

**THE  
SKYLINE 70-1000X  
EPROM PROGRAMMER**

**USER MANUAL**

***Skyline Engineering Services***

# THE SKYLINE 70-1000X EPROM PROGRAMMER

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As part of its policy of continual product improvement, SkyLine reserves the right to make changes in its hardware and software at any time without notice.

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## ACKNOWLEDGEMENTS

As with all projects of this magnitude, the development of the SkyLine 70-1000X programmer could not have been undertaken without the assistance of third parties.

I would like to acknowledge the very real and valued assistance provided by:

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# THE SKYLINE 70-1000X EPROM PROGRAMMER

## LEGISLATIVE AND REGULATORY OBLIGATIONS

In almost every country there are legislative and regulatory requirements which govern the operation of "Land Mobile Radio Service" equipment (two-way radio transceivers). Invariably these require that the owner/operator of such equipment hold a valid licence authorising operation on assigned frequencies and in prescribed geographical locations or regions.

In many cases these same provisions render the service organisation responsible for ensuring that an appropriate licence is held before programming such equipment. As user of this equipment it is your responsibility to ensure that all such provisions are met.

SkyLine has no control over the end use of the equipment and shall not be held liable for any legislative or regulatory breach by either the user of the equipment or the user of any radio equipment programmed with it.

## WARNING!

The SkyLine 70-1000X programming system was designed specifically for the Z-273 module as used in Syntech 1 series radio transceivers. This module uses a full 8-bit data bus interface.

The 8-channel 70-336/526 mobiles use a **different** module - the Z-383 - that uses only four bits of each byte of data. The Z-383 is traditionally programmed using the Midland 70-1000 and the Midland 70-1072 adaptor, which connects the four unused data lines from the programmer to +5V or ground. **If you plug a Midland 70-1072 adaptor directly into the SkyLine 70-1000X - with or without a Z-383 EPROM module - you are very likely to damage your computer's parallel port.**

**We have produced a suitable adaptor - the SkyLine X383 - which allows the Z-383 module to be read and programmed using the 70-1000X programmer. This is not in any way interchangeable with the Midland 70-1072 adaptor. The X383 should NOT be connected to a Midland 70-1000 programmer, and the Midland 70-1072 should NOT be connected to a SkyLine 70-1000X programmer.**

A picture of an X383 adaptor with a Z-383 EPROM module can be seen in Appendix 8.

Refer also to our website at <http://www.radioprogrammers.com/X383.html>.

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**Note:** pages marked ☒ have been omitted from this abbreviated version of the User Manual.

# THE SKYLINE 70-1000X EPROM PROGRAMMER

## 1 GENERAL INFORMATION

### 1.1 INTRODUCTION

Since the late 1980's, SkyLine Engineering Services ("*SkyLine*") has provided a two-way radio service facility, including transceiver programming. The SkyLine 70-1000X EPROM Programmer ("*the programmer*") and the associated software were originally an in-house development to meet the requirement to program the Z-273 EPROM module employed in both the Midland Syntech 1 and the A.W.A. RT-85 radios.

Over the years, numerous requests have been received for the programmer and supporting software to be made available to outside users. That has now taken place after some re-design of both software and hardware.

This manual provides a description of the package and instructions for its use.

### 1.2 DESCRIPTION

Midland LMR offered their **70-1000** stand-alone programmer as a support device for their Syntech 1 radios. The SkyLine **70-1000X** Programmer is so named as it began as an experiment to obviate the need to acquire an expensive dedicated programmer for a relatively modest level of use.

Unlike the Midland 70-1000, the SkyLine 70-1000X programmer connects directly to a Personal Computer ("PC"). This arrangement provides a much more user-friendly form of data entry - as anyone who has used the Midland machine would testify - and provides for EPROM image file storage and manipulation on the host PC.

Packaged in a compact case, the programmer features the following connectors and indicators:

- FRONT:*
- D25M connector for interface to PC parallel port.
  - LEDs to indicate that 5V and 25V supplies to the module header are active (voltages present).
- REAR:*
- DC input receptacle - for 12V power supply to programmer.
  - LEDs to indicate 5V and 25V supplies ready.
- TOP:*
- Two "pin headers" to accept the Z-273 EPROM module.

Refer to illustrations of the programmer in section 2.1 below.

All voltages required by the programmer are derived internally from the external 12V source provided by the user. This facilitates use of the programmer in the field with a laptop computer if required, using an automobile power source. Refer to section 4.2 "**FIELD OPERATION**".

