1 OVERVIEW

The RA/RT (TRC control) configuration allows a Quantar/Quantro station to be TRC controlled by a remote console using either a radio link or a microwave link in place of the usual wireline link. This configuration is typically used in cases where the station is located in a relatively inaccessible location (such as a mountain top) where running phone lines is either impractical or impossible.

As shown in Figure 1A, a pair of stations (called station 1 and station 2) is used to substitute for the normal wireline connections between the repeater station and the console. Figure 1B shows a microwave RA/RT link.

**Figure 1A** RA/RT WITH RF LINK

**Figure 1B** RA/RT WITH MICROWAVE LINK

**Figure 1.** Typical RA/RT Systems (TRC Control)
ELECTRICAL CONNECTIONS (RF LINK)

Install stations 1, 2, and 3 as described in the appropriate functional base station manual. Figure 2 shows the connections between the stations necessary to allow RA/RT (TRC control) operation. Perform the following procedures to make the wiring connections between the console and Station 1 and between Stations 2 and 3.

**Figure 2.** RA/RT (TRC Control) Wiring Connections (RF Link)

### Console to Station 1
**Wiring Connections**

**Step 1.** Connect the landline—to—station audio (from the console) to the Line 1 connections on the backplane of Station 1 as shown below.

**Step 2.** Connect the station—to—landline audio (to the console) to the Line 2 connections on the backplane of Station 1, as shown below.

*Note* Phone line connections may be made at either the 50-pin Telco connector or the 8-position terminal connector. Refer to the Installation section of the appropriate station functional manual for more details on phone line connections.
Station 2 to Station 3 Wiring Connections

**Wireline Connections**

**Step 1.** Connect the Line 1 audio from Station 2 to the Line 2 connections on Station 3 as shown below.

**Step 2.** Connect the Line 2 audio from Station 2 to the Line 1 connections on Station 3 as shown below.

**Note** Phone line connections may be made at either the 50-pin Telco connector or the 8-position terminal connector. Refer to the Installation section of the appropriate station functional manual for more details on phone line connections.

**RDSTAT to EXT PTT Connection**

**Step 1.** Connect the RD STAT + and − signals from Station 3 to the EXT PTT + and − signals on Station 2 as shown below. An equivalent schematic circuit for the RD STAT and EXT PTT signals is also shown.

**Note** RDSTAT INT signal goes high when Station 3 detects receive signal (according to RX Activation parameter setting via RSS). This energizes relay, turns on LED in optocoupler, and pulls EXT PTT INT low. This causes Station 2 transmitter to key up and routes Line 1 audio to the transmitter.
3 ELECTRICAL CONNECTIONS (MICROWAVE LINK)

Install the station as described in the appropriate functional base station manual. Figure 2 shows the connections between the station, microwave equipment, and console necessary to allow RA/RT (TRC control) operation. Perform the following procedures to make the wiring connections between the console and the Microwave Station 1 and between Microwave Station 2 and Station 3.

![Diagram: RA/RT (TRC Control) Wiring Connections (Microwave Link)]

**Figure 3.** RA/RT (TRC Control) Wiring Connections (Microwave Link)

---

**Console to Microwave Station 1 Wiring Connections**

**Note** Refer to the Microwave Station manual for details of making wireline connections.

**Step 1.** Connect the landline-to-station audio (from the console) to Microwave Station 1.

**Step 2.** Connect the station-to-landline audio (to the console) to the Microwave Station.
Microwave Station 2 to Station 3 Wiring Connections

**Note** Refer to the Microwave Station manual for details of making wireline connections.

**Note** Phone line connections may be made at either the 50-pin Telco connector or the 8-position terminal connector. Refer to the Installation section of the appropriate station functional manual for more details on phone line connections.

**Wireline Connections**

**Step 1.** Connect the station—landline audio from Microwave Station 2 to the Line 1 connections on Station 3 as shown below.

**Step 2.** Connect the landline—station audio to Microwave Station 2 to the Line 2 connections on Station 3 as shown below.

**RDSTAT to E-Lead Connection**

**Step 1.** Connect the RD STAT + and − signals from Station 3 to the E-Lead signal on Microwave Station 2 as shown below. An equivalent schematic circuit for the RD STAT and E LEAD signals is also shown.

**Note** RDSTAT INT signal goes high when Station 3 detects receive signal (according to RX Activation parameter setting via RSS). This energizes relay and provides ground signal to E LEAD input on Microwave Station 2.
RSS PROGRAMMING

Using the Quantar/Quantro Radio Service Software (RSS) program, make the following codeplug data changes to allow proper RA/RT operation. (Refer to the RSS User's Guide 68P81085E35 for details on making codeplug programming changes.)

**Table 1.** Codeplug Data Changes for RA/RT Operation (RF Link Configuration)

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Codeplug Data Parameter</th>
<th>RSS User's Guide Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Station 1</td>
<td>Change command for Guard Tone from (typically) MORE to KEY. Leave all other commands empty.</td>
<td>Programming the TRC Commands Data (p/o Chapter 4)</td>
</tr>
<tr>
<td></td>
<td>Disable TX Notch Filter</td>
<td>Programming the Wireline Configuration Data (p/o Chapter 4)</td>
</tr>
<tr>
<td>Station 3</td>
<td>Enable TX Notch Filter</td>
<td>Programming the Wireline Configuration Data (p/o Chapter 4)</td>
</tr>
</tbody>
</table>

**Note** — Make sure console is programmed for 240 msec HLGT. On SECURENET systems, increase to 360 msec.

**Table 2.** Codeplug Data Changes for RA/RT Operation (Microwave Link Configuration)

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Codeplug Data Parameter</th>
<th>RSS User's Guide Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Station 3</td>
<td>Enable TX Notch Filter</td>
<td>Programming the Wireline Configuration Data (p/o Chapter 4)</td>
</tr>
</tbody>
</table>

**Note** — Make sure console is programmed for 240 msec HLGT. On SECURENET systems, increase to 360 msec.
5 TX WIRELINE ALIGNMENT

You may align the TX Wireline levels as described in the RSS User's Guide 68P81085E35 (which requires the use of an external signal generator), or you may use the station to generate the alignment tone. This method is described as follows.

Note — Make sure the Automatic Line Control parameter is disabled for Stations 1, 2, and 3.

Station 1 TX Wireline Alignment


Station 2 TX Wireline Alignment

Step 1. Connect the RSS to Station 3 and access the RX Wireline Alignment screen.

Step 2. Set the RX wireline level and Save it. (Note that the wireline level is typically set to −6 dBm.)

Step 3. Press F2 to turn on the 1 kHz tone. Do not exit this screen.

Step 4. With the RSS program still running, disconnect the RSS cable from Station 3 and connect it to Station 2. Now exit the RX Alignment screen.

Step 5. Access the TX Wireline Alignment screen and press F8 to save the alignment value. (Station 3 is providing the 1 kHz alignment tone.)

