SVR-D300 *DMR*

Models SVR-D300V, SVR-D300UA, SVR-D300UD

PYRAMID
COMMUNICATIONS

Includes:

Specifications
Operation
Installation
Alignment
Circuit Description

VHF 136 - 174 MHz
UHF-A 380- 470 MHz
UHF-D 450 - 520 MHz

PRELIMINARY

Service Manual

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Foreword

Scope of This Manual

This manual contains the specifications, functional description, operating instructions, schematic, parts locator and parts list for the SVR-D300 synthesized vehicular repeater.

This manual is intended for use by qualified service technicians to aid them with installation, interfacing, alignment and trouble shooting of the SVR-D300 when used with other land mobile radios.

Service Manual Revisions

Component changes, additions and deletions may occur in the circuit design to improve operation and will be reflected in future releases of this service manual. Specifications and circuit changes are subject to change without prior notice or obligation by Pyramid Communications.

Safety Information

The SVR-D300 is designed to operate within all applicable Federal regulations at the time of manufacture. Proper operation and service procedures will assure continued compliance with these regulations:

• Do not operate any SVR-D300 without an antenna or appropriate RF load connected to the antenna connector.

• Do not operate any SVR-D300 in the presence of unshielded electrical blasting caps or explosive environmental conditions.

• Do not operate any SVR-D300 while refueling the vehicle or in the presence of explosive fumes.

• Do not operate any SVR-D300 with persons standing closer than 2 feet from the mobile or repeater antenna.

FCC Information

The SVR-D300 complies with the FCC rules parts 90 and 22 for radio frequency transmitters. The user must apply for a license to operate the SVR-D300 transmitter pursuant to parts 90.243 and 90.247. Other FCC rules may apply depending on the class of service the user qualifies for. A complete listing of FCC rules and regulations may be ordered from:

> Superintendent of Documents
> Government printing office
> Washington DC 20402

The following information pertaining to the SVR-D300 should be included in the FCC license application:

	VHF	UHF-A or UHF-D
Type Acceptance:	LRUSVR-D300V	LRUSVR-D300U(A) or (D)
Output Power:	1 - 2.0W	1 - 2.0W
Frequency band:	136-174 MHz	380-470 or 450-520 Mhz
Number of Channels:	20	20
Emission designators:	10K0F1D, 10K0F1E, 10K0F7D, 10K0F7E, 11K0F3E, 12K3F1D, 16K0F3E, 4K8F2D	
	7K6F1D, 8K1F1D, 8K1F1E, 8K1F7D, 8K1F7E, 8K4F2D	

Specifications

Transmitter:	VHF	UHF-A	UHF-D
Frequency Range:	136-174 MHz	380-470	450-520 MHz
Rf power out:	1 - 2W	1- 2W	1- 2W
Spurious emissions:	-80dBc	-80 dBc	-80 dBc
Freq stability -30°~+60°C:	1.0 PPM	1.0 PPM	1.0 PPM
Hum and Noise:	45dB	40dB	40dB
Audio response (300-3kHz):	Flat or +6dB/octave	Flat or +6dB/octave	Flat or +6dB/octave
Audio distortion:	<3% @ 60% deviation	<3% @ 60% deviation	<3% @ 60% deviation
Local mic sensitivity:	300mV-5VPP	300mV-5VPP	300mV-5VPP
FCC Type Acceptance:	LRUSVR-D300V	LRUSVR-D300UA	LRUSVR-D300UA
Industry Canada Approval:	2390A-SVR300V	2390A-SVR300UA	Not Approved in Canada

Receiver:

	VHF	UHF-A	UHF-D
Frequency Range:	136-174 MHz	380-470	450-520 MHz
RF sensitivity Analog:	.28µV	.28µV	.28µV
Digital (5% BER):	.20µV	.20µV	.20µV
Squelch sensitivity:	.2µV to 2µV adjustable	.2µV to 2µV adjustable	.2µV to 2µV adjustable
Selectivity:	81db	80dB	80dB
Spurious/image rejection:	87db	85db	85db
IMD response:	80db	75db	75db
Frequency stability:	1.0 PPM	1.0 PPM	1.0 PPM
Audio response (300-3kHz):	Flat or -6db/octave	Flat or -6db/octave	Flat or -6db/octave
Audio output:	0-5VPP AC coupled	0-5VPP AC coupled	0-5VPP AC coupled
Local Rx Audio:	400 mW 8 Ohms	400 mW 8 Ohms	400 mW 8 Ohms

Power Requirements:

	VHF	UHF-A	UHF-D
DC Supply	13.6 VDC	13.6VDC	13.6VDC
Standby	350 mA	350 mA	350 mA
Receive	400 mA	400 mA	400 mA
Transmit	2.5A @ 2W	2.5A @ 2W	2.5A @ 2W

Physical:

Dimensions:	5.75"W x 8"L x 2.25"H
Weight:	50 oz.
Case:	One piece extruded aluminum

Intellectual Property Rights

DMR*TM* is a protocol name for the digital communications systems using 4-level FSK technology which has been developed by JVCKenwood and Icom.

