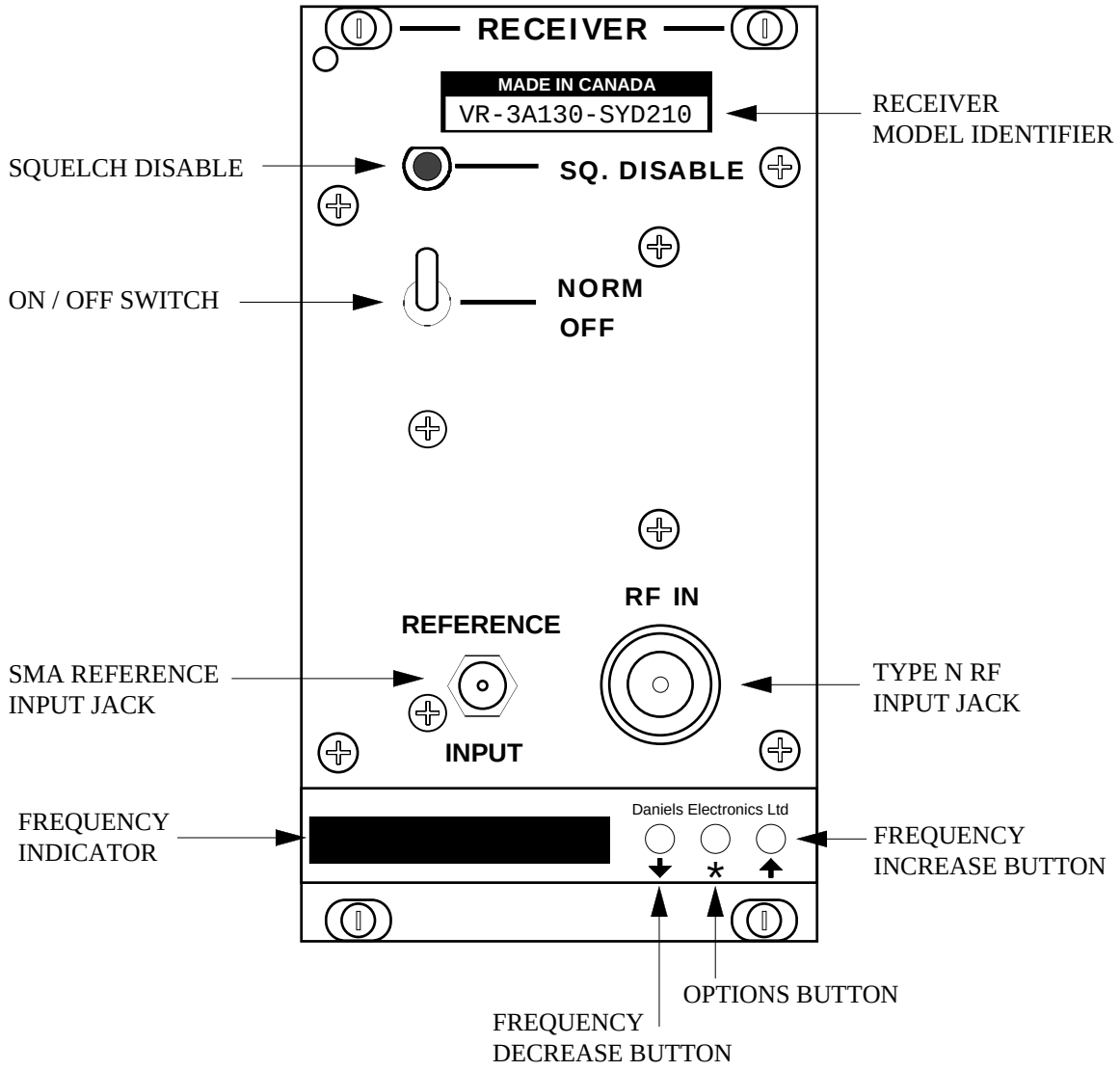
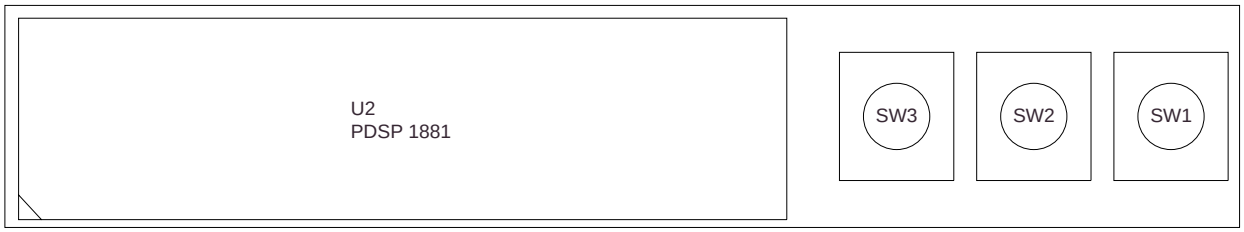
4 ILLUSTRATIONS AND SCHEMATIC DIAGRAMS