Step 6. Exit the TX Wireline Alignment screen.

Step 7. With the RSS program still running, disconnect the RSS cable from Station 2 and connect it to Station 3.

Step 8. Access the RX Wireline Alignment screen and turn off the 1 kHz tone.
Station 3 TX Wireline Alignment

Step 1. Connect the RSS to Station 2 and access the RX Wireline Alignment screen.

Step 2. Set the RX wireline level and Save it. (Note that the wireline level is typically set to –6 dBm.)

Step 3. Press F2 to turn on the 1 kHz tone. Do not exit this screen.

Step 4. With the RSS program still running, disconnect the RSS cable from Station 2 and connect it to Station 3. Now exit the RX Alignment screen.

Step 5. Access the TX Wireline Alignment screen and press F8 to save the alignment value. (Station 2 is providing the 1 kHz alignment tone.)

Step 6. Exit the TX Wireline Alignment screen.

Step 7. With the RSS program still running, disconnect the RSS cable from Station 3 and connect it to Station 2.

Step 8. Access the RX Wireline Alignment screen and turn off the 1 kHz tone.
1 OVERVIEW

The RA/RT (E & M keying) configuration allows a Quantar/Quantro station to be controlled by a remote console using either a radio link or a microwave link in place of the usual wireline link. This configuration is typically used in cases where the station is located in a relatively inaccessible location (such as a mountain top) where running phone lines is either impractical or impossible.

As shown in Figure 1A, a pair of stations (called station 1 and station 2) is used to substitute for the normal wireline connections between the repeater station and the console. Figure 1B shows a microwave RA/RT link.

Figure 1A  RA/RT WITH RF LINK

Figure 1B  RA/RT WITH MICROWAVE LINK

Figure 1. Typical RA/RT Systems (E & M Keying)
2 ELECTRICAL CONNECTIONS (RF LINK)

Install stations 1, 2, and 3 as described in the appropriate functional base station manual. Figure 2 shows the connections between the stations necessary to allow RA/RT (E & M keying) operation. Perform the following procedures to make the wiring connections between the console and Station 1 and between Stations 2 and 3.

Figure 2. RA/RT (E & M Keying) Wiring Connections (RF Link)

Console to Station 1
Wiring Connections

Step 1. Connect the landline—to—station audio (from the console) to the Line 1 connections on the backplane of Station 1 as shown below.

Step 2. Connect the station—to—landline audio (to the console) to the Line 2 connections on the backplane of Station 1, as shown below.

Note Phone line connections may be made at either the 50-pin Telco connector or the 8-position terminal connector. Refer to the Installation section of the appropriate station functional manual for more details on phone line connections.
Station 2 to Station 3
Wiring Connections

Wireline Connections

**Step 1.** Connect the Line 1 audio from Station 2 to the Line 2 connections on Station 3 as shown below.

**Step 2.** Connect the Line 2 audio from Station 2 to the Line 1 connections on Station 3 as shown below.

*Note* Phone line connections may be made at either the 50-pin Telco connector or the 8-position terminal connector. Refer to the Installation section of the appropriate station functional manual for more details on phone line connections.

**RDSTAT to EXT PTT Connection (Station 3 to Station 2)**

**Step 1.** Connect the RD STAT + and − signals from Station 3 to the EXT PTT + and − signals on Station 2 as shown below. An equivalent schematic circuit for the RD STAT and EXT PTT signals is also shown.

*Note* RDSTAT INT signal goes high when Station 3 detects receive signal (according to RX Activation parameter setting via RSS). This energizes relay, turns on LED in optocoupler, and pulls EXT PTT INT low. This causes Station 2 transmitter to key up and routes Line 1 audio to the transmitter.
Station 2 to Station 3
Wiring Connections
(Cont’d)

**RDSTAT to EXT PTT Connection (Station 2 to Station 3)**

**Step 1.** Connect the RD STAT + and – signals from Station 2 to the EXT PTT + and – signals on Station 3 as shown below. An equivalent schematic circuit for the RD STAT and EXT PTT signals is also shown.

**Note**  
RDSTAT INT signal goes high when Station 2 detects receive signal (according to RX Activation parameter setting via RSS). This energizes relay, turns on LED in optocoupler, and pulls EXT PTT INT low. This causes Station 3 transmitter to key up and routes Line 1 audio to the transmitter.
3 ELECTRICAL CONNECTIONS (MICROWAVE LINK)

Install the station as described in the appropriate functional base station manual. Figure 2 shows the connections between the station, microwave equipment, and console necessary to allow RA/RT (E & M keying) operation. Perform the following procedures to make the wiring connections between the console and the Microwave Station 1 and between Microwave Station 2 and Station 3.

![Diagram showing electrical connections](image)

**Figure 3.** RA/RT (E & M Keying) Wiring Connections (Microwave Link)

---

**Console to Microwave Station 1 Wiring Connections**

**Step 1.** Connect the landline-to-station audio (from the console) to Microwave Station 1.

**Step 2.** Connect the station-to-landline audio (to the console) to the Microwave Station.

---

*Note* Refer to the Microwave Station manual for details of making wireline connections.
Microwave Station 2 to Station 3 Wiring Connections

**Note** Refer to the Microwave Station manual for details of making wireline connections.

**Note** Phone line connections may be made at either the 50-pin Telco connector or the 8-position terminal connector. Refer to the Installation section of the appropriate station functional manual for more details on phone line connections.

### Wireline Connections

**Step 1.** Connect the station—to—landline audio from Microwave Station 2 to the Line 1 connections on Station 3 as shown below.

**Step 2.** Connect the landline—to—station audio to Microwave Station 2 to the Line 2 connections on Station 3 as shown below.

---

**RDSTAT to E-Lead Connection (Station 3 to Station 2)**

**Step 1.** Connect the RD STAT + and − signals from Station 3 to the E-Lead signal on Microwave Station 2 as shown below. An equivalent schematic circuit for the RD STAT and E LEAD signals is also shown.

---

**Note** RDSTAT INT signal goes high when Station 3 detects receive signal (according to RX Activation parameter setting via RSS). This energizes relay and provides ground signal to E LEAD input on Microwave Station 2.
Microwave Station 2 to Station 3 Wiring Connections (Cont’d)

M-Lead to EXT PTT Connection (Station 2 to Station 3)

**Step 1.** Connect the M-Lead on the Microwave Station 2 to the EXT PTT + signal on Station 3 as shown below. An equivalent schematic circuit for the EXT PTT and M LEAD signals is also shown.

**Note** MLEAD output from Microwave Station 2 goes low when transmitting signal on wireline. This causes EXT PTT to activate and key Station 3 transmitter.
4 RSS PROGRAMMING

Using the Quantar/Quantro Radio Service Software (RSS) program, make the following codeplug data changes to allow proper RA/RT operation. (Refer to the RSS User's Guide 68P81085E35 for details on making codeplug programming changes.)