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## 1.3 PC PLATFORM REQUIREMENTS

To use the 70-1000X programmer, you will need:

- A PC running MS-DOS® 3.3 or later (through to and including Windows® 9X – see note below), with a mouse and mouse driver and an available parallel ("printer") port which supports bi-directional data transfer. A check of the PC BIOS should confirm whether bi-directional operation is supported.
- A regulated DC power supply (wall-wart or similar - NOT SUPPLIED) to power the programmer, nominal voltage 12V DC @ 300 mA minimum. Refer to Section 4.1 below (**POWER SUPPLY - SPECIFICATIONS**).

### Notes about PC operating systems.

- All Microsoft operating systems from DOS through Windows® 3.x and Windows® 95/98/ME allow direct program access to I/O ports, including the parallel port. The 70-1000X programmer's software requires this direct access.
- Microsoft's operating systems based on Windows® NT (which includes all incarnations of Windows® NT, Windows® 2000 and Windows® XP) prevent direct program access to I/O ports. On machines using any of these NT-based operating systems, this programming equipment can only be employed if:
  - the PC can boot from removable media (floppy drive or USB flash drive), the programming software is loaded onto that media, and the system booted from that source; or
  - a dual boot configuration is established on the PC, one of the alternate operating systems is **not** NT-based, and the software is run from within that alternate environment; or
  - a third-party tool is used to facilitate port access in NT-based systems.

In these situations, SkyLine cannot guarantee a successful outcome

**WARNING:** The operating software controls the power to the module headers. Damage to the PC parallel port, the programmer and/or the EPROM module may occur if the module is inserted or removed at any time other than when indicated safe to do so. Always follow the on-screen prompts.

**WARNING:** The operating software controls the configuration of the PC parallel port. Damage to the port and/or the programmer may occur if the programmer is connected to or disconnected from the port or power applied/removed at any time other than when indicated safe to do so. Always follow the on-screen prompts.

**NOTICE:** There are no user-serviceable parts inside the programmer. In the event of suspected malfunction, please contact SkyLine directly for information regarding resolution.

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## 2

## INSTALLATION

### 2.1 HARDWARE CONNECTION

Connection of the programmer is straightforward, and comprises:

- connecting the D25M connector (front panel) to the PC's parallel (LPT:) port via a straight-through 25-pin M-F cable (*supplied by user*);
- connection of a suitable 12V DC power supply (*supplied by user*) to the DC power receptacle (rear panel).

Then either

- connection of a Z-273 module to the pin headers (top of programmer)  
**OR**
- connection of a Midland 70-1071 adaptor to the pin headers (top of programmer), and connection of a Z-350 module to the 70-1071 adaptor  
**OR**
- connection of a SkyLine X383 adaptor to the pin headers (top of programmer); and connection of a Z-383 module to the X383 adaptor

**WARNING:** Only make the above connections as and when directed by the programming software.

### 2.2 SOFTWARE INSTALLATION

It is widespread practice in the two-way radio service industry for the workshop to be equipped with a slow DOS-based computer for programming transceivers, as much of the available software does not function correctly on faster platforms. With this in mind, the original in-house software – and this public release – have been targeted to such machines as a baseline. Written to operate in a DOS environment, it does not require a Windows®-type installation. Instead, the software should simply be copied to a directory/folder of your choice and run from that location.

Although intended to run in a DOS environment, the software has been extensively tested under Windows® 98SE. If you envisage operation under Windows® 9X, it is recommended that you create a desktop shortcut and edit its properties to ensure full-screen operation. In the **Properties** of the shortcut (**Program** tab, **Run**) select **Maximised** and (**Screen** tab, **Usage**) select **Full-screen**. On laptop computers it may require a special function key combination to achieve full screen operation, and this is usually machine-dependent.

### 2.3 INITIAL CONFIGURATION

The software uses a "configuration" file (**progger.ini**) to record parameters such as the parallel port address and platform speed/timing information. When the software is run, it will search for this file in the current (operating) directory. If the file is not found you will be alerted and prompted to run the program **CONFIG.EXE** to create the file.



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## 2.4 RUNNING CONFIG.EXE

The opening screen offers a choice of LPT1: LPT2: or LPT3: at their standard base addresses. If a non-standard port name or base address is required, this option is also presented. The selection is then reviewed.

**WARNING:** The selected port **MUST** be set to **EPP** in the BIOS for the programming software to be able to properly communicate with the target module. A setting of **SPP** may result in damage to the programmer or the computer's port.

