



Multi-Modal Communication

14 November 2011

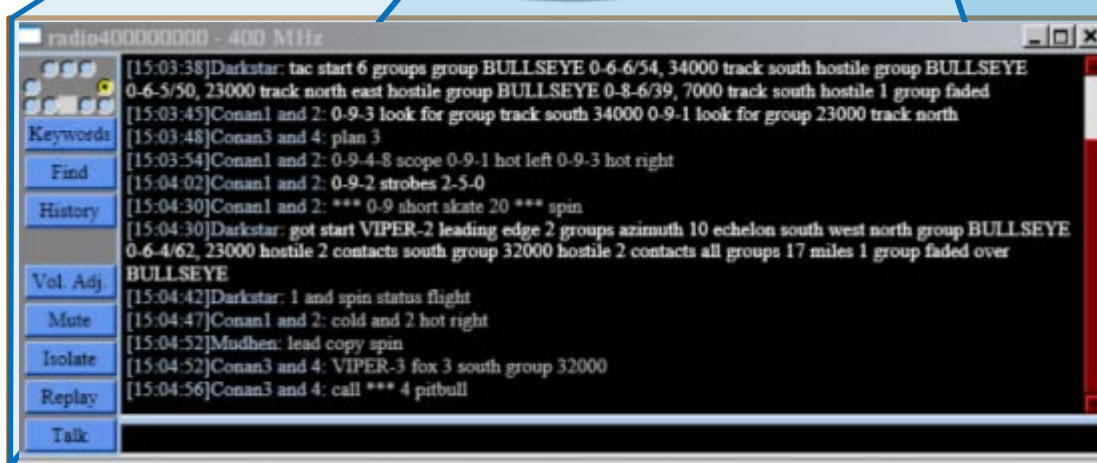
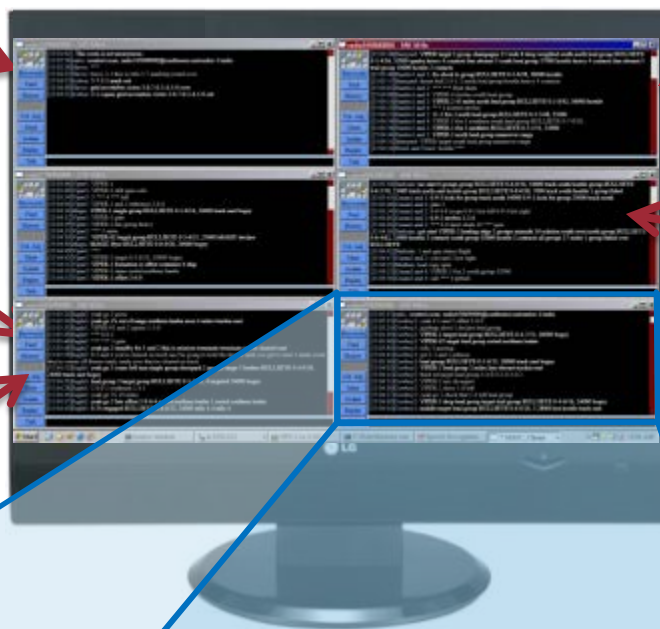
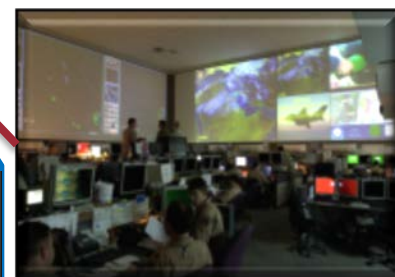


Victor S. Finomore, Jr., Ph.D.
Research Psychologist
Battlespace Acoustic Branch
Air Force Research Laboratory

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Multi-Modal Communication





Spatial Audio

- Spatializing communication into virtual locations increases intelligibility by 30 – 40% as well as reduces listener's perceived mental workload