**Table 1.** Codeplug Data Changes for RA/RT Operation (RF Link Configuration)

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<thead>
<tr>
<th>Equipment</th>
<th>Codeplug Data Parameter</th>
<th>RSS User's Guide Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Station 1</td>
<td>Disable TX Notch Filter</td>
<td>Programming the Wireline Configuration Data (p/o Chapter 4)</td>
</tr>
<tr>
<td>Station 3</td>
<td>Disable TX Notch Filter</td>
<td>Programming the Wireline Configuration Data (p/o Chapter 4)</td>
</tr>
</tbody>
</table>

**Table 2.** Codeplug Data Changes for RA/RT Operation (Microwave Link Configuration)

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Codeplug Data Parameter</th>
<th>RSS User's Guide Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Station 3</td>
<td>Disable TX Notch Filter</td>
<td>Programming the Wireline Configuration Data (p/o Chapter 4)</td>
</tr>
</tbody>
</table>
5 TX WIRELINE ALIGNMENT

You may align the TX Wireline levels as described in the RSS User's Guide 68P81085E35 (which requires the use of an external signal generator), or you may use the station to generate the alignment tone. This method is described as follows.

Note — Make sure the Automatic Line Control parameter is disabled for Stations 1, 2, and 3.

Station 1 TX Wireline Alignment


Station 2 TX Wireline Alignment

Step 1. Connect the RSS to Station 3 and access the RX Wireline Alignment screen.

Step 2. Set the RX wireline level and Save it. (Note that the wireline level is typically set to –6 dBm.)

Step 3. Press F2 to turn on the 1 kHz tone. Do not exit this screen.

Step 4. With the RSS program still running, disconnect the RSS cable from Station 3 and connect it to Station 2. Now exit the RX Alignment screen.

Step 5. Access the TX Wireline Alignment screen and press F8 to save the alignment value. (Station 3 is providing the 1 kHz alignment tone.)

Step 6. Exit the TX Wireline Alignment screen.

Step 7. With the RSS program still running, disconnect the RSS cable from Station 2 and connect it to Station 3.

Step 8. Access the RX Wireline Alignment screen and turn off the 1 kHz tone.
Station 3 TX Wireline Alignment

Step 1. Connect the RSS to Station 2 and access the RX Wireline Alignment screen.

Step 2. Set the RX wireline level and **Save** it. (Note that the wireline level is typically set to −6 dBm.)

Step 3. Press **F2** to turn on the 1 kHz tone. **Do not** exit this screen.

Step 4. With the RSS program still running, disconnect the RSS cable from Station 2 and connect it to Station 3. Now exit the RX Alignment screen.

Step 5. Access the TX Wireline Alignment screen and press **F8** to save the alignment value. (Station 2 is providing the 1 kHz alignment tone.)

Step 6. Exit the TX Wireline Alignment screen.

Step 7. With the RSS program still running, disconnect the RSS cable from Station 3 and connect it to Station 2.

Step 8. Access the RX Wireline Alignment screen and turn off the 1 kHz tone.
1 OVERVIEW

Feature Description
The Fall Back In-Cabinet Repeat (FBICR) feature provides limited backup communications capabilities in Simulcast (Option U764) and Non-Simulcast Voting (Option X269) systems in which the link to the Comparator has been lost (phone line disruption, cable disconnection, etc.). Figure 1 and Figure 2 illustrate typical scenarios in which the FBICR mode is activated. (Note that in these examples automatic FBICR mode is assumed; refer to Automatic and External Modes below for details.)

Note  The FBICR feature is supported only for Station/RSS Release R10.03.00 and later.

Automatic and External Modes
The FBICR feature may be configured for either automatic or external modes (depending on system types, as explained later). Automatic mode is configured by programming certain station parameters using the Radio Service Software (RSS). External mode requires (in addition to RSS settings) that electrical connections be made to certain pins on the System Connector (Connector #17) located on the station backplane; external equipment (customer-provided) is used to ground one or more of these lines to force the station into FBICR mode.

The FBICR feature can be configured for the following system types in Automatic or External Modes:

Automatic Mode
- Conventional Analog (both Simulcast and Non-Simulcast Voting Systems)
- Conventional ASTRO (CAI) (both Simulcast and Non-Simulcast Voting Systems)
- Trunked ASTRO (SMARTZONE or SMARTNET) (CAI, VSELP) (Simulcast only)

External Mode
- Conventional Analog (both Simulcast and Non-Simulcast Voting Systems)
- Conventional ASTRO (CAI) (both Simulcast and Non-Simulcast Voting Systems)
- Trunked Analog (SMARTZONE or SMARTNET) (both Simulcast and Non-Simulcast Voting Systems)
- Trunked ASTRO (SMARTZONE or SMARTNET) (CAI, VSELP) (Simulcast only)

— continued on page 3 —
If either/both of these links fail (for any coverage area), station will revert to FBICR mode.

Figure 1. FBICR Feature in Simulcast Voting System (Automatic FBICR Mode Shown)
**Figure 2.** FBICR Feature in Non-Simulcast Voting System (Automatic FBICR Mode Shown)

**Link Failure Detection Requirements**

Before automatically enabling FBICR mode, a link failure detection must occur, defined as follows:

*For Digital Systems*
- Protocol Failure
- Carrier Detect Loss

**Note** In a V.24 Hybrid Configuration, the loss of the analog link will *not* cause the station to enter FBICR mode. Only the failure of the digital link will cause the station to enter FBICR mode.

*For Analog Systems*
- Loss of External PTT (Simulcast)
- No TRC Keyup (Voting)

**Other Things to Know**
- It is important to note that a station operating in FBICR mode is independent of other stations/receivers in the particular system. This is especially important in a Simulcast system, because simulcast transmission timing will be lost for the overlap coverage area between an active Simulcast station and a FBICR station. In a typical Simulcast scenario, the station responsible for the major coverage area is set for FBICR, and any adjacent stations are subsequently disabled.
- Automatic and External modes are mutually exclusive (i.e., a station may not be configured for both modes).
2 CONFIGURING THE FBICR FEATURE

Depending on the system type and whether you wish to configure for automatic or external operation, the FBICR feature must be configured by using the RSS only, or a combination of RSS programming and external wiring connections. Each configuration scenario is described on the following pages.

Automatic Mode

Conventional Analog or Conventional ASTRO (CAI) (Simulcast or Non-Simulcast Voting Systems)

Step 1. Access the Wireline Configuration Screen.

Step 2. Set the Fall Back In-Cabinet Repeat field to ENABLED.

Step 3. Enter the desired delay time (in msecs) in the Fall Back Timer field.