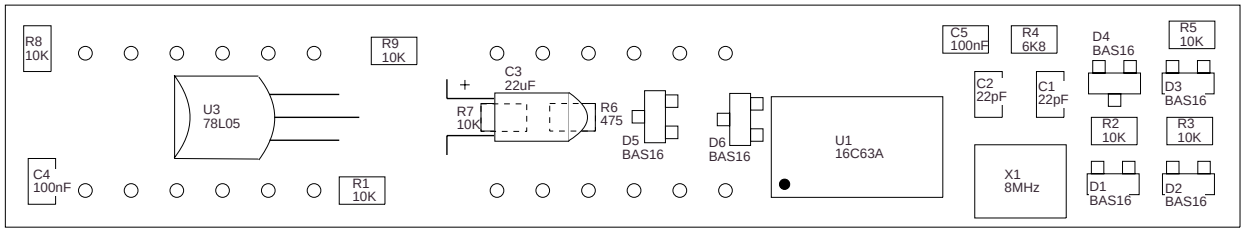
4.1 VR-3A130 Receiver Front Panel



AM3RXM1A

4.2 Frequency Select Handle Component Layout

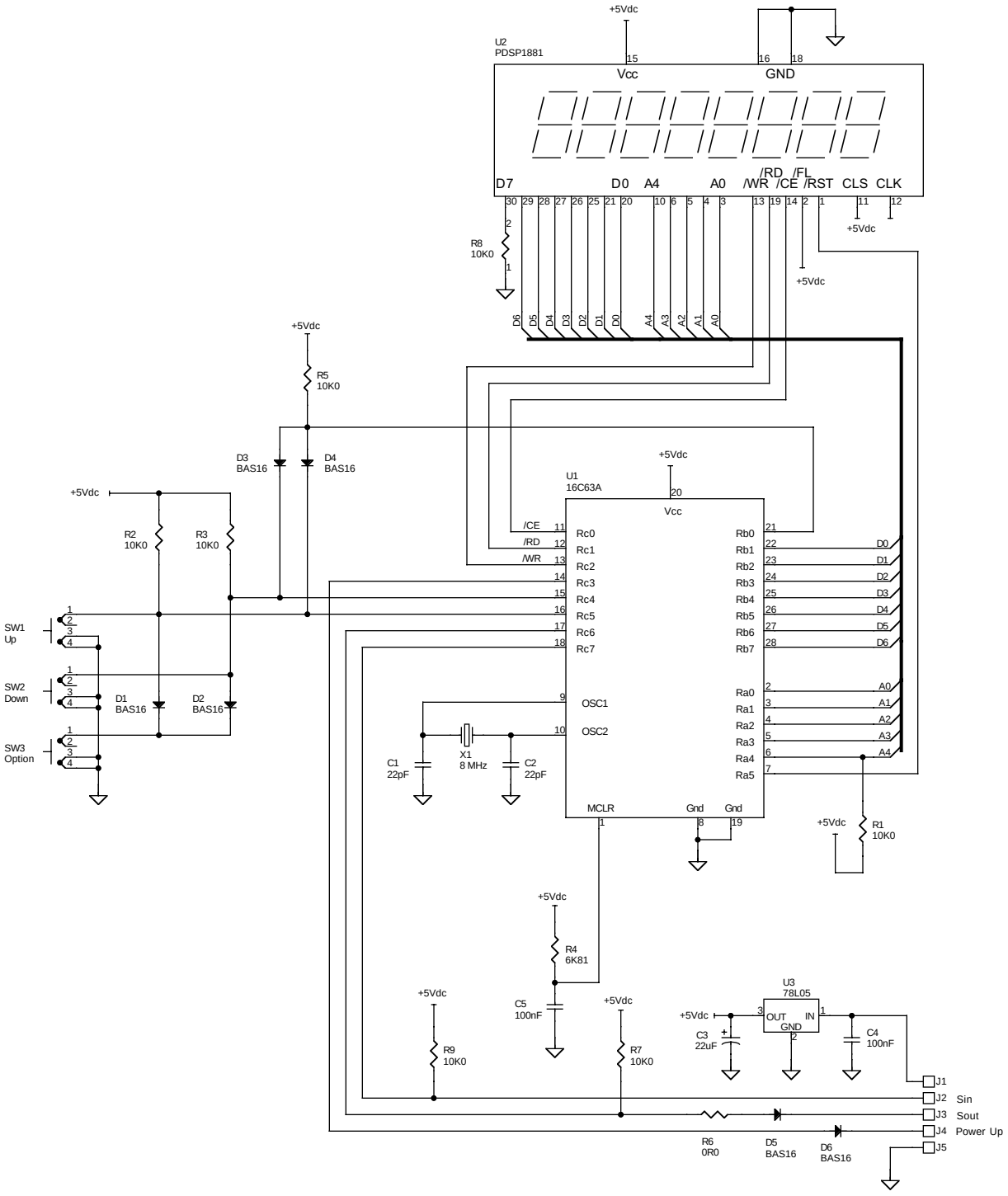




PCB 50088-04

FSH3M1

4.3 Frequency Select Handle Schematic Diagram



HIGHEST REFERENCE DESIGNATORS		
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UNUSED REFERENCE DESIGNATORS		
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-----	-----	-----
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DANIELS ELECTRONICS LTD.		VICTORIA B.C.
TITLE: FREQUENCY SELECT HANDLE SCHEMATIC DIAGRAM		
DATE: 01 December 99	DWN BY: Paul Ellis	APRVD:
DWG No: FSH3M2B	DWG REV DATE:	
BOARD No: 50088-04	BOARD REV: V 04	

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5 PARTS LISTS

5.1 Frequency Select Handle Electrical Parts List

Ref. Desig	Description	Part No.
C1, C2	CAP., SM, 22pF CER., 0805, C0G	1008-1A220J1G
C3	CAP., 22uF DIP. TANT., 20%,20V	1054-6G226M20
C4, C5	CAP., SM,100nF CER,0805,X7R,50	1008-5A104K5R
D1-D6	DIODE, BAS16, SWITCHING, SOT23	2100-BAS16000
PCB	PCB, FREQUENCY SELECT HANLE	4312-90500884
R1-R3	RES., SM, 10K0 0805, 1%,100ppm	1150-4A1002FP
