

# AUX7 AUXILIARY PROGRAM BOARD, MODEL 1536

## INSTALLATION & OPERATING INSTRUCTIONS

### 1 Introduction

The AUX7 is a plug-in unit which allows the user to program up to 8 auxiliary 500 kHz frequency ranges for instant selection from the front panel of a TR7 or R7. In addition, a crystal socket is provided for each of the eight auxiliary ranges to allow fixed frequency receive and/or transmit (*in the case of a TR7*) operation within a selected range.

For receive only applications, programming is accomplished by using one RRM7 Range Receive Module per band segment. One of these modules is included with the AUX7. For transceive operation, one RTM7 Range Transceive Module per band segment is required.

#### NOTE:

Proof of license or other F.C.C. authorization must be submitted to the R. L. Drake Co. in order to obtain RTM7 Range Transceive Modules. All RTM7 Range Transceive Modules will be programmed at the factory to the specified frequency range.

### 2 Frequency Programming

Each Range Receive Module (RRM7) and Range Transmit Module (RTM7) must be programmed for a specific, integral 500 kHz range. The modules are programmed by removing pins in accordance with the chart shown in figure 1. Note that pin 10 of the RRM7 module has been removed in production to provide the transmit inhibit feature. On the RTM7, *which is provided for transceive operation upon receipt of proof of license*, pin 10 must not be removed unless it is desired to inhibit the transmit function.

Follow the procedure listed in figure 1 exactly when programming a module. Carefully note the location of each module pin to be removed in accordance with the chart. Incorrect programming will result in operation on undesired frequencies, and could damage the transceiver.

The service department of the R. L. Drake Company will assist you in programming your RRM7 or RTM7 at no additional charge. Fill in the frequency range desired for each module to be programmed on the card provided. Our service department will fill in the post card, indicating which module pins to remove, and return it to you. ***Be sure to include your return address in the space provided.*** Note that the card can also serve as a record of what ranges you have programmed into which channels.

Refer to figure 2 and install the range modules into the AUX7 in the desired location. Be sure that all module pins are properly seated in the appropriate socket, and that the index marks on the range modules are correctly oriented.

Note that each range module socket has a corresponding crystal socket. To operate on a fixed receive and/or transmit (*in the case of a TR7*) frequency within a selected range, the proper crystal must be installed in the socket corresponding to the appropriate range module. Use the following formula to determine the crystal frequency:

$$\text{Crystal Freq. (kHz)} = 5050.0 \text{ kHz} + \text{Desired Carrier Frequency (kHz)} - \text{Lowest Range Frequency (kHz)}.$$

For example, suppose it is desired to operate on a fixed carrier frequency of 4358.6 kHz. Referring to figure 1, this frequency falls in the 4.0-4.5 MHz range, so a range module must be programmed by clipping pins 2, 3, 4, 9, 11, 12, and 14. This module should be installed in the desired channel location on the AUX7. Channel crystal carrier frequency is then calculated as follows:

$$5050.0 \text{ kHz} + 4358.6 \text{ kHz} - 4000.0 \text{ kHz} = 5408.6 \text{ kHz}$$

Thus, a 5408.6 kHz crystal is required for fixed operation on 4358.6 kHz, along with the appropriate range module. Note that the fixed crystals will always fall in the range 5050.0 kHz to 5550 kHz.

When ordering a fixed channel crystal, always specify the following information:

1. Crystal frequency in kHz.
2. Frequency tolerance + .003% or better.
3. Parallel resonant, 32 pf load.
4. Series resistance 35 ohms, maximum.
5. HC-25/U Holder.

Crystals of this type are available from several manufacturers, or can be obtained on a special order basis from the R. L. Drake Company.

### 3 Installation in TR7/R7

Once the desired ranges and/or frequencies have been programmed on the AUX7, the module can be installed by the following procedure outlined below. *Refer to figure 3 for module location.*

1. Remove all interconnecting cables .
2. Remove the cabinet wraparound by removing eight screws on the bottom and sliding the wraparound toward the rear.

#### **NOTE:**

Perform steps 3 through 6 if the DR7 is installed.