The program also runs a quick test of the programmer, and adjusts parameters in the configuration file in response to the combination of processor & bus speed of the host PC. This is necessary to obtain optimal programming speed without over-running the EPROM module. For this reason, the configuration file must be created afresh on each machine, and not simply copied from another machine.

An EPROM module is NOT required for this calibration process.

Refer to Appendix 5 for further notes.

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## 3 OPERATING THE PROGRAMMER

**NOTICE:** Each operation is extensively described in this manual, and it is strongly recommended that users read and understand all operations before connecting or operating the equipment. The software was created to support operation by users familiar with their task, and no “**ARE YOU SURE?**” type of warnings are given when data is about to be changed or over-written by a user click on a **CLEAR** or **OK** button. The exception is file over-writing on saving, where a warning is given.

### 3.1 PROGRAM OPERATIONS

The focus of the software is the memory buffer area which stores data corresponding to the required frequency/tone/scan etc information in the EPROM's binary format. Except for EPROM blank check, all operations involve data in the buffer area.

The software supports disk file data as a binary format image of the EPROM.

The main menu allows the user to select from the following operations:

- read a binary disk file into the buffer
- write the buffer contents to a binary disk file
- blank check a Z-273 or Z-383 module.
- program the buffer contents to a blank Z-273 or Z-383 module.
- read a programmed Z-273 or Z-383 module into the buffer
- compare the buffer contents with an EPROM module
- display buffer contents and allow data entry and editing
- view/edit scan group membership
- view/edit radio “personality” parameters
- define radio model/band parameters
- print buffer contents to file

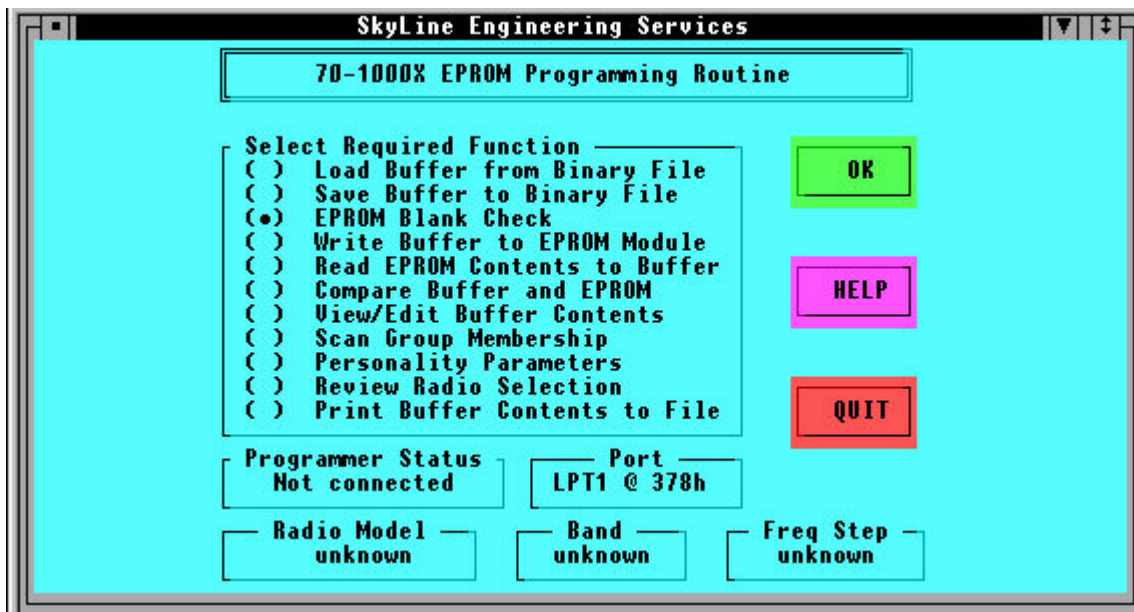


Fig 1 MAIN MENU SCREEN

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Any operation requiring disk I/O uses a common routine to determine the file name and path.

On the first occasion that an operation requires the programmer be connected to the PC, the user will be prompted to connect the programmer and connect the 12V DC power source. Before any EPROM module operation, the software will de-power the module headers and prompt the operator that it is safe to insert/remove the module. The programmer can be left connected and powered throughout all subsequent operations, but must be disconnected when prompted on closing the program.