ESP*TM* is a protocol name for the multi-vehicle protocol used by Pyramid Communications SVR products has been developed by Pyramid Communications for use only in this product.

The AMBE+2*TM* voice coding Technology embodied in this product is protected by intellectual property rights including patent rights, copyrights and trade secrets of DVSI (Digital Voice Systems, Inc.   This voice coding Technology is licensed solely for the use within this Communications Equipment. The user of this Technology is explicitly prohibited from attempting to extract, remove, decompile, reverse engineer, or disassemble the Object Code or in any other way convert the Object Code into a human-readable form. US Paten Nos. #5,870,405, #5,826,222,#5,754,974, #5,701,390, #5,715,365, #5,649,050, #5,630,011, #5,581,656, #5,517,511 and #5,491,772.

Firmware Copyrights: The title to and ownership of copyrights for firmware embedded in this product and memories are reserved for Pyramid Communications and JVCKenwood respectively.

Functional Description

Generally, vehicular repeaters are used as mobile extenders in cross-band operation: the link is VHF or UHFMHz simplex and the mobile is Lo-band, VHF, UHF conventional or trunking. In-band operation is possible, but care must be taken to prevent interference between the mobile's higher power transmitter and the repeater receiver. Proper frequency selection and antenna placement are important even in cross-band operation, but especially for inband use. Low power pre-selector & notch filter cavities may be placed in line with the repeater antenna cable since it is simplex and low power.

☞ *Important Note Analog Operation*

The SVR-D300 is designed to operate on simplex frequencies; part of the multi-vehicle format dictates that all of the SVR-D300s must be able to monitor all link traffic on site and be able to determine if a handheld is transmitting, or if other repeaters are transmitting. In Analog mode, the handhelds must transmit CTCSS, but should be carrier squelch receive. *The handhelds do not use CTCSS decode if the repeater is utilizing the multi-vehicle format*, as this will interfere with the priority sampling which is essential for multi-vehicle operation. Also, the handhelds would have to have different encode and decode tones in order for the repeater to be able to tell the difference between handhelds and other repeaters, so the handhelds would not be able to hear each other. *The repeaters will not transmit CTCSS unless used only in a single vehicle environment*.

☞ *Important Note DMR Operation*

In DMR mode, the SVR-D300 must also operate on simplex frequencies in Tier 2 operation. The handhelds must transmit a different GID code than the SVR-D300 transmit GID code, and the *Handheld MUST Transmit the 16776400 GID and must bet set to decode several GIDs, incuding 167772015 (All-Call), 16776400 through 16776404.* The SVR uses different GID calls to signal intercommuncations. Decoding multiple GID's can be setup different ways depending on the model of portable radio.

When the user leaves the vehicle, they activate the SVR-D300 via their mobile radio front panel or a separate switch. When the mobile radio is receiving carrier and proper tone, the SVR-D300 will begin transmitting on the handheld's receive frequency. The user is able to hear and respond to all radio traffic, including other handhelds at the site. In analog mode the SVR-D300 can be programmed to give the handhelds priority in a conversation by periodically sampling for handheld activity (carrier and proper tone) during base-to-portable transmissions. During sampling, if the SVR-D300 detects a handheld transmission, it will cease transmissions, key the mobile radio and repeat portable-to-base. This allows the handheld to respond during repeater hang time or during full duplex interconnect calls. Priority sampling can be enabled/disabled through PC programming and the interval can be programmed between .25 seconds and 2.5 seconds in .25 second increments. *Priority sampling is not available in DMR mode.*

The SVR-D300 has a programmable time out timer for base-to-portable transmissions. If the mobile COR is active for more than the programmed time (and the SVR-D300 is the priority unit) it will send a double blip and cease transmission until the mobile COR is inactive. The time-out is in affect regardless of whether the SVR-D300 is programmed for priority sampling or not.

Multi-Vehicle Operation

The SVR-D300 has 2 different multi-vehicle priority formats; both are compatible with the existing SVR-200 and Motorola PAC/RT formats. The new SVR-D300 with ESP™ logic has enhanced features that ensures a priority vehicle is selected and ready to transmit during the idle time rather than during voice transmissions. The 2 formats are explained below:

SVR-200 Legacy Format

When the SVR-D300 is first activated, it will transmit a short "lock tone" that alerts the user that the system is functioning. It will then assume the priority status and be ready to repeat any base-to-portable or portable-to-base transmissions. If another unit arrives on scene and is activated, it too will transmit the "lock tone"; when

the first SVR-D300 detects the lock tone from the second unit, it will increment a "priority counter" and will no longer repeat any transmissions. The recently arrived unit will be the priority repeater, and the first unit will be 1 count away from priority. This process will continue for each unit that arrives at the site, creating a priority hierarchy for up to 256 vehicles, each with a unique count and only one unit at priority status. The SVR-D300 will not transmit its lock tone if the radio channel is busy when first enabled. It will wait in non-priority status until all transmissions cease, then send its lock tone and become the priority unit.