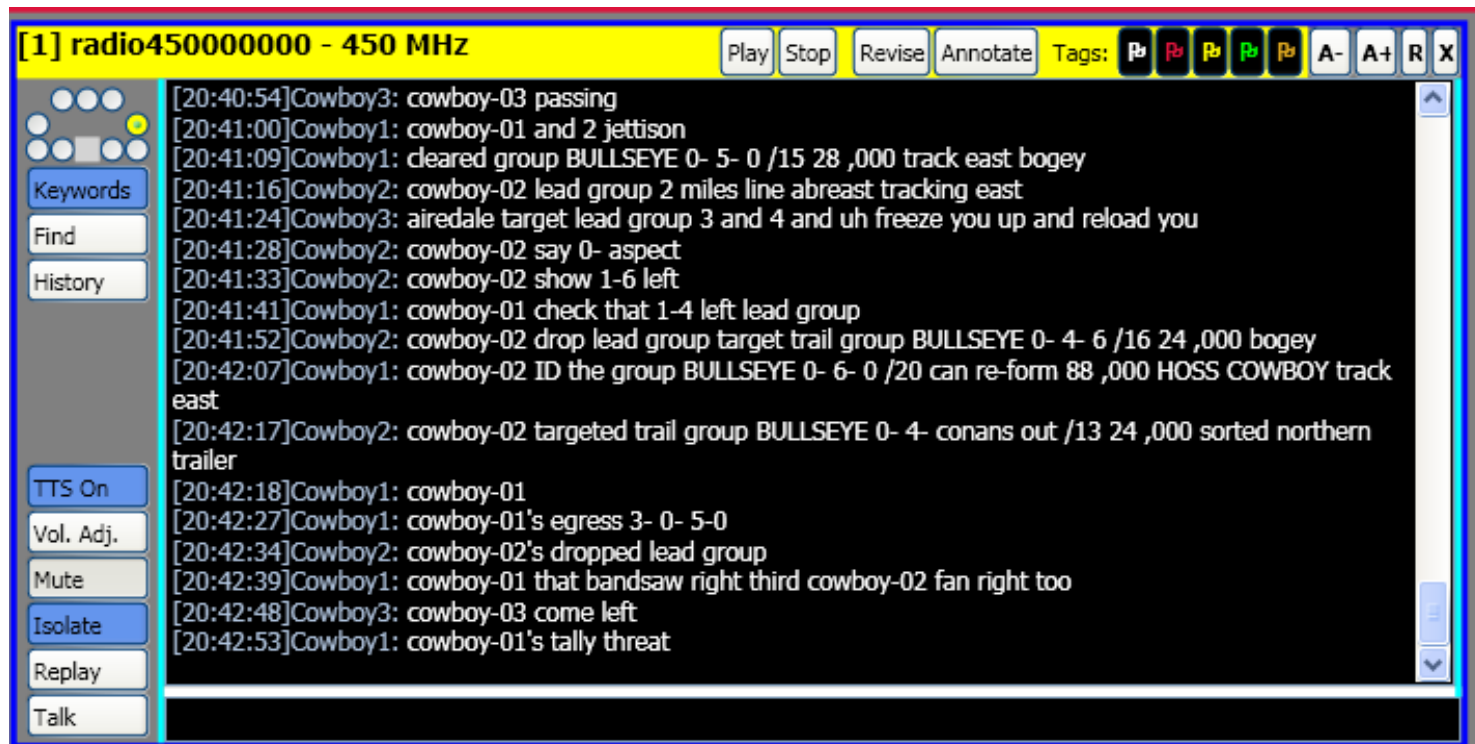




Capture and Display of Radio Messages



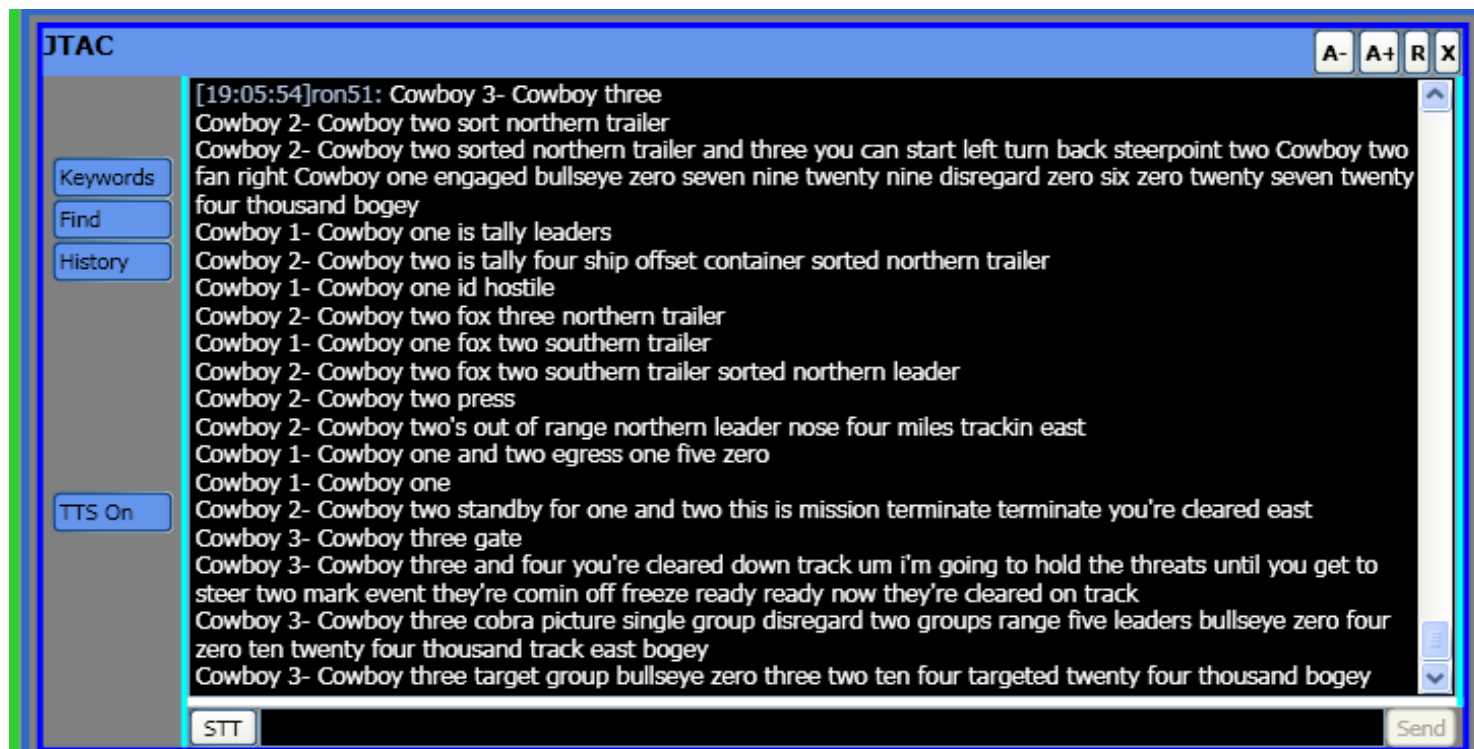
- Real-time speech-to-text transcription of radio messages
- Audio files are recorded and linked to transcription
 - Messages can be replayed in faster than real time
- Messages are timestamp





Text-Chat

- Sends and receives Chat messages
- Chat input via typing or speech-to-text (STT)
- Chat messages can be heard with text-to-speech (TTS)





Edit / Annotate Messages



- ASR is not 100% accurate
- Messages can be edited to reflect the correct information
- Text can be formatted to user's preference
- Ability to copy and paste
- Operators can leave notes to themselves for later review or debriefings

The screenshot displays two windows of a radio communication interface. The top window is titled 'radio450000000 - 450 MHz' and the bottom window is titled 'radio350000000 - 350 MHz'. Both windows have a toolbar with buttons: Play, Stop, Revise, Annotate, and