WJ-861X RECEIVER

APPENDIX M

WJ-861X REAL TIME CLOCK (RTC) OPTION

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WARNING

This equipment utilizes voltages which are potentially dangerous and may be fatal if contacted. Exercise extreme caution when working with the equipment with any protective cover removed.

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TYPE 796185-6, REAL-TIME CLOCK (RTC) OPTION

M.1 GENERAL DESCRIPTION

The Real-Time Clock option provides the operator with a 24 hour clock for reference during RLOG (Remote Logging) operation. The Real-Time Clock information is provided as an item in the RLOG data sent to a terminal or printer device. Using the time as a reference of when the signal contacts were made allows the operator to review signal contacts made within the last 24 hours.

M.2 FIELD INSTALLATION

Installation of the Type 796185-6 Real-Time Clock assembly into the receiver is accomplished by performing the following steps.

1) Turn the receiver power off and remove the top protective dust cover. The protective covers are held in place with quick release quarter-turn fasteners.

2) Locate Option Slot 1 on the Digital I/O Motherboard (A5) and insert the Type 796185-6 Real-Time Clock assembly into the vacant Option Slot 1. (Refer to the decal on the bottom of the top cover for the location of Option Slot 1.)

3) Insert the new U4 EPROM in the Microprocessor assembly (A5A3). This EPROM is placed in the U4 socket position. If this EPROM is not replaced, the receiver will not respond properly to the change in receiver configuration.

   Information required for a replacement EPROM are:

   - Receiver Type (WJ-861XB-X)
   - Receiver Serial Number (XXX)
   - Software Revision Level (X.X.X)
   - EPROM location Number (UX)
   - Options Installed
   - IF Bandwidths Installed

4) After installing the RTC assembly and the new EPROM into the Microprocessor assembly, replace and secure the top protective cover.

5) Turn the receiver power on.

M.3 OPERATION

With the Real-Time Clock assembly installed in the receiver, apply power to the unit. After the receiver is operational, perform the following steps to set the RTC time to the current or desired time.

1) Press the FUNCTION key to place the receiver front panel in the upper case mode. In the upper case mode, the LED on the FUNCTION key is illuminated.

2) Press the TIME key (DISABLE) key to display the 24 hour clock time.

3) Press the HOUR (1 MHz) key to highlight the hour LEDs in the FREQUENCY display window.

4) Rotate the TUNING knob to display the desired hour (0 to 23). Clockwise rotation increases the displayed time and counterclockwise rotation decreases the displayed time. Rotating the tuning wheel beyond the upper hour limit (23) cycles the hour back to 0.

5) Press the MINUTE (10 MHz) key to change the displayed minutes. When rotating the TUNING wheel for the hour or minute setting causes the displayed seconds to be reset to zero each time the TUNING wheel is rotated.

6) Press the TIME (DISABLE) key again to return the displayed time to the FREQUENCY display.

The time may also be set remotely by using the **TIM** and **TIM?** mnemonics. Section II of the WJ-861XB Receiver Instruction Manual lists the remote mnemonics. The TIM mnemonic, followed by six ASCII numbers and two colons (HH:MM:SS) is used to set the time. The receiver set time is determined by sending the "TIM?" query. The response to the TIM? query is the same format for setting the time (TIM HH:MM:SS). If the RTC option is not installed, the response will be TIM/.

M.4 CIRCUIT DESCRIPTION

Refer to **Figure M-2** for the Type 796185-6 Real-Time Clock schematic diagram. The reference designation for the Real-Time Clock option is Option M. Table A, located on the RTC schematic diagram, provides a list of the different versions of the Type 796185-X Real-Time Clock assembly. The Type 796185-6 Real-Time Clock assembly provides a real-time clock that provides the time of day.

Inserting the Real-Time Clock option into Option Slot 1 and then turning the receiver power on applies +5 Vdc from connector pin 12 (OPT INST) to the Digital I/O Motherboard (A5). At power-up, the Microprocessor reads the status of this line to determine what options are installed in the receiver and the PFAIL line (connector pin 4) is forced High. RAM VCC at connector pin 6 is applied to real-time clock device U13 to allow constant operation of the clock circuit, even when power is turned off. With the PFAIL line High, data may written to or read from the RTC assembly and when this line is Low, the exchange of data is inhibited.