<table>
<thead>
<tr>
<th>MOTOROLA RADIO SERVICE SOFTWARE</th>
<th>Use Up/Down Arrow Keys to Select Wireline Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASE STATION PRODUCTS</td>
<td></td>
</tr>
<tr>
<td>Page 1 of 2</td>
<td></td>
</tr>
<tr>
<td>VER:XX.XX.XX</td>
<td></td>
</tr>
<tr>
<td>CHANGE/VIEW/WIRELINE CONFIGURATION</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wireline Operation</th>
<th>4 WIRE FULL DUPLEX</th>
<th>OPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Console Priority</td>
<td>DISABLED</td>
<td></td>
</tr>
<tr>
<td>Remote Control</td>
<td>ASTRO</td>
<td></td>
</tr>
<tr>
<td>Line 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outbound Analog Link Timer</td>
<td>120 sec</td>
<td></td>
</tr>
<tr>
<td>Comparator</td>
<td>NONE</td>
<td>OPTION</td>
</tr>
<tr>
<td>Fall Back In-Cabinet Repeat</td>
<td>ENABLED</td>
<td></td>
</tr>
<tr>
<td>Fall Back Timer</td>
<td>xx msecs</td>
<td></td>
</tr>
<tr>
<td>Status Tone</td>
<td>ENABLED</td>
<td></td>
</tr>
<tr>
<td>Status Tone Frequency</td>
<td>2175 kHz</td>
<td></td>
</tr>
<tr>
<td>Wireline Squelch</td>
<td>DISABLED</td>
<td></td>
</tr>
<tr>
<td>Rx Securenet/ASTRO To Wireline</td>
<td>ENABLED</td>
<td></td>
</tr>
<tr>
<td>Equalization</td>
<td>DISABLED</td>
<td></td>
</tr>
</tbody>
</table>

F1 HELP F2 F3 F4 F5 F6 F7 F8 F9 F10 EXIT

◆ End of Procedure ◆
Automatic Mode (continued)

**Trunked (SMARTZONE or SMARTNET) ASTRO (CAI, VSEL) (Simulcast Systems Only)**

**Step 1.** Access the *Wireline Configuration Screen*.

**Step 2.** Set the *Fall Back In-Cabinet Repeat* field to **ENABLED**. *(No Fall Back Timer setting is required.)*

<table>
<thead>
<tr>
<th>MOTOROLA RADIO SERVICE SOFTWARE</th>
<th>Use Up/Down Arrow Keys to Select Wireline Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASE STATION PRODUCTS</td>
<td></td>
</tr>
<tr>
<td>VER:xx.x.x.x.xx</td>
<td></td>
</tr>
<tr>
<td>:CHANGE/VIEW:WIRELINE CONFIGURATION</td>
<td></td>
</tr>
</tbody>
</table>

- **Wireline Operation**: 4 WIRE FULL DUPLEX
- **Console Priority**: Disabled
- **Remote Control Type**: ASTRO
- **TRC Input**: Line 1
- **Outbound Analog Link Timer**: 120 sec
- **Comparator**: None
- **Fall Back In-Cabinet Repeat**: Enabled

- **Status Tone**: Enabled
- **Status Tone Frequency**: 2175 kHz
- **Wireline Squelch**: Disabled
- **Rx Sccurencet/ASTRO To Wireline**: Disabled
- **Equalization**: Disabled

F1 HELP
F2 F3 F4 F5 F6 F7 F8 F9 F10 EXIT

**Step 3.** Access the *6809 Trunking Interface Screen*.

**Step 4.** Make sure the *Failsoft* field is set to **ENABLED**, and set the *Modulation Type* to ASTRO or ANALOG.

<table>
<thead>
<tr>
<th>MOTOROLA RADIO SERVICE SOFTWARE</th>
<th>Use Up/Down Arrow Keys to Select RSTAT Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASE STATION PRODUCTS</td>
<td></td>
</tr>
<tr>
<td>VER:xx.x.x.x.x</td>
<td></td>
</tr>
<tr>
<td>:CHANGE/VIEW:6809 TRUNKING</td>
<td></td>
</tr>
</tbody>
</table>

- **RSTAT Mode**: Normal
  - **Failsoft**: Enabled
  - **Line TRC Encode**: Disabled
  - **Failsoft Carrier Squelch**: Disabled
  - **Dual CT Failsoft Only**: Disabled
  - **Modulation Type**: ASTRO

- **Trunking Tickle Source**: TX DATA LINE
- **Trunking Tickle Source: TOT**: 1 sec
- **CSC Logical Channel Number**: 1
- **Rx Discriminator Type**: QUANTAR/MICOR

F1 HELP
F2 F3 F4 F5 F6 F7 F8 F9 F10 EXIT

◆ End of Procedure ◆
External Mode

Conventional Analog or Conventional ASTRO (CAI) (Simulcast or Non-Simulcast Voting Systems)

Step 1. Access the Wireline Configuration Screen.

Step 2. Set the Fall Back In-Cabinet Repeat field to DISABLED.

<table>
<thead>
<tr>
<th>MOTOROLA RADIO SERVICE SOFTWARE</th>
<th>Use Up/Down Arrow Keys to Select Wireline Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASE STATION PRODUCTS</td>
<td></td>
</tr>
<tr>
<td>Page 1 of 2</td>
<td>VER-XX-XX-XX</td>
</tr>
<tr>
<td>:CHANGE/VIEW/ WIRELNE CONFIGURATION</td>
<td></td>
</tr>
</tbody>
</table>

- Wireline Operation: 4 WIRE FULL DUPLEX
- Console Priority: DISABLED
- Remote Control Type: ASTRO
- TRC Input: Line 1
- Outbound Analog Link Timer: 120 sec
- Comparator: NONE
- Fall Back In-Cabinet Repeat: DISABLED
- Fall Back Timer: 0 msec
- Status Tone: ENABLED
- Status Tone Frequency: 2175 kHz
- Wireline Squelch: DISABLED
- Rx Securenet/ASTRO To Wireline: ENABLED
- Equalization: DISABLED

<table>
<thead>
<tr>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
<th>F5</th>
<th>F6</th>
<th>F7</th>
<th>F8</th>
<th>F9</th>
<th>F10</th>
</tr>
</thead>
<tbody>
<tr>
<td>HELP</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>EXIT</td>
</tr>
</tbody>
</table>

Step 3. Connect a wire to pin 16 of System Connector #17 (located on the station backplane). To activate FBICR mode, an external circuit (customer-provided) must ground this pin.

End of Procedure
External Mode (continued)

**Trunked (SMARTZONE or SMARTNET) Analog (Simulcast or Non-Simulcast Voting Systems)**

**Step 1.** Access the Wireline Configuration Screen.

**Step 2.** Set the Fall Back In-Cabinet Repeat field to **ENABLED**.
Set the Fall Back In-Cabinet Repeat field to **0 msec**.

