

## Intercom System Transfer Report

### **Introduction**

This system transfer report is created for the BTV 221 (Television Studio Operations and Maintenance Lab) class in Fall of 2006. The system reported on is the intercom system. The purpose of the intercom system project is to replace the old low-fidelity 48-volt carbon-microphone/earpiece intercom system with one based on donated RTS two-wire intercom system components.

### **Team Membership History**

I was a member of the intercom team from August 29, 2006 through Monday, October 16, 2006 when I was transferred to the monitor maintenance team. On Wednesday, September 20, 2006, I was made the guru/lead of the intercom team, a position which I held until being transferred out of that team.

### **Status As Received**

There had been some work done during the 2005-2006 school year on the intercom system. The existing carbon mic system had been improved with better headsets and by running intercom cable along the triaxes for the cameras. The program had received a donation of various components of the RTS two-wire intercom system. These components were being stored in the lab and the condition of many of the components was unknown.

One of the RTS master stations (powered by a 14VAC wall wart) had been installed in an equipment rack in the white/server room. A 50-wire cable had been run down to the lab apparently to connect that master station with another master station to be installed in the lab, and for system testing and development.

### **Changes to Concept or Direction**

We made some additions to the concept/direction, both at the start of the team's work this year, and once we had learned more about the RTS system and had assessed the condition of the donated components.

As long as we were basing our intercom system on such a flexible component system as the RTS two-wire system, we wanted to add the capability of a house intercom system that was independent of any production activities, like for communications between Steve and Joe, and between any major rooms assigned to the program (including a new storage room assigned to the program once the new Performing Arts building is built and the Drama department moves out of building 900).

We also were hoping to include in the system the inventoried wall-embedded user stations outside the front door of the studio and outside the door of the

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laboratory.

### **Accomplishments**

We accomplished a lot in a month and a half.

### ***Inventory***

We developed an inventory of donated components so we would know what was possible to design assuming that the components worked. We also read the manuals corresponding to the components we had that we knew worked; that helped us understand what we could do with the components.

### ***Test System***

We developed a test system with which to assess the condition of donated components. As a result, we expanded the test system as we learned how to hook up many of the components into a working intercom system. Working on a test system before designing and implementing the studio system made research and development work go faster since all of the components in the test system were on one or two benches in the lab, so it was easier to change components, integrate new components, and test components.

We tested many of the donated components and added a condition report for each tested component to the inventory. We retested components each time we learned significant new information about the capabilities of the RTS intercom system and had implemented those capabilities in our test system.

### ***System Design***

We designed an intercom system for production and general communications. We decided which components (master stations, user stations, belt packs) should be used by which production and administrative roles.

### ***System Implementation***

We began implementing the intercom system. We set up the following parts of the new intercom system.

### **Master Stations**

We installed master stations in the following locations:

- at the video switcher in the control room
- a (no speaker, no mic) master station in a rack in Steve's new desk

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- in the rack in the studio containing the lighting control console
- in the main equipment rack in the lab

We hooked them up, together with the existing master station in the white/server room, into one intercom system.

### **Camera ISO**

We installed camera ISO electronics unit in the racks in the camera engineering station. The camera ISO system was not hooked up to the operating portion of the new intercom system by the time I left the intercom team.

### **Wiring**

We ran 50-wire cables as follows:

- between the white room and the control room
- between the white room and the studio
- between the white room and the lab (reversing the existing cable for gender compatibility)

### **Program-built Components**

We took two power supplies that Joe built and integrated them into the system to power the master stations in the lab and the server/white room.

We worked on the design and implementation of a program-built equivalent of a source assign panel and break out panel. This work was greatly simplified by the find of an RTS source assign panel in the program's storage area after I had transferred out of the intercom team.

### **Future Vision**

There is still lots of work to be done on the intercom system.

### ***User Stations and Belt Packs***

Add user station into the VTR room. Add user station in Joe's office. Add hookups for belt packs for floor manager, floor director, control room guest.

### **Camera ISO**

Build 25-pin cable between source assign panel and camera ISO electronics.

Run the 25-pin cable between source assign panel and camera ISO electronics.

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See if the source assign panel recently discovered can replace the ISO electronics.

Hook up the 12-channel switcher to the ISO electronics. Choose a wall wart to power the ISO switcher and ISO electronics.

### **Wall-embedded User Stations**

Install tested wall-embedded user stations (clearcom units).

### **Source Assign Panel and Break Out Panel**

Figure out what the SAP we have provides us in functionality. Integrate SAP into the program's RTS intercom system. Finish building BOP and integrate that into the program's RTS intercom system.

### **Connecting Intercom Output to Audio Patch Panel**

Build adapters for incoming and outgoing intercom audio for audio console and hook other end of adapters to intercom system.

Build adapter for intercom audio and hook it up to audio patch panel so that intercom audio can go to a channel on the audio console.

### **Programming Master Stations**

Read the manual about programming master stations to discover what can be programmed and how.

Program the master stations for any features deemed useful.

## **Challenging Questions and Answers**

Question Answer

How many master stations can one system interconnect unit support? 4

Does a system interconnect unit have to be powered on for it to transfer intercom audio between connected master stations? No

Can system interconnects be connected to each other? Yes, through a 50-wire cable.

How many channels do the belt packs support? 2.

What unit chooses what channels (out of the 12 possible) are assigned to a particular belt pack? The source assign panel.

Can belt pack users listen to two channels simultaneously? Yes.

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What camera intercom interfaces do the ISO electronics support? Two-wire and four-wire.

What can you use to secure a loosely-fitting 50-pin connector? You can use a cable tie on the end of the connector plug that doesn't have a screw that screws into the jack. There are also rectangular metal blocks that screw into the center of the set of 4 jacks that help hold down the connector plugs.

What unit chooses what channels are assigned to the camera ISO electronics? The source assign panel.

On a master station, how can the internal speaker be disabled? Through a switch on the back panel of the master station.

Can the built-in gooseneck microphone be disabled on a master station? Yes, through a button on the front panel.

What external apparatus do all types of intercom stations (except one) accept? Headsets.

What type of intercom station doesn't accept a headset? The wall-embedded user stations.

To what component does the master station connect? A system interconnect.

Through what cable does a system interconnect connect to a RTS power supply? A 4-pin XLR.

Through what cable does the camera ISO electronics connect to the source assign panel? A 25-wire cable with DB-25 connectors on each end.

If you don't mind using only two channels on the camera ISO units, how do you connect the camera ISO system? Through a DB-25 connector hooked up to a 3-pin XLR connected to an XLR jack on a power supply (see the notebook of manuals for instructions on how to assemble such a cable).

How do the belt packs handle received audio on the two channels? One channel gets sent to one earpiece in the headset, the other channel gets sent to the other earpiece in the headset.

How does the audio console accept intercom input? Through the COMM IN XLR jack.

How does the audio console output to the intercom system? Through the talkback XLR jack.

## Recommendations for Training New Team Members

It's useful to read the Basic Intercom Applications Guide written by various employees of Telex/RTS if a new team member has no background in intercom systems.

## **Apprentice Assessment**

Submitted separately in e-mail.