



P Y R A M I D
COMMUNICATIONS

Programming & Installation Instructions for:
Kenwood TK-690, 790, 890
For use with:
Pyramid Communications
Model SVR-200 / SVR-250
Vehicular Repeater
and
Model RCS-200
Remote Channel Selector

Revision H
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Introduction

Before you begin, you will need to have a copy of KPG-44D (V1.2 or better) programming software and a KPG-43 programming cable available to program the mobile radio. Also, you will need a copy of the Pyramid SVR-200 / SVR-250 CPS software and FY-1 programming cable to program the SVR-200 or an FY-4 to program the SVR-250.

Programming the Pyramid SVR-200 / SVR-250

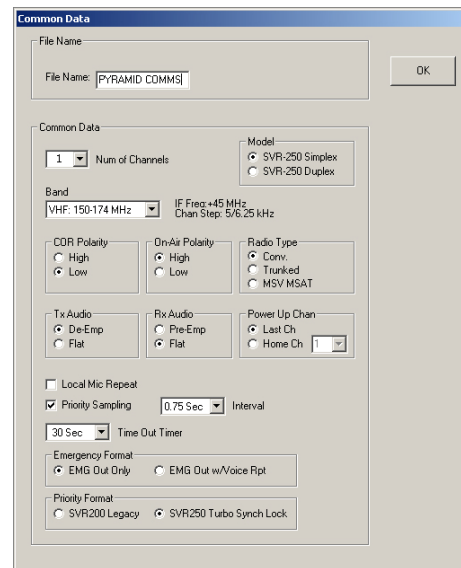
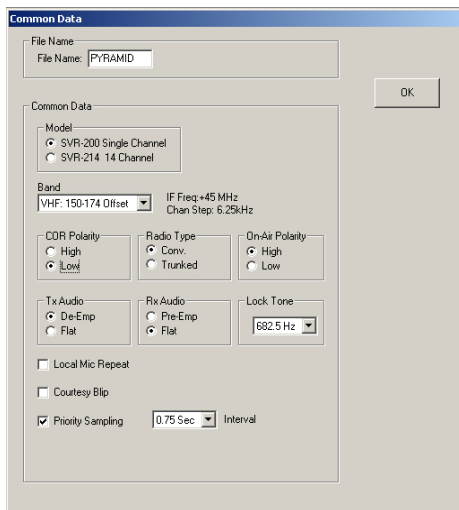
The SVR-200 / SVR-250 repeater needs to be programmed to accommodate the polarities of signal that the Kenwood 90 Series mobile will provide it.

If you have not already done so, install the SVR CPS software on to your PC by following the instructions in the SVR-200 / SVR-250 service manual.

Start running the Pyramid SVR-200 / SVR-250 CPS software on your PC. From the **Data** pull down menu, under the **Common Data** screen, program the unit as shown the figure below.

SVR-250 CPS, Common Data

SVR-200 CPS, Common Data



It is important to set the following items on either corresponding program:

1. COR Polarity = Low
2. On-Air Polarity = High
3. TX Audio = De-Emp
4. RX Audio = Flat
5. Radio Type = Conv.

Setting the SVR-200 / SVR-250 Internal Jumper Settings

Remove the SVR-200 / SVR-250 from its extrusion chassis. Throughout the PCB you will see several jumper settings. For use with the Kenwood 90 Series mobile radios, the jumpers need to be positioned as follows:

Jumpers	JP-1	(-)	Remote Enable
	J1	In	TX Audio Level
	J2	In	TX Audio Impedance
	J4	In	Local Mic Audio
	J5	Out	Local Mic PTT
	J6	In	Mic Sensitivity
	J7	In	RX Sensitivity
	J8	+	Pull Up Resistor
	J9	In	MCOR Pull Up

Cabling for the SVR-200 / SVR-250 to Kenwood radio

The interface cable between the SVR-200 and the Kenwood 90 Series mobile radio is a color-coded DB-9 to DB-25 cable. This cable is available from Pyramid Communications. Order Part # 7500-10-1045 for the SVR-200 or 7500-10-1245 for the SVR-250. If you choose to make your own cable, the following chart depicts the pin outs for this cable.

