FEATURES

CONTENTS
1. FEATURES ........................................ 2
2. PREPARATION FOR USE ........ 3
3. Controls and their functions .... 3
4. OPERATION ...................................... 5
5. SCHEMATIC DIAGRAM ................. 6
6. SPECIFICATIONS ............................... 7

1. 20Hz-step digital VFO
   The digital VFO uses a highly stabilized 10 MHz
   reference oscillator. Equipped with AN 8-bit
   microprocessor and digital control circuit, the
   VFO-230 shifts frequencies in 20 Hz steps simi-
   lar to an analog VFO. Unlike conventional L/C
   oscillators, the digital VFO provides excellent
   frequency stability against temperature change.
   No warm-up is required.

2. 5 CH memory circuit
   The VFO-230 has its own built-in memory cir-
   cuit for further enhancing the capabilities of your
   transceiver. The memory circuit accepts fre-
   quency input from both the VFO-230 or the
   transceiver analog VFO. It is also possible to
   call back memory frequencies to the digital VFO.

3. Frequency locking mechanism
   A frequency lock switch is provided to prevent
   the operating frequency from shifting when the
   frequency dial is accidentally turned during
   QSO.

4. Split frequency operation and transmit
   frequency setting.
   Split frequency operation is possible between
   any of three frequencies: the remote VFO,
   transceiver of memory frequencies. The
   VFO-230 is also equipped with a T-F SET
   (transmit frequency setting) switch for checking
   transmit frequencies while in receive MODE.

ACCESSORIES
The following accessories are furnished with the
VFO-230:
Instruction manual
(B50-2753-00) ........................................... 1
Fuse
(0.5A, F05-5011-05, in U.S.A.)
(0.3A, F05-3012-05, in Europe) .................. 1
Remote cable
(E30-1672-05) ........................................... 1
Ground cable
(E30-1835-05) ........................................... 1
RCA-plug
(E14-0101-05) .......................................... 1
Auxiliary foot
(J02-0049-14) .......................................... 2
Auxiliary foot mounting screw
(N30-4010-41) .......................................... 2
PREPARATION FOR USE

Connection to THE TS-830S (see Fig. 1)

Connect the supplied Remote cable to the VFO-230 VFO OUT connector and to the TS-830S EXT VFO connector. Connect the ground cable to the GND terminals of both units.

Note:
1. Ascertain that the TS-830S FIX switch is set to the VFO position (not depressed).
2. When disconnecting the remote cable, turn the TS-830S power switch OFF. This procedure MUST be observed for protection of both the TS-830S and VFO-230.

CONTROLS AND THEIR FUNCTIONS

FRONT PANEL
1. MEMORY indicator
This LED (light emitting diode) indicates the memory circuit is ON.

2. VFO indicator
This LED indicates the remote VFO is ON.

3. MAIN indicator
This LED indicates the TS-830S VFO is ON.

4. Digital display
The digital display indicates true operating frequency in the range of 100 KHz to 100 Hz order. In the case of upper zero blanking and 14,000 MHz, the lower frequency is displayed as L 999.9. When the frequency is lower than 3.5 MHz, it is displayed as L 499.9.
5 MAIN tuning
This control is used to select the desired operating frequency and changes the operating frequency by 25 KHz a turn. The scale on the control is calibrated at 1 KHz intervals. The control changes frequency in 20 Hz steps.

6. MEMORY IN switch
When FUNCTION switch is in the MAIN position, the Transceiver frequency is stored in the memory. In the VFO position the remote VFO frequency is stored in memory.

7. MEMORY RECALL switch
This switch is used to call-up the remote VFO stored frequency.

8. MEMORY selector
This switch selects the desired memory channel (channels 1 through 5). Frequency is stored in or recalled from the selected channel.

9. RIT indicator
This LED illuminates when the remote VFO RIT switch is turned ON.

10. RIT control (Receiver Incremental Tuning)
When the RIT circuit is ON, the receive frequency can be varied approximately ±900 Hz, independent of the transmit frequency. Use this feature when you party’s transmit frequency is shifted or the transceiver is used for cross frequency QSO. The RIT functions only when the remote VFO or memory circuit are operating. The remote VFO frequency on the display remains unchanged even when the RIT adjusted.

11. FUNCTION switch
This switch is used for split frequency operation between one of three frequencies. The transceiver VFO, remote VFO or memory frequencies. Split frequency operation between memory frequencies is not possible.

12. LOCK switch
With this switch ON, the operating frequency can not be changed. The dial has no effect.

13. RIT switch
The RIT switch turns the RIT circuit ON and OFF.

14. T-F SET switch
This switch is used to receive on your transmit frequency. For details, refer to “T-F SET Switch”, page 5.

REAR PANEL

1. GND Terminal
   This terminal should be grounded to the TS-830S GND terminal.

2. VFO OUT Connector
   This terminal should be connected to the TS-830S EXT VFO terminal using the supplied cable.

3. CAL
   Connect this terminal to the TS-830S antenna terminal when calibrating the remote VFO oscillator against WWV.

4. AC power cable
   In U.S.A... 120 VAC, 50/60Hz
   In Europe... 220/240 VAC, 50/60Hz
   (Selectalbe)

5. AC voltage selector (Only in Europe area)
   This switchs the power transformer primary, selecting 220 VAC and 240 VAC windings.
OPERATION

FUNCTION SWITCH
The FUNCTION switch has three positions, MAIN (TS-830S), VFO (remote VFO) and MEMO (memory) for transmission and reception. Its use is shown in TABLE 1.