Even though the other SVR-D300s are not at priority status, they will continue to monitor the channel for activity. If the priority unit were to leave the scene or become disabled, the other units will detect the condition to repeat and determine that there is no priority unit repeating the transmission. They will then begin to decrement their priority counters until one of them reaches the priority status and begins repeating the transmission. Since the   SVR-D300s are all at different counts, only one will reach priority status and begin transmitting. The other units will sense the new priority repeater and cease counting down, preserving the priority hierarchy.

If another unit were to arrive from a different scene and it is still the active priority, there will be two active repeaters on the air when a condition to repeat exists. When one of the SVR-D300s unkeys to check for handheld activity (analog mode only), it will detect the presence of the other active SVR-D300 and increment its priority counter and cease transmission. This is the self clearing mode to prevent radio collisions.

ESP^TM Priority

The SVR-D300 Enhanced Sensor Priority works similar to the SVR-200 and PAC/RT formats and is completely backward compatible with those systems. The SVR-D300 determines if there is a priority (and re-establishes the priority if missing) during idle time between conversations rather than at the critical start of a conversation. When a condition to repeat exists, the SVR-D300 is always ready.

The priority SVR-D300 will transmit a short tone burst every 10 seconds. This serves 2 purposes: It informs the handheld operator that they are still within range of the vehicle and it alerts the non-priority units that a priority vehicle is still on scene. As long as the non-priority units hear this "beacon" every 10 seconds, they preserve their counts and maintain the priority hierarchy. If the priority vehicle leaves the scene, after 10 seconds, the non-priority vehicles will not hear the "beacon" and begin counting down. When one of the counts=0, that

SVR-D300 will send lock tone for 800 mS, assume priority and begin sending the "beacon" tone every 10 seconds as before. Since the "beacon" tone must be heard every 10 seconds, it does not have busy carrier lock out and will send the tone if 2 handhelds are communicating directly or in the presence of co-channel interference.

Emergency Operation (DMR mode Only)

The SVR-D300 can be programmed for Emergency operation on a per channel basis. If enabled, the SVR-D300 can detect an Emergency Status in the DMR data packet. The emergency status will indicate an Emergency condition from the portable and will assert an output pin when decoded.

There are 2 different Emergency formats: EMG output only or EMG output with voice repeat.

EMG output only will assert pin 10 on the main cable for as long as the Emergency call is being received; it is used as a momentary output to the mobile to initiate an Emergency sequence. This is the common configuration with most radios.

EMG output with voice repeat will assert pin 10 as before, but will also key the mobile and repeat portable-to-base as long as the Emergency call is being received. This format is used with only some mobile radios that support an external emergency with PTT.

Additionally, there is a solder jumper on the main logic PCB that determines if the EMG output signal pulls to ground (NO) or breaks ground (NC).

Courtesy Beep

If enabled, the SVR-D300 will send a short beep to the handheld user at the end of each portable-to-base transmission to confirm that the user is still within range.

Power Up Channel

The SVR-D300 can be programmed to revert to the last channel used when powered down or a pre-programmed "Home" Channel.

LEDs

The SVR-D300 has a 2 digit channel display as well as eight status LEDs:

CPU: Flashes at a 1 Hz rate to indicate proper operation of the microprocessor.
PRI: When on, indicates that the unit is at priority count zero and will repeat all transmissions.
RCOR: Repeater Carrier detect.
RTONE: Repeater sub-audible decode; when on, indicates a condition to repeat portable-to-base.
RTX: Repeater transmit indicator.
MCOR: Mobile unmute detector indicating a condition to repeat base-to-portable.
MTX: Mobile transmit indicator.
OPT: Emergency Tone/Code Decode.

☞ If the 2 digit channel shows "- -", the unit is not enabled. Use the Blue Wire (pin 3) or the front control head switch to enable the SVR-D300.

☞ If the decimal point is illuminated in the 2 digit channel display it indicates a DMR channel is selected.

Installation

Before installing the SVR-D300, ensure that the mobile radio is properly aligned per the manufacturer's tuning instructions.   Additionally, ensure that the SVR-D300 jumpers are properly configured for use with the particular mobile radio that it will be connected to:

J1   Controls the maximum drive level of the transmit audio output to the mobile radio. If J1 is installed, output amp U1A will have an adjustment range of 0-100 mVPP. If J1 is removed, U1A can be adjusted between 0-5VPP.