a set of colored buttons (P, B, G, R, A, A+, R, X). Below the toolbar is a list of messages with timestamps and content. The messages are as follows:

radio450000000 - 450 MHz

- [17:12:13]Cowboy1: CONAN trail group BULLSEYE 0- 4- 0 /11 can target 0- 5- 0 /12 conan-04 ,000 track east bogey
- (R)[17:12:17]Cowboy3: cowboy-01 and 2
- [17:12:28]Cowboy2: cowboy-02 say aspect of the lead group track 0- 7- 0-1 and 2-1 conan-03's up and reload ship
- (R)[17:12:36]Cowboy3: cowboy-03 drop lead group gimbal airedale target
 - 1. cowboy-02 drop lead group gimbal airedale target
 - 0. cowboy-03 drop lead group gimbal airedale target
- [17:12:45]Cowboy3: cowboy-03 target trail group now BULLSEYE 0- 5- 5 /28 4 ,000
- cowboy-03 target trail group now BULLSEYE 0- 5- 5 /28 4 ,000
- [17:12:51]Cowboy1: cowboy-01 sorted northern trailer
- [17:13:02]Cowboy3: can a all target group BULLSEYE 0- 6- 5 /28 28 ,000
- [17:13:18]Cowboy3: cowboy-01 and 2 crackle
- [17:13:18]Cowboy1: cowboy-03's 10 miles power hud