<table>
<thead>
<tr>
<th>MOTOROLA RADIO SERVICE SOFTWARE</th>
<th>Use Up/Down Arrow Keys to Select Wireline Operation</th>
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<table>
<thead>
<tr>
<th>Wireline Operation</th>
<th>4 WIRE FULL DUPERX</th>
<th>OPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Console Priority</td>
<td>DISABLED</td>
<td></td>
</tr>
<tr>
<td>Remote Control Type</td>
<td>ASTRO</td>
<td></td>
</tr>
<tr>
<td>TRC Input</td>
<td>Line 1</td>
<td></td>
</tr>
<tr>
<td>Outbound Analog Link Timer</td>
<td>120 sec</td>
<td></td>
</tr>
<tr>
<td>Comparator</td>
<td>NONE</td>
<td>OPTION</td>
</tr>
<tr>
<td>Fall Back in-Cabinet Repeat</td>
<td>ENABLED</td>
<td></td>
</tr>
<tr>
<td>Fall Back Timer</td>
<td>0 msec</td>
<td></td>
</tr>
<tr>
<td>Status Tone</td>
<td>ENABLED</td>
<td></td>
</tr>
<tr>
<td>Status Tone Frequency</td>
<td>2175 kHz</td>
<td></td>
</tr>
<tr>
<td>Wireline Squelch</td>
<td>DISABLED</td>
<td></td>
</tr>
<tr>
<td>Rx Security/ASTRO To Wireline</td>
<td>ENABLED</td>
<td></td>
</tr>
<tr>
<td>Equalization</td>
<td>DISABLED</td>
<td></td>
</tr>
</tbody>
</table>

F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 EXIT

**Step 3.** Access the 6809 Trunking Interface Screen.

**Step 4.** Set the Modulation Type to **ANALOG**.

<table>
<thead>
<tr>
<th>MOTOROLA RADIO SERVICE SOFTWARE</th>
<th>Use Up/Dn Arrow Keys To Select RSTAT Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASE: STATION PRODUCTS</td>
<td></td>
</tr>
<tr>
<td>VER:XX.XX.XX</td>
<td></td>
</tr>
<tr>
<td>:CHANGE/VIEW/6809 TRUNKING</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RSTAT Mode</th>
<th>Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failsoft</td>
<td>DISABLED</td>
</tr>
<tr>
<td>Line TRC Encode</td>
<td>DISABLED</td>
</tr>
<tr>
<td>Failsoft Carrier Squelch</td>
<td>DISABLED</td>
</tr>
<tr>
<td>Dual CT Failsoft Only</td>
<td>DISABLED</td>
</tr>
<tr>
<td>Modulation Type</td>
<td>ANALOG</td>
</tr>
<tr>
<td>Trunking Tickle Source</td>
<td>TX DATA LINE</td>
</tr>
<tr>
<td>Trunking Tickle Source TOT</td>
<td>1 sec</td>
</tr>
<tr>
<td>CSC Logical Channel Number</td>
<td>1</td>
</tr>
<tr>
<td>Rx Discriminator Type</td>
<td>QUANTAR/MICOR</td>
</tr>
</tbody>
</table>

F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 EXIT

--- continued on next page ---
External Mode (continued)

Trunked (SMARTZONE or SMARTNET) Analog (continued)

Step 5. Connect a wire to pin 11 and pin 16 of System Connector #17 (located on the station backplane). To activate FBICR mode, an external circuit (customer-provided) must ground these pins.

Note When pins 11 and 16 are grounded, the station will enter FBICR operation. The station will ignore any wireline transmit activity, ignore the EXT PTT line, and assert the TSTAT line. While in FBICR mode, the station will transmit Failsoft beeps and the subscriber will give the Failsoft indication.

◆ End of Procedure ◆
External Mode (continued)

**Trunked (SMARTZONE or SMARTNET) ASTRO (CAI, VSEL)**
(Simulcast Systems Only)

**Step 1.** Access the Wireline Configuration Screen.

**Step 2.** Set the Fall Back In-Cabinet Repeat field to **DISABLED**.
(No Fall Back Timer setting is required.)

<table>
<thead>
<tr>
<th>MOTOROLA RADIO SERVICE SOFTWARE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASE STATION PRODUCTS</td>
</tr>
<tr>
<td>Page 1 of 2</td>
</tr>
<tr>
<td>VER:XX.XX.XX</td>
</tr>
<tr>
<td>CHANGE/VIEW/WIRELINE CONFIGURATION</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Use Up/Down Arrow Keys to Select Wireline Operation</th>
</tr>
</thead>
</table>

- **Wireline Operation**: 4 WIRE FULL DUPEX
- **Console Priority**: Disabled
- **Remote Control Type**: ASTRO
- **TRC Input**: Line 1
- **Outbound Analog Link Timer**: 120 sec
- **Comparator**: NONE

**Fall Back In-Cabinet Repeat**: **DISABLED**

- **Status Tone**: Enabled
- **Status Tone Frequency**: 2175 kHz
- **Wireline Squelch**: Disabled

- **Rx Securnet/ASTRO To Wireline Equalization**: Enabled

**F1** HELP **F2** **F3** **F4** **F5** **F6** **F7** **F8** **F9** **F10** EXIT

**Step 3.** Access the 6809 Trunking Interface Screen.

**Step 4.** Set the Modulation Type to **ASTRO** or **ANALOG**.

<table>
<thead>
<tr>
<th>MOTOROLA RADIO SERVICE SOFTWARE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASE STATION PRODUCTS</td>
</tr>
<tr>
<td>VER:XX.XX.XX</td>
</tr>
<tr>
<td>CHANGE/VIF:6809 TRUNKING</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Use Up/Do Arrow Keys to Select RSTAT Mode</th>
</tr>
</thead>
</table>

- **RSTAT Mode**: Normal
- **Failsoft**: Disabled
- **Line TRC Encode**: Disabled
- **Failsoft Carrier Squelch**: Disabled
- **Dual CT Failsoft Only**: Disabled
- **Modulation Type**: ASTRO

- **Trunking Tickle Source**: TX DATA LINE
- **Trunking Tickle Source TOI**: 1 sec
- **CSC Logical Channel Number**: 1
- **Rx Discriminator Type**: QUANTAR/MICOR

**F1** HELP **F2** **F3** **F4** **F5** **F6** **F7** **F8** **F9** **F10** EXIT

--- continued on next page ---
**External Mode**
(continued)

**Trunked (SMARTZONE or SMARTNET) ASTRO (CAI, VSEL)**
(continued)

**Step 5.** Connect a wire to pin 11 and pin 16 of System Connector #17 (located on the station backplane). To activate FBICR mode, an external circuit (customer-provided) must ground these pins.

---

**Note** When pins 11 and 16 are grounded, the station will enter FBICR operation. The station will ignore any wireline transmit activity, ignore the EXT PTT line, and assert the TSTAT line. While in FBICR mode, the station will transmit Failsoft beeps and the subscriber will give the Failsoft indication.