3. Unplug the 5 cable connectors connecting the DR7.  
Carefully position these cables to the side.
4. Unplug the antenna coax and blue/white bandswitch stepping wire from the Filter module and remove the rubber grommet.
5. Remove the DR7 hold-down screw and lockwasher.
6. Carefully remove the DR7 by hooking the board puller under the rear edge and lifting upward. Once unplugged, the DR7 can be removed toward the rear of the TR7/R7.
- 7 Plug the AUX7 into the proper connector. *Be sure that all connetor pins arc aligned and that the board is fully seated in the chassis.* Orient. the board so that the component side is toward the rear.

#### **NOTE:**

Perform steps 8 through 11 if the DR7 has been removed.

Figure 7-RRM7 and RTM7 Module Programming

C = Cut off pin

RANGE	MODULE PIN NUMBERS													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
*0.0-0.5	RT ONLY	C			C	C	C	C			C		C	C
*0.5-1.0			C		C	C	C	C			C		C	C
*1.0-1.5		C	C		C	C	C	C			C		C	C
1.5-2.0				C	C	C	C	C					C	C
2.0-2.5		C		C	C	C	C	C					C	C
2.5-3.0			C	C	C	C	C	C					C	C
3.0-3.5		C	C	C	C	C	C	C			C	C		C
3.5-4.0			C	C							C	C		C
4.0-4.5		C	C	C							C	C		C
4.5-5.0					C							C		C
5.0-5.5		C			C							C		C
5.5-6.0			C		C							C		C
6.0-6.5		C	C		C							C		C
6.5-7.0				C	C							C		C
7.0-7.5		C		C	C							C		C
7.5-8.0			C	C	C							C		C
8.0-8.5		C	C	C	C							C		C
8.5-9.0			C	C			C					C		C
9.0-9.5		C	C	C								C		C
9.5-10.0					C	C						C		C
10.0-10.5		C			C	C						C		C
10.5-11.0			C		C	C						C		C
11.0-11.5		C	C		C	C						C		C
11.5-12.0				C	C	C						C		C
12.0-12.5		C		C	C	C						C		C
12.5-13.0			C	C	C	C						C		C
13.0-13.5		C	C	C	C	C						C		C
13.5-14.0			C	C			C					C		C
14.0-14.5		C	C	C				C				C		C
14.5-15.0					C			C				C		C
15.0-15.5		C			C		C				C	C	C	C
15.5-16.0			C		C		C				C	C	C	C
16.0-16.5		C	C		C		C				C	C	C	C
16.5-17.0				C	C		C				C	C	C	C
17.0-17.5		C		C	C		C				C	C	C	C
17.5-18.0			C	C	C		C				C	C	C	C
18.0-18.5		C	C	C	C		C				C	C	C	C
18.5-19.0			C	C		C	C				C	C	C	C
19.0-19.5		C	C	C		C	C				C	C	C	C
19.5-20.0					C	C	C				C	C	C	C
20.0-20.5		C			C	C	C				C	C	C	C
20.5-21.0			C		C	C	C				C	C	C	C
21.0-21.5		C	C		C	C	C				C	C	C	C
21.5-22.0				C	C	C	C				C	C	C	C
22.0-22.5		C		C	C	C	C				C	C	C	C
22.5-23.0			C	C	C	C	C				C	C	C	C
23.0-23.5		C	C	C	C	C	C				C	C	C	C
23.5-24.0			C	C				C			C	C	C	C
24.0-24.5		C	C	C				C			C	C	C	C
24.5-25.0					C			C			C	C	C	C
25.0-25.5		C			C			C			C	C	C	C
25.5-26.0			C		C			C			C	C	C	C
26.0-26.5		C	C		C			C			C	C	C	C
26.5-27.0				C	C			C			C	C	C	C
27.0-27.5		C		C	C			C			C	C	C	C
27.5-28.0			C	C	C			C			C	C	C	C
28.0-28.5		C	C	C	C			C			C	C	C	C
28.5-29.0			C	C		C		C			C	C	C	C
29.0-29.5		C	C	C		C		C			C	C	C	C
29.5-30.0					C	C		C			C	C	C	C

