Pro-Turbo

(C) 1998 Paul E. Turton & Lennard G. Carpenter
Version 4.3.01a

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Register by sending $50 USD cheque or money order to:

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> **Wainfleet, Ontario**
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Include your Internet email address with your registration so that your registration code can be sent to you promptly.

Please respect the copyright and register this program. When you have registered Pro-Turbo, you are licensed to use it concurrently on all your own computer and scanner/interface systems.

READ THIS PRO-TURBO MANUAL BEFORE RUNNING SETUP!

NOTE:

The 68HC11 CPU in the CE232 interface MUST have had its EEPROM programmed with EEPUTV13.EXE prior to running Pro-Turbo or the DOS program HB232V13.EXE. The program EEPUTV13.EXE is available from COMMtronics Engineering and is included with the DOS program package accompanying your CE232 kit.

Because the PER files included with your HB/CE232 interface are copyrighted they are not distributed with this program. These PER files if needed must be copied to the Pro-Turbo directory to complete installation. Pro-Turbo includes PER files for the Pro-2004/5 and Pro-2006 which enable A/D conversion.

Pro-Turbo creates sub-directories for such files as APF, LOG and lookup when it is run for the first time. Copy your interface files to the appropriate sub-directories after Pro-Turbo has been run for the first time.

Pro-Turbo has been written in Visual Basic 6 and used and tested with Windows 95, 98 and NT4 on various systems.

This program requires as a bare minimum:

> An understanding of the CE232 interface and its documentation
> An understanding of the Pro-Turbo documentation
> SVGA monitor running at 800x600
> 486 66 MHz CPU
> 16 Megs RAM
> Windows 95, 98 or Windows NT 4
> Mouse or other pointing device
> Pro-2004, 5 or 6 scanner
> HB/CE232 Interface from COMMtronics Engineering
> A free serial port that does not share its IRQ

Recommended System components:

> Accelerated SVGA running at 1024x768 or better
> Pentium P100 CPU or better
> 64 Megs RAM
> PS2 mouse or pointing device
> Sound Blaster 16 or compatible sound card
> Windows NT 4
> 2 free serial ports that do not share IRQs

Although Pro-Turbo was written primarily for use with a Pro-2004, 5 or 6 it programs my Pro-43 and Pro-60 without problems.

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Installation

REMOVE PREVIOUS INSTALLATIONS OF PRO-TURBO FIRST!

Remove all files from the directory of any previous installed version of Pro-Turbo. Only the files in this directory need to be removed; sub-directories DO NOT need to be removed. The registry entries for a previous installation can be left untouched.

Un-Zip the **pt4xxx.zip** file into a temporary directory and run the setup.exe program by double-clicking on it in Windows Explorer. Follow the prompts of the set up program. **Once Pro-Turbo (or any other program) has been installed it is advisable to reboot the system.**

NOTE:
Because the .PER files included with your HB/CE232 interface are copyrighted they are not distributed with this program. These PER files if needed must be copied to the Pro-Turbo directory to complete installation. Pro-Turbo includes PER files for the Pro-2004/5 and Pro-2006 which enable A/D conversion.

Pro-Turbo creates sub-directories for such files as APF, LOG and lookup when it is run for the first time. Copy your interface files to the appropriate sub-directories after Pro-Turbo has been run for the first time.

Start-up

Before starting, you should know which COM port the HB/CE232 is connected to. The appropriate 'PER' files must be copied to the Pro-Turbo directory if you are not using a Pro-2004/5/6.

First-time Start-up

1. **Turn OFF your scanner/interface.**

2. Execute Pro-Turbo.exe directly or from a shortcut. The sub-directories required for Pro-Turbo will be created off the directory in which Pro-Turbo.exe resides.

3. Enter the correct COM port number for your interface. The program defaults to suggest using COM2 because most internal modems are installed on COM3 which may cause IRQ conflicts on many systems and the default IRQ for COM2 has a higher priority than COM1 or COM3.

4. Click "YES" to save your interface's COM port.

5. Select a PER file that matches your system. If no file is selected or the operation is cancelled, Pro-Turbo exits. A PER file is necessary for Pro-Turbo to run.

6. The program will now continue and check your selected COM port looking for your interface. Turn your scanner/interface ON when the message box tells you to.

7. The contents of the PER file will be downloaded to the interface and Pro-Turbo will start.

### Start-up with Scanner/Interface NOT Initialised With PER File Code

1. **Turn OFF your scanner/interface.**

2. Execute Pro-Turbo.exe directly or from a shortcut. The sub-directories required for Pro-Turbo will be re-created off the directory in which Pro-Turbo.exe resides if they have been removed or renamed.

3. The program will now check your selected COM port looking for your interface. Turn your scanner/interface ON when the message box tells you to.

4. The contents of the PER file will be downloaded to the interface and Pro-Turbo will start

Start-up with Scanner/Interface Already Initialised With PER File Code

1. Execute Pro-Turbo.exe directly or from a shortcut. The sub-directories required for Pro-Turbo will be re-created off the directory in which Pro-Turbo.exe resides if they have been removed or renamed.

2. The program will now continue and check your selected COM port looking for your interface. When and if it is found, the code in the Interface is compared to that of the selected PER file. The Interface is re-loaded with code if there is an error detected.

3. Pro-Turbo starts.

Start-up Failure

Pro-Turbo will look for your Interface for several seconds and if not found will stop and ask you to check connections. You may change your COM port selection at this time if necessary. Exit the initialisation screen and check your set-up.
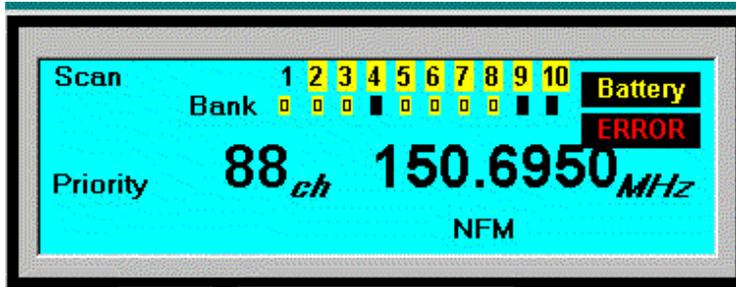
If Pro-Turbo starts and you get a screen similar to that above, your Interface has not been properly synchronised. Pressing the scanner reset switch at the rear of the scanner will correct this… OR exit Pro-Turbo and turn the scanner/interface OFF and re-start Pro-Turbo and turn the scanner/interface ON when asked by the initialisation screen.

*An explanation of initialisation and synchronisation:*
On start-up the HB/CE232 interface must be initialised before the LCD driver in the scanner so the code in the interface can catch this LCD driver initialisation code and synchronise with it. Unless the interface has been properly initialised/synchronised an error will result.

Once the interface has been initialised properly and is in synchronisation with the scanner, and the PER file code has been downloaded successfully, PT can be started, stopped and re-started without error as long as the scanner/interface have not been turned off or the interface has not received invalid data from another source..

If your properly initialised scanner/interface has not been powered down and you cannot re-start PT without a problem, then some other device or program has sent data out the serial port while PT is shut down and the initialisation code from PT is being ignored.

For example, rebooting my computer will send data out all serial ports unless I include a command in my boot.ini to tell NT not to check for serial mice. If this command is missing on my system and the interface has been properly initialised and synchronised with the scanner, after rebooting I get the display shown above.

Pro-Turbo Window
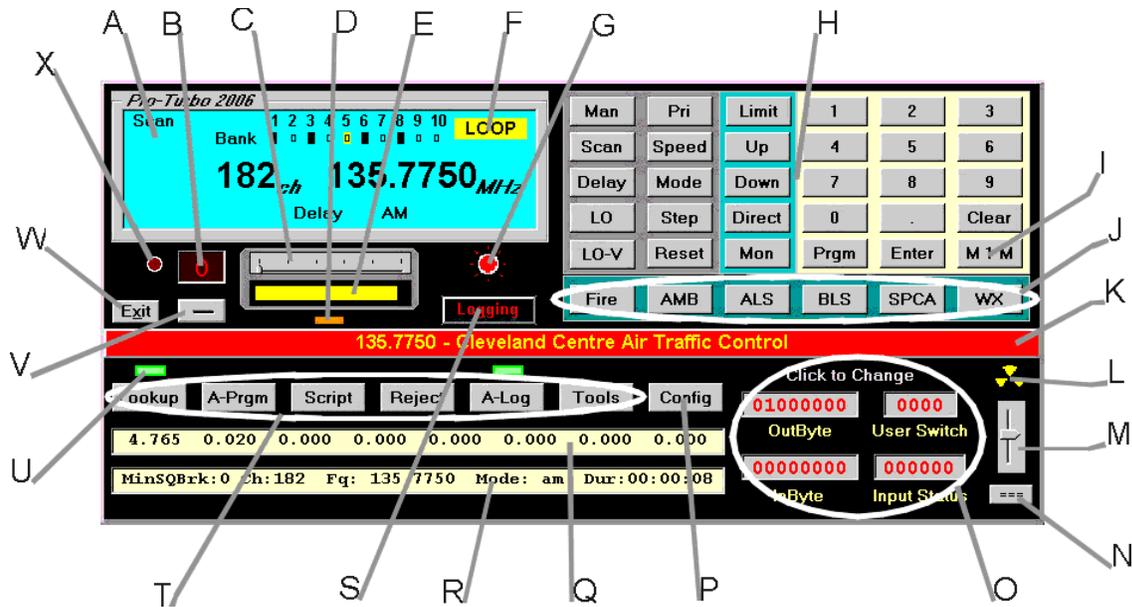
A. LCD display - click the various labels to send a command. E.g.: click MHz to send Manual.

