CENTRAL CASTING OF AUDIO PROGRAMS
Central casting is a cost effective approach to distributing programming to multiple locations. The challenge is to increase the listening audience and ad revenue by providing customized content to each location. Currently, customized audio broadcasts create/distribute separate channels or integrate media servers at each remote location with multiple devices for local ads, station identifiers, local traffic and weather. This adds cost and maintenance concerns, such as, the cost of distribution (satellite or terrestrial bandwidth) and maintaining additional pieces of equipment at each remote locations.

WEGENER offers an end-to-end solution that utilizes a single downlink device to receive live audio broadcasts, store audio programs and seamlessly combine them to play-out custom broadcasts. The iPump System includes Network Control, Content Management and iPump Media Servers.

This paper explores how the WEGENER iPump System is a cost effective, flexible solution for a central control audio broadcaster to offer basic automation, liners, spot verification, file delivery and time shifted programming to individual receive locations.
iPump Media Server

The iPump Media Server is an integrated digital satellite receiver, IP router, and multimedia server. It provides digital and analog audio outputs. Customized playlists, network control commands and audio programs transmitted to targeted iPump Media Servers can be stored directly to internal hard-drives, or output for live broadcast. The iPump Media Server uses the playlists and network commands to generate a ‘virtual audio channel’ from stored audio programs.

A virtual audio channel includes a collection of audio files and play-out schedule. Using the internal iPump’s system clock audio files are seamlessly combined and played on the dates and times scheduled (see Appendix for additional information). Repetitive broadcasts can be sent once and scheduled to play at a specific time, many times, or in a random sequence continuously. Updates, modifications and deletions to the playlists and stored audio files can be made by the central network operator without local intervention. Audio quality is maintained throughout the process as stored content is not re-encoded or re-compressed.

Key benefits of the iPump Virtual Channel are:
- Seamless blending of stored content for custom shows
- Flexible playback for station automation
- Selective updates around custom liners/voice tracks
- File delivery
- Automatic time zone shifted playback and ShowShifting™
- MicroCasting™
- Auto recovery from power outage
SEAMLESS BLENDING OF STORED CONTENT FOR CUSTOM SHOWS
Auto fades and mixes in a variety of styles (including ‘cross fades’) make sure the listener hears a smooth broadcast. Stored files are saved in their original digital format from the satellite and can be replayed without degeneration of sound quality.

FLEXIBLE PLAYBACK FOR STATION AUTOMATION
For flexibility, the playlist that creates the Virtual Channel may have the time of playback attached as a date and time or a time only. The program plays on the day and time specified.

SELECTIVE UPDATE AROUND CUSTOM LINERS/VOICE TRACKS
The items contained in a playlist are the program names and the directory in which they are located. Any of the programs may be selectively updated at any time without changing the playlist, programs, custom liners or voice tracks.

For example, playlist “Week36_nightly_countdown” contains the following programs:

- Ad1.mpg
- Station_call.mpg
- nightly_countdown10_5.mpg
- Ad2.mpg
- Station_call.mpg
- nightly_countdown4_1.mpg
- Ad3.mpg

The files nightly_countdown10_5.mpg and nightly_countdown4_1.mpg could be updated each day while the rest of the files remain unchanged for the week.

AUTOMATIC TIME ZONE DELAY AND SHOWSHIFTING™
Control program play back - whether live or at the correct time in different time zones automatically. Time in the iPump is always based on the local time set in the unit. Thus, a program scheduled for 2:00:00 PM will play at that local time in each time zone.

Additionally, ShowShifting™ allows affiliates or the network operators to control when selected programs will play out of networked iPump® 6420 audio media servers. The
extremely flexible feature allows playback of key programs at multiple times and on different days.

FILE DELIVERY AND FILE SERVING
The iPump Media Server will receive and store data in any format. These data files are readily accessible on a local area network connection.

MICROCASTING™
The optional feature enables radio affiliates to receive and combine custom programming with local content and local automation schedules without a localized automation system. The network’s scheduling system is used for all affiliates, which allows the sequence definition to take a “rules-based” form and tailored to each affiliate’s needs.

AUTO RECOVERY FROM POWER OUTAGE
Since the unit contains non-volatile memory that retains the playlists of all channels, the selected channel will begin to play after a power outage at the correct time in the schedule without requiring operator intervention. This also holds for all time zone delay and ShowShifing operations.
NETWORK CONTROL AND CONTENT MANAGEMENT

Network Control is the backbone of central casting. WEGENER’s solution offers dynamic control over remote sites - enabling central operators to transmit regionalized playlists with unique advertising, programming and announcements. Operators can reduce operational expenses by eliminating separate remote servers, cue-ing devices and/or distributing multiple unique program streams. Figure 2, illustrates a national advertiser using one time slot to send different promotions to different regions of the US. Utilizing a WEGENER iPump network less money is spent on distributing and playout of the advertisements compared to traditional methods.