J2   Controls the output impedance of the transmit audio line to the mobile radio. If connected to a low impedance point in the mobile, installing JP2 sets the output impedance to 600 ohms. If JP2 is open, the output impedance is 2.2Kohms. Install the jumper for radios that require a lot of modulation drive or that have low impedance microphone circuits. Remove the jumper if the SVR-D300 installation decreases local microphone audio at the mobile.

J4   Used to internally tie the local mic input of the SVR-D300 to the transmit audio output line which is usually connected to the mic hi line in the mobile.

J5   Used to internally tie the on-air detect input of the SVR-D300 to the PTT output. Do so *only on conventional radios*; trunking radios *must have the on-air detect line connected to a line indicating that the radio is transmitting*.

J6   Changes the maximum gain of the local mic input amp from unity (Out) to 10x (In).

J7   Changes the maximum gain of the receive audio line input from unity (Out) to 7x (In).

J8   Adds a pull up (+ position) or pull down (- position) resistor to the remote enable line (blue).

J9   Adds a pull up resistor (10K to 5VDC) to mobile COR line (violet)

J10 Connects the front panel on-off control to the remote enable line to enable the SVR-D300 from the front panel.

J11 Adds (Out) or removes (In) a 100KOhm resistor in series with the Tx audio line for applications with low level mic audio and alternator whine problems (see Service Bulletin 113).

EMG Selects the Emergency output polarity: NO=pull to ground during Emg NC=break ground during Emg.

Make the connections between the mobile radio and the SVR-D300 cable as follows:

Pin 1:   **Ground**. Connect to the radio's chassis or ground plane.
Black/Shield

Pin 2:   **Mobile transmit audio**. Connect to the mobile transmit audio path or tone input. If connected to the
White   mobile mic input, ensure that the SVR-D300 is programmed for flat (common data). If connected after pre-emphasis, ensure that the SVR-D300 transmit audio path is programmed for pre-emphasis. Pin 2 is AC coupled and has an output impedance of 600 or 2.2Kohms (determined by J2). RV3 sets the transmit audio output level and J1 sets the adjustment range between 0-5VPP (J1 open) or 0-100mVPP (J1 shorted).

Pin 3:   **Remote enable/disable**. Connect to the radio's auxiliary output or a separate switch to remotely
Blue   enable or disable the repeater. If this line goes high to activate the repeater, ensure that JP1 is set to the "+" position. If this line goes to ground, set JP1 to the "-" position. J8 has two positions to add a pull up (+) or pull down (-) resistor to this line if used with an open collector or dry contact output. J10 connects this line to the front panel on/off control.

Pin 4:   ***Mobile PTT output***. Connect to mic PTT on the mobile radio, or a line that goes active low to
Green   transmit. Pin 4 is an open drain output rated at 2A at 15VDC.

Pin 5:   ***12 VDC input***. Connect to the radios 12V switched supply or a point capable of supplying at least
Red   2A of current.

Pin 6:   ***Mobile receive audio.*** Connect this line to the mobile receive audio path before the volume control. If
Yellow   pin 6 is connected to the mobile discriminator, ensure that the SVR-D300 receive path is programmed
for de-emphasis (common data). If connected after de-emphasis, program the receive path for flat.
Pin 6 is AC coupled and high impedance (>15K ohm). RV5 sets the receive audio level sensitivity;
this input should be between 30mVPP and 5VPP. J7 sets the gain of the receive input amp. If open,
the input has a maximum gain of one; if installed, the input has a maximum gain of 7.

Pin 7:   ***Mobile COR detect.*** This line is used to indicate when the SVR-D300 should repeat the transmission
Violet   to the handheld. Connect to a logic point in the radio that indicates proper tone and carrier have
been detected or the audio unmute line. If this line goes more positive during an unmute condition,
program the mobile COR line as active high (common data). If the line goes more negative during
an unmute condition, program the mobile COR line as active low. The input from pin 7 is high
impedance and does not have to go rail to rail. The SVR-D300 uses a voltage comparator as a COR
threshold detector and is factory set at 1.6VDC. The COR input must go at least 0.5VDC on either
side of this threshold.

Pin 8:   Not used.
Brown

Pin 9:   ***On Air Detect.***
Gray   ***Trunking:*** Connect to a point in the radio that indicates the mobile transmitter is actually on the air.
This is not the same as mic PTT. If pin 9 goes positive during transmit, program the on-air detect
line for active high (common data). If pin 9 goes to ground during transmit, program the on air
detect line for active low.
Conventional: Used for local mic repeat indication from the mobile. Connect pin 9 to pin 4 of the
SVR-D300 and program the on-air detect line for active low. Solder jumper J5 will connect pin 9
to pin 4 (PTT output) and can be used on conventional systems only. Do not install J5 for trunking
operation.

