

SeaChange® Tone+™ Digital Tone Solution

The SeaChange® Tone+™ Digital Tone Solution converts DTMF tones into both IP cue tone messages and SCTE-35 splice-in messages to support Transport Stream Insertion into digital networks. The Tone+ Digital Tone Solution also provides redundant tone delivery to protect against revenue loss resulting from missed tones. Monitoring at multiple points in the tone path enables quick and easy troubleshooting of tone problems.

The Tone+ Digital Tone Solution processes up to 48 channels of DTMF analog cue tones (expandable up to 96 channels) in real time. For each tone, the Tone+ Digital Tone Solution determines the Universal Time Code specifying the desired splice-in time and converts that data into SCTE-30 splice-in and IP cue messages. The IP messages are distributed to Spot™ digital ad inserters and the SCTE-30 messages are sent to tone injecting splicers instructing them to insert SCTE-35 messages into the program stream.

To reduce the risk of failed insertion due to missed tones, the Tone+ Digital Tone Solution requires at least one redundant receiver path for DTMF analog cue tones. This provides an additional set of tones so insertion can succeed even if a tone receiver or an entire receive site goes down.

How It Works

Up to 6 tones per channel are received via satellite dish and Wegener satellite receiver and fed into the Master Tone Interface (MTI). The MTI converts the tones from DTMF to serial format and passes them to the Tone Injector.

The Tone Injector communicates with the Spot™ system (including the Spot database and ad inserters) and the tone injecting splicers via an IP network. From the Spot system, it receives

information about which tones are in use on which channels, and it stays in synch with the other Spot components and the tone injecting splicers via Network Time Protocol (NTP).

The Tone Injector creates the UTC splice-time stamp for each tone then converts the tone into an IP cue message which it distributes to the appropriate inserters via UDP multicast. It also converts the tone into an SCTE-30 splice-in message which it passes to the tone injecting splicer via IP. The tone injecting splicer uses the SCTE-30 splice-in message to insert an SCTE-35 message into the program stream.

A second MTI and Tone Injector receive, time stamp, convert, and distribute another set of tones from the redundant tone receiver path. If the first Tone Injector is successfully connected to the tone injecting splicer, the SCTE-30 splice-in message generated by the Tone Injector in the redundant path will be ignored.

When all parts of the system are live and functioning properly, each ad inserter will receive two IP tone messages per DTMF tone, and the ad splicer will receive an SCTE-35 message in the program stream to trigger insertion. (More IP messages will be received if more than one redundant tone path is configured.)

Successful ad insertion occurs regardless of whether IP cues or an SCTE-35 message actually triggers it. And because all tones, whether IP or SCTE-35, that originated from the same DTMF analog cue tone carry the identical UTC splice-time stamp, insertion occurs at the correct time despite any network latency in message delivery.