B. Active Memory Block number or User Switch decimal value.

C. Memory Block slider - use right/left arrow keys or mouse to change active Block or User Switch.

D. Function active indicator - handy if using the short display.

E. S-meter - use **Config**uration to set up input for metering.

F. Indicator that auto-logging and recording are active in a simulated tape loop.

G. Carrier Detect light.

H. Keypad - click or use the keyboard to send a command to the scanner.

I. Manual 1 Manual - click or press <Alt>+M to jump to Channel 1.

J. Six user definable keys. Use with <Shift>, <Alt> and <Ctrl> to access 24 definitions of Channels, Memory Blocks or Scan Banks.

K. Status bar - click to toggle view of functions etc. Turns red when recording audio.

L. Log Player Icon. Double-click to activate **PTLogPlayer.exe** and play recorded audio back by frequency.

M. Volume control - use **Config**uration to set up line input.

N. Click to activate Windows' Volume control, <Alt>+Click for Recorder or <Ctrl>+Click for Media Player.

O. Binary inputs and output display.

P. Configuration window (see below).

Q. Display of the 8 Analogue/Digital inputs - available if using the 200xPT8BitAD.per file.

R. Display of last frequency logged.

S. Record audio when a log is not required. Record button is disabled when Auto-Log is recording audio.

T. Function keys bring up corresponding tab window for configuration and use.

U. Function active status indicator.

V. Minimise button.

W. Exit button

X. Serial data tracker active indicator. Click or press **<Alt>+T** to open Tracker window.

Configuration Window
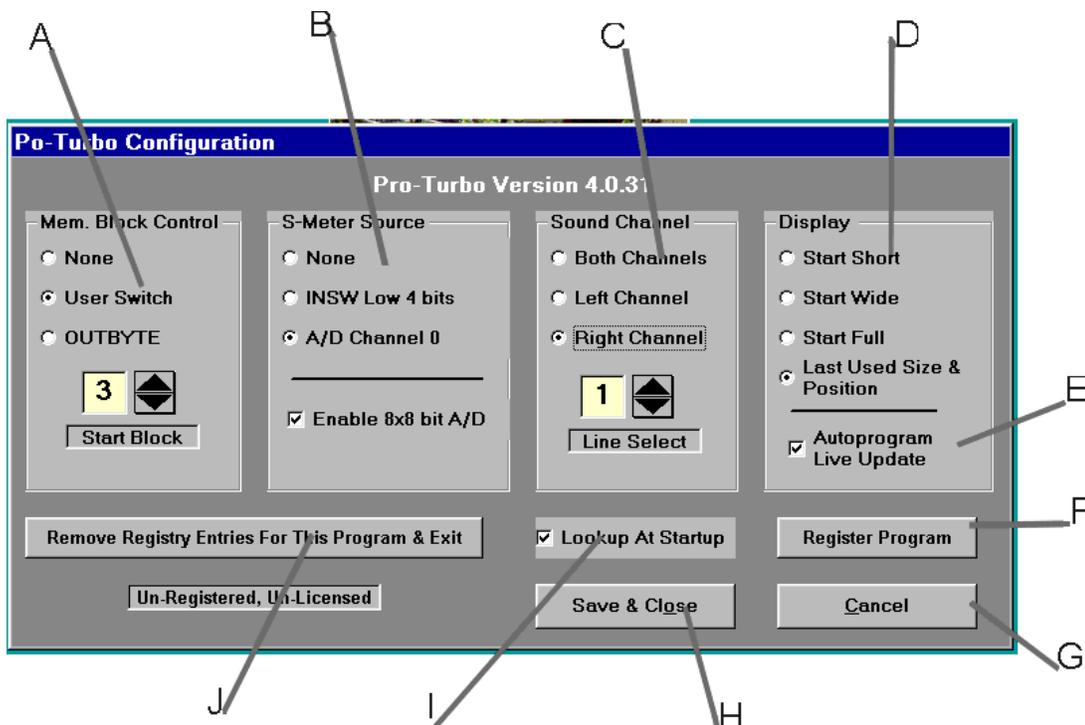
A. Memory Block control configuration. Use None, User Switch for 16 blocks or OUTBYTE for 64 blocks. The expanded memory address lines must be wired appropriately to use this control. The Start Block sets the memory block that is to be active upon starting Pro-Turbo.

B. S-meter source set up. Check **Enable 8x8 bit A/D** to enable A/D conversion.

C. The audio line input must be found manually. With your scanner's audio connected to your Sound Blaster compatible sound card, test to find the line that works for your system. Pro-Turbo determines how many lines are available on your system but cannot determine where the scanner audio is connected.

D. Pro-Turbo has 3 windows sizes that can be changed by key press or mouse click. Select the window size that will be used when Pro-Turbo starts. If you prefer to have Pro-Turbo start in the same size and position as when you closed the program, check **Use Last Size & Position**.

E. Check to use live screen update when auto-programming. Not recommended for slow systems. **Autoprogram Live Update** turns on display of 'what info the scanner received' instead of what data was sent. This may not work on all systems and is not used by scanners other than the Pro-2004,5 & 6.

F. Enter registration name and ID. This is disabled once the proper information has been entered.

G. Cancel changes and exit this window without saving them.

H. Save changes and close configuration window. This will change the Memory Block to the Start Block.

I. Check to have a lookup file loaded at start-up. The name of the last lookup file selected with the LookUp tab is saved for this usage. **Lookup At Start** loads the last used lookup file and starts Lookup when Pro-Turbo begins.

J. Before un-installing Pro-Turbo or to return to Pro-Turbo defaults use this function to remove Pro-Turbo sub-keys from the registry.

Function Buttons

LookUp Toggles Lookup OFF or brings up Lookup tab.

> **Show Only Comments When Using APF File** - only the comment field is displayed if an APF file is used for lookup.
> **Ignore trailing Zero's** - strips trailing zeroes from the scanner's frequency for a second search. This is useful if your lookup file also has the trailing zeroes stripped.

**A-Prgm** Turns off any active function and brings up **Auto-Program** tab.

> If using filtering, an "**!**" as the very first character of the filter will create an Exclusion filter.

> When '**A - Use Channel #'s**' or '**C - Filtered & Use Channel #'s**' is checked, PT now scans the APF file and if a channel number is missing or invalid, a message pops up asking if you want to continue.

> If you continue, PT will program the channel number if there is one otherwise the frequencies will be placed in consecutive channels beginning at the current channel. If any channel numbers are found, programming will continue at those channels and then in consecutive channels following if channel numbers are skipped in the file. Invalid channel numbers, those less than 1 or greater than 400 are considered missing.

Script Brings up **Script** tab. (Self-explanatory)

**Reject** Brings up **Reject** tab. (Self-explanatory)
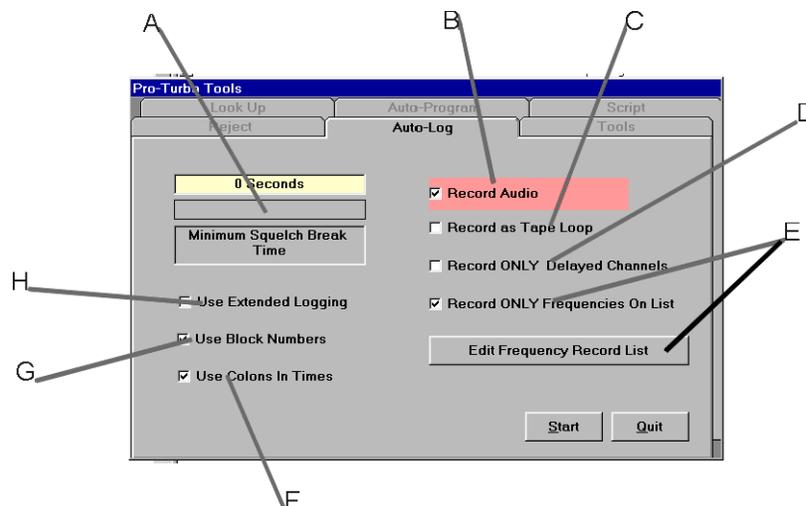
A-Log Brings up **AutoLog** tab.

A. **Minimum Squelch Break** sets the time that the squelch must be broken on a signal before that signal is saved to the log. This time is set to 0 if recording audio.

B. **Record Audio** records with a synchronised log file that allows for play back of audio by frequency if using PT Log Player.

