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# **DSP-232**

## **Upgrade Kit A.06113**

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Installation  
and  
Operation  
Manual  
Rev. 2.0



# WARRANTY

## TIMEWAVE TECHNOLOGY INC. LIMITED ONE YEAR WARRANTY

### WHO IS COVERED

This warranty is extended only to the original purchaser of the A.06113.

### WHAT WE WILL DO

If your A.06113 fails in normal use because of a defect in workmanship or materials within one year of the date of purchase, we will repair or replace (at our option) the equipment at our factory without charge to you. Timewave will pay for the return of the warranty-repaired unit to you.

### WHAT YOU MUST DO

First, double check your connections and operating procedure. If you're certain that the unit is faulty, notify Timewave Customer Service immediately. If Timewave is unable to resolve the problem by telephone or email, we will give you an RMA number and ask you to return the unit. You must pay all shipping and insurance charges for returning the unit to our factory.

### WHAT IS NOT COVERED

We cannot be responsible for damage caused by accidents, abuse, misuse, improper installation, or unauthorized attempts to repair the unit. This warranty does not cover any parts of the DSP-232 except the A.06113.

### SERVICE WARRANTY

Timewave service work performed in connection with this warranty is warranted to be free from defects in materials and workmanship for 30 days from the date of repair. All other terms of the limited warranty apply to the service warranty.

### HOW TO CONTACT TIMEWAVE

Contact Timewave Customer Service by telephone at (651) 489-5080 or by FAX at (651) 489-5066.

#### Mailing and shipping address:

Timewave Technology Inc.  
1025 Selby Ave., Suite 101  
St. Paul, MN 55104-6533

email: sales@timewave.com  
techsupport@timewave.com  
service@timewave.com

web: www.timewave.com

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# Introduction

Thank you for purchasing the Upgrade kit for the DSP-232. The Timewave part number of this kit is A.06113.

The kit contains a firmware upgrade that enables the CW keying output, Pactor, and the mailbox function for Pactor, AMTOR, and packet. The firmware release also adds 1600/1400 modems for compatibility with MARS and Pactor operation. With this upgrade, the DSP-232 will operate the Baudot, ASCII, AMTOR, Pactor 1, Morse, 1200 baud packet and 9600 baud packet modes with mailbox.

The kit also contains the circuit board necessary for the hardware CW keying output. This modification provides an output to operate a CW key input on modern transceivers. An open collector transistor output pulls a positive voltage (100 volts DC @ 100 mA. maximum) radio key input to ground when the DSP-232 sends morse code. An alternate connection is available for negative keying (-30 VDC @ 20 mA. maximum).

The 10k resistor is a replacement for R31, currently 27K. Replacing this component will increase the sensitivity of your DSP-232.

This kit contains two mailbox memory upgrade chips. A copy of the mailbox memory upgrade appendix from the DSP-232 manual is included in this document.

The enclosed CD contains a demo copy of PK-Term for Windows. This is a 32-bit Windows 95 or later program that supports the DSP-232. If you decide to purchase PK-Term for Windows, contact Creative Services Software at [sales@cssincorp.com](mailto:sales@cssincorp.com) or (256) 381-6100. You can also download the latest version of PK-Term for Windows from the CSS web site.

Follow the instructions carefully and you should have no problem in getting the unit on the air. If you do have questions, Timewave has technical support available at (651) 489-5080 and [service@timewave.com](mailto:service@timewave.com).

# DSP-232 Upgrade Kit

## Section 1

### DSP-232 Upgrade Kit Installation

#### Installation steps

Please check the contents of the kit at this time. You should have received:

- 1 CW keying output upgrade assembly
- 3 Eprom I.C. ver. 1.0H (U4, U5, U33)
- 2 128k x 8 SRAM I.C. (U6, U7)
- 1 10k 1/4 watt resistor
- 1 DSP-232 Upgrade Installation and Operation instructions
- 1 Warranty card
- 1 Timewave CD ROM (also contains this document in .pdf format)

Here are the tools you will need:

- Wire Cutters
- Phillips Screwdriver
- Needle nose pliers
- Flat head screwdriver
- 3/16" hex nut driver
- Solder pencil and solder
- Solder sucker tool or solder wick for cleaning the pads on R31

Clear an area to work on your DSP-232. You should take standard anti-static electricity precautions when working on any ham equipment.

