D.F.C. MEMORY UNIT

Model DF-180

INSTRUCTION MANUAL

	To receive	To transmit
DX station	14.250.0 MHz	14.220.0 MHz
Your station	14.220.0 MHz RCV in M1 or M	14.250.0 MHz XMIT out Main tuning

Note:

1. Only figures below the MHz order are memorized for any band.
   Therefore, band selection has nothing to do with the memory function. For example, when 14.220.0 MHz is memorized and the band switch is changed to 21 MHz the frequency recalled will be 21.220.0 MHz.
2. When a memory frequency is recalled to receive, depress the RCV switch.
3. When receiving on the VFO and transmitting on a FIX/M channel, depress the XMIT switch, but not the RCV switch.

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and two nuts and remove the two connectors attached to the dummy printed-circuit board.
* Connect the DF-180 to the TS-180S as shown in Fig. 4.
* Fasten the unit with six screws.
* Install the two connectors disconnected from the dummy board to the DF-180.
* Reinstall the IF unit and the bottom case. Reinstall the power cable to the transceiver.
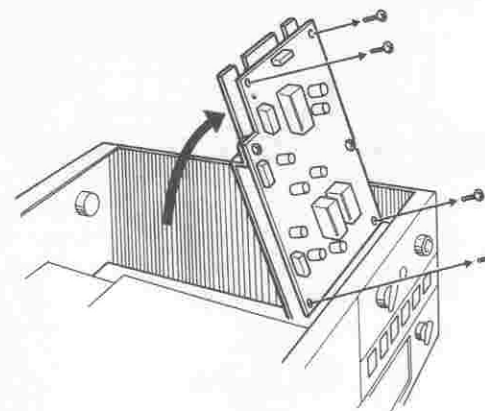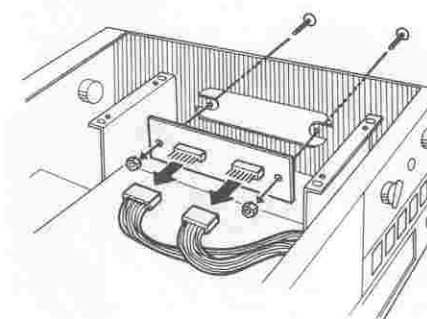

Fig. 2 Unscrew and Swing the IF Unit Forward

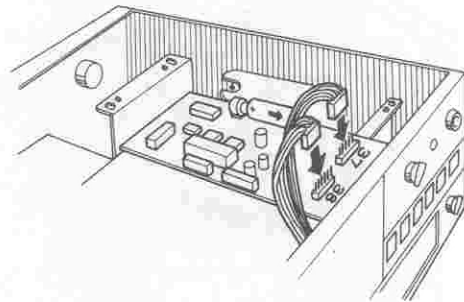

Fig. 3 Remove the Dummy P.C. Board

BACK-UP BATTERY PACK ASSEMBLY
(Batteries shall be owner supplied)

Assemble the back-up battery pack (supplied empty with the DF-180) with three silver oxide cells (OWNER-SUPPLIED) as shown in Fig. 5. Observe polarity.

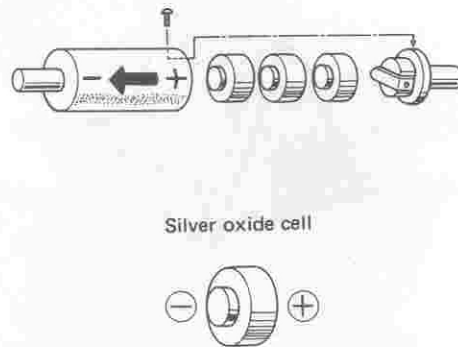Silver oxide cell polarity is indicated in Fig. 5.

Silver oxide cell

Fig. 5 Battery Pack Assembly

Fig. 4 Install the DF-180

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Note:
When nothing is put in the memory circuits, the display reads a random high limit frequency when selected by the FIX/M RECALL switch.

M1/DSP back-up memory modification.
M1/DSP does not have battery back-up for the memory because this function is mostly a temporary in-out memory.

However, M1/DSP can be modified for battery back-up memory as shown in Fig. 11.

RCV and XMIT switch application (Split Frequency Operation)

It is sometimes preferrable to transmit and receive on different frequencies in such cases as DX operation or "Pile-ups".

Example: To receive 14.220 MHz and transmit on 14.250 MHz.

Set the main tuning to 14.220 MHz to receive a DX station.

The DX station then advises that he is listening 30 kHZ up (14.250 MHz).

First depress the DSP/M1 or M switch to memorize 14.220.0 MHz.