radio350000000 - 350 MHz

- [17:14:59]: This room is not anonymous.
- [17:11:07]Rambo1 and 2: cowboy-01 in-place 90 left reference 2- 5- 5 BARNYARD bogey dope
- [17:11:18]Barnyard: CONAN 01 as group BRAA 2- 5- 5 /33 static out of 10 ,000 hostile heavy 4 contacts
- [17:11:25]Rambo1 and 2: rambos push
- (A)[17:11:27]Barnyard: BARNYARD
- [17:11:55]Barnyard: counter are 3- group champagne 15 wide 8 deep weighted south north lead group BULLSEYE 0- 5- 4 /36 32 ,000 spades heavy 4 contacts line abreast 3 cowboy-03 group 27 ,000 hostile heavy 4 contacts line abreast 5 trail group 10 ,000 hostile 2 contacts
- [17:12:03]Rambo1 and 2: rambo-02 group BULLSEYE 0- 5- 6 /38 36 ,000 hostile
- [17:12:13]Barnyard: cowboy-02 locked north lead group hostile heavy 4 contacts
- [17:12:20]Rambo1 and 2: rambos float skate
- [17:12:24]Rambo3 and 4: RAMBO 0- 4- strobes south lead group
- [17:12:33]Rambo1 and 2: cowboy-02 45 miles north lead group BULLSEYE 0- 5- 8 /42 36 ,000 hostile
- [17:12:41]Rambo1 and 2: rambo-02 45 miles north lead group BULLSEYE 0- 5- 8 /42 36 ,000



Accessing Information



- 'Find' function allows operators to search for specific words or phrases
- Flag lines of communication for easy retrieval
- 'History' goes to particular times

The screenshot displays a radio communication interface with two windows. The top window, titled "[3] radio300000000 - 300 MHz", shows a list of communication logs with timestamps and text. The bottom window, titled "[12] radio450000000 - 450 MHz", also shows a list of communication logs. The interface includes a top menu bar with tabs for JTAC, Tanker, AWACS, and Fighters. Below the menu bar are buttons for Play, Stop, Revise, Annotate, and Tags. The main display area shows a list of communication logs with timestamps and text. Red arrows point from the bullet points to specific features: the 'Find' button in the left sidebar, a line of communication in the log, and the 'History' button in the left sidebar.



Keyword

- User defined keywords are highlighted
- Counts number of messages since channel was last visited

The screenshot shows a radio monitoring interface with a yellow header bar displaying "[18] radio300000000 - 300 MHz". On the left side, there is a control panel with buttons for "Keywords", "Find", "History", "TTS On", "Vol. Adj.", "Mute", "Isolate", "Replay", and "Talk". The main display area shows a list of messages with timestamps and speaker identifiers. Keywords are highlighted in yellow and red. A red arrow points from the text "User defined keywords are highlighted" to the word "BULLSEYE" in the message "[20:35:03]Eagle3: eagle-03 target trail group now BULLSEYE 0- 5- 5 /28 24 ,000". Another red arrow points from the text "Counts number of messages since channel was last visited" to the number "18" in the header bar.

[18] radio300000000 - 300 MHz

[20:34:36]Eagle3: eagle-01 and 2 gate
[20:34:45]Eagle2: eagle-02 say aspect of the lead group track 0- 7- 0 want bandsaw 2 untargeted 0 02
[20:34:53]Eagle3: hud eagle-03 drop lead group gimbal cobra uh target
[20:35:03]Eagle3: eagle-03 target trail group now **BULLSEYE** 0- 5- 5 /28 24 ,000
[20:35:06]Eagle1: eagle-01 sorted northern trailer
[20:35:16]Eagle3: cobra targeted lead group **BULLSEYE** 0- 6- 5 /28 28 ,000 track east bogey
[20:35:21]Eagle3: eagle-01 and 2 shackle
[20:35:27]Eagle1: eagle-03's 10 miles power hud 30
[20:35:38]Eagle3: eagle-03's engaged **BULLSEYE** 0- 6- 2 /25 24 ,000 tally 2-4 tally 2
[20:35:41]Eagle1: eagle-01 and 2 cross turn
[20:35:47]Eagle3: eagle-03's ID hostile hostile
[20:35:52]Eagle2: eagle-02 fox-2 northern trailer
[20:35:58]Eagle3: eagle-03 fox southern trailer
[20:36:04]Eagle3: eagle-03's out east below 20
[20:36:12]Eagle3: eagle-03 this is mission terminate you're cleared out east
[20:36:15]Eagle1: eagle-01's ready
[20:36:19]Eagle1: eagle-01 you're cleared on track
[20:36:31]Eagle1: can 01 cobra-03 target 2- groups 0 /10 15 north group **BULLSEYE** 0- 1- 0 /15 22 ,000 track east bogey
[20:36:42]Eagle3: eagle-01 and 2 offset 2- 9- 0 south group **BULLSEYE** 0- 7- 5 /7 28 ,000 track east bogey



Multi-Modal Communication



Questions?

Victor S. Finomore

937-904-7123

victor.finomore@wpafb.af.mil