SVR-200 DB-9/15	SVR Description	DB-25	Radio Description
Black/Shield	Ground	Pin-7	Ground
White	TX Audio	Pin 13	Mi/Di Input
Blue	Remote Enable	Pin 21	AO3
Green	PTT Out	Pin 4	AI3 (programmable)
Red	SW B+	Pin 14	SB Line
Yellow	RX Audio In	Pin 19	Detect Out (DEO)
Violet	COR	Pin 22	AO4 (programmable)
*Grey	On Air Detect	Pin 11	TX Sense

Note:* In Dual Band Operation, you must run a second DB-25 to RF Deck #2 for *On Air Detect (TX Sense)*** and ***Ground***. These lines must be common between both RF Decks.

Modifications to the Pyramid SVR-200 / SVR-250

The following modifications are optional to the Pyramid SVR-200 / SVR-250 for use with the Kenwood TK 90 Series radios.

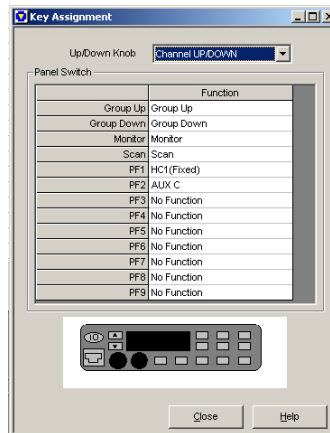
- **If you experience “alternator noise” on your on the mobile radio side of the system, we suggest you remove J1 and J2 and remove the solder bridge at J11.**

Programming the Kenwood 90 Series Radio

It is necessary program the TK 90 Series radio to support the SVR-200 / SVR-250. The following is a list of items that are required for use with the Pyramid SVR.

From the *Edit* pull down menu, select *Key Assignment*. Program one of the control head keys for AUXC out to enable the SVR-200 / SVR-250. When the key us pressed, the output of the radio (AO3) will go to ground, enabling the SVR-200 / SVR-250.

The figure below shows the PF2 Key programmed for AUX C output.

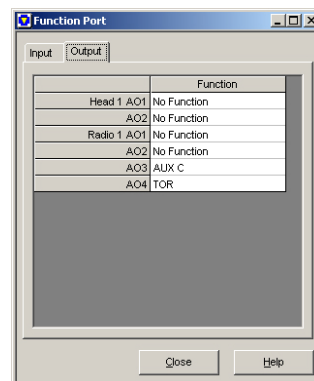
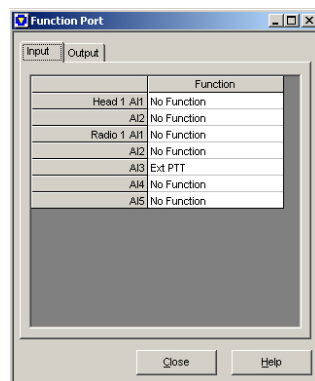


In addition to programming the keypad as shown above, it is also necessary to program the radio's function port to support the necessary I/O connections to the SVR-200 / SVR-250.

From the *Edit* pull down menu, select *Function Port*. In this screen you will need to:

- Program the radio's function port AI3 for EXT PTT input. This sets this input for external PTT from the SVR-200 / SVR-250.
- Program the radio's function port AO3 for AUX C.
- Program the radio's function port AO4 for TOR.

The figures below show a typical configuration:



Modifications to the Kenwood TK 90 Series Radio

Kenwood provides the 90 series radio in a variety of head configuration options. Because the SVR-200 / SVR-250 vehicular repeater uses various audio components of the radio for its normal operation, it is necessary to modify the Kenwood 90 Series radio to provide audio to the SVR-200 / SVR-250 when setup in the variety of remote head configurations. If interfacing to **Dual Band** radios, **make sure that the SVR-200 / SVR-250 is connected to Radio #1.**

Use the configurations below to modify the radio for your application. You can pre-order these modifications to the TK-x90 radio from Kenwood using the labor codes located next to each modification (i.e. LC-XXX).

Single Band/Single Head Configuration (L-858)

In The Radio

- On the radios control unit, move the 0 ohm chip resistor from R641 to R640.
- Solder a jumper wire from the display unit side of F502 to the accessory port side of F501.

Other Modifications

- Modify the KMC-27 microphones to mute properly. See Appendix A. (L-917)

Note: If L-858 is used Kenwood will supply a modified Mic automatically.