Pin 10:   ***Emergency Output***. Connect to the Emergency input on the mobile radio. On Motorola radios, the
Black/White   Emergency input opens from ground on activation and jumper J13 should be in the "NC" position.
On all other radios, the Emergency input pulls to ground on activation and jumper J13 should be in
the "NO" position.

Install the SVR-D300 in the vehicle using the supplied mounting bracket and hardware. Install the unit
where it will be easily visible by the driver and will not interfere with the drivers vision or constitute a hazard
during a vehicle collision. The SVR-D300 mounts in the bracket using the four 8-32 x ¼" machine screws. Do
not use longer screws to mount the SVR-D300 to the bracket or circuit damage may result.

Alignment

Before aligning the SVR-D300, ensure that the mobile radio is aligned per the manufacturer's service procedure; Ensure that the SVR-D300 is properly programmed and the jumpers are set per the previous section.

In order to properly align the SVR-D300, you will need two service monitors and the mobile radio that the repeater will be installed with.

Dis-assemble the repeater by removing the two cap screws on the front panel; disconnect the front panel from the main chassis by removing the 2 connectors. Remove the two cap screws from the rear panel and slide the main circuit board out of the housing with the rear panel attached. Re-connect the front panel to the main PCB. Connect one service monitor to the SVR-D300 TNC jack and the other to the mobile antenna jack. Connect the cable from the mobile radio to the SVR-D300 (See figure 4 on page 11). Turn on the mobile and activate the SVR-D300.

SVR-D300 Transmitter

1. *Maximum deviation/lock tone deviation*: Press S3 (Test) and adjust RV7 (Lock Tone) for maximum. Adjust RV8 (repeater deviation) until the wave form just enters clipping; adjust RV7 for total 60% deviation . Release S3.

2. *Mobile COR*: Measure the voltage at TP2 (R11) on the SVR-D300 main PCB and record. Ensure the mobile COR LED on the front panel is off. Set the mobile service monitor for the mobile receive frequency, 1mV RF output and CTCSS modulation of 15% deviation. Measure the voltage again at TP2 and record. Ensure the mobile COR LED on the front panel is on. The 2 voltages at TP2 must be at greater than 2.1VDC and less than 1.1 VDC.

3. *RX audio sensitivity/CTCSS deviation*: Set the service monitor connected to the mobile for the mobile receive frequency and 1mV RF output. Modulate the signal generator with a 1kHz tone at 60% deviation and CTCSS tone at 15% deviation. Ensure that the SVR-D300 mobile COR and repeater PTT LED's are on. Adjust RV5 on the SVR-D300 main board for 75% deviation if CTCSS/DCS transmit is programmed, adjust for 60% deviation if carrier squelch transmit, as read on the service monitor connected to the SVR-D300. Turn the RF output from the mobile service monitor off and ensure that the SVR-D300 mobile COR and repeater PTT LEDs are off.

SVR-D300 Receiver

1. ***Transmit audio output***: Adjust the service monitor RF output for 1mV. Turn the CTCSS modulation on and set for 15% deviation. Confirm that the repeater COR, CTCSS and mobile PTT LED's are on. Adjust RV3 on the SVR-D300 main board for 60% deviation as read on the service monitor connected to the mobile radio. Turn off the CTCSS modulation of the service monitor connected to the SVR-D300. Confirm that the repeater CTCSS and mobile PTT LED's are off.