C. **Record as Tape Loop** records audio with a synchronised log file that allows for play back of audio by frequency if using PT Log Player. The Log and recorded WAV file are changed on twenty minute intervals - 20 and 40 minutes past the hour and on the hour. This gives up to 40 minutes of logging… the previous log and whatever is in the current log. Log files are named with a L0, L1, L2 or L3 in the file names. If the logging is started, stopped and restarted, the previous log is renamed to L0.

D. **Record ONLY Delayed Channels** records audio with a synchronised log file only from those channels that have the delay turned on. All other channels are logged but not recorded.

E. **Record ONLY Frequencies On List** records audio with a synchronised log file only from those frequencies that are on a user created list. The list may be edited by clicking the edit button.

F. **Use Colons in Times** "**:**" changes the time format to my preference. E.g.: 98-07-22,08:40:02,00:00:09 instead of 980722,084013,000051. Also, the S-meter reading is stored if using the A/D input for it.

G. **Use Block Numbers** adds the Memory Block Number (Value of the User Switch or OUTBYTE lower 6 bits) to the beginning of each log entry.

H. **Use Extended Logging** includes the In/Output status and user switch.

Tools
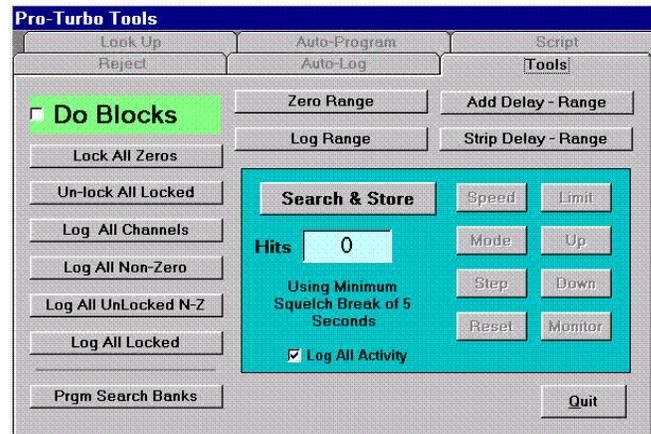
Do Blocks enables some operations (tool buttons below this checkbox) across all Memory Blocks if the **User Switches** or **OUTBYTE** control the switching of Memory Blocks on your system. The use of Blocks expects 16 blocks of 400 channels with the **User Switch** control and 64 blocks of 400 channels if using the **OUTBYTE** as control.

Lock All Zeros - Locks all channels that are not programmed except that there must be **one** channel in each bank that is not locked.

Unlock All Locked unlocks all non-zero channels that are locked.

Log All Channels logs all channels including zeroed to an 'APF' file in the 'DOWN' directory.

Log All Non-Zero logs all non-zero channels to an 'APF' file in the 'DOWN' directory.

Log All UnLocked NZ logs all non-zero, unlocked channels to an 'APF' file in the 'DOWN' directory.

Log All Locked logs all non-zero, locked channels to an 'APF' file in the 'DOWN' directory.

Prgm Search Banks uses an '**SPF**' file in the 'APF' directory to program search banks. The file must be formatted: Bank,Low,High This does not work across Memory Blocks.

e.g.: 1,851,868
2,140.525,141.5
:
etc... to bank 10
:
0,869.04,893.97

Search and Store - Follow the prompts to set up Low/High frequency to search, Start/End Channels to store hits and Minimum Squelch Break Delay before a hit is stored. If **Do Blocks** is checked, a prompt for a Memory Block is given first. The **Reject** tab is brought up so that you can manage the current **Reject List** and save it if desired. Frequencies that are found active are programmed into channels starting at your 'start channel' in the Block that you have chosen. The frequency is added to

to the **Reject List** and also stored in the 'DOWN' directory as
'SnS_b_FreqLowlimit-Highlimit_Date.APF' for example: 'SnS_15_Freq851-853_980720.APF'.
The **Minimum Squelch Break** used with **Search and Store** is saved as the **Auto-Log** default time.
Buttons are made available to set Speed, Mode, Step, Reset, Limit, Up, Down and Monitor. Checking
Log All Activity creates a log file in the 'LOGS' directory with the name formatted as
'SNS_b_DateHour.log' for example 'SnS_15_98112215.log' . The '_b_' indicates the memory block
used.

ZeroRange prompts for the Start/End channels to zeros out. This does not work across Memory
Blocks.

Log Range prompts for the Start/End channels and logs these channels to an 'APF' file in the 'DOWN'
directory. Empty channels are not logged. This does not work across Memory Blocks.

Add Delay - Range prompts for the Start/End channels to turn ON Delay. This does not work across
Memory Blocks.

Strip Delay Range prompts for the Start/End channels to turn OFF Delay. This does not work across
Memory Blocks.

OutByte and User Switch

Clicking on either, brings up a window which allows changing of the individual bits and saving these as start-up
defaults. The slider control below the blue display controls **User Switches, OUTBYTE** or **Memory Blocks**
depending how the Memory Block Control has been configured in the Configuration window.

InByte and Input Status

Displays current status of these inputs. These values may be used in scripts.

Scripting

Scripting is available in the Pro-Turbo program. The design and syntax of the script language follows the original script language but scripts may need to be re-written to work in the Windows environment with this program. The scripting language follows closely that outlined in the original HB232 DOS program manual.

- Every **IF** must have a matching **ENDIF**.

- Comments MUST be proceeded by a slash '**/**'.

- Tabs are allowed and are now considered as white space in a script.

- A built-in syntax checker will catch most scripting errors BUT NOT ALL of them.

- Default file extensions i.e. **rej**, **apf** and **scr** are expected.

- Long file names may work but the name used should be run in a test script to be sure.

- **VALUE@x** must have a value assigned to it before it is used in a conditional statement or an error may occur.

- The SHELL command accepts all words and characters on the line.
    e.g.:

        SHELL NOTEPAD.EXE THIS_REALLY_GREAT_SCRIPT.SCR

    or

        SHELL C:\MSOffice\Winword\WINWORD.EXE D:\DOCS\COMPLAINT.DOC

New script functions and changes:

ADCx   A/D channel 0 to 7 when the appropriate PER file is used. **ADCx** can be used in a condition statement as an item with a value 0 TO 255.

        IDLE UNTIL ADC0 = 128/ wait for 2.5 volts
        IF AD1 > 100 THEN   / check for 1.96 volts

AUTOLOG ON/OFF
        Toggle   Controls the auto-logging function.

ALOG ON/OFF Toggle   ditto

        These commands are used to catch frequency and channel info when the squelch is broken and then unbroken. If the squelch control is set to off and the channel is changed, the **AUTOLOG** function does not get the needed un-squelched condition to log the data. *USE LOGIT FOR THAT SITUATION*. Some of the scripts that used **AUTOLOG ON/OFF** with the squelch control set to off have been implemented as tool buttons.

BEEP   Beep speaker

DELAY   **if DELAY = YES | NO | ON | OFF then**

        Checks the channel to see if **Delay** is ON. Outside of a conditional statement, **DELAY** still functions as before turning the Delay ON|OFF. Use of channel delay as a channel marker allows the user to do events based on this condition such as turning on a tape recorder or WAV recorder.

        DO
                MSG5- Waiting to record transmission on channels with Delay turned ON.
                IDLE UNTIL SQBREAK = YES

                IF DELAY = YES THEN
                        SW1 = ON   / turn on tape recorder with user switch
                        VALUE0@ = FREQ

```
            endif

            IDLE UNTIL SQBREAK = NO
            SW1 = 0FF
    LOOP
```

LOGIT   Grabs the current frequency, channel etc. and logs it to a file.
This command replaces the following in a script:

IDLE UNTIL SQBREAK = YES
AUTOLOG ON
IDLE UNTIL COUNT = 6
AUTOLOG OFF

...WITH

IDLE UNTIL SQBREAK = YES
LOGIT

Scripts that use **AUTOLOG ON** and then turn it **OFF** just to grab a frequency or channel contents will not work well if at all with this program. Use **LOGIT** instead. Logging style depends on defaults chosen on the **ALOG** set-up tab.