## **3.2 OPERATING SEQUENCE**

The basic sequence for operating the programmer is:

- 1 Start the program
- 2 \* Connect the programmer to the LPT (printer) port **when prompted**
- 3 \* Connect the external 12V source to the programmer **when prompted**
- 4 \* Insert the Z-273 or Z-383 module into programmer **when prompted**
- 5 Execute the required commands
- 6 \* Remove the Z-273 or Z-383 module from the programmer **when prompted**
- 7 \* Disconnect the external 12V source from the programmer **when prompted**
- 8 \* Disconnect the programmer from the LPT (printer) port **when prompted**
- 9 Exit the program from the main menu.

**WARNING:** *Steps marked \* above are prompted by the software. DO NOT execute these steps unless/until prompted, or damage to the programmer/port/module may result.*

**NEVER insert or remove the EPROM module if EITHER front panel LED is illuminated.**

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## **3.3 MAIN MENU COMMANDS**

### **3.3.1 READ A BINARY DISK FILE INTO THE BUFFER**

When you select this function, a window opens to facilitate selection of the required file. On clicking **OK**, the file is read into the buffer. The file is only checked for the correct length.

### **3.3.2 WRITE THE BUFFER CONTENTS TO A BINARY DISK FILE**

When you select this function, a window opens to facilitate entry of a file name (see 3.3.1 above) and path, or selection of an existing file to be replaced. On clicking **OK**, the buffer contents are written to the named file. If the file exists, the user is asked for confirmation before over-writing the file.

### **3.3.3 BLANK CHECK AN EPROM MODULE**

Following the on-screen prompts, a Z-273 or Z-383 EPROM module which is placed in the programmer is checked to ensure all locations are blank. If the module EPROM is not completely blank, the program reports the address of the first non-blank byte. The contents of the buffer are not affected by a blank check.

### **3.3.4 PROGRAM THE BUFFER CONTENTS TO A BLANK EPROM MODULE**

Following the on-screen prompts, the contents of the buffer are written to a Z-273 or Z-383 module placed in the programmer. Each byte is written then verified. If any byte fails to write correctly, the write cycle is aborted and an error message displayed.

### **3.3.5 READ A PROGRAMMED EPROM MODULE INTO THE BUFFER**

Following the on-screen prompts, the contents of a Z-273 or Z-383 module placed in the programmer are read, and stored in the buffer.

### **3.3.6 COMPARE THE BUFFER CONTENTS WITH AN EPROM MODULE**

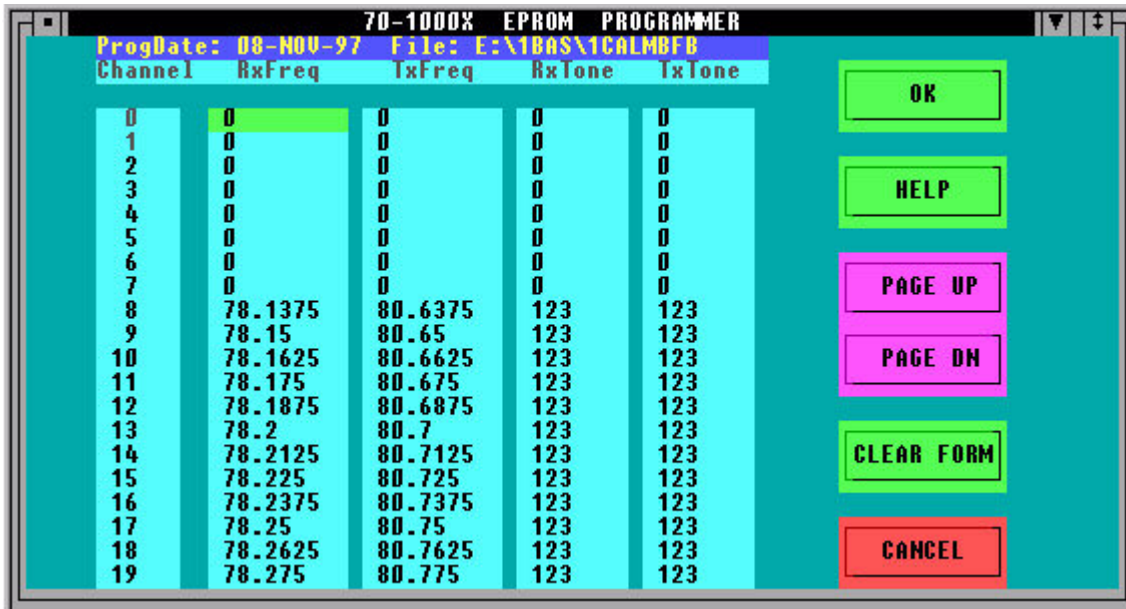
Following the on-screen prompts, the contents of the buffer are compared to a Z-273 or Z-383 module placed in the programmer. If any byte differs, the comparison is terminated and an error message is displayed showing the address of the first differing byte.

