# *TSAM™*
# *Transmitter Steering Unit*


## Introduction

The TSAM Transmitter Steering Unit extends radio system talk-out range using steered transmitters. Transmitter steering systems provide expanded coverage at a fraction of the cost of a simulcast system.

The TSAM Transmitter Steering Unit is compatible with:

- Motorola Digitac and Spectra-TAC Comparators
- M/A-Com / Ericsson /G.E. Voters.
- DHE Voters
- JPS Voters
- All major consoles.
- The MCN Monitoring and Control Network through TIB modules

## Features

- Smart-Steer or First Receive steering modes
- Programmable Steering Updates:
  - Start of Receive Message
  - End of Receive Message
  - Dynamic Mode for repeater operation updates on start of first transmission and then at the end of all transmissions
- Steered Transmitter Indication
- Manual Select Function
- Home Site Reverting
- Keying encoder for standard Tone Remote Control (TRC) or Positive Mode Control (PMC) keying tone sequences
- User programmable modes, timing, and home site
- Expandable to 64 sites
- Optional “Secondary” Operation

## Flexible Operation

All timing, mode, and tone parameters are user-programmable. This lets you custom tailor the operation to your system.

## Smart-Steer™ Selection Mode

Our proprietary Smart-Steer selection mode eliminates problems found in other types of transmitter steering systems.

Other transmitter steering systems select a transmit site based on the last voted site. They may mis-steer due to slow-squelching receivers, dual-level squelch systems, or variations in the voter cards. A slow-squelching receiver will be selected whether or not it has the best signal. Dual squelch receivers lengthen the squelch tail on weak signals. Conventional steering systems tend to pick the weaker signals since they have longer squelch tails. The alternative in a conventional steering system is to use a first receiver voted mode.

The Smart-Steer selection mode eliminates these problems by picking the site which was voted for the longest total time over a programmable period. The TSAM unit offers the benefits of a last-voted steering mode without the problems caused by slow-squelching and dual-level squelch receivers.

## Repeater Operation

When a TSAM steering unit is used in a repeater system, the End of Receive update mode is used. This selects the transmitter site at the end of a mobile transmission. For example, when mobile A stops transmitting, the talk-back transmitter is selected. When mobile B answers, his transmission is repeated over A's transmitter site. Likewise, when mobile A responds, his message is repeated on B's transmitter site. Thus, conversations can take place between mobiles or portables that are widely separated.

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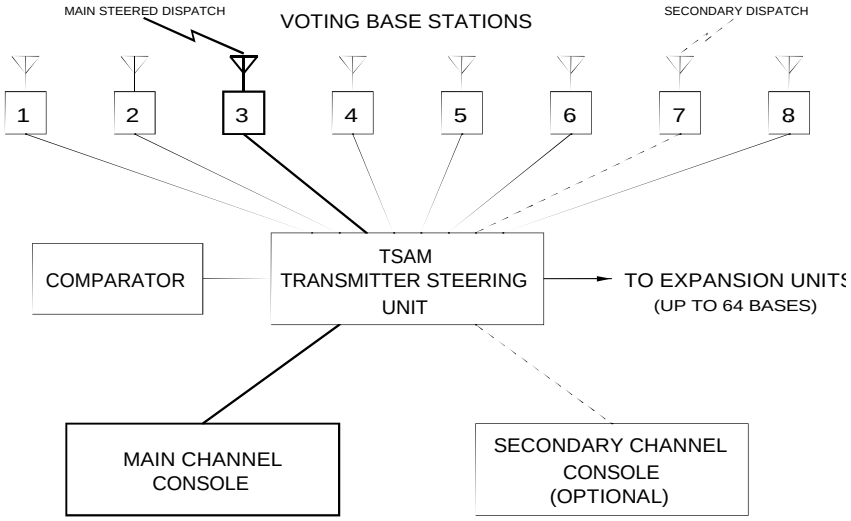


**Typical Transmitter Steering System**

### How the system works:

The TSAM unit works with standard voting receiver systems, consoles, and base stations. When a mobile or portable calls the dispatcher, the comparator selects the best receiver site. The TSAM unit uses vote indicate lines from the comparator to determine the best transmitter to use for the next transmission. The TSAM unit routes the transmit audio to the appropriate transmitter and provides a steered transmitter indication to the console.

### Home Site Revert

The TSAM unit can return the steered transmitter to a user-programmable home site after a period of system inactivity. The next transmission will be sent out over the home site.

### Manual Select

The dispatcher can use the Manual Select function for an initial transmission when a field unit is not in the home site coverage area. When the field unit responds, the system will steer to the proper site for the next transmission. The Manual Select function can be used to select the proper site when multiple units call in at the same time

### Optional Secondary Operation

The optional Secondary Operation function allows a steered base to be moved to a secondary channel for handling special details or tactical communications. The TSAM unit automatically disables the comparator, changes frequency of the base station, and re-routes transmit and receive audio to a secondary dispatch console. The secondary base operates completely independently from the main steered channel.

### General Specifications

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|---|---|
| Audio Outputs | (8) TX Audio, 600 Ohms Balanced<br>-30 to +3 dBm adj. |
| Audio Input | Console TX Audio, 600 / 10K Ohms Balanced,<br>-32 to +6 dBm adj. (3 ranges) |
| Freq Response | 300-3200 Hz +/- 2 dB |
| Hum & Noise | 50 dB below rated output |
| Distortion | less than 2% |
| Crosstalk | 55 dB below rated output |
| Tone resolution | Programmable in 1 Hz steps |
| Programming | RS-232 port, (requires dumb terminal) |
| Power | 20-30 VDC or 20-24 VAC 24 W Nominal |
| Control Inputs | (8) Vote Indicates, Force Select, Console PTT,<br>Coded/Clear, Repeat Disable |
| Input/Outputs | (8) TX Select (bidirectional) |
| I/O Connector | 50-pin Champ Male (Telco style) |
| Environmental | 0 to 95 degrees C,<br>10 to 95% RH, non condensing |
| Size | 19” rack mount, 3.5” high x 15.25” deep |
| Expandability | Units can be daisy-chained up to 8 units total<br>(Maximum 64 transmitters) |

### Secondary Option:

| | |
|---|---|
| Control Inputs | (6) Secondary Site Select (Binary)<br>(4) Secondary Freq. Select (Binary)<br>Secondary PTT & Coded/Clear<br>Reset All Sites, |
| Control Outputs | (8) Disable RX |
| Audio Inputs | (8) RX Audio, 600 / 10K Ohms<br>(1) Secondary TX Audio<br>Balanced, -32 to +6 dBm adj. (3 ranges) |
| Audio Outputs | (1) Secondary RX Audio, 600 Ohms<br>Balanced -30 to +3 dBm adj. |