Single Band/Dual Head Configuration (L-859)

In The Radio

- On the radios control unit, move the 0 ohm chip resistor from R641 to R640.
- Solder a jumper wire from the display unit side of F502 to the accessory port side of F501.

In The KRK-6

- Add a 0 Ohm jumper on the pad next to R26 (0 Ohm). Pad (R30) is located next to K2 in KRK-6. Both R26 and jumper (R30) must be in place. (*See Appendix B for PCB Layout.*)

Other Modifications

- Modify the KMC-27 microphones to mute properly. See Appendix A. (L-917)

Note: If L-859 is used Kenwood will supply modified Mics automatically.

Dual Band/Single Head Configuration (L-921)

Radio #1

In The Radio

- On the radios control unit, move the 0 ohm chip resistor from R641 to R640.
- Remove the DEO line from the connector CN-505 and jumper this wire to the DE3 line of the connector CN-504.
- Solder a jumper wire from the display unit side of F502 to the accessory port side of F501.

In The KRK-7

- Add a jumper to the Mic trace between CN1 and CN-4 on the KRK-7 (*See Appendix B for PCB Layout.*)

Radio #2

- No Modifications are required in radio #2, although **you must make sure that you connect the SVR-200 to Radio #1 for proper operation.**

Other Modifications

- Modify the KMC-27 microphones to mute properly. See Appendix A. (L-917)

Note: If L-921 is used Kenwood will supply modified Mics automatically.

Dual Band/Dual Head Configuration (L-922)

Radio #1

In The Radio

- On the radio's control unit, move the 0 ohm chip resistor from R641 to R640.
- Remove the DEO line from the connector CN-505 and jumper this wire to the DE3 line of the connector CN-504.
- Solder a jumper wire from the display unit side of F502 to the accessory port side of F501.

In The KRK-8DBH

- Add a jumper wire across the chip resistor pad for R30 in the KRK-8DBH.
- In the KRK-8DBH, make sure that R23 and R26 are in place. (*See Appendix B for PCB Layout.*)

Other Modifications

- Modify the KMC-27 microphones to mute properly. See appendix A. (L-917)

Note: If L-922 is used Kenwood will supply modified Mics automatically.

Radio #2

In The Radio

- No Modifications are required in radio #2, although **you must make sure that you connect the SVR-200 / SVR-250 to Radio #1 for proper operation.**

Other Modifications

- Modify the KMC-27 microphones to mute properly. See appendix A. (L-917)

Note: If L-922 is used Kenwood will supply modified Mics automatically.

KVC-5/6 Vehicle Charger Support

In most models of the KVC-5/6, the repeater enable line out of the charger, when the radio is in the charger, does not go completely to ground. This causes the SVR-200 / SVR-250 to remain enabled at all times. To correct this problem, perform the following modifications to the SVR-200 / SVR-250.

- Add a 10K resistor across the base and emitter of Q1.
- JP1 must be in the plus (+) position.
- J8 must be in the negative (-) position.

RCS-200 Support in the Kenwood 90 Series Radio

After Modifying the 90 Series radio for the SVR-200 / SVR-250, you can now install the RCS-200. By installing an RCS-200 into the control head of the TK 90 Series radio, this allows you to remotely change channels through a conventional portable and your SVR-200. This application is capable of channel changing only within one system in the radio, since the home channel is a global setting. The RCS-200 must be a **Version 1.4** to operate with the Kenwood 90 Series radio. When installed, the RCS-200 can change channels on the radio at a speed of approximately 25 channels per second.

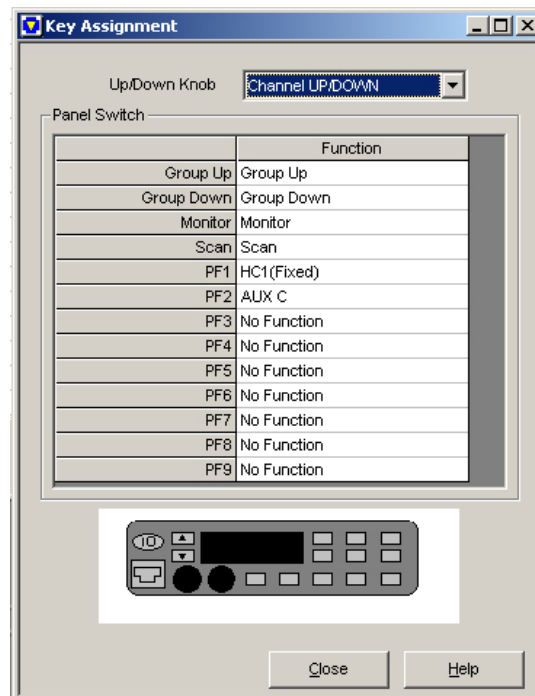
Note: *It is recommended to use the KCH-11 control head when installing an RCS-200.*