Here are the steps in the upgrade procedure:

## **Disassembly**

*Keep all removed parts, some are necessary to re-assemble the DSP-232*

1. Remove all cables and power from the unit.
2. Remove the 2 3/16 nuts from the DB-9 serial port interface.
3. Remove knurl nuts from receive jacks 1 and 2.
4. Remove the six screws from the sides and back of the DSP-232.
5. Remove the top cover of the DSP-232.

## **EPROM Installation**

1. Position the unit with the face toward you. Locate U4 and U5 in the center of the board.
2. Note the position of U4 and U5 in the socket (notch toward the front of the unit). The chip is inserted toward the back of the IC socket (Pins 1, 2, 31 and 32 are not used).
3. Use a small flat blade screwdriver to remove U4. Be sure to insert the blade between the IC and the socket, **NOT UNDER THE SOCKET**.
4. Examine the pins on the new chip. Be sure the legs of the IC are not bent
5. Place the chip in the socket and seat. Examine the chip carefully to make sure that the legs of the IC are in the socket and are not bent and folded under the IC.

Repeat steps 3 through 5 for IC U5.

Repeat steps 3 through 5 for IC U33. Note the position of U33 in the socket (notch toward the rear of the unit). **This is the reverse of U4 and U5.**

## **Sensitivity Resistor Installation**

Next locate U23 (located 1" above the battery. U23 is parallel to front panel. R31 is located next to the left-hand end of U23. It is currently a 27K resistor (Color code red, purple, orange and gold). Use a small soldering iron to remove and replace R31 with the 10K resistor supplied with the upgrade kit. This completes the sensitivity upgrade

## **CW Keying Board Installation**

1. Remove the two black jumpers from the pins on the J5 Option Jack near the right side of the DSP-232.
2. Slide the CW keying board connector P1 on the pins of J5 Option Jack near the right side of the DSP-232. The components on the CW keying board should face the right edge of the DSP-232. Make sure all the pins fit into the corresponding jacks on P1. See Figure 1 for orientation of the board.
3. Mount the CW keying jack in top of the Option slot in the back panel.
4. You should only have two black jumpers remaining – they are not used. Tape them to the inside cover of your manual in case you should decide to use them later.

## **Mailbox Memory Upgrade**

### **Increasing the size of your mailbox**

You purchased your DSP-232 with the standard 18K mailbox (32K RAM). You may increase the size of the mailbox in your DSP-232 by installing either one or two additional SRAM chips. If you install only one, you will have a 150K mailbox (160K RAM). If you install two chips, you will have a 242K mailbox (256K RAM).

The firmware in your DSP-232 does not need to be changed. All that is necessary is to install the additional SRAM chip(s).

### **To install additional mailbox space do the following:**

#### **150K (160K RAM) instructions**

Remove the SRAM IC in socket U6 and install it in U7. Make sure you install the IC with pin one oriented correctly.

Install the new SRAM chip in socket U6. Make sure you install the IC with pin one oriented correctly.

### **242K (256K RAM) instructions**

Remove the SRAM IC in socket U6 and set it aside.

Install a new SRAM IC in both sockets U6 and U7. Make sure you install the IC with pin one oriented correctly.

### **Re-assembly**

1. Replace the cover and replace all screws and nuts removed in steps 2-4.
2. Reconnect the cables to the unit. Reset the unit and start operating!