---

◆ End of Procedure ◆
1 OVERVIEW

The Main/Standby configuration allows two Quantar/Quantro stations to operate as a redundant pair. If the Main station should fail (due to hardware or software malfunction), the Standby station will immediately take over and provide service. Each station’s operating mode (Main or Standby) is determined by a setting made using the Radio Service Software (RSS).

Please note the following requirements/restrictions that are applicable to the Main/Standby feature:

- Main/Standby feature is compatible with stations in Conventional systems only
- Main/Standby feature is not compatible with ASTRO signaling
- The station must be equipped with an 8-wire Wireline Interface Module and the Enhanced Wildcard Option
2 ELECTRICAL CONNECTIONS

Install both stations (designating one as A and the other as B) as described in the appropriate functional base station manual. Make the wiring connections as shown in Figure 2 to allow Main/Standy operation.

**Hint**  Wiring connections between the two stations and with external equipment will be facilitated by using a standard telephone punch block. Figure 1 shows how to connect the stations and punch block.

![Diagram showing wiring connections between Station A and Station B through a punch block.]

*Figure 1.* Using Punch Block to Facilitate Wiring Connections
Figure 2. Wiring Connections for Main/Standby Configuration
SETTING WIRELINE IMPEDANCE JUMPERS

Set the impedance jumpers on the Wireline Interface Modules in Stations A and B as described in Table 1. Figure 3 shows the location of the jumpers.

Table 1. Wireline Impedance Jumpering for Main/Standby Operation

<table>
<thead>
<tr>
<th>STATION A</th>
<th>STATION B</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2–Wire Connection to Console</strong></td>
<td><strong>4–Wire Connection to Console</strong></td>
</tr>
<tr>
<td>Jumper in position 1 on T1001</td>
<td>Jumper in position 1 on T1000 and T1001</td>
</tr>
<tr>
<td>Jumper JU1010 in 2-wire position</td>
<td>Jumper JU1010 in 4-wire position</td>
</tr>
<tr>
<td>All jumpers removed (high impedance) on T1001</td>
<td>All jumpers removed (high impedance) on T1000 and T1001</td>
</tr>
<tr>
<td>Jumper JU1010 in 2-wire position</td>
<td>Jumper JU1010 in 4-wire position</td>
</tr>
</tbody>
</table>

Figure 3. Wiring Connections for Main/Standby Configuration

Note: All jumpers removed for high impedance input/output.
RSS PROGRAMMING

In order to enable the Main/Standby Feature, the following two tasks must be performed using the Quantar/Quatro Radio Service Software (RSS) program. (Refer to the RSS User’s Guide 68P81085E35 for details on performing the following tasks.)

**Step 1.** Connect a PC running the RSS program to one of the two stations and read the station codeplug.

**Step 2.** Access the Hardware Configuration screen and set the Main/Standby field for MAIN (for station designated as Main) or STANDBY (for station designated as standby) as shown in Figure 4.

**Step 3.** Perform all other RSS programming tasks to configure the station (as described in the RSS User’s Guide 68P81085E35).

**Step 4.** Access the Wildcard Configuration menu screen and select State/Action Configuration. Press F4 to set the WildCard Tables to their default values. This ensures that the tables for the Main/Standby Feature are programmed with the factory values. Note that any WildCard Tables that have been custom created by the customer will be deleted, and that any customization of the default tables will be returned to the factory default values. Re-enter these if the functions are still required for this installation.

**Step 5.** Save the codeplug to the station.

**Step 6.** Repeat Steps 1 thru 4 for the other station.

---

**Figure 4.** Making Main/Standby RSS Setting
5 MAIN/STANDBY OPERATION

Three Modes of Main/Standby Operation

The Main/Standby Feature offers three modes of switching from MAIN to STANDBY and from STANDBY to MAIN:

- **Automatic (or “Hot”) Switchover** — Whenever one of the modules fails in the MAIN station, the MAIN station will automatically set itself to STANDBY and will signal its companion station to set itself to MAIN. The MAIN station will not automatically switch to STANDBY unless it is connected to its companion station and the companion station has not indicated a failure mode. (To disable automatic switchover mode, refer to page 8.)

- **Tone Remote Control Switchover** — Sending function tone 4 to the stations will force the MAIN station to STANDBY mode and the STANDBY station to MAIN mode. Sending function tone 5 to the stations will force the MAIN station back to MAIN mode and the STANDBY station back to STANDBY mode. If either station has detected a module failure, neither switchover will occur. (To change the particular function tones that trigger these events, refer to 9.)

- **External Control Switchover** — An external control device may be connected to Input 2 on Connector #17 (located on backplane of both stations) to initiate a Main-to-Standby or a Standby-to-Main switchover to occur. Grounding this signal causes the MAIN station to go to STANDBY mode and the STANDBY station to go to MAIN mode. Pulling this signal high causes the STANDBY station to go to MAIN mode and the MAIN station to go to STANDBY mode.

Additional Functions Provided by the Main/Standby Feature

- **Antenna Relay Control** — When the MAIN station is operating in MAIN mode, the relay driven output 8 is energized. The use of this closure is left up to the user. Typically a user will use this closure to drive an external relay which connects the antenna to whichever station is operating in MAIN mode.

- **Status Request** — Utilizing TRC function tone 14, the console operator can request which station is in MAIN mode. One beep will be returned if the MAIN station is in MAIN mode and two beeps if the STANDBY station is in MAIN mode.

- **Reset** — Utilizing TRC function tone 15, both stations will reset.
6 CUSTOMIZING MAIN/STANDBY OPERATION

Default Operation

The Main/Standby Feature is implemented using the Radio Service Software (RSS) WildCard Feature. As shipped from the factory, the RSS contains 21 WildCard Tables for the Main station and 20 WildCard Tables for the Standby station. These tables contain default settings that define the basic operation of the Main/Standby Feature (i.e., control of Main and Standby status of two interconnected stations via pre-defined Tone Remote Control function tones to provide backup redundancy in the event of a station failure).

Customizing Main/Standby Operation

Although all of the Main/Standby WildCard Tables are user configurable (via the RSS), it is recommended that only the following functions be customized by the user. Follow the instructions in Chapter 11 of the RSS User’s Guide 68P81085E35 for details on modifying the WildCard Tables.