2. ***Lock Tone/Code Decode***: Change the 1kHz tone modulation to the lock tone frequency or proper LOCK/RAN in DMR mode. Confirm that the PRI LED goes off after approximately .5 seconds.
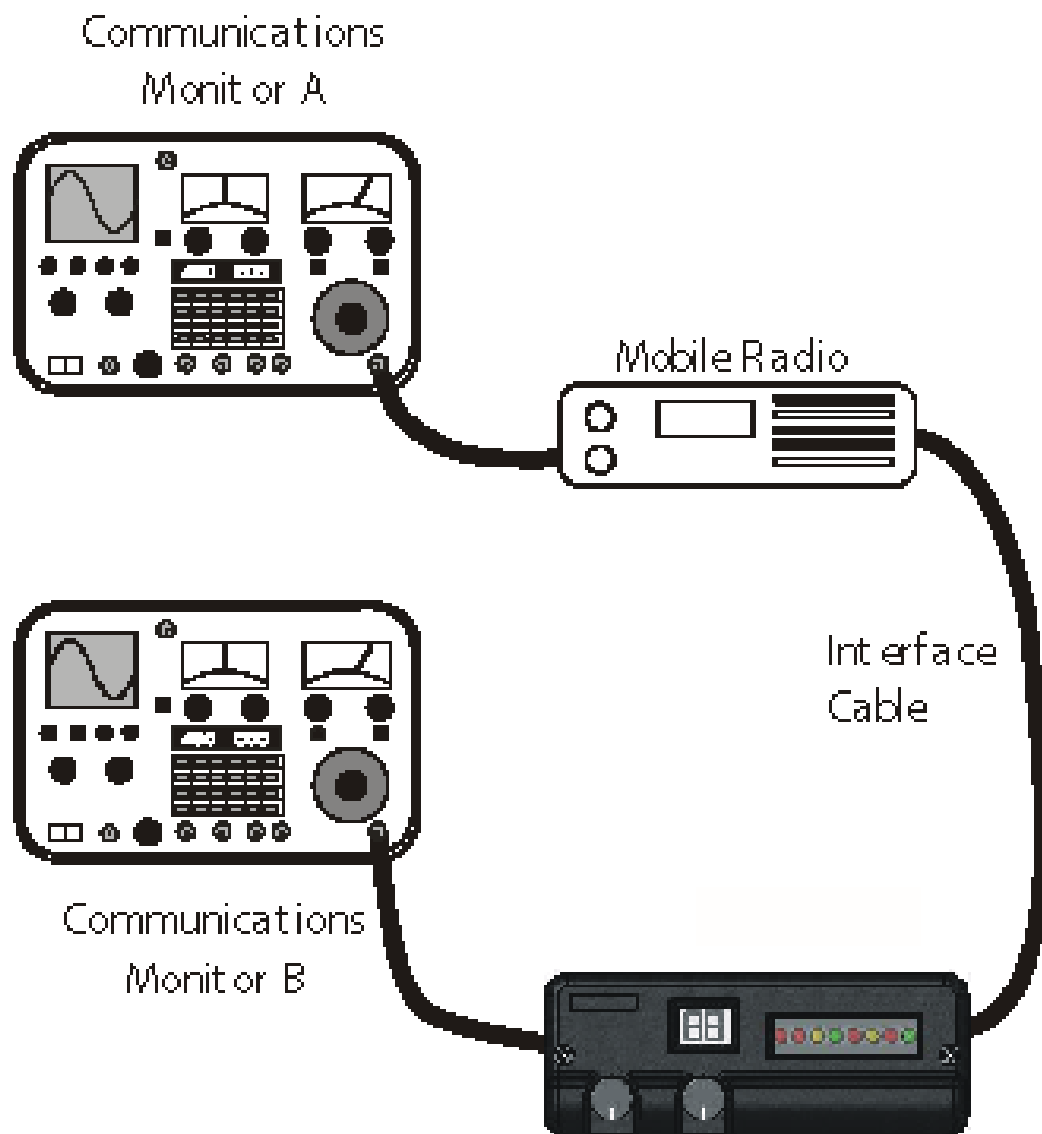

Figure 4

Programming

Using the Software

The SVR-D300 CPS personalization software is used to program the SVR-D300 for all of the operating parameters and options. The software is compatible with Windows operating systems. The software is menu driven and on-line help is available at any time by clicking the left mouse button on the HELP icon on the right side of the tool bar.

Important Note:

Before attempting to program the SVR-D300 start the software and ensure the FY-5 programming cable is plugged into the correct serial port. The com port may be selected under the "Transfer" menu. Plug the FY-5 programming cable into P3 on the front of the SVR-D300.
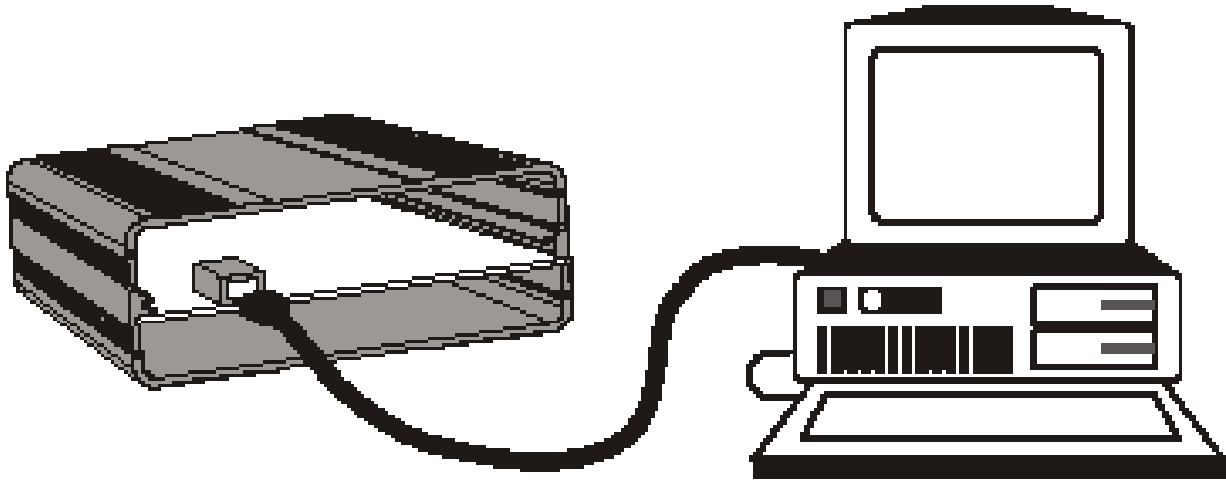
Menu selections

File

Open: Allows you to load a previously saved file from disk. Enter the file name or select from the Windows Dialog box. Only files with the .300 extension can be loaded.