Then set the main tuning to 14.250.0 MHz to transmit, with the XMIT switch out (not depressed).

Depress the RCV switch, and set the FIX/M RECALL switch to another position, and return this switch to the M1 or M position (depending on which memory was used).

14.220.0 MHz will be recalled when receiving.

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In the DF-180 instruction manual, the section "Installation of the DF-180" applies to those TS-180S models without DFC. All other sections apply to the TS-180S with factory installed DFC.

Note:
1. Before reading this instruction manual, read through the TS-180S instruction manual.
2. If no frequencies are stored in the memory, the digital display will indicate " □□ 000.0".

INSTALLATION OF THE DF-180

* Disconnect the power cable BEFORE proceeding.
* Remove the bottom case by unscrewing nine screws, and place the unit bottom up as shown in Fig. 1.
* Remove the IF unit by unscrewing six screws.
* Tilt the IF unit upright as shown in Fig. 2.
* Remove the dummy printed-circuit board shown in Fig. 3 by removing two screws
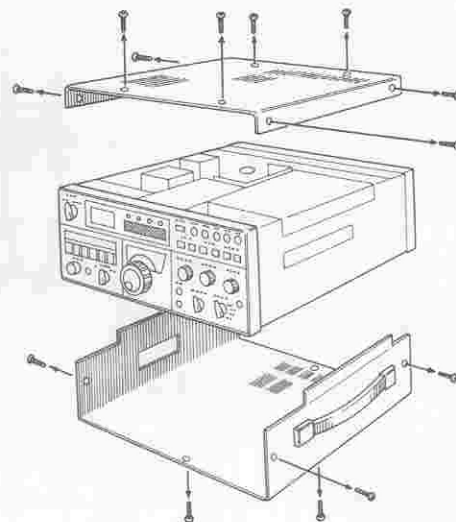
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Fig. 1 Remove the Top and Bottom Covers

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Memory Function Operation

This function makes it possible to program a different frequency for either transmission or reception within the same band.

1) How to memorize by using the DSP/M1 switch:

i) Set the main tuning to the desired frequency, for example 21.225 MHz.

ii) Depress the DSP/M1 switch (the beep indicates data entry). Now the frequency of 21.225 MHz is memorized in M1.

To recall from M1:

When you desire to receive on the memory frequency, depress the RCV switch. When you desire to transmit on the the M1 frequency, depress the XMIT switch. When you desire to transmit and receive on the same memory frequency, depress both switches.

2) M switch operation: (See Fig. 7)

A. Let us suppose that 14.100.0, 14.200.0 and 14.300.0 MHz are to be memorized.

i) Set the TS-180S to 14.100.0 MHz.

ii) Depress the M switch. This latching switch, once depressed remains IN, and 14.100.0 MHz is memorized.

iii) Set the TS-180S to 14.200.0 MHz.

iv) Depress the M switch to release it. Once again depress this switch. Now, 14.200.0 MHz is memorized.

v) Set the TS-180S to 14.300.0 MHz.

vi) Depress the M switch to release it. Depress once again and 14.300.0 MHz is memorized.)

B. To recall the memorized frequencies:

i) To receive on a memorized frequency: Depress the RCV button.

To transmit on a memorized frequency: Depress the XMIT button.

To transmit and receive on the same memorized frequency: Depress both RCV and XMIT buttons.

ii) Set the M RECALL switch to the M position. Now, 14.300.0 MHz is recalled and displayed.

iii) Set the M RECALL switch to the M' position, and 14.200.0 MHz is recalled and displayed.

vi) Set the M RECALL switch to the M'' position, and 14.100.0 MHz is recalled and displayed.

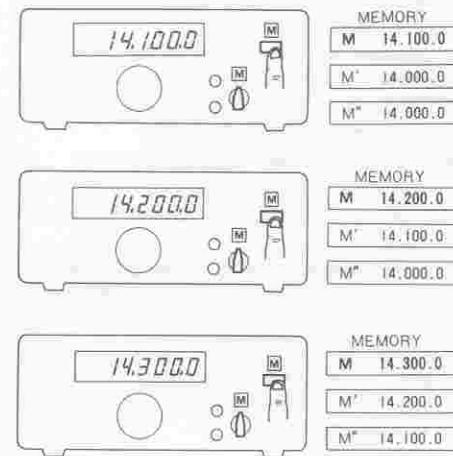As detailed, the memory functions such that

Fig. 7

the first frequency is memorized in the M position of the FIX/M RECALL switch by depressing the M button once.

Then, when the second frequency is put in memory by depressing the M switch, the first frequency is moved to the M' position.