M1M   Manual 1 Manual

MEMBLOCK   **MEMBLOCK [=] { y | VALUE@x }**
This command changes the Memory Block using the configured control. If **'None'** is selected as the **Mem. Block Control** in the Configuration window, **MEMBLOCK** changes the **User Switch** to the value assigned. If a value higher than the maximum number of blocks is assigned, the value 15 or 63 is used according to the Mem. Block Control in effect.
The following script will program a Block ID into channel 400 of Memory Blocks 0-15:

```
VALUE@1 = 0
VALUE@2 = 1000
DO
        MEMBLOCK = VALUE@1
        CHAN = 400
        FREQ = VALUE@2
        LOCKOUT = ON
        VALUE@1 = VALUE@1 + 1
        VALUE@2 = VALUE@2 + 1

        PAUSE 1
LOOP UNTIL VALUE@1 >=16

MEMBLOCK 0
```

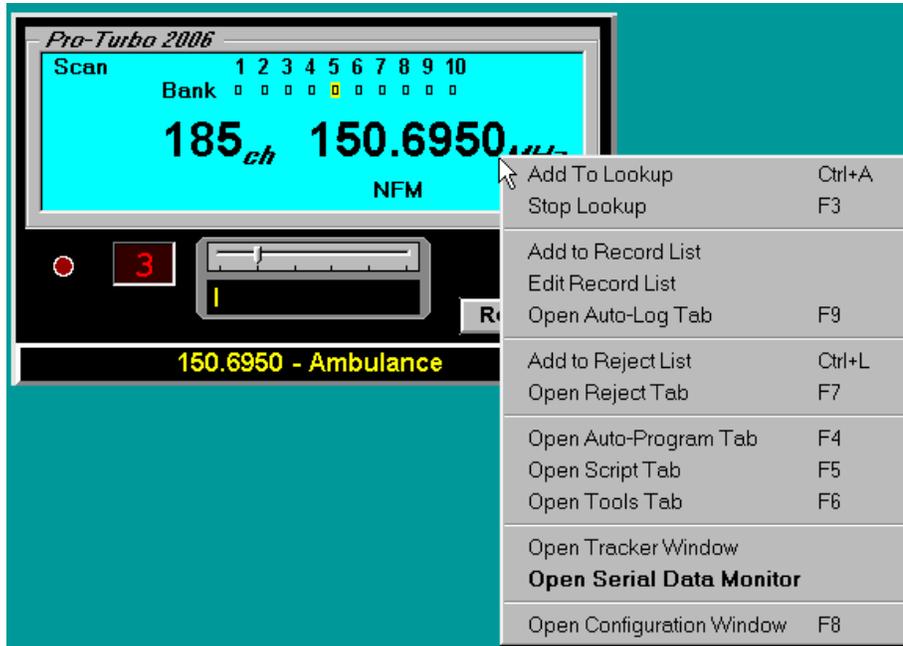**REFRESH**   Update screen

RECORD ON/OFF
            Turns audio recording ON/OFF. This command does the same as the **Record** button and does not have a corresponding log file.
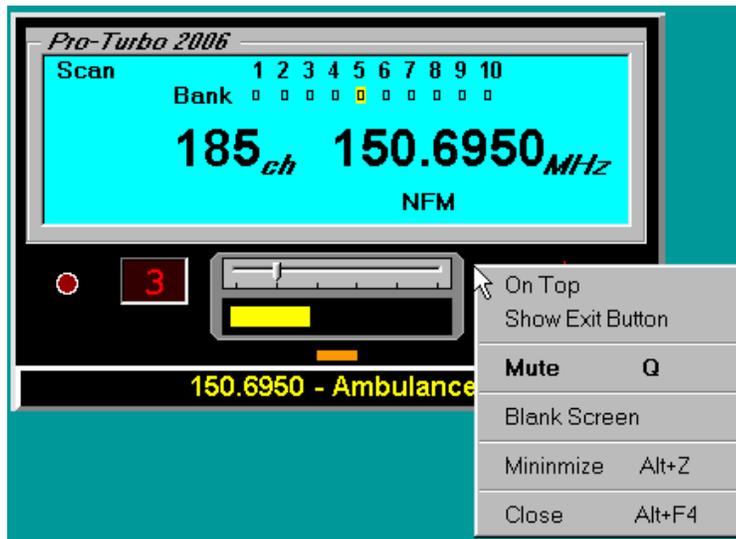
UseRecordWithALog ON/OFF
            Turns audio recording ON/OFF with the Auto-Log. Same as check box item on Auto-Log tab.

Menus

A right click on the displayed frequency will pop up the above menu which gives access to many Pro-Turbo functions. To the right of the menu items are displayed the keyboard shortcuts.

A right click on the black area of the main Pro-Turbo window will pop up this menu. which is self-explanatory.

Audio Recording

When recording is activated, the free space on the hard drive in use is checked. If less than 50 Mega-bytes is free, a warning message appears. If during recording the hard drive free space falls below 10 Mega-bytes, another warning appears. Recording only occurs when the squelch is broken.
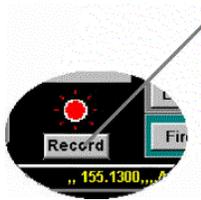
The **Record** button starts recording without a synchronised log file. The file can grow to about 36 Mega-bytes for a recording session of one hour's duration. The file is closed and a new file is created every hour. When depressed and active, the button displays the message "No Log" as a reminder.

This button is disabled when Auto-Log is active and recording audio is turned on.

When recording audio and logging to a synchronised log file, the positions, start and end of the transmission audio are stored in this log. Use Pro-Turbo Log Player to play back the recorded audio by frequency.

Pro-Turbo Log Player
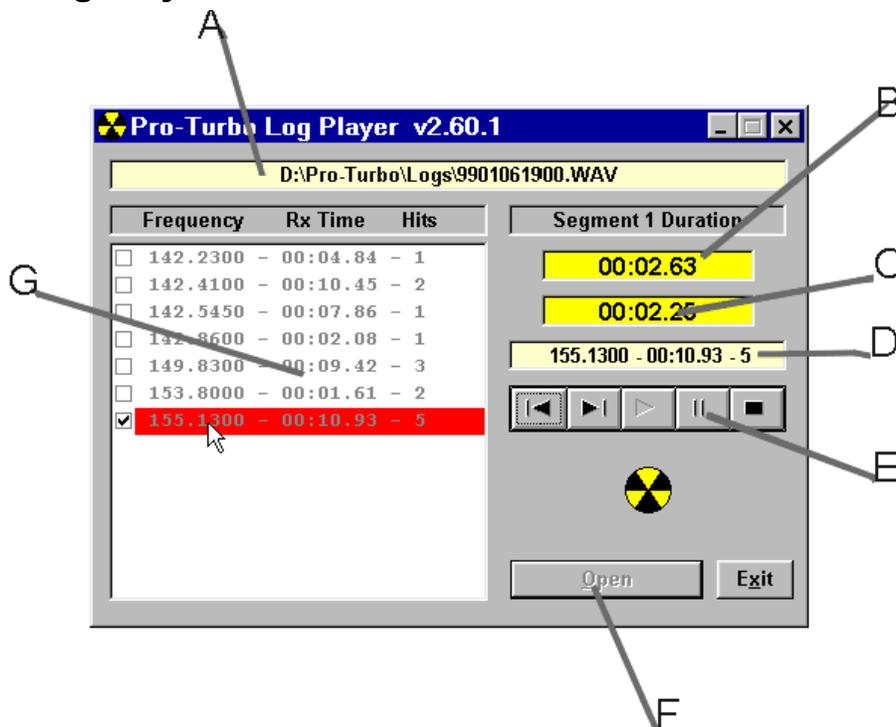
A.   File name of loaded WAV file.

B.   Duration of the current segment of audio being played.

C.   Countdown of the current segment of audio being played.

D.   Frequency selection being played.

E.   Manual player controls - Previous, Next, Play, Pause, Stop.

F.   Open Log file for play back.

G.   Play list of frequencies showing the total recorded time and the number of transmissions.

Double-click a frequency in the list to play that frequency's segments.
The Play button plays the WAV file from the beginning and does not use the LOG reference.

# Meters For Analogue to Digital Conversion

Press **F11** or **F12** to bring up the meters A/D ports 0-3 and ports 4-7 respectively. **Right click on the meter's caption label to configure it.** When you enter the voltage, use the voltage that you want displayed as full scale and make your electrical interface accordingly always remembering that 5VDC is absolute MAXIMUM input to the 68HC11 A/D inputs.
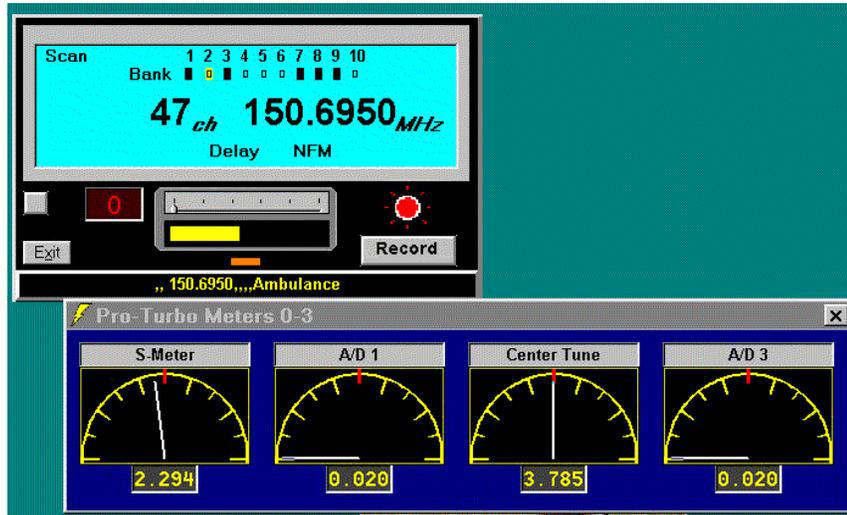
For example to monitor 20 VDC full scale:

Build a low current resistor voltage divider with a tap at 5 VDC when 20 VDC is applied across the network. Use a 5 volt Zener diode and small capacitor from the tap to ground. The capacitor should act as a buffer to slow the meter movement. Enter 20 as the maximum voltage for the appropriate meter when you configure it in Pro-Turbo. The meter will now display 0 -20 VDC.
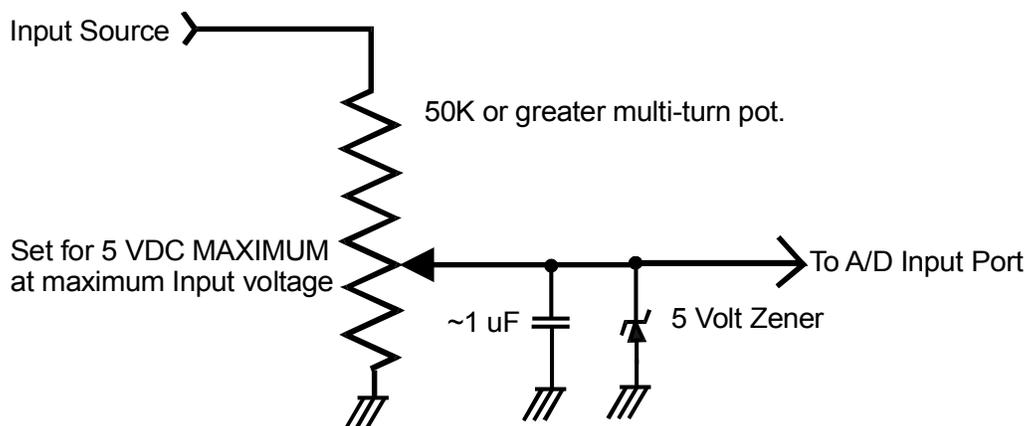
Size the meter window to suit your meter usage. If the "Last Used Size & Position" is selected in the Configuration, the meters will load to whatever position you last used next time you run Pro-Turbo and press F11 or F12.

PortTest.exe
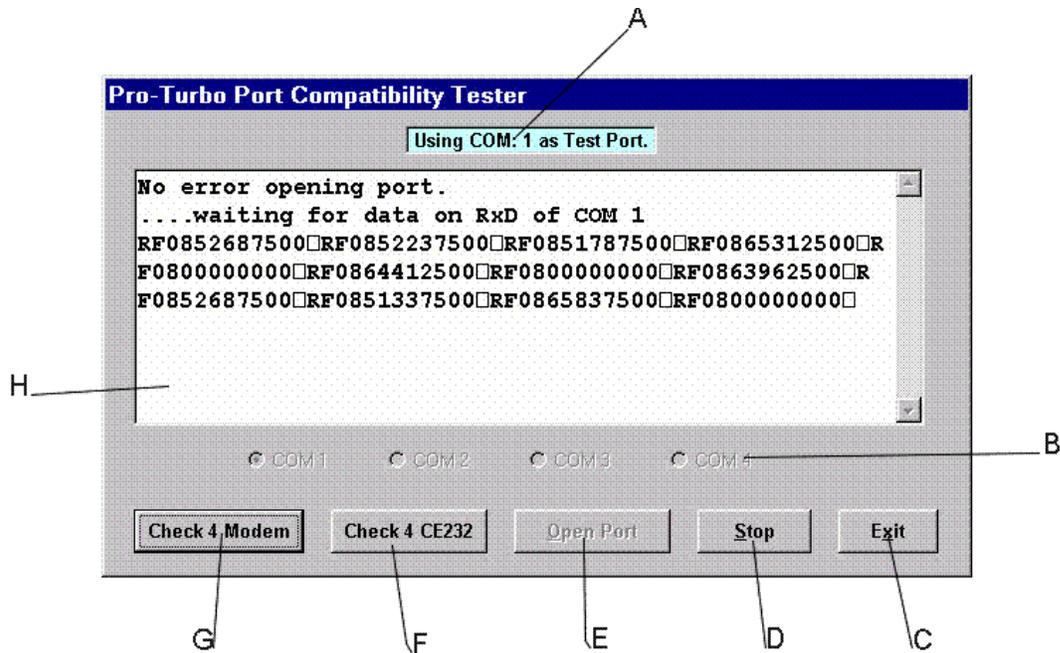
A. COM port selected to test.

B. COM port selection.

C. Close port and Exit PortTest program.

D. Stop test of selected port.

E. Open selected port for test.

F. Check if a CE232 is powered up and attached to selected port. The initialisation code for the CE232 is sent out the port and if &HFF is returned it is reported that a CE232 has been found.

G. Check for a modem by sending an 'AT' command. If a modem is connected, 'AT' and 'OK' are echoed back unless there is no modem connected OR the connected modem has its echo disabled.

H. Display area for messages and input from the selected serial port.

If PortTest.exe is in the Pro-Turbo directory, it will be started whenever the Tracker port configuration is run. PortTest.exe uses the same functions to access the serial ports as Pro-Turbo. Running PortTest can be helpful in resolving port conflicts that interfere with the running of Pro-Turbo.

Select the port to test. If a terminal program or some other program such as trunker.exe is running on a second computer and its output is connected to the selected serial port's RxD line at 9600 baud, data received will be displayed in the text window. The display above shows COM 1 opened without error and is receiving frequency data from trunker.exe.

Tracker

The Tracker function can be used with any program or device that outputs frequency information in the AOR8000 format (for example: RF0853127500) via a serial port at 9600 baud. Use of this program function can help one decide if a trunk tracker scanner would be worth the purchase. To access Tracker press **<Alt>+T** or **Click the LED** just above the Exit button on the main Pro-Turbo window.
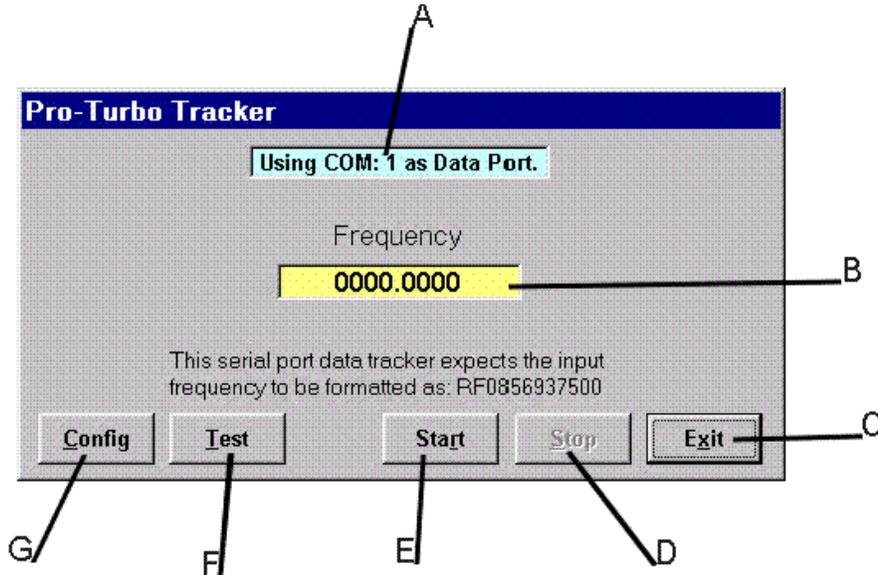
A. COM port selected for data input. Only the RxD (Receive Data) and ground lines need be connected.

B. Frequency decoded from input data.

C. Close Tracker window. This will not stop the current tracking session but will stop a test.

D. Stop the current tracking session or test.

E. View data input if any is available. The decoded frequency and channel information is displayed when data in AOR8000 format is received.

F. Select COM port for serial data input. This will run PortTest.exe if it is in the Pro-Turbo directory.
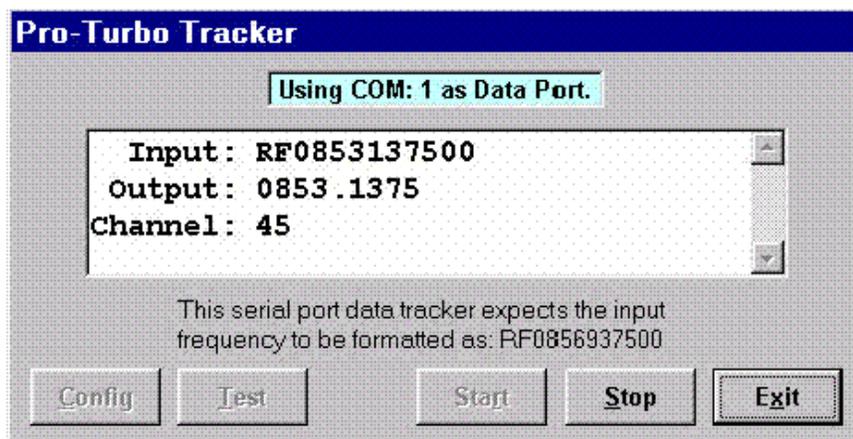
Above, the input data, decoded frequency and the channel that would be output to the scanner are shown if the trunk decoding program and data port are configured properly.