Save: Allows you to save the current configuration to disk. Enter the file name to save as or select a previous file from the Windows Dialog box to overwrite. The .300 extension is automatically added to the file name. The program will prompt you before overwriting an existing file.

Print: Sends the current configuration to the selected printer. Make sure the printer is on line and paper is loaded before executing this command.

Exit: You will be asked to confirm before exiting the program. The software will also prompt you if the configuration has changed since program start up and data has not been saved to disk.

Common Data

File Name: 15 character name for this profile stored in E2PROM.

Number of Channels: Select 1-20 channels

Band: Select the frequency band to match your SVR-D300. Changing bands resets all data to default values (confirmation req.)

Remote Enable Polarity: Determines the polarity of the remote enable input from the mobile radio or external switch.

COR Polarity: Determines if the COR signal from the mobile is active high or low.

On-Air Polarity: Determines if the Tx indication from the mobile is active high or low.

Radio Type: Select either Conventional or Trunking mode. In Conventional mode, the SVR-D300 will operate in a traditional mode. If Trunking is selected, the SVR-D300 will go through the voice channel acquisition procedure during the portable-to-base repeat mode.

Tx Audio: If the mobile Tx audio from the SVR-D300 to the mobile is connected to the mic input, select Flat response. If connected after pre-emphasis, select Pre-Emp.

Rx Audio: If the Rx audio from the mobile to the SVR-D300 is connected to the discriminator, select De-Emp. If connected after de-emphasis, select Flat response.

Power Up Channel: Select either Last Channel or Home Channel.

Priority Sampling: If the SVR-D300 is used in a multi-vehicle environment, priority sampling must be enabled for proper operation. Priority sampling is in effect for *Analog Channels Only*.

Sampling Rate: If Priority sampling is enabled, this selects the sampling interval. Range is 0.25 seconds to 2.5 seconds in .25 sec increments. The higher this setting, the longer the handheld operator must wait before speaking after pressing PTT during base-to-portable sampling.

Enable Front Switch: If enabled, the SVR-D300 will look for the remote enable line on the radio interface connection as well as the status of the on/off knob on the control head of the SVR-D300. The "ON" position of the control head knob will override a the signal from the mobile radio interface. If you want to use the control head as the primary control, set the radio interface to the "inactive" position.

Priority Revert Time: This is the time that the SVR waits for traffic on the mobile radio system before assuming priority. Use this on systems that have longer turn around times, such as wide area or voted receiver systems.

Time Out Timer: This is the maximum duration of a single base to portable transmission that will be allowed.

Priority Format: The SVR-D300 has an enhanced signalling format to determine if the priority vehicle has left the scene during idle time. Select SVR-200 legacy to turn off this feature. Both formats are fully SVR-200 compatible.

Channel Data

☞ *Note:* The number of channels available is determined by the setting in Common Data.

Tx and Rx Frequency: Enter the Transmit and Receive frequencies for each channel. The frequency must be in the range for the band selected under Common Data and will be rounded to the nearest channel step.

Squelch Type: Select either CTCSS, DCS or DMR. These can be selected on a per channel basis, but cannot be mixed within a channel.

☞ *Note:* NXDN will appear as an option, however, NXDN operation is not available on the SVR-D300. SVR-D300 units cannot be configured or changed to NXDN.

Rx Code: This is the Color Code selection for the DMR Protocol. Range 0-15.

Tx Code(s): When DMR is selected, this field represents the DMR Time Slot for the channel. Range is 1-2.

☞*Note:* The SVR-D300 always expects to decode voice traffic on DMR Group ID (GID) 16776400. It uses multiple transmit GIDs back to the portable, depending on the mode. The portable radio needs to decode 16777215 (All Call) and 16776400 through 16776404 Group IDs.

Lock Tone: This is the tone burst (Analog Mode) or LOCK1-4 (DMR mode) first transmitted when the SVR-D300 is enabled and sent every 10 seconds if ESP™ priority mode is selected. The tone must be the same in all vehicular repeaters in the system.

Encryption Key: In DMR mode this specifies which stored Encryption key is used. Range 1-16.

Encryption: If selected the channel will be encrypted (DMR mode Only).