This function does not alter the contents of the EPROM module or the buffer.

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## 3.3.7 DISPLAY BUFFER CONTENTS AND ALLOW DATA ENTRY AND EDITING

This function presents a table for frequency & tone data entry or editing. If the buffer has previously been filled from an EPROM or file read, or user data entry has been executed, that information will be displayed, otherwise the table will be blank.



Channel	RxFreq	TxFreq	RxTone	TxTone
0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	78.1375	80.6375	123	123
9	78.15	80.65	123	123
10	78.1625	80.6625	123	123
11	78.175	80.675	123	123
12	78.1875	80.6875	123	123
13	78.2	80.7	123	123
14	78.2125	80.7125	123	123
15	78.225	80.725	123	123
16	78.2375	80.7375	123	123
17	78.25	80.75	123	123
18	78.2625	80.7625	123	123
19	78.275	80.775	123	123

Fig 3 DATA ENTRY SCREEN

Note that if a radio model/band selection has not been performed either by the user or from interpretation of a file or EPROM module, a selection is required at this point.

Refer to 3.3.10 below.

As a keystroke-saving shortcut, the “=” key can be used to enter “matching” data in any cell on this data entry form. For example, entering “=” in the TxFreq cell for Channel 5 will copy the RxFreq data from Channel 5, creating a simplex channel. Similarly CTCSS values can be duplicated from TxTone to RxTone or vice versa.

To exit the form, choose either **CANCEL** or **OK**. **CANCEL** negates all changes made to the data displayed when the form was initialised, while **OK** applies those changes to the buffer without seeking further confirmation from the user.

## 3.3.8 VIEW/EDIT SCAN GROUP MEMBERSHIP

The Midland Syntech radio supports two scan lists, while the A.W.A. RT-85 supports only one. Any channel may be present more than once in a list, and channels are scanned in the order shown. Be aware that after checking one channel, the radio’s microprocessor steps *upwards* to the next listed channel. As result, a scanning list of 5-4-3-2-1 will always execute slower than 1-2-3-4-5. Unless there are compelling reasons not to, listing the desired channels in ascending order gives best results.

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If not already achieved by a file or EPROM read or explicit selection, a radio model selection (see 3.3.10 below) is required at this point. Also note that only channels with a valid receive frequency can be listed in the scan sequence. Normal practice is to program all required channels before entering any scan group information.

To exit the form, choose either **CANCEL** or **OK**. **CANCEL** negates all changes made to the data displayed, while **OK** applies those changes to the buffer without seeking further confirmation from the user.

## **3.3.9 VIEW/EDIT RADIO “PERSONALITY” PARAMETERS**

There are substantial differences between the functionality of the two radio types (Midland Syntech and A.W.A. RT-85), and separate forms are used for each to facilitate user selection. A radio model selection (see 3.3.10 below) is required at this point if not done previously (either explicitly or by a file or EPROM read).

## **3.3.10 DEFINE RADIO MODEL/BAND PARAMETERS**

This form allows user definition of the radio model, frequency band, band modifier and synthesiser step information. The main menu screen (see Fig 1) displays the current information, which is either user entered or derived from a file or EPROM module whose contents have been read into the buffer.

Selection of a modifier will alter the frequency step to the value matching the modifier, while selecting a frequency step value will cause the modifier to be “aligned” to the value corresponding to the selected step and the default injection side for the selected band. These selections are interactive.

See APPENDIX 2 for information on the role and proper use of the **Band Modifier**, and APPENDIX 6 regarding amateur band 6-metre frequencies.

The current selection can be reviewed/altered at any time. However any change will generally render the buffer data invalid for the new selection, and no check is made that the buffer contents are valid for the new selection. Instead, the buffer is cleared, and the frequency/tone information visible in the VIEW/EDIT table is also cleared.

One exception is where **ONLY** the radio model has been changed (but not the band). In this case the buffer is still cleared but the frequency/tone information visible in the VIEW/EDIT table is left unaltered as a convenience to allow coding a Midland Syntech to match an existing RT-85 table or vice versa. (Note that all the personality information is reset to default in this case, as the two radios store different information in this area - see the Personality Parameters forms for the information stored for each type). After such a cross-coding, the buffer data will only be regenerated from the frequency/tone data by visiting the VIEW/EDIT form and clicking **OK**.