Using the address lines (A10 to A12), data lines (D0 to D3) and the control lines (R/W, OPT, DBE, and PFAIL), the operation of the RTC assembly can be controlled. The address lines (A11 and A12) are applied to dual 1-of-4 decoder/demultiplexer U6. **Table M-1** illustrates the control line logic levels required to enable certain devices within the RTC assembly.

Table M-1. Type 796185-6 RTC Control Inputs

PFAIL	OPT	A12	A11	A10	R/W	Function
1	0	0	1	0	1	Enables Latch U12 to read Clock data
1	0	0	1	0	0	Enables Latch U13 to Set Clock
1	0	0	1	1	0	Clocks Latch U10 to select U13 Clock counter
X	1	X	X	X	X	Disables the RTC assembly
0	X	X	X	X	X	Disables the RTC assembly

With the DBE line (connector pin 16) High, 1-of-8 decoder/demultiplexer U7 is enabled. Enabling U7 allows latch U7 to be clocked. Clocking U10 allows the data at the D inputs to be transferred to the Q outputs.

Using address lines A10 and A11 and the read/write line, the microprocessor reads data from or writes data to the real-time clock/calendar device (U13). Setting address lines A10 and A11 both High, the microprocessor is able to write data to the real-time clock (U13). When address line A10 is Low and address line A11 is High, the microprocessor reads data from U13.

Before writing data to the real-time clock/calendar (U13), the Q5 output from U10 is forced High. This High inhibits the internal clock of U13 and sets all of the internal counters to their static states, allowing error-free read or write operations.

When the microprocessor writes data to real-time clock device U13, data is placed on the data bus (D0-D3) and the read/write line is set Low. This data is applied to octal flip-flops U10 and U11. Data is applied through flip-flop U10 when the output enable (pin 1) is set Low. This allows data at the D inputs to be directed through U10 to the Q outputs when clocked. Data at the D outputs is applied to address lines A0-A3 of real-time clock U13. These address lines are used to select one of the seven different registers inside of U13. Each register is used to control one separate function of the real-time clock/calendar. Presently, only the hour, minute, and second registers are used. Crystal oscillator Y1 and capacitors C6 and C7 provide the 32.768 kHz reference frequency used by the real time-clock/calendar (U13).

The microprocessor reads data from the RTC assembly by setting the read/write line High. With this line High, data is read from the real-time clock/calendar and applied to 8-bit latch U12. This data is applied through U12 when the output enable (pin 1) is Low. Data applied through U12 is directed to data bus lines D0-D3 for use by the microprocessor. Unused data lines are pulled High by pull-up resistors R3 to R6.

M.5 ALIGNMENT PROCEDURE

The following steps describe the procedure to follow for the alignment of the Type 796185-6 assembly. Refer to **Figure M-1** for the location of terminal E1. A frequency counter capable of measuring period (such as the Fluke 1953A or its equivalent) is required for the following alignment procedure.

1) Turn the receiver power off and remove the top protective dust cover.

2) Place the Type 796185-6 Real-Time Clock assembly on an extender card and turn the receiver power on.

3) Connect the frequency counter to terminal E1 on the Type 796185-6 Real-Time Clock assembly. Adjust the counter controls to display the period of the signal present at E1.

4) Press the front panel CLR push button twice and then press the MAN push button to activate the 1024 Hz test signal.

5) Adjust C7 until the frequency counter displays 976.2625 µsec. Then remove the frequency counter from terminal E1.

6) Remove the RTC assembly from the extender card and insert the RTC assembly into Option Slot 1. Replace and secure the receiver top protective cover.

7) Turn the receiver power on and set the clock to the proper time. Refer to **paragraph M.3** for the procedure for setting the clock time.