Features

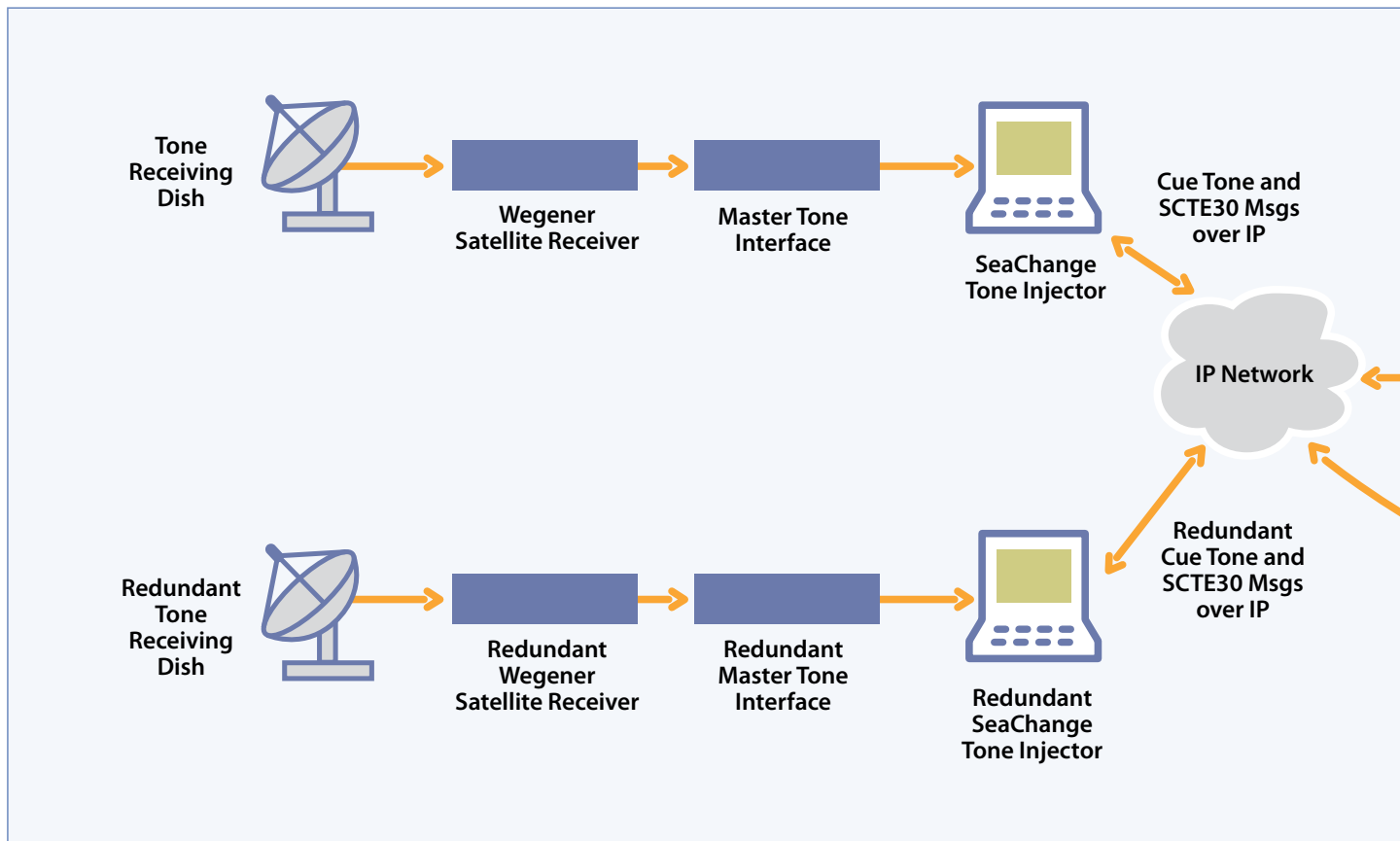
- Configurable tones
 - Define pre-roll and other delays
 - Choose IP, SCTE35, or both cue methods
- Remote monitoring and management
- NTP used to ensure time synchronization
- Integrated with the SeaChange alarms package through the Event Viewer
- Does not require static IP addresses
- Master Tone Interface
 - 48 ports, expandable to 96 by adding a second MTI
 - Each port supports six programmable tones and one contact closure and ground
 - Maximum of one channel per port
 - Supports up to 30 tones per frame
 - 56K baud connection to the IP network
- Tone Injector
 - JMR II 1RU chassis
 - Dual 10/100 Ethernet cards

Tone Monitoring and Troubleshooting

Tone status is monitored at the following critical points in the SeaChange Tone+ Digital Tone Solution:

- Serial tone received at the Tone Injector
- SCTE-30 message sent from the Tone Injector
- SCTE-30 message received at the tone injecting splicer
- IP tone sent from the Tone Injector
- IP tone received at the ad inserter
- SCTE-30 message from ad splicer received at ad inserter (indicates ad splicer detected an SCTE-35 message in the program stream)

Monitoring inputs and outputs at critical points makes it easy to troubleshoot whether a tone problem is due to an unresponsive piece of hardware (a device got an input but didn't generate an output) or a problem with the signal path between devices (device sent an output but no input was received).





Minimum System Requirements

- Microsoft® XP, Service Pack 2
- Spot System Software Version 4.6.1 or higher with NTP version 4.20 or higher
- 100 MB network; full duplex
- Minimum two (2) Master Tone Interfaces (supports up to 48 channels and two tone receiver paths)
- Minimum two (2) Tone Injectors (supports up to 48 channels and two tone receiver paths)