To exit the form, choose either **CANCEL** or **OK**. **CANCEL** negates changes made, while **OK** applies those changes without seeking further confirmation.

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## 4

## POWER SUPPLY

### 4.1 SPECIFICATIONS

The programmer is designed to operate from a reasonably well-regulated DC power supply ("wall-wart" or similar - NOT SUPPLIED), nominal voltage 12V DC - 13.8V DC @ 300 mA minimum capacity. Many plug-packs ("wall warts") are unregulated and the no-load voltage can be significantly in excess of nameplate voltage. Before connecting any external power source to the 70-1000X, check with a reliable multimeter that the voltage does not exceed 14V under no-load conditions.

The 2.5 mm (\*) power receptacle on the rear panel of the 70-1000X has the centre pin positive, and the negative is common to the programmer chassis and hence the PC chassis. The power supply should either be a transformer-isolated type with floating output, or have its negative terminal at the same potential as the PC chassis. If unsure, check with a multimeter or have a qualified technician check it for you.

**NOTE:** Although the 70-1000X programmer is protected against damage from reverse polarity power application at the input, for the device to operate the external power lead must be **CENTRE PIN POSITIVE**.

(\*) On request, the 70-1000X can be supplied with a 2.1 mm receptacle.

### 4.2 FIELD OPERATION

**WARNING:** When used in conjunction with an automotive power source, ensure that the vehicle has a nominal 12 volt system (negative earth), and the engine **is not running and is not started** while the programmer is connected. Voltage transients or excess voltage could potentially cause damage to the computer, programmer or EPROM module.

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## APPENDIX 6

### EPROM REFRESHER

**EPROM** is an acronym for *erasable programmable read-only memory*. These are non-volatile memory devices (i.e. they retain stored data when power is removed). The industry standard "2716" EPROM on the Z-273 module stores "16K" bits of data, addressed as 2048 eight-bit bytes.

When an EPROM is erased, all bits are returned to 1's - i.e. all bytes are returned to 11111111 or (hex) "FF". Programming can ONLY change bits from 1 to 0, not vice versa. As a result, EPROMs require erasure before programming can be carried out.

Erasure of EPROMs is achieved by exposure of the memory cells to ultra-violet light. Anecdotal evidence suggests some chips have been partially erased by lengthy exposure to various radiation sources, including sunlight and fluorescent lamps. The normal precaution to avoid accidental erasure is to cover the EPROM's quartz glass window with an adhesive label.

The normal sequence of operations for reprogramming an EPROM is:

1. read the data contained in the EPROM and save it.
2. erase the EPROM in an EPROM eraser.
3. blank check the EPROM to ensure erasure is complete.
4. program the required data into the erased EPROM.
5. verify that the programming process has worked correctly.

Step #1 is strongly recommended. It might sound unnecessary but surprisingly often it avoids having to say "oops!" later.

Step #2 should be carried out in accordance with the eraser manufacturer's recommendations. Erasure time varies between devices.

Verification is sometimes executed as a separate step after programming is completed. The SkyLine 70-1000X verifies each byte immediately after it has been programmed, before progressing to the following byte.



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## APPENDIX 7

### SUPPORT FOR AMATEUR BAND PROGRAMMING

The SkyLine 70-1000X system software for the Z-273 directly accommodates frequencies in the 10m, 6m, 2m and 70cm amateur bands. The band limits applied replicate the band selection table in the Midland 70-1000 User Manual, as follows:

- Band 0        25-55 MHz
- Band 1        60-90 MHz
- Band 2        136-174 MHz
- Band 3        403-520 MHz
- Band 4        806-866 MHz

Refer to Section 3.3.10 of this manual (page 12) for a screen shot of the band selection offered. Note that the screen display differs from the actual limits applied.

6-metre support for Band 0 radios (models 70-05x) is intrinsic in the above spread. Where modified VHF midband (Band 1, 60-90 MHz) equipment is employed for operation on the 6-metre band, the Band 1 limits can be changed by invoking "ham" mode. This can be achieved by:

(a) initiating the executable file with a command-line switch, "/ham" (without the quotes):

```
C:\> PROG273.EXE /ham
```

or

(b) reading in a file (or reading an EPROM module) coded as band 1 with (only) 6-metre frequencies, or coded as Band 4 with (only) 33cm frequencies.