M.6 PARTS LIST

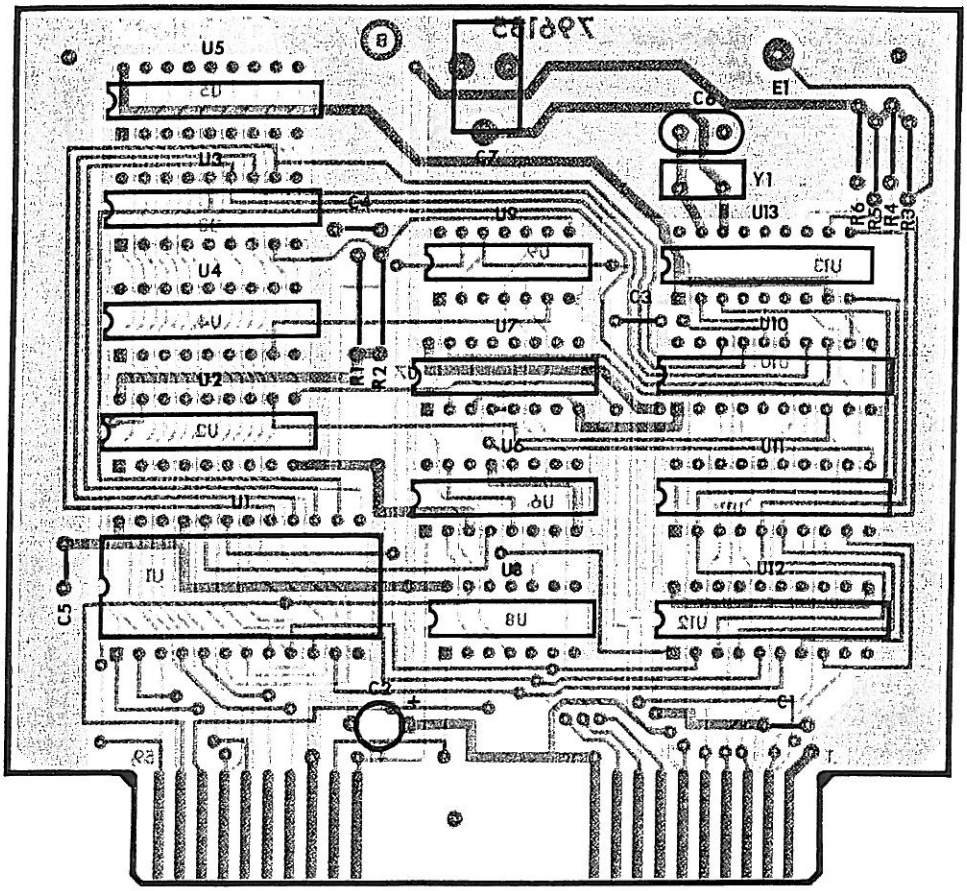

Figure M-1. Type 796185-6 Real Time Clock, (Option M-RTC) Location of Components

M.6.1 TYPE 796185-6 REAL-TIME CLOCK

REF DESIG PREFIX RTC

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
	Revision C				
C1	Capacitor, Ceramic, Disc: 0.1 µF, 20%, 50 V	4	34475-1	14632	
C2	Capacitor, Electrolytic, Tantalum: 4.7 µF, 20%, 35 V	1	199D475X0035CE3	56289	
C3 Thru C5	Same as C1				
C6	Capacitor, Mica, Dipped: 15 pF, 5%, 500 V	1	CM05ED150J03	81349	
C7	Capacitor, Variable, Air: 0.8-10 pF, 250 V	1	5201/W HDW	91293	
R1	Not Used				
R2	Not Used				
R3	Resistor, Fixed, Film: 10 kΩ, 5% 1/8 W	4	CF1/8-10K/J	09021	
R4 Thru R6	Same as R3				
U1 Thru U5	Not Used				
U6	Integrated Circuit	1	SN74LS139N	01295	
U7	Integrated Circuit	1	SN74LS138N	01295	
U8	Integrated Circuit	1	8674L04	14632	
U9	Not Used				
U10	Integrated Circuit	1	MM74HC273N	27014	
U11	Integrated Circuit	1	MM74C374N	27014	
U12	Integrated Circuit	1	MM74C373N	27014	
U13	Integrated Circuit	1	MSM5832	52624	
Y1	Crystal: 32.768 kHz	1	CX-.03	51791	