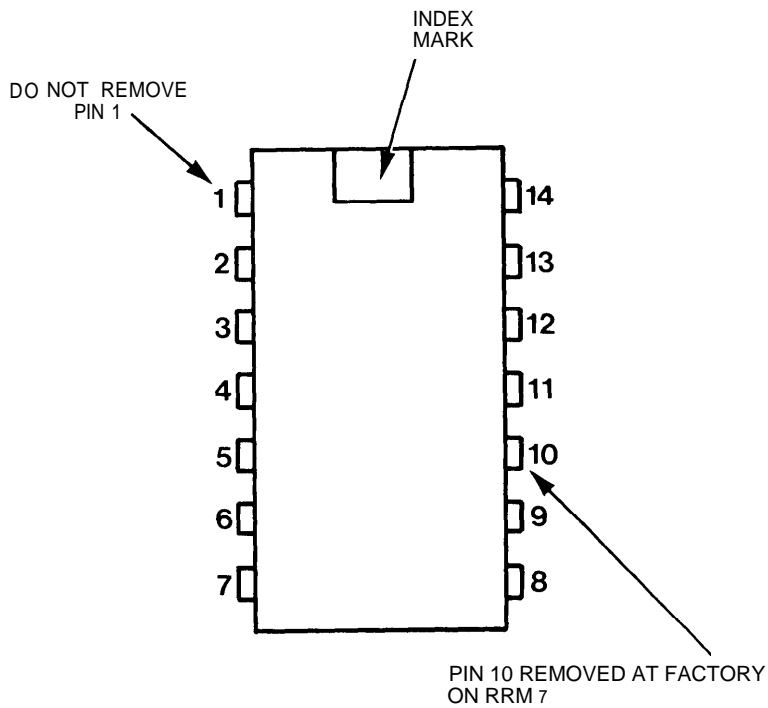
LEAVE PIN ON MODULE FOR TRANSMIT. REMOVED AT FACTORY ON RRM7.

COMMON PIN. DO NOT REMOVE.

0.0-0.5	RT ONLY	C			C	C	C	C						
0.5-1.0					C	C	C	C			C	C		
1.0-1.5		C	C		C	C	C	C			C	C		

\*Use VLF antenna input (pin 7 on accessory connector) for reception on these ranges. Transmission is not possible between 0.0 and 1.5 MHz. Band switch may be set to 1.5 MHz to extinguish set band indicator.

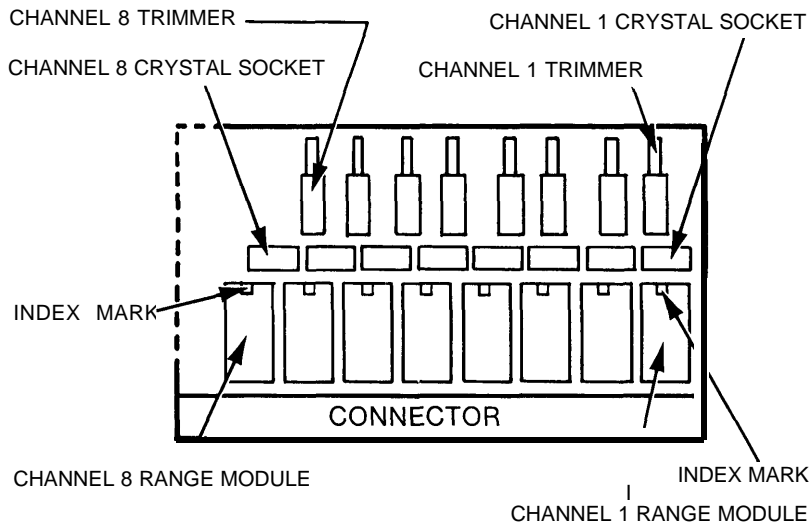
## PROGRAM MODULE, TOP VIEW



### PROGRAMMING INSTRUCTIONS

1. Find desired range in chart.
2. Orient module as shown and identify pins.
3. Cut off pins indicated in chart by C. Make cut close to body of module to avoid shorts.
4. Straighten remaining pins and check for shorts.