PL Encode: If selected, sub-audible transmit is enabled for that channel (Analog Mode Only).

NB: No applicable to DMR operation.

Courtesy Beep: If selected, a short beep will be sent to the handheld user at the end of each portable-to-base transmission to confirm they are still within range.

Tx Pwr: The transmitter power can be set on a per channel basis. Select 0.5W, 1W or 2W.

Transfer

Send: Downloads the current configuration to the SVR-D300. The program will prompt you to make the FY-5 connection before downloading. Download takes approx 2 seconds.

Receive: Uploads the current configuration from the SVR-D300. The program will prompt you to make the FY-5 connection before uploading. Download takes approx 1 second.

Com Port: Selects the serial port to use for uploading and downloading between the PC and the SVR-D300. Comm ports 1-20 are supported.

Help

On-line context sensitive help is available for all entry fields by selecting the field on a form and clicking on the Help Icon on the tool bar.

Additional help menu items:

About: Gives you version information about the software and contact information for Pyramid Communications.

Remote Tech Support: Remote Tech Support is a utility that allows the Customer Service Technicians at Pyramid Communications to remotely access your computer via the internet in order to troubleshoot any problems you might be having with the software or to assist you in operation of the program. Please call Pyramid Communications during normal business hours prior to selecting remote support. The Technician will give you a password to enter and the remote connection screen will appear:
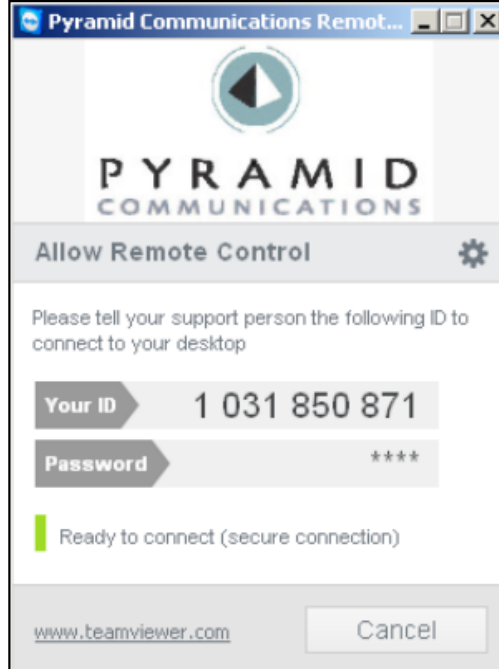
Once the internet connection is made, the Technician will be able to see your computer screen at their location and assist you with the program. The remote connection is only active when this item is selected and can only be enabled by the local PC user.

Flash Programming

The SVR-D300 uses an Atmel MCU which contains the operating system. The chip can be reprogrammed in-circuit using the internal bootloader in the MCU and flash utility from Pyramid Communications.

You can download the utility at www.pyramidcomm.com/pc-programming-software
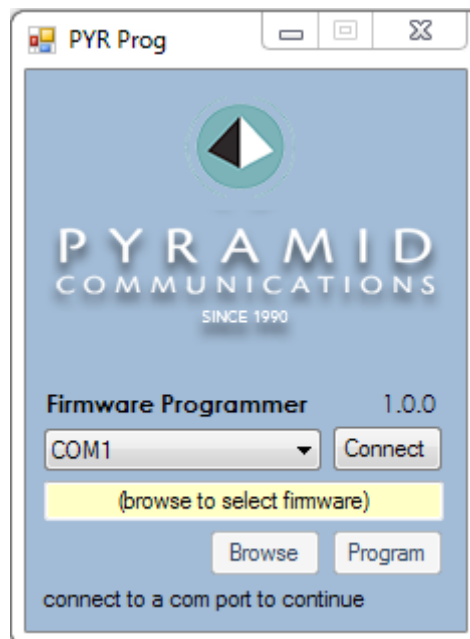
✋ ***Warning- Do not attempt to re-flash the SVR-D300 µP unless you are familiar with operation of the SVR-D300 and reasonably competent using Windows software. If the MCU is not programmed correctly, it can render the SVR-D300 inoperable.***

Install the software onto your PC; use the downloaded or provided (.hex) files from Pyramid. Ensure the HEX file is copied into a known directory on your computer. Perform the flash programming in the ***EXACT*** steps as outlined below:

1. Run the Pyramid Flash Utility.

2. Ensure your SVR is powered on and connected via USB to your PC.   Select the comport from the list in the Flash Programmer.

3. Click Connect.

4. Browse for the firmware .HEX file provided by Pyramid Communications.

5. Click Program when ready.

6. The program will notify you when the flash is updated.

DO NOT REMOVE POWER or USB DURING THE PROCESS.

7. If any errors occur, try the process again for call Pyramid Communications technical support.

Parts Locator