Programming the 90 Series radio for the RCS-200

It is necessary program the TK 90 Series radio to support the RCS-200. The following is a list of items that are required for use with the Pyramid RCS-200.

From the **Edit** pull down menu, select **Key Assignment**. Program one of the control head keys for HC1 (Fixed). This enables this button, when pressed, to revert to the first channel in the system. The RCS-200 will press this button automatically, and increment up to the desired channel when selected channels remotely.

The figure below shows the PF1 Key programmed for HC1 (Fixed).



Interfacing the RCS-200 to the Kenwood 90 Series Radio

The wires coming out of the RCS-200 are color-coded. Follow the chart below to interface the RCS-200 to the Kenwood 90 Series control head. This interface is to be done in the control head of the radio.

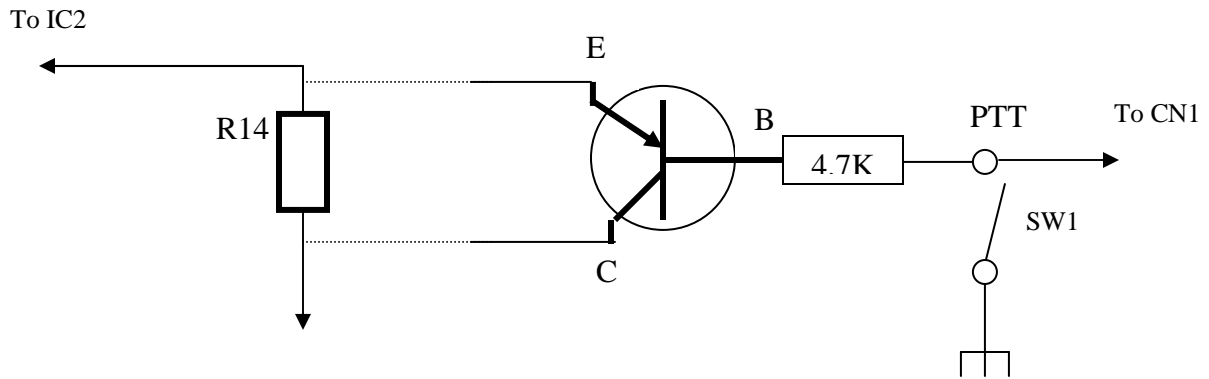
Connections	RCS-200	Function	Radio
	Red	Switched B+	J1 Pin 1 (Mic Connector [SB])
	Black	Ground	J1 Pin 5 (Mic Connector [E])
	White	I Out	Chan Sw (W1) bottom pin (Brown)
	Blue	Q Out	Chan Sw (W1) top pin (Orange)
	Orange	Home Channel	IC4 pin 4 (PF1)
	Green	PTT Out	J1 Pin 10 (Mic Connector [PTT])
	Yellow	Audio In	J1 Pin 4 (Mic Connector [Mic])
	Brown	Voice Out	N/C

On the RCS-200 board, you must set the jumpers as shown in the chart below.

Jumpers	J1	[Out]	Rx Sensitivity
	J2	[Out]	Output Impedance
	J3	[Out]	Output Sensitivity
	J4	[In]	Audio Loop Back

Appendix A (Kenwood Hot Mic Modification)

When installing an external headset or other type of external microphone, it may be necessary to shut off the audio in the KMC-27 local microphone. This can be done easily by using a typical PNP transistor, a 4.7Kohm resistor and three jumper wires. Using the existing holes left open for the KMC-28's DTMF circuit, the transistor can be securely mounted in the KMC-27. R14 must be removed to open the power supply circuit to the Mic element. The signal through the resistor to the base will cause the transistor to complete the power path upon PTT.



Appendix B (KRK-6/7/8 PCB Parts Identification)