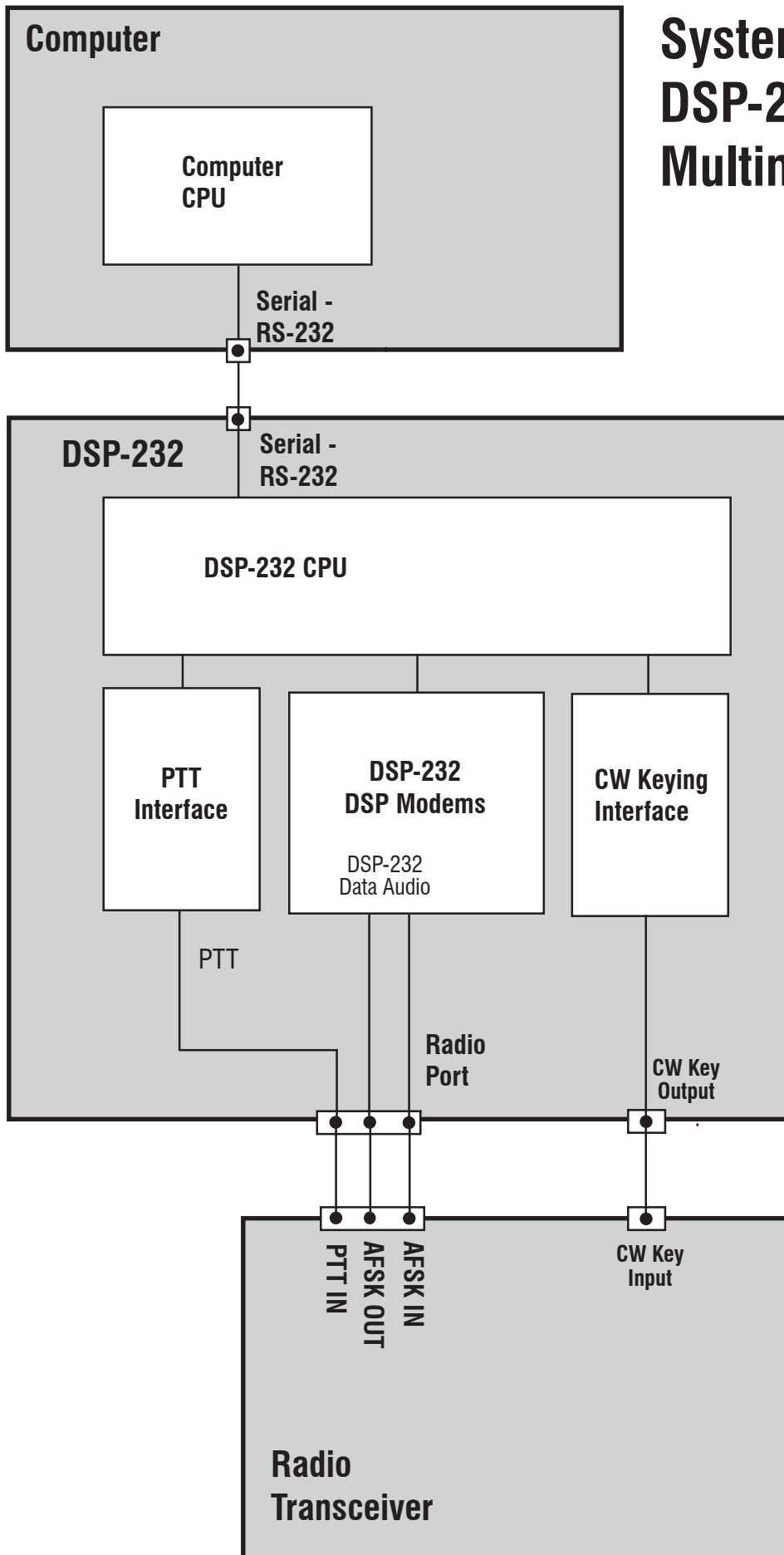
## Section 2

### CW keying Connections for the DSP-232

The 3.5mm phone plug from your radio's keying input should have the tip connected to the CW keying line and the sleeve connected to ground.

**Your radio must be keyed by pulling the positive keying input line to ground. Contact Timewave if you wish to use you DSP-232 with an older transmitter with grid-block keying.**