Figure 2-AUX7 Module



8. Reinstall the DR7 by locating the LED readout block in the proper slot in the front panel and lowering the pins on the bottom of the DR7 into their respective sockets. Be sure *that all pins are aligned with the proper sockets, and that the antenna coax is routed through the correct hole on the DR7.*
9. Reinstall the DR7 hold down screw and lockwasher.
10. Reinstall the rubber grommet on the antenna coax and band-switch stepping wire. Connect these wires to the appropriate connectors and dress the wires and grommet into the slot provided in the chassis.
11. Reconnect the 5 cable connectors to the appropriate pins on the DR7. Be sure to install the connectors so that the black stripe is up (*facing you*).
12. Check for broken or pinched wires, board misalignment, etc. and correct any problems. Dress all leads down into chassis.
13. Reconnect the TR7/R7 to all other station equipment and set the fixed channel crystals (if installed) on frequency. Note that the crystal trimmers are accessible through the DR7. See *section IV for operating instructions.*
14. Remove all cables from the TR7/R7 and reinstall the cabinet wraparound (see *step 2*).

15. Reconnect the TR7 to the other station equipment.

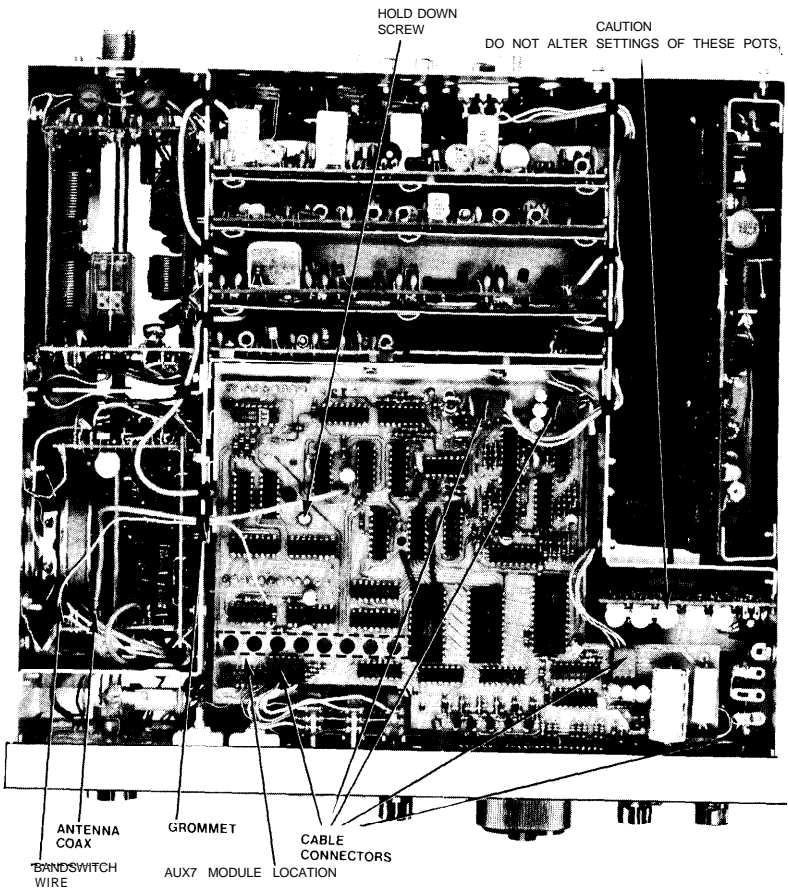


Figure 3-AUX7 Module Location/Installation

#### 4 Operation

Operation of the TR7/R7 with the AUX7 is described in the Operator's Manual (see *figure 3-1*). Programmed ranges are selected by the front panel AUX PROGRAM switch (W), and fixed operation is selected by the FIXED XMIT and FIXED RCV pushbuttons (F and G). Channel crystals may be set on frequency by selecting the proper range and fixed mode and adjusting the corresponding trimmer capacitor with a non-metallic tool (see *figure 3*).

When using an auxiliary range, be sure to set the BAND selector to the proper position, as indicated by the SET BAND light. The light will extinguish when the BAND setting is correct.

#### 5 Maintenance

If difficulty is encountered with operation of the AUX7, check to be sure that the range modules are programmed correctly and that they are fully seated in the board sockets. If the difficulty is present only in the fixed frequency mode of operation, check to be sure that the crystal is properly installed, and that the oscillator and buffer transistors are operative.

If problems still persist, advise the factory of the difficulties and obtain authorization to return the AUX 7 for service (you *need not return the entire TR7/R7*). Address your request for authorization to:

R. L. DRAKE COMPANY  
540 Richard Street  
Miamisburg, Ohio 45342  
ATTN: Customer Service Department  
TELEPHONE: (513) 866-3211  
TELEX NO.: 288-017