With a frequency source such as trunker.exe running on another system and its data out port connected to the system running Pro-Turbo the Tracker function can read the frequency data input, look this frequency up in the APF file used to program the scanner under Pro-Turbo control and jump to the channel number that holds this frequency. If the frequency is not programmed into the scanner, nothing happens.

The Tracker function has been added for those who like to experiment. It is only a benefit to those who have the necessary resources - 2 scanners, 2 computers, free serial ports and etc. Our support for this function is minimal.

> ***Notes on use of this function for trunk tracking are included in a separate file.***
> ***A working understanding of trunk tracking with trunker.exe is essential!***

Serial Data Monitor

The Serial Data Monitor can be used to view data received on its serial port configured at 9600,n,8,1.
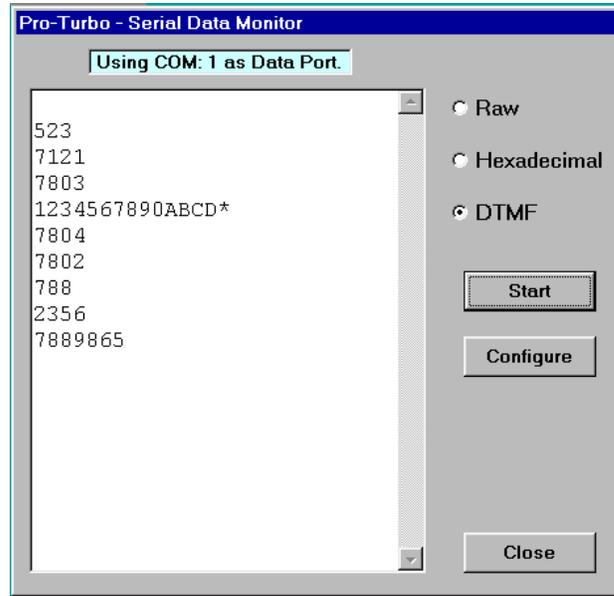
NULLs are stripped from the data flow. If a DTMF decoder circuit similar to the one included in this document is used, telephone DTMF can be decoded and displayed here and logged if desired. Any circuit that decodes DTMF and has a hexadecimal output similar to that of the MC145436 decoder should work for this monitor. The serial port used for this monitor must be a free port that is not being used by another device. It is configured similarly to the Tracker function port.

Like the Tracker function, this monitor is for those who like to experiment with hardware and circuits.

Miscellany

The gauge below the **Memory Block** slider displays the 4 lower bits of the **Input Status** or channel 0 of the **A/D** converter if either input is used for the S-meter.

Double Click the red digital **Block** display to place the window in the upper left corner of your screen.

All serial port communication in Pro-Turbo is at 9600 baud using a port configuration of 9600,n,8,1.

Click the **status panel bar** across the middle or bottom of the window to toggle the functions OFF/ON.

ALOG displays last logged entry on screen below the A/D voltages.

Save as APF button on **Reject** tab saves the **Reject List** in a bare APF format.

To use the **A/D** feature of the MC68HC11F1 with this program, the active PER file must be either the 2004PT8BitAD.PER, 2005PT8BitAD.PER or 2006PT8BitAD.PER. These files contain the needed code to

activate the AD conversion. To access this function as the S-Meter source, click on '**Config**'. Of course, your HB/CE232 interface must be wired appropriately to use Analogue to Digital conversion.

The 2004PT8BitAD.PER and 2005PT8BitAD.PER files contain the same code but separate files are used so as to display the proper model number of the scanner on the frame around the blue LCD display.

If the 200xPT8BitAD.per file is used and **'Enable 8 x 8 bit A/D'** is checked, the current voltages at A/D channels 0-7 are logged when extended logging is enabled.

When programming other scanners such as a Pro-43, any key code that is not a valid code for the Pro-2004,5 or 6 disables that key. The user is responsible for using an APF file that has compatible frequencies and number of channels and lines for non-2004,5 & 6 scanners.

When programming a hand-held scanner, use a proper AC power supply (wall wart) to provide power to the scanner. Battery power is not always reliable for auto-programming these units.

If using the **User Switches** to switch memory Blocks, 400 channels per block and 0-15 blocks are assumed.

If using the **OUTBYTE** to switch memory Blocks, 400 channels per block and 0-63 blocks are assumed.

ManualDown - clicking PT frame or **<Alt>+down arrow** decrements channel. **<Alt>+up arrow** increments same as "**M**"anual.

Jump to the start channel of a bank by right-clicking the bank numbers in the blue display if in manual mode.

Store and retrieve bank configurations for each Memory Block setting. Press **F2** to restore stored banks configuration if scanning. Use **<Shift> + F2** to store current banks configuration while scanning.

Click the scan bank blocks to restore the stored bank configuration. (Same as pressing **F2**).

The background colour and the caption of the User buttons changes to reflect the active definitions.

When running scripts, it may appear that the script is not running if there are no messages displayed to show script status. Add meaningful message indicators to your scripts to show its progress.

msg5-	**Waiting for local traffic.**
msg7-	**Hits: value@0**
msg9-	**Car: value@1 Repeater: value@2**

Scripts must handle all key presses while the script is running.

An un-supported APF utility **APF_Fixup.exe** has been included. This is a simple program to help create and clean up APF files. It is placed in the Pro-Turbo directory during installation.

When using the **Add to Lookup** function, note that the entry is made as "Frequency - Description"
   e.g. 123.4500 - Low flying planes.
If you use an APF as your lookup file, entries added or changed using this function will NOT be written in APF format.

Keyboard Commands

<ESC> to stop Auto-Program and most other functions.

<Alt>+X or **<Alt>+F4** to exit program.

M – **M**anual	**!** – Priority	**I** – lim**I**t
S – **S**can	**E** – sp**E**ed	**–** – search up
D – **D**elay	**O** – m**O**de	**+** – search down
L – **L**ock-out	**T** – s**T**ep	***** – direct
V – L/O re**V**iew	**R** – **R**eset	**<space>** – monitor
P – **P**rogram	**<bksp>** – clear	**<Alt>+M** – M1M

F to show/hide functions

Q or Right-click window to Mute

Z or Double-click window to Zoom

<Alt>+Z - Minimize window

up/down arrows - Search

<Alt>+up arrow - Manual

<Alt>+down arrow or Click frame around blue display for Manual down.

right/left arrows - Change Memory Block or User Switch

<Ctrl>+A - Add entry to lookup file if **LookUp** is active

<Ctrl>+L - Add displayed frequency to **Reject** list

<**Ctrl>+C, E, R, S, V** - Bring up **Reject** tab

<Ctrl>+T - Bring up **Tools** tab

<Alt>+T or Click the LED indicator above the Exit button to bring up Tracker window.

<Alt>+<Shift>+0 to 5 - Jump to user defined channel (0-5).

<Ctrl>+<Shift>+0 to 5 - Jump to user defined channel (6-11).

<Ctrl>+<Alt>+0 to 5 - Set user defined banks for scanning.

<Ctrl>+0 to 5 - Jump to user defined memory block or set User Switch.

<Alt>+<Ctrl>+B - Bold lettering in buttons. This may cause wrapping of characters on some systems.

<Alt>+<Ctrl>+P - Bold lettering in buttons and smaller font on status bar. This may cause wrapping of characters on some systems.

<Alt>+<Ctrl>+N - Return lettering on buttons to normal.

```
    F1 - This text file        F2 - Restore user preferred banks

    F3 - LookUp tab            F4 - Auto-Program tab

    F5 - Script tab            F6 - Program Configuration window

    F7 - Reject tab            F8 - Tools tab

    F9 - Auto-Log tab          F10 - Toggle immediate audio recording On/Off.

    F11 - Meters 0-3           F12 - Meters 4-7
```

When scanning:

      F2 - Restore user preferred banks.

      <Shift>+F2 - Store current scan banks for current Memory Block.

Clicking on various labels in the blue display area also performs some scanner functions.

      e.g.:   **MHz** and Manual press the Manual button.

                 Clicking the bank numbers presses that digit.

                 ch presses the Scan button.