R4	RES., SM, 6K81 0805, 1%,100ppm	1150-3A6811FP
R5	RES., SM, 10K0 0805, 1%,100ppm	1150-4A1002FP
R6	RES., SM., ZERO OHM JUMPER.	1150-0A0R0000
R7-R9	RES., SM, 10K0 0805, 1%,100ppm	1150-4A1002FP
SW1-SW3	SWITCH, SM/PB, SPST/MOM,SEALED	5238-309J05NW
U1	IC, PIC16C63A-20I,M/CTR,SSOP28	2380-16C63S28
U2	DISPLAY, 8CHAR,5x7 DOT MTX,YEL	2018-D857330Y
U3	IC, 78L05AB, +5.OV REG., TO-92	2205-78053T92
X1	RESONATOR, SM, 8.0MHz, CERAMIC	1575-8001816A

5.2 Frequency Select Handle Mechanical Parts List

Description	Part No.	Qty.
HOUSING, 0.1",5 POS.,MALE TERM	5021-HM05L001	1
HOUSING, 0.1",5 POS.,FEM. TERM	5021-HF05L002	1
LABEL,	3537-40121010	1
SHIELD,	3702-67201305	1
TERMINAL, CRIMP, MALE,22-24,Au	5021-TM22B001	5
TERMINAL, CRIMP, FEM.,22-24,Au	5021-TF22B002	5
WIRE, PVC/STRAND., 22AWG,BLACK	7110-22S07300	18 cm
WIRE, PVC/STRAND., 22AWG, RED	7110-22S07302	18 cm
WIRE, PVC/STRAND., 22AWG, ORG.	7110-22S07303	18 cm
WIRE, PVC/STRAND.,22AWG,YELLOW	7110-22S07304	18 cm
WIRE, PVC/STRAND., 22AWG, VIO.	7110-22S07307	18 cm

6 REVISION HISTORY

ISSUE	DATE	DESCRIPTION AND (REASON)
1	Feb 00	• Issue 1

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