The second frequency is memorized at the M position. When the third frequency enters the memory, the first and second frequencies move to the M'' and M' positions, and the third frequency is memorized in the M position. In other words, the memories move up the stack.

The FIX/M indicator is lighted while operating on the memory.

Note:

If the M. IN switch is pressed twice while calling up a stored frequency, the digital display may not operate properly.

DFC* MEMORY UNIT OPERATION
TS-180S WITH DF-180 DFC MEMORY UNIT

DF-180 has four memories as shown in Table.

	M1/DSP	M, M', M''
DIFF. Display	Yes	No
Memory Back-up (Batteries required)	No (Owner can modify for battery back-up)	Yes
UP/DOWN Shift	Yes	Yes

* DFC

(Digital Frequency Control)

M1/DSP is intended for fast or temporary operation, including differential display (DIFF) for showing amount of frequency change, and memory that might often be changed.

M, M', and M'' are to be used as memories for relatively longer storage applications, such as for net frequencies, schedules, etc. Battery back-up is available for these memories. The frequencies are controlled in 20 Hz steps in the DF-180, for accurate DFC operation, especially when minute frequency adjustments are required (as in precise CW tuning).

The DF-180 memories can store frequencies from the TS-180S internal VFO, FIX CH, any of the memories, VFO-180 remote VFO, and RIT frequency.

If a frequency is memorized in the DSP/M1 position its offset from the present frequency is indicated + or − from the memory frequency when the DSP/DIFF switch is depressed.

Example: A frequency of 14.200.0 MHz is entered in the memory, and the VFO frequency is 14.330.0 MHz.
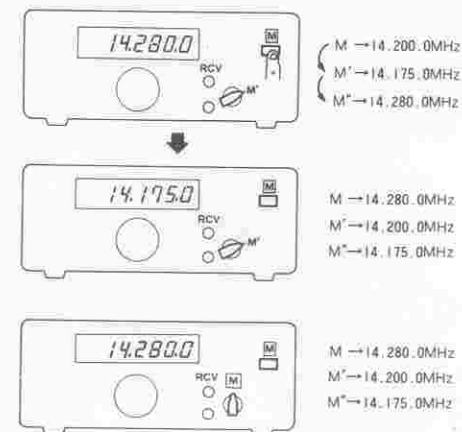

UP/DOWN switch Operation

These switches are used to continuously change or fast forward memorized frequencies (M1, M, M' and M'') either upward or downward in 20-Hz steps.
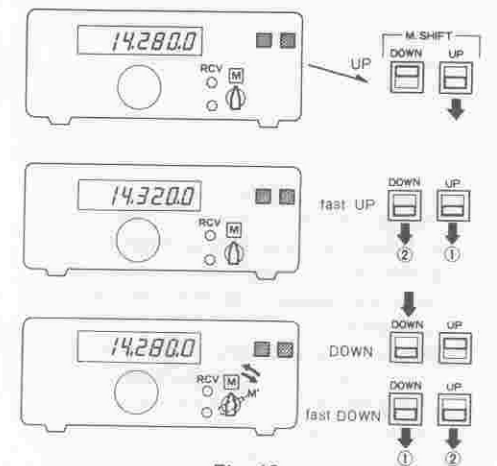

Fig. 9

Fig. 10

RCV/XMIT SWITCH OPERATION (See Fig. 8)
These switches are provided to select either the built-in VFO, memory channels or the fixed channel.
Operation of these switches are described below:
Example: VFO Frequency 14.280 MHz.
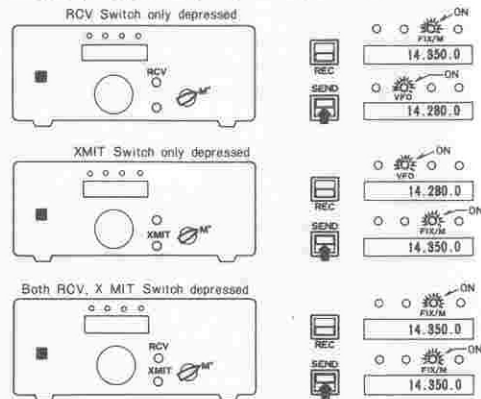Memory frequency (M") 14.350 MHz

Fig. 8

As shown above, you can watch a total of six frequencies: the memory frequency by using the RCV and M RECALL switches.
This is convenient and valuable for split-frequency DX operation etc.
Operation on the memory is as stable as on the crystal fixed channel.
In addition, frequencies may be transfered between M1 and M or from M, M' or M" to the M1 memory for flexibility and operating convenience.