A/D Channels 0-7

	61	63	65	67	1
	1	2	3	X	X

	60	62	64	66	68	2
	4	5	6	7	X	X

58 X   59 0

68HC11 Pin-out

56 X   57 X
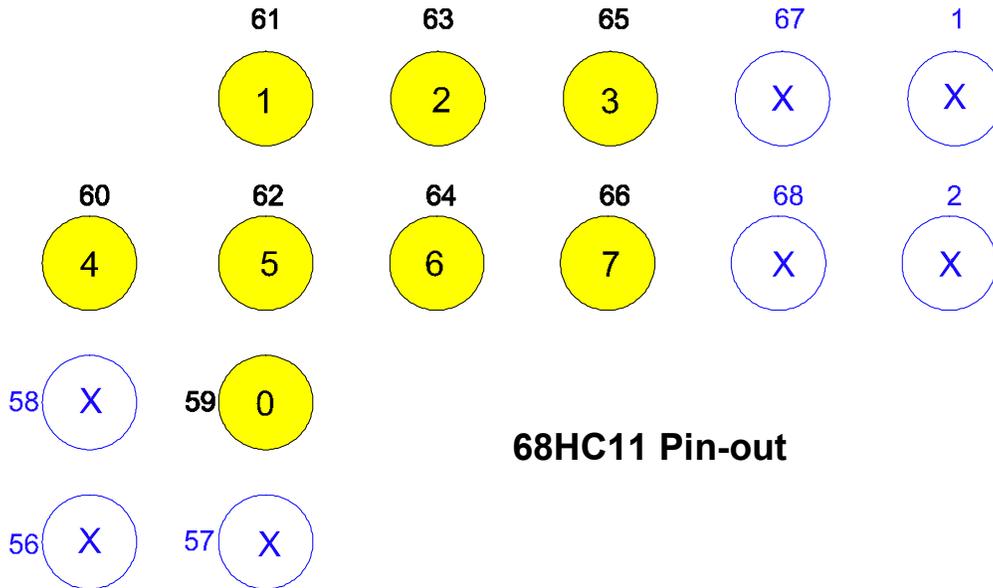
Viewed from under-side of PCB

Solder Connection Detail

Use wire-wrap wire to connect the A/D pins of the 68HC11 to the interface circuit below.

Wire-Wrap Wire

HB/CE232 PCB Underside

68HC11
Socket Pin

Solder
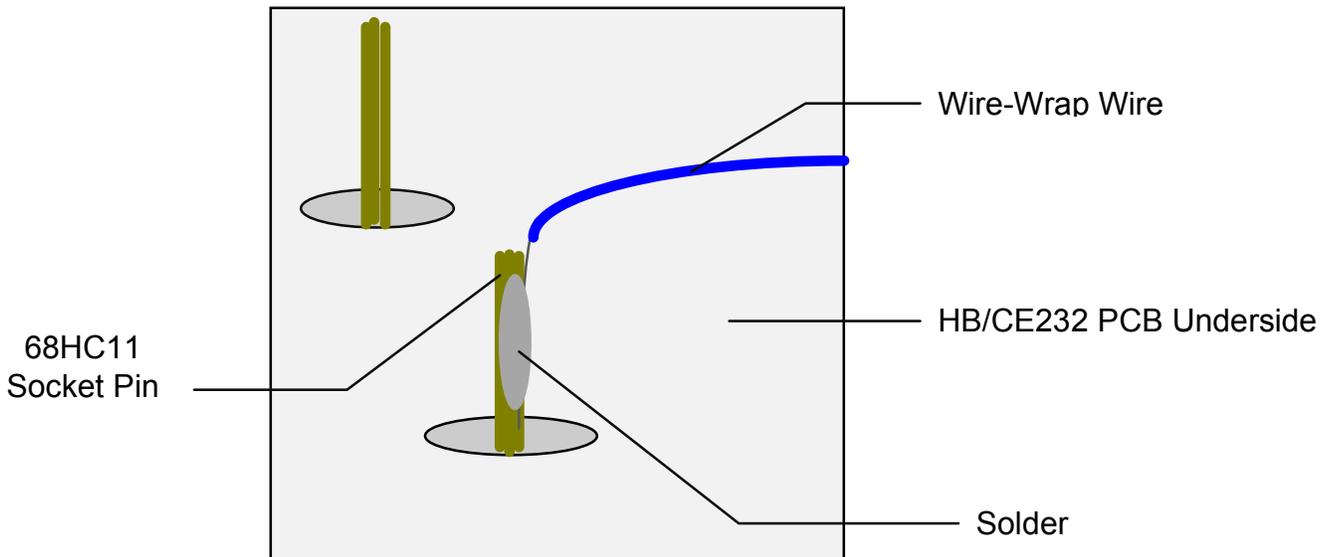
68HC11 Analogue to Digital Interface
For HB/CE232 Scanner/Computer Interface

Outputs to A/D pins on 68HC11

Pin 59 61 63 65 60 62 64 66
Channel 0 1 2 3 4 5 6 7

S-Meter Input to Channel 0

Inline Socket for Analogue Inputs

8x Dip Switch
Close if Channel not in use.

10K

5 VDC Zener Diodes
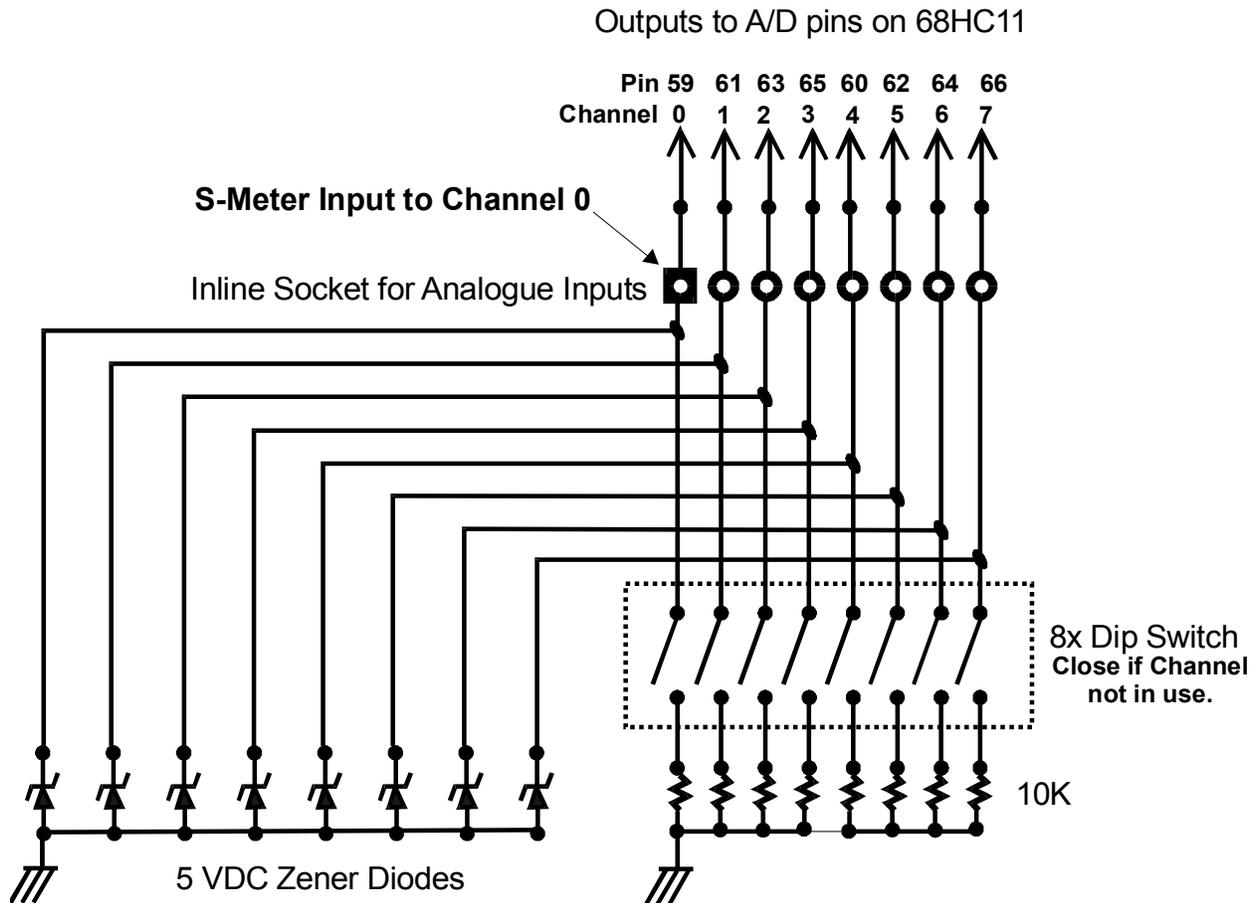
Maximum 5VDC input allowed to A/D pins of the 68HC11

S-Meter Using Analogue to Digital Conversion

Use of the S-meter input to channel 0 of the A/D converter requires that a S-meter circuit has been added to your scanner. Its output must be conditioned to swing from 0 to 5 VDC by use of an op-amp circuit. To get my S-meter up and running as quickly as possible, I used the circuit below. Other circuit designs may be better but this worked for me. Select components with appropriate voltage and current ratings.