# System Block Diagram DSP-232 Multimode Controller



## Section 3

### DSP-232 Upgrade Operation

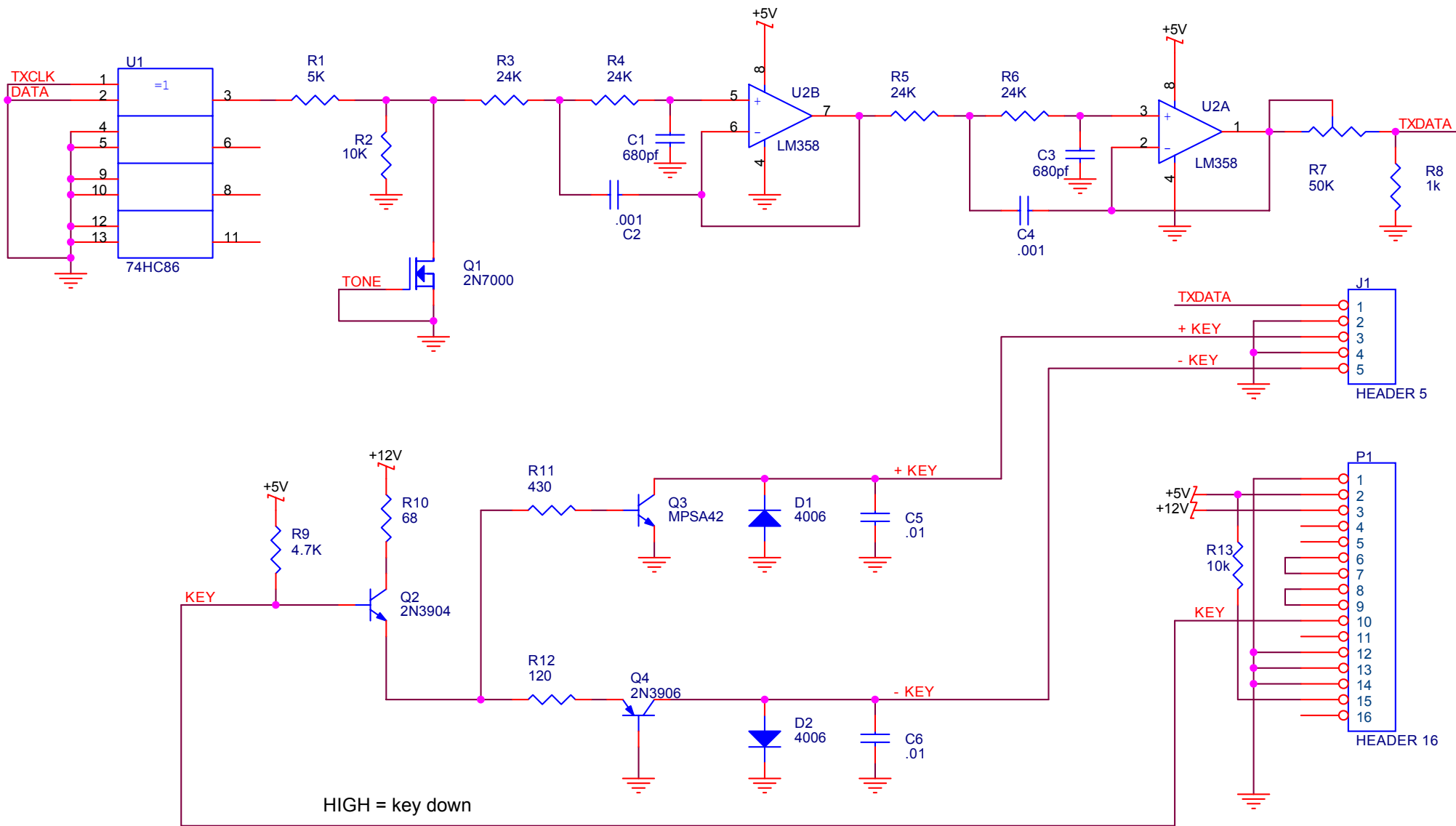
The DSP-232 upgrade allows you to operate Pactor and use the mailbox feature for AMTOR, Pactor and packet. Follow the instructions in the DSP-232 operating manual to operate in these modes. You will need a PC software program for the mode you wish to use. PK-Term for Windows fully supports the DSP-232. Download the latest demo copy of PK-Term for Windows from <http://www.cssincorp.com>. A copy is also on the Timewave CD for your convenience.

The CW Keying output feature added by the DSP-232 Upgrade requires no changes to your operating procedure for CW. Follow the instructions in the DSP-232 operating manual to operate in this mode.

The input sensitivity added by the DSP-232 Upgrade requires no changes to your operating procedures. The DSP-232 will require less input signal after the modification is installed.

## **Section 4**

### **DSP-232 CW Output Upgrade kit Schematic Diagrams**



Note: Manchester modulator disabled by grounding inputs.

<b>Timewave Technology Inc.</b>		
Title		
Manchester Modulator/CW Keying Option Board		
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