Both techniques will reflect the appropriate limits in the type definition form and in the summary at the foot of the main screen. **Once "Ham" mode has been invoked, it remains in force until the user exits the program.**

*Note that as the radios cannot support both 6-metre and VHF midband frequencies simultaneously, the band limits are altered to 50 - 54 MHz when this mode is active. For 800 MHz equipment, the ham mode limits are altered to 902-928 MHz.*

For those who are committed Windows types wanting to use "ham" mode, and are not particularly familiar with the command line usage, the options are:

(a) Start->Run and type    <path>PROG273.EXE /ham

where the path to the executable is to be entered where shown; or

(b) Create a desktop shortcut and modify the command line:

Rt\_Click on shortcut icon, select Properties. On the "Program" tab, after the existing entry in the "Cmd Line" box add "/ham" without quotes, select Apply and OK.

# THE SKYLINE 70-1000X EPROM PROGRAMMER

## APPENDIX 8

### SUPPORT FOR THE Z-383 MODULE

#### A. INTRODUCTION

Midland LMR produced an 8-channel mobile radio in VHF highband (70-336) and UHF (70-526). These use a Z-383 EPROM module, which is substantially different to the Z-273 module employed in the Syntech 1 mobile radios. Later firmware revisions to the Midland 70-1000 were able to accommodate the Z-383 modules via a 70-1072 adaptor. Do NOT connect a Midland 70-1072 adaptor to the 70-1000X.

**Refer to the *WARNING! Message on page iii.***

The SkyLine 70-1000X programmer can read and program the Z-383 module using a special SkyLine X383 adaptor. In use, the adaptor is attached to the headers on the 70-1000X when prompted, and then can remain there for the duration of the session. The Z-383 module(s) can then be attached and removed as required/directed. Note that the EPROM module is inserted downwards onto the X383 adaptor, with the connection pins towards the user, in the back row of the two-row header. This arrangement is to facilitate correct alignment of pins and receptacle. Refer to the photo below.

**At the time of this manual revision, the software for programming the Z-383 is still a BETA version. There may be some minor issues with this release, and it is recommended that you verify the programmed functionality matches your requirements before returning the radio to service.**

If you observe any discrepancy, your feedback to SkyLine will be appreciated and the software will be revised accordingly.

#### B. WHAT IS DIFFERENT WHEN PROGRAMMING THE Z-383?

There are a few small differences between the procedure and screen forms for the Z-383 and the Z-273. These include:

1. There is an additional step required - installing the X383 adaptor.
2. While MOST screens depicted earlier in this manual are unaltered, the **View/Edit Buffer Contents** screen has been changed to suit the 8-channel capacity, and the **Scan Group Membership** screen is also different to suit the 10-channel scan sequences which these radios accommodate.
3. If a radio serial number or customer ID have been found in the Z-383 module, these are displayed on the **View/Edit Buffer Contents** form. **In the Beta software, support for entering data into these fields is not available.**

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## APPENDIX 9

### IMPORTING TABLES OF FREQUENCIES & TONES

Frequently the required channel information (frequencies and CTCSS tones) is already available in a tabular form. To alleviate the tedium and risk of errors associated with re-entering this information into the programming software, we have incorporated a direct import facility.

Due to the multiplicity of file formats and their ever-morphing nature, the decision has been made to limit the importing to one type - comma separated variable (CSV).

The main menu selection "**Load Buffer from Binary File**" is employed. If the file is not recognised as a proper binary file, a dialogue box asks if it is a CSV format file. If it isn't, file processing is aborted. If the file is a CSV format and structured as required, the data will be imported. Note that before processing the file data, the user is required to identify the target radio so that a proper interpretation can be made. The data can then be viewed/edited via the main menu "**View/Edit Buffer Contents**" selection as if it had been directly entered on the edit form.

If the available tabular data is in a formatted file such as a Microsoft Word table, it is suggested that this should be imported into Excel (or a similar spreadsheet) and the columns "massaged" to fit the structure detailed below before saving as a .CSV file.

If the data does not match the specified radio type/band and these requirements, the import process is aborted.

To be recognised as a valid file, the CSV file **MUST** be structured as follows:

1. Column order:

**Channel #, Tx frequency, Rx frequency, Tx tone, Rx tone**

- OR -

**Channel #, Rx frequency, Tx frequency, Rx tone, Tx tone**

(Frequencies **MUST** be in MHz)

2. A header row with labels:

First column (channel #): must start with "c" or "C"

Second column: must start with "T" or "R" to indicate which of the above column orders are to be used for import.