S-Meter Voltage Conditioner

LM324N Operational Amplifier
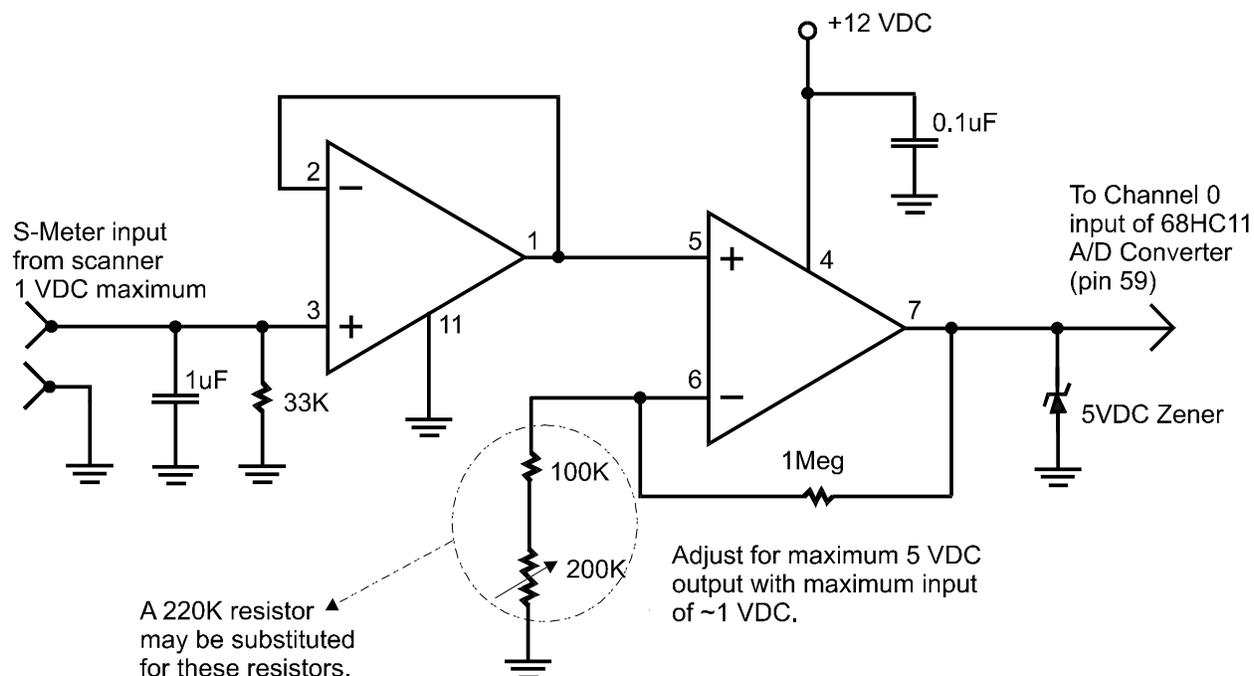
Similar circuits may be constructed to condition inputs from other devices BUT remember that the MC68HC11 A/D converters as used in the HB/CE232 interface **MUST NOT HAVE NEGATIVE VOLTAGES i.e. VOLTAGES LESS THAN 0 VDC OR POSITIVE VOLTAGES GREATER THAN 5 VDC APPLIED.**

A KMBC can be substituted
for the Dip Switches
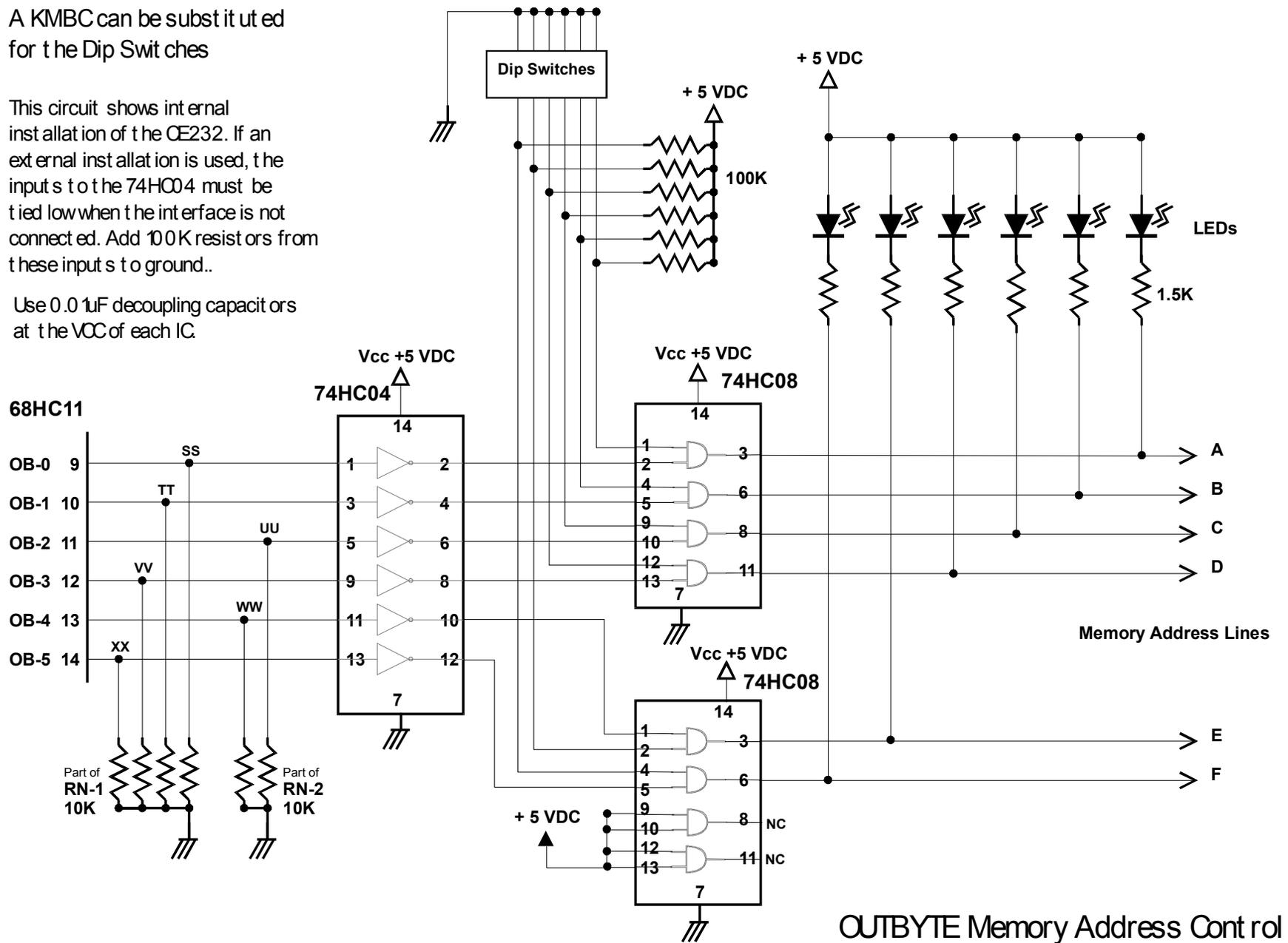
This circuit shows internal
installation of the CE232. If an
external installation is used, the
inputs to the 74HC04 must be
tied low when the interface is not
connected. Add 100K resistors from
these inputs to ground..

Use 0.01uF decoupling capacitors
at the VCC of each IC.

Dip Switches

+ 5 VDC

100K

+ 5 VDC

LEDs

1.5K

Vcc +5 VDC

74HC04

Vcc +5 VDC   **74HC08**

14

68HC11

SS

OB-0 9

TT

OB-1 10

UU

OB-2 11

VV

OB-3 12

WW

OB-4 13

XX

OB-5 14

14

1
2

3

1   2

3   4

5   6

9   8

11   10

13   12

7

1
2
4
5
9
10
12
13

3

6

8

11

7

A

B

C

D

Memory Address Lines

Vcc +5 VDC   **74HC08**

14

1
2
4
5
9
10
12
13

3

6

8   NC

11 NC

7

E

F

+ 5 VDC

Part of
RN-1
10K

Part of
RN-2
10K

OUTBYTE Memory Address Control

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A buffer with its inputs tied low by 10K to ground
can be added between the MC145436A data
out pins and the EDE300 data input pins.
A 74HC541 and 10K resistor network works
well as a buffer input.

Vcc +5 VDC

10uF
50VDC

MAX232

16

1

10uF
50VDC

3

2

10uF
50VDC

4

6

10uF
50VDC

5

10uF
50VDC

10uF
50VDC

Vcc +5 VDC

EDE300

11 T1   T1 14

10 T2   T2 7

To PC Serial Port
RxC Pin

2 BAUD   XMIT 18

4 +5V   RCV 17

12 R1   R1 13

9 R2   R2 8

Ground

14 +5V   OSC1 16

4 MHz

GND

15

OSC2 15

6 D0

MODE 3

Vcc +5 VDC

MC145436A

7 D1

3 ENB   D1 2

8 D2   D7 13

10K

4 VDD   D2 1

9 D3   D6 12

10K

6 XEN   D4 14

10 D4   D5 11

10K

0.1 uF

5 GT   D8 13

GND

5

11 ATB   DV 12

XIN 10

1M

0.1 uF

7 AIN   XOUT 9

Audio Input
(from scanner
tape output)

3.579545 MHz

VSS

8

DTMF Decoder
With Serial Output to PC

Copyright 1998 Paul E. Turton

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It is highly advisable to double check all circuits contained in this package against the appropriate manufactures data sheets to be sure that the pin numbering etc. is correct before proceeding to build them.