Memory to Memory (See Fig. 9)
Frequencies may be transfered between each memory for flexibility and operating convenience.

Example: Transfer the M" frequency to M
i) Recall the M" frequency of 14.280 MHz.
ii) Press the M switch and put 14.280 MHz into M memory.
iii) Set the M RECALL switch to M position now, M" frequency 14.280 MHz is transfered to M.

When the DSP/M1 switch is depressed, the frequency is memorized in the M1 memory.
Note:
1. The M, UP, DOWN, RCV, XMIT and M RECALL switches are inoperative in a TS-180S without DFC.
2. The DSP/M1 switch is the M1 memory switch for rigs with the DF-180 DFC* memory unit, in addition to the display memory function.
The display memory is an algebraic sum of both frequencies and is displayed at the right when the DSP/M1 switch is reset once, and the memory frequency is shown at the left.
If a frequency was memorized in the M1, the difference between it and the present VFO frequency is displayed.
No change is observed in frequency display when the DSP/M1 switch is first depressed. The display memory function is available only when the DSP/M1 switch is depressed with both displays being present after the DSP/DIFF switch is depressed.

The TS-180S will show a memory frequency at the left and the difference between it and the present VFO frequency at the right by depressing the DSP/DIFF switch, if any frequency is in the M1 memory.
*Digital Frequency Control

EXAMPLE:
Displayed frequency 14.250.0MHZ
M1 frequency   14.200.0MHz
i) When the DSP/M1 switch is depressed

(MEMORY +   Δf [offset])

| 200.0 | 50.0 |

ii) Recall the memory frequency by the FIX/M switch (M1 position) and RCV switch.

| 200.0 | 0.0 |

Note:
If the UP or DOWN switch is kept depressed on any band, frequency change stops when it reaches approximately 100 kHz above or below the band edge.
Fast Forward Operation (See Fig. 10)
a) To raise a frequency quickly, first depress the UP switch, and then the DOWN switch, keeping both switches depressed.
b) To lower a frequency quickly, first depress the DOWN switch, and then the UP switch, keeping both switches depressed.
To recall the original frequency after shifting by the UP or DOWN switch, move the M RECALL switch to any other position than on which it is memorized, and then reset the switch to the original memory position. Now, the original memorized frequency is reinstated.
Example: 14.200.0 MHz Memorized in M
14.320.0 MHz Changed upward.
To recall 14.200.0 set the FIX/M RECALL switch to any other position, and then reset to the M position.
Now,   14.200.0 MHz is recalled.

Memory Back-Up Power
The DF-180 can retain memorized frequencies for a period of about 30 seconds even after power is shut off. If power is inadvertently switched off, the frequencies can still be recalled if power is restored immediately. The DF-180 can also retain M, M', M" memory frequencies even after power is turned off by installing memory back-up batteries (available from most electronic parts dealers) in the empty pack supplied with the DF-180.
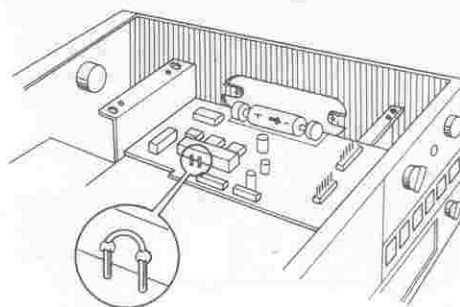

Fig. 11 M1/DSP Back-Up Enable
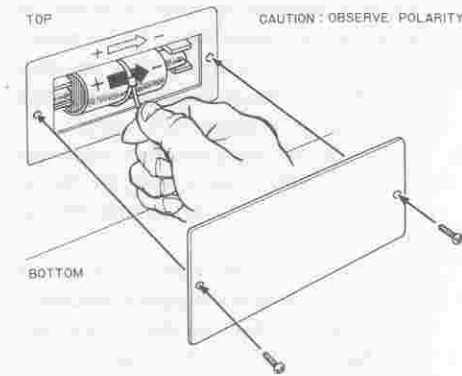
TOP   CAUTION : OBSERVE POLARITY
BOTTOM

Fig. 6 Back-Up Battery Installation

Install the battery pack into the unit through the battery pack entrance on the left side of the case.
A polarity indicator also appears on the transceiver case.
The nylon cable tie attached to the battery pack is supplied for convenient removal.

Type of Silver-Oxide Battery.
(IEC SR-44 Type)

PANASONIC	WL-14
	G-13
EVEREADY (U.C.C)	357
DURACELL (P.R. MALLORY)	10L14
RAY-O-VAC (E.S.B.)	RW-22
	RW-42