- Disable Automatic (Hot) Switchover — Delete WildCard Table 8 in both stations

<table>
<thead>
<tr>
<th>STATE CONDITION</th>
<th>MAIN/STANDBY 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>State AND Input 8</td>
</tr>
<tr>
<td>State</td>
<td>Cond</td>
</tr>
<tr>
<td>ACTION</td>
<td>INACTION</td>
</tr>
<tr>
<td>STANDBY</td>
<td>0</td>
</tr>
<tr>
<td>RX ML MUTE</td>
<td>1</td>
</tr>
<tr>
<td>CLR OUTPUT</td>
<td>2</td>
</tr>
<tr>
<td>CLR OUTPUT</td>
<td>3</td>
</tr>
<tr>
<td>WAIT</td>
<td>4</td>
</tr>
<tr>
<td>MRTI DISABLE</td>
<td>5</td>
</tr>
<tr>
<td>NULL</td>
<td>6</td>
</tr>
</tbody>
</table>

TABLE 8 OF 20
Select Alternate Function Tones to Activate Main/Standby Switchover (default is FT4 to switch, FT5 to switch back) — To modify the Function Tone that initiates the initial switch from Main to Standby, modify the TRC TONE entry in WildCard Table 19 in the MAIN station and WildCard Table 17 in the STANDBY station.

To modify the Function Tone that initiates the switch back from Standby to Main, modify the TRC TONE entry in WildCard Table 18 in the MAIN station and WildCard Table 18 in the STANDBY station.
- Select Alternate Function Tone to Initiate a Status Request (default is FT14)
• Select Alternate Function Tone to Initiate a Reset to Both Stations (default is FT15)
1 OVERVIEW

The Fast Keyup Feature allows Quantar and Quantro stations to be keyed up by an external device (such as a Data Controller) in approximately 12 milliseconds (Quantar VHF and Quantro UHF) or 10 milliseconds (all other stations). Note that normal keyup time using the station’s PTT input is approximately 50 msecs.

In order to implement this feature, three signals (TX Audio, RX Audio, and PTT) must be connected between the station and the external device. Also, an RSS parameter setting must be made to properly configure the feature’s operation. This manual provides step-by-step instructions for performing these tasks.

Note — The Fast Keyup Feature applies only to non-Simulcast, Analog Conventional stations.
ELECTRICAL CONNECTIONS

As shown in Figure 1, the following signals must be connected properly between the station and the external device:
- PTT
- TX Audio
- RX Audio

Additionally, there are two possible connection configurations — Direct Connection and Splatter Filter Connection. The Direct Connection configuration is chosen when the external device provides the required splatter filtering of the TX Audio signal. The Splatter Filter Connection configuration is chosen when the station’s internal splatter filter is to be utilized (no splatter filtering provided by the external device).

The following procedures describe how to make the signal connections for each type of connection configuration.

Figure 1. Fast Keyup Feature Wiring Diagram
Wiring Details for Direct Connection and Splatter Filter Configurations

**Step 1.** Connect the PTT signal from the external device to Connector #14 on the station backplane as shown below.

**Step 2.** Connect TX Audio (+) and (-) from the external device to Connector #17 on the station backplane as shown below.

**Step 3.** Connect Aux RX Audio and GND from the station backplane Connector #17 to the external device as shown below.

---

**Direct Connection Configuration**

![Diagram of Direct Connection Configuration]

- **25-PIN D-TYPE CONNECTOR #14**
  - PTT: Pin 23

- **50-PIN TELCO CONNECTOR #17**
  - Gen TX Data: Pin 9
  - Gen TX Data +: Pin 34
  - Aux RX Audio: Pin 30
  - Station GND: Pin 7

---

**Splatter Filter Connection Configuration**

![Diagram of Splatter Filter Connection Configuration]

- **25-PIN D-TYPE CONNECTOR #14**
  - PTT: Pin 23

- **50-PIN TELCO CONNECTOR #17**
  - Aux TX Audio: Pin 5
  - Station GND: Pin 7
  - Aux RX Audio: Pin 30
  - Station GND: Pin 7
3 RSS PROGRAMMING

Using the Quantar/Quantradio Service Software (RSS) program (Version R09.05.00 or higher), make the following codeplug data changes to allow proper Fast Keyup operation. (Refer to the RSS User’s Guide 68P81085E35 for details on making codeplug programming changes.)

**Table 1.** Codeplug Data Changes for Fast Keyup Operation

<table>
<thead>
<tr>
<th>Codeplug Data Parameter</th>
<th>RSS User’s Guide Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set the Fast Key—Up parameter to WIDEBAND for Direct Connection configurations, or to AUX TX for Splatter Filter Connection configurations.</td>
<td>Programming the RF Configuration Data (p/o Chapter 4)</td>
</tr>
</tbody>
</table>

**Note** AUX TX selection is not compatible with MRTI.
FAST KEYUP PERFORMANCE CHARACTERISTICS

Figure 2 shows the performance characteristics of the station after implementing the Fast Keyup Feature.

Figure 2. Fast Keyup Performance Characteristics
DUAL CONTROL
OF GATED ACCESS
VIA TRC AND SAM
For Quantar and Quatro Stations
Servicing MCS Users

1 OVERVIEW

This section describes how to program the station (Quantar or Quatro) and the Station Access Module (SAM) to allow two functions (repeater setup/knockdown and “gated access” to be controlled (toggled on and off) by both of the following methods:

- Console Operator using TRC tones
- Subscriber Unit using DTMF or MDC 1200 signaling transmitted over the air

By utilizing the MCS Feature and controlling the repeater setup/knockdown and “gated access” functions, an effective “Mutual Aid” talk group configuration can be created. In this configuration, subscribers within a specific coverage area (local subscribers) are assigned a “primary” PL and have their MCS User Access field set to ENABLED. These subscribers will repeat as normal (assuming station is toggled to “repeater setup” mode). Should emergency conditions require other subscribers outside of the local area to enter the communications area, these subscribers will be able to communicate with each other (as well as local users) via the same local repeater if they have been assigned with a “secondary” PL and have their MCS User Access set to GATED. Additionally, the repeat mode (setup or knocked down) and gated access mode (enabled or disabled) may be controlled by both a console operator or a subscriber unit. (Note that Gated User Access is disabled upon station reset. Gated Access must be enabled via over-the-air transmissions to the SAM module, or via TRC tones from the console.)

The following table shows how the repeater access and “gated access” functions may be controlled to provide access to local and visiting subscribers. Refer also to Figure 1 (showing a typical repeater access call flow chart before Gated Access is employed), and Figure 2 (showing a repeater access call flow chart after Gated Access is incorporated).