3. Each row which has a channel number **MUST** have data in all columns, whether zero or not, as this drives the comma presence on each line of data.
4. Each channel's data is represented by one line in the CSV file, being the five fields above separated by a comma and terminating in a <CR><LF>.

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5. If a channel is not programmed, it does not need to appear in the file. See the following sample file:

```
Ch#,RxF,TxF,RxTone,TxTone
1,80.45,77.95,123,186.2
2,80.45,80.45,162.2,162.2
5,79.725,79.725,114.8,179.9
```

which imports as

Channel	RxFreq	TxFreq	RxTone	TxTone
0	0	0	0	0
1	80.45	77.95	123	186.2
2	80.45	80.45	162.2	162.2
3	0	0	0	0
4	0	0	0	0
5	79.725	79.725	114.8	179.9

### IMPORT ROUTINE NOTES:

- A. Mismatch between CSV file frequencies and selected frequency band.

Where the data does not fit the band, importing will fail and a blank table will result.

- B. Amateur band frequencies.

These are supported as normal. For example, with a CSV file containing frequencies in the 6 metre band and:

- a selection of “66-88 MHz” is made, the resulting import will presume a modified VHF mid-band radio and show the radio type as “50-54 MHz”
- a selection of “30-50 MHz”, the import will presume a VHF low-band radio and show the radio type as “25-55 MHz”.

Be aware that (as always - see Appendix 7) once Ham mode has been triggered, it remains active until the program is closed.

- C. Column headers in the CSV file.

Although technically the MINIMUM required for import is the first two columns, it is good practice to provide proper headers for all five columns. This also ensures that the header line/row delivers the correct comma count to the import routine.

- D. File length issues.

CSV importing has been implemented without any attempt to make the process over-smart. The initial check of an input file is the length (byte count). A binary (EPROM image) file will be 2048 bytes. If the byte count is NOT 2048, the user is asked if the selected file is a CSV type, and if the response is **Yes** it is tested accordingly. If the response is **No**, the file is not valid and the entire file read process is aborted.

In the unlikely event that a CSV file is exactly 2048 bytes, the user will not be asked a question but the file read will fail with an **“Invalid File!”** error message. In this event, you will need to add/remove data from the CSV file to alter the byte count. This can be as simple as adding an extra space or trailing zero.

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## APPENDIX 10

### TALKAROUND PROGRAMMING AND OPERATION

"Talk-around" is simplex operation on the OUTPUT frequency of a repeater pair - sometimes called "local" or "direct". The Syntech 1 series radios are capable of Talk-around operation when appropriately programmed and activated by a front panel switch. Reference is made to this function in the Midland 70-1000 programmer manual, in relation to the Z-273TA module.

The good news is that this does NOT actually require a different EPROM module - the standard Z-273 is fully capable of containing the information required. Now your channel list no longer needs to be filled with the simplex-on-output version of your repeater channels, and that means faster selection of Talk-around and valuable extra channel space.

The bad news is that you need to arrange a suitable switch to select Talk-around operation. In a Syntech 1 with the two scan buttons, one can readily be diverted to this role. Details are available on request.

Commencing with version 1.14 of the Z-273 programming software, the required TA information will automatically be placed into the Z-273 module. Where a TA switch has not been connected this will have no effect.

The functionality is identical in the early (36-channel) versions of the radio. The microprocessor in the A.W.A. RT-85 has different mask programming, and Talk-around cannot be implemented on that series of radios.

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## APPENDIX 11

### SUPPORT FOR THE Z-350 MODULE

#### A. INTRODUCTION

Midland LMR produced a series of 80-channel Syntech portable radios in VHF highband (70-155) and UHF (70-255). These use a Z-350 EPROM module, which is significantly different to the Z-273 module from the Syntech 1 mobile radios. These are programmed on either the Midland 70-1000 (when equipped with the correct firmware) or the SkyLine 70-1000X, both using the same 70-1071 (Z-349) adaptor.

SkyLine have released software to program these modules (PROG350.EXE). The web page <http://www.radioprogrammers.com/70-1000Xversions.html> identifies the current version. **At the time of this manual revision, the version 0.99 software for programming the Z-350 is still a BETA version. There may be some minor issues with this release, and it is recommended that you verify the programmed functionality matches your requirements before returning the radio to service.**

If you observe any discrepancy, your feedback to SkyLine will be appreciated and the software will be revised accordingly.

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