<table>
<thead>
<tr>
<th>Receive</th>
<th>Transmit</th>
<th>TS-830S</th>
<th>VFO-230</th>
<th>MEMORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAIN</td>
<td>MAIN</td>
<td>TX and RX</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>MAIN</td>
<td>VFO</td>
<td>RX</td>
<td>TX</td>
<td>—</td>
</tr>
<tr>
<td>MAIN</td>
<td>MEMO</td>
<td>RX</td>
<td>—</td>
<td>TX</td>
</tr>
<tr>
<td>VFO</td>
<td>MAIN</td>
<td>TX</td>
<td>RX</td>
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<td>VFO</td>
<td>VFO</td>
<td>—</td>
<td>TX and RX</td>
<td>—</td>
</tr>
<tr>
<td>VFO</td>
<td>MEMO</td>
<td>—</td>
<td>RX</td>
<td>TX</td>
</tr>
<tr>
<td>MEMO</td>
<td>MAIN</td>
<td>TX</td>
<td>—</td>
<td>RX</td>
</tr>
<tr>
<td>MEMO</td>
<td>VFO</td>
<td>—</td>
<td>TX</td>
<td>RX</td>
</tr>
<tr>
<td>MEMO</td>
<td>MEMO</td>
<td>—</td>
<td>—</td>
<td>TX and RX</td>
</tr>
</tbody>
</table>

Table 1 FUNCTION Switch Operation

RIT CONTROL
By using the RIT control, the receive frequency can be shifted by about ±900 Hz without changing the transmit frequency.
If the frequency of the station you are working changes, your receive frequency can be reset by turning the RIT switch ON and adjusting the RIT control.

NOTE:
1. The RIT shift is not displayed on the remote VFO but it can be read on the TS-830S digital display.
2. When the transceiver's MODE switch is set to TUNE, the RIT control of the remote VFO does not function.

T-F SET SWITCH
Depress this switch and you will receive on the transmit frequency without using the FUNCTION switch. Use this feature during split frequency operation. For example, when the FUNCTION

SWITCH IS SET AS SHOWN BELOW! IT IS POSSIBLE TO RECEIVE ON THE REMOTE VFO frequency by pressing the T-F SET switch. This enables you to check or listen on the transmit frequency during receive operation. The T-F SET switch is a non-locking (Momentary) switch. When it is released, the transceiver is automatically reset as selected by the FUNCTION switch, thereby preventing misoperation. This switch is also useful in quickly setting the optimum transmit frequency for DX operation. The T-F SET switch does not function during transmission.
BACK-UP OF REMOTE VFO
With the power cable connected to power source, the micro-processor of the VFO-230 keeps operating even when the transceiver power switch is OFF.

NOTE:
If the VFO-230 frequency display is abnormal, disconnect the AC power cable and after around 1 minute reconnect it. The display shows 0.0 and the VFO starts correct operation.

NOTES ON MEMORY OPERATION
When the transceiver’s MODE switch is set to TUNE or when the VFO frequency is stored during CW transmit mode, a frequency which is shifted by about ±800 Hz is stored in the memory. This is caused by the frequency which is shifted by about ±800 Hz in the VFO TUNE or CW mode. To prevent this, when storing a frequency, set the MODE switch to a position other than TUNE or set the unit to reception mode during CW operation.
In the remote VFO operation mode, a correct frequency can be stored. During SSB operation, a correct frequency can also be stored.

SPECIFICATIONS

Oscillation frequency ......................... 5.40 ~ 6.10 MHz
Output voltage ................................ 0.2V ±1 dB
Frequency stability ............................ Within ±1 x 10⁻⁴ at room temp
................................................ within ±3 x 10⁻⁴ at 0 ~ 50°C.
Power consumption .............................. 13W
Power requirement .............................. AC 120V 50/60Hz (in U.S.A.)
................................................ AC 220V/240V (Selectable) 50/60Hz (in Europe)
Semiconductors used ............................ CPU LSI ....................... 1
................................................ FET ................................. 1
................................................ IC .................................... 29
................................................ Transistors ....................... 55
................................................ Diodes .............................. 57
Dimensions ................................. 180 (182) W
................................................ 133 (147) H
................................................ 287 (330) D mm
(Figures in ( ) include projections.)
Weight ................................................. Approx. 3 kg

- Specifications are subject to change without notice for technical improvement.
**MODIFICATION for 240V AC operation (u.s.a.type)**

To operate the VFO-230 on 240V AC, the power transformer primary tap must be rewired from 120V to either the 220V or 240V tap.

1. Unplug the AC power cable and VFO interconnecting cable.
2. Remove the top cover.
3. Move the AC line from the 120V (Red) to either the 220V (Green) or 240V (Blue) transformer winding.

4. Change the AC fuse from 0.5A to 0.3A. Tag the power cord at the back of the unit to indicate that the transformer is wired for 240V AC, and the power fuse should be 0.3A and not 0.5A.
5. Replace the top cover and cable up to verify your work.
Circuit design and ratings are subject to change for improvement without notice.
Model VFO-230
Serial No.  
Date of Purchase  /
Dealer  

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