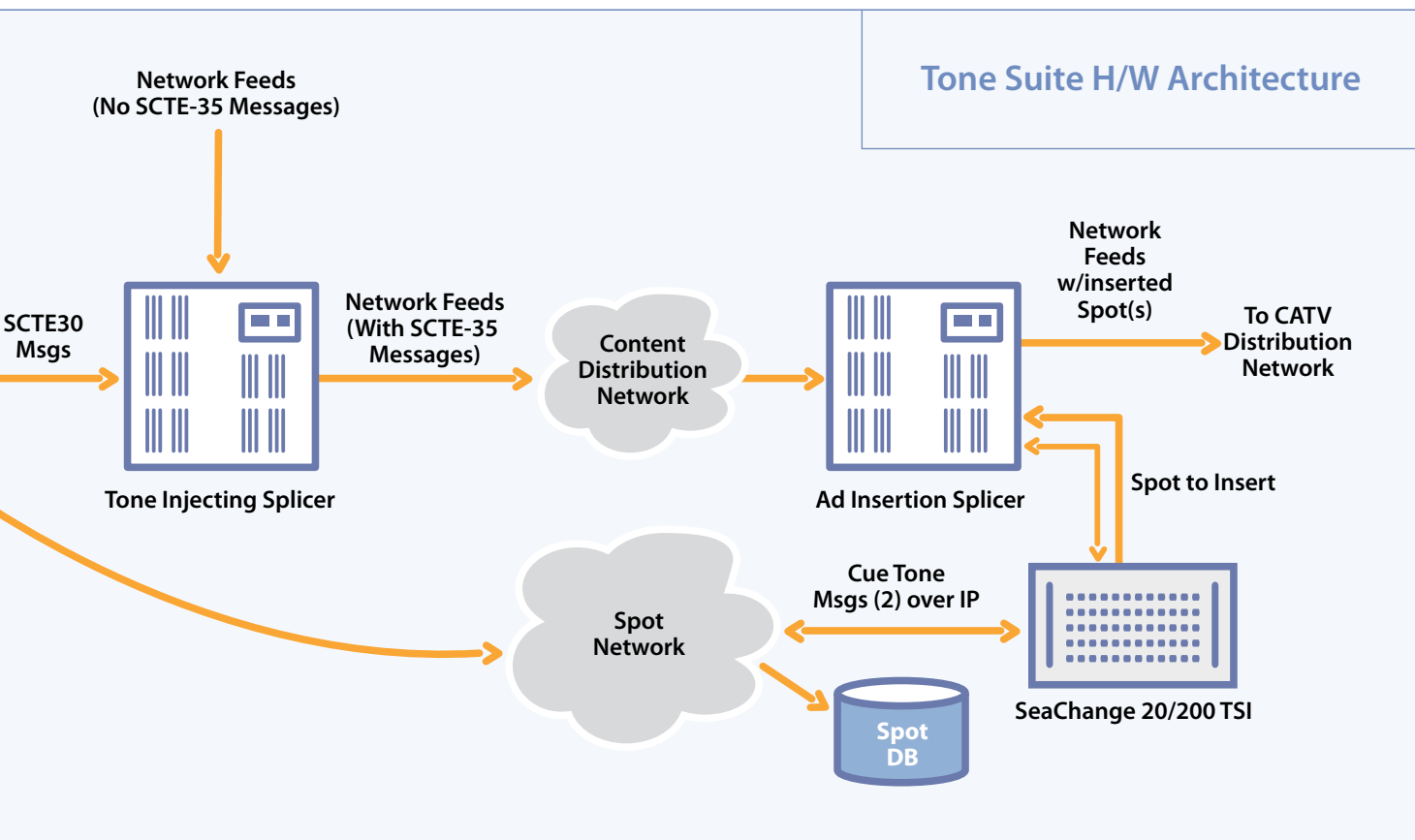
Compatibility

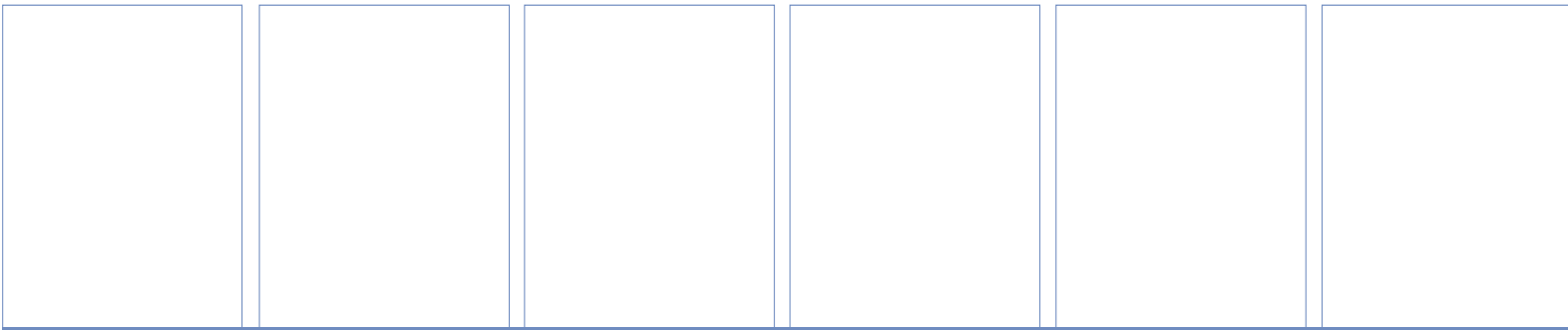
The Tone+ Digital Tone Solution is fully compatible with the following:

- Terayon Cherrypicker® DM6400 splicers
- BigBand BMR®1200 splicers

Future Features

Future versions of the Tone+ Digital Tone Solution are planned to enable creation and distribution of SCTE-104 messages to support real-time encoders.





ORDERING INFORMATION

Part Number	Description
TLA-0131-00	SeaChange Tone+ Digital Tone Solution basic package (includes 2 MTIs, 2 Tone Injectors, and Tone+ Software)
To be determined	SeaChange Tone+ Digital Tone Solution Redundant Tone Path expansion package to add third tone receive path (or more) to basic package; each expansion package supports one additional receive path of up to 48 channels (includes 1 MTI, 1 Tone Injector; requires Basic Package)
FGA-0376-00	SeaChange Tone+ Digital Tone Solution Master Tone Interface (for expanding to 96 channels, requires one per tone receive path for a total of two MTIs per tone receive path)

About SeaChange®

SeaChange International™ provides digital video systems that are changing television. Its powerful server and software systems enable television operators to provide new on-demand services and to gain greater efficiencies in advertising and content delivery.

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