![Figure 2: Central casting regional commercials](image)

WEGENER’s COMPEL Network Control puts every receiver and uplink under an operator’s control with reliable, unparalleled flexibility. Features include:

- Control up to 10,000 groups of receivers
- Optional encryption
- Verified file delivery
- Content management
Each receiver group is a portion of a network that is commanded to perform specific functions simultaneously. Patented control logic allows the operator hundreds of combinations of groups, intersections and exclusions. For example, an operator can send commands to all west coast receivers or all west coast receivers excluding San Francisco. WEGENER has provided patented network control systems for over a decade and is commercially deployed in many audio and video networks. These networks range in size from a few hundred to tens of thousands sites.

WEGENER’s next generation of Network Control and Content Management extends functionality to individual audio asset files. This allows an operator total digital asset management in an end-to-end environment, supporting:

- Management of archived digital files with customized metadata tags
- Remote tracking of individual files on iPump Media Servers
- Remote updating or deleting of files on iPump Media Servers
- Targeting iPump groups, regions or individual sites with;
  - Custom liners/voice tracks
  - Custom show playlists
  - Time shifted programming
  - Digital files
- Background ‘healing’ function to ensure asset delivery

Total digital asset management adds flexibility to continually power dynamic broadcasts.
SUMMARY

Radio networks worldwide have used WEGENER equipment to deliver their message. For 25 years, WEGENER has continually brought innovative analog and digital solutions to the marketplace. These solutions include:

- The first stereo encoder for satellite networks
- PANDA™ audio processing system
- FM² subcarrier data receivers
- MPEG-2 satellite receivers
- Digital store and forward audio satellite receivers
- Real time command & control with flexible addressing network control systems

WEGENER’s iPump System is a cost effective, flexible solution for a central control audio broadcaster to offer basic automation, custom liners, file delivery and time shifted programming to individual receive locations.

Localization through robust central control enables new revenue models for medium and large audio broadcasters. WEGENER offers an end-to-end solution that utilizes a single downlink device to receive live audio broadcasts, store audio programs and seamlessly combine them to play-out custom broadcasts. The iPump System includes Network Control, Content Management and iPump Media Servers.
APPENDIX: HOW VIRTUAL AUDIO CHANNELS WORK

Figure 4 illustrates how the iPump Media Server translates a playlist into a virtual audio channel output stream.

The playlist Alpha (1) begins with the file segment01 located in directory program1 (2). It is scheduled to begin playing at 8:00 AM on October 15, 2005 (3). This program is 30 minutes long and is followed by segment02 which is 60 minutes long (4). The three spot ads (5), which don’t have times attached, will play sequentially after segment02. Then at 9:01 AM news_segment01 located in directory program2 will play (6). The diagram shows how the iPump Media Server (7) reads the playlist, then uses the file timing information to select the scheduled program from the iPump disk storage (8). The disk file output is then routed to the audio decoder.
APPENDIX: SPOT VERIFICATION

Through a combination of As-Run logs and Off Air Recording, Compel and the iPump 6420 allow a radio network operator to offer advertisers a high level of confidence in their ad play-out. These options require little or no labor at the affiliate-level.

The iPump 6420 logs every insertion of an ad that occurs over the live format. These log events then may be returned over the Internet to the network side, where they can be reconciled against the intended ad play-out schedule.

![Figure 5: Ad confirmation via file comparison](image)

Additionally, the iPump 6420 contains two independent software tunable AM/FM receivers, along with circuitry and software to allow a digital recording to be made of the current ‘off-air’ audio signal. These recorded segments may then be compressed and returned to the broadcaster to be compared with the expected playout, giving ultimate confidence that the scheduled programming and advertising played.
ABOUT WEGENER COMMUNICATIONS

WEGENER® (Wegener Communications, Inc.), a wholly-owned subsidiary of Wegener Corporation (Nasdaq: WGNR), is an international provider of digital video and audio solutions for broadcast television, radio, telco, private and cable networks. With over 30 years experience in optimizing point-to-multi-point multimedia distribution over satellite, fiber, and IP networks, WEGENER offers a comprehensive product line that handles the scheduling, management and delivery of media rich content to multiple devices, including video screens, computers and audio devices. WEGENER focuses on long- and short-term strategies for bandwidth savings, dynamic advertising, live events and affiliate management.

WEGENER’s product line includes: iPump® media servers for file-based and live broadcasts; Compel® Network Control and Compel® Conditional Access for dynamic command, monitoring and addressing of multi-site video, audio, and data networks; and the Unity® satellite media receivers for live radio and video broadcasts. Applications served include: digital signage, linear and file-based TV distribution, linear and file-based radio distribution, Nielsen rating information, broadcast news distribution, business music distribution, corporate communications, video and audio simulcasts.

WEGENER® can be reached at (770) 814-4000 or at www.wegener.com.

WEGENER
Johns Creek Technology Park
11350 Technology Circle
Duluth, Georgia 30097
USA

TEL: 770-814-4000
EMAIL: info@wegener.com
WEB: www.wegener.com

OPTIMIZING MEDIA DISTRIBUTION

WEGENER, COMPEL, COMPEL CONTROL, iPUMP, MEDIAPLAN, UNITY, ASSURED FILE DELIVERY, PANDA, PROSWITCH, VIDATA, the stylized W-design logo (for WEGENER®), the stylized C-design logo (for Compel®) and the stylized PANDA design logo are all registered trademarks of WEGENER®.
Specifications subject to change without notice ©2009 WEGENER. All Rights Reserved.