<table>
<thead>
<tr>
<th>Gated Access</th>
<th>Repeater Up/Down</th>
<th>Subscriber Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enabled</td>
<td>Up</td>
<td>• Local subscribers (primary PL) will repeat.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Emergency subscribers (secondary PL and MCS User Access set to GATED) will repeat.</td>
</tr>
<tr>
<td>Enabled</td>
<td>Down</td>
<td>• No subscribers will repeat.</td>
</tr>
<tr>
<td>Disabled</td>
<td>Up</td>
<td>• Only local subscribers (primary PL) will repeat.</td>
</tr>
<tr>
<td>Disabled</td>
<td>Down</td>
<td>• No subscribers will repeat.</td>
</tr>
</tbody>
</table>

In order to perform the procedures in this section, you must program certain parameters in the Quantar or Quatro station and the Station Access Module (SAM). In order to do this, you will need the following software programs:

- RVN5002 Quantar/Quatro Radio Service Software (RSS) Version R09.05.00 or higher
- RVN4110 Station Access Module (SAM) Radio Service Software (RSS) Version R01.01 or higher
Call Flow Prerequisites

- MCS User Access is Enabled (but not Gated)
- Analog Rptr Activation RSS Parameter set to SC
- Local Subscribers are using "Primary" PL

Figure 1. Typical Call Flow Chart Without Gated Access Incorporated
Call Flow Prerequisites

- MCS User Access is set to “Gated”
- Analog Rpfr Activation RSS Parameter set to SC
- Emergency conditions exist, in which non-Local Subscribers are using “Secondary” PL

![Call Flow Chart]

*Figure 2.* Typical Call Flow Chart With Gated Access Incorporated
2 STATION RSS PROGRAMMING

In order to support dual control of gated access by TRC and SAM, certain station parameters must be programmed using the Quantar/Quantrio Radio Service Software (RSS) program (Version R09.05.00 or higher). (Refer to the RSS User’s Guide 88P81085E35 for details on making these settings.)

Step 1. Connect a PC running the Station RSS program to one of the two stations and read the station codeplug.

Step 2. Access the Hardware Configuration screen and set the Multi-Coded Squelch field to MULTI—PL ONLY to enable the Multi-Coded Squelch feature (as shown in Figure 3).

---

Figure 3. Making Multi-Coded Squelch RSS Setting

continued on next page
Step 3. Access Page 1 of the Channel Information screen and set the Analog Rptr Access field to MDC/TONE (as shown in Figure 4) to enable the Station Access Module (SAM).

![Figure 4. Making Analog Rptr Access RSS Setting](image)

Step 4. Access the RF Configuration Data screen and set the Repeater Operation field for REPEATER (as shown in Figure 5).

![Figure 5. Making Repeater Operation RSS Setting](image)

continued on next page
Step 5. Access the Multi-Coded Squelch screen, enter the desired number of users, then set the “secondary” PL’s User Access field to GATED (as shown in Figure 6). Refer to the RSS User’s Guide 88P81085E35 for details on setting up users in the Multi-Coded Squelch screen.

![Diagram](image)

**Figure 6.** Entering Users and Setting to Gated
Step 6. Access the TRC Commands screen and program tones FT3—FT6 (as shown in Figure 7). Refer to the RSS User’s Guide 68P81085E35 for details on programming the tones.

Figure 7. Programming TRC Tones FT3—FT6

◆ End of This Procedure ◆
3 SAM RSS PROGRAMMING

In order to support dual control of repeater access by TRC and SAM, certain SAM parameters must be programmed using the Station Access Module (SAM) Radio Service Software (RSS) program. (Refer to the SAM RSS User's Guide 68P80309E35 for details on performing the following tasks.)

Step 1. Connect a PC running the RSS program to the RSS port on the front panel of the SAM module and read the SAM codeplug.

Step 2. For DTMF operation, access Page 03 of the SAM Decoder Selection screen and program the TARGET and ACT TBL settings as shown in Figure 1. These settings establish the keypad sequences and corresponding Action Tables for Repeater Setup, Repeater Knockdown, Gated Access Enable and Gated Access Disable. Note that if there is default data already entered when opening the screen, overwrite the data with the data shown below.

![Screenshot of the SAM Decoder Selection screen]

**Figure 1.** Making DTMF SAM Decoder Selection RSS Settings

continued on next page
For MDC 1200 operation, access Page 02 of the SAM Decoder Selection screen and program the **OPCODE, ID**, and **ACT TBL** settings as shown in Figure 2. These settings establish the IDs and corresponding Action Tables for Repeater Setup, Repeater Knockdown, Gated Access Enable and Gated Access Disable. Note that if there is default data already entered when opening the screen, overwrite the data with the data shown below.

**Figure 2.** Making MDC 1200 SAM Decoder Selection RSS Settings

*continued on next page*
Step 3. Access the SAM Action Tables screen and program Tables 03 and 04 as shown in Figure 3. These Action Tables control the Gated Access functions (enabled and disabled). Note that if there is default data already entered when opening the tables, overwrite the data with the data shown on the facing page.

continued on next page
Setting Action Table 03 (Enable Gated Access)

Use UP/DOWN Arrows to Change Fields

Use arrow keys to toggle to 03.

Program Actions 01–03 as shown.

Setting Action Table 04 (Disable Gated Access)

Use UP/DOWN Arrows to Change Fields

Use arrow keys to toggle to 04.

Program Actions 01–04 as shown.

Figure 3. Programming the Action Tables for Gated Access Enable/Disable
Step 4. Access the SAM Action Tables screen and program Tables 06 and 07 as shown in Figure 4. These Action Tables control the Repeater Setup and Knockdown functions. Note that if there is default data already entered when opening the tables, overwrite the data with the data shown on the facing page.

◆ End of This Procedure ◆
### Setting Action Table 06 (Repeater Setup)

<table>
<thead>
<tr>
<th>ACTION TABLE</th>
<th>ACTION TABLE # 06 of xx</th>
</tr>
</thead>
<tbody>
<tr>
<td># ACTION</td>
<td>ADDRESS</td>
</tr>
<tr>
<td>01 MAN BIT</td>
<td>004C</td>
</tr>
<tr>
<td># ACTION</td>
<td>WAIT TIME</td>
</tr>
<tr>
<td>02 WAIT</td>
<td>100</td>
</tr>
<tr>
<td># ACTION</td>
<td>ADDRESS</td>
</tr>
<tr>
<td>03 MAN BIT</td>
<td>004C</td>
</tr>
<tr>
<td># ACTION</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td></td>
</tr>
</tbody>
</table>

Use arrow keys to toggle to 06.

Program Actions 01–03 as shown.

### Setting Action Table 07 (Repeater Knockdown)

<table>
<thead>
<tr>
<th>ACTION TABLE</th>
<th>ACTION TABLE # 07 of xx</th>
</tr>
</thead>
<tbody>
<tr>
<td># ACTION</td>
<td>ADDRESS</td>
</tr>
<tr>
<td>01 MAN BIT</td>
<td>004C</td>
</tr>
<tr>
<td># ACTION</td>
<td>WAIT TIME</td>
</tr>
<tr>
<td>02 WAIT</td>
<td>100</td>
</tr>
<tr>
<td># ACTION</td>
<td>ADDRESS</td>
</tr>
<tr>
<td>03 MAN BIT</td>
<td>004C</td>
</tr>
<tr>
<td># ACTION</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td></td>
</tr>
</tbody>
</table>

Use arrow keys to toggle to 07.

Program Actions 01–03 as shown.

*Figure 4.* Programming the Action Tables for Repeater Setup/Knockdown