On-Air Operations

THE CUTTING EDGE
WMUL
88.1 FM
MARSHALL UNIVERSITY

Volume II of The WMUL-FM Operations Manual

On-Air Operations

Volume II of The WMUL-FM Operations Manual

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For Students, Staff, Faculty, and Community Volunteers Participating
in the Operation and Programming of Radio Station
WMUL-FM 88.1 MHz

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Huntington, West Virginia 25755-2635
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January 2021 Edition

Dedicated to Reginald Fessenden and the other
pioneers of radio as a mass medium.

"Knowledge is of two kinds. We know a subject ourselves,
or we know where we can find information upon it."

— Samuel Johnson

Some glossary definitions (Part G) are taken from
Modern Radio Production: Production, Programming, and Performance
Tenth Edition
Hausman, Messere, Benoit, and O'Donnell

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JOHN MARSHALL
CHIEF JUSTICE OF THE UNITED STATES
1801 ~ 1835

6. Introduction to Volume II

Reader's Notes

The instructions for operating WMUL-FM are spread across several volumes. If you are new to WMUL-FM, this volume is the place to start. Parts 6-8 comprise the New DJ Guide. They cover the most important policies and technical information for your first DJ shift. Parts 9-12 cover the equipment in Studio A in detail.

Volume I - Policies and Station Organization covers the station's organizational structure and policies. The January 2021 edition is a 147-page document with a picture of someone playing keyboard on the cover.

Volume III - Computer Playback (Automation) Manual covers everything about the computer playback system. It covers both the on-air usage of the workstations in the studios and the behind the scenes usage of the auxiliary software. The January 2021 edition is a 121-page document with the picture of several vintage computers on the cover.

6.A. Using This Volume

If you are new to WMUL-FM, begin with Parts 6, 7, and 8: The New DJ Guide. Part 7 has the introductory instructions for the operation of WMUL-FM. This part is designed to help you get through your first DJ shift. More detailed instructions are in the parts that follow. Those instructions will help you become more proficient in the equipment. Part 8 covers keeping the logs.

Part 9 covers the equipment that every operator will use during a DJ shift. Part 10 covers equipment that only a subset of operators will use, including the digital router, delay box, and CD players. Part 11 covers the equipment and procedures for board-operating newscasts, sportscasts, and remotes. Part 12 provides technical details on the transmitter remote control, emergency alert system, digital router, and the transmitter. Part G is the glossary. It is identical to the one printed in Volumes I and III.

Please skim the entire volume to get an overall picture of how things work at WMUL-FM. Then go back and concentrate on the areas that apply to you. Do not try to learn every aspect of station operation at once, especially if you are new to WMUL-FM.

Reader's Notes

It is important not to go past something that you do not understand. Read it again. Ask questions. Much of what you do at WMUL-FM is built upon previous procedures. If your foundation is weak, the whole house could tumble down. In the case of WMUL-FM that can mean damaging very expensive equipment.

IMPORTANT

Do not press any button, turn any knob, or flip any switch unless you know exactly what will happen as a result of your action.

This manual covers all the procedures the on-air staff performs during a broadcast day. Staff members have varying degrees of experience and competence. This manual is written so that even a new staff member can come in and conduct the duties of an air shift with a minimum of confusion and a maximum of independence. Even with this manual, some staff members will require personal assistance. Do not feel bad if you do. There is no such thing as a dumb question.

Before doing your first shift at WMUL-FM, the Training Coordinator or a training staffer will show you everything you need to know to get started on the air. You have the right and the responsibility to insist on proper training. Make certain the person who is training you has been authorized to train new personnel by the Training Coordinator. Ask this person if the Training Coordinator has given this authorization.

If you are on a weekend shift, remember that your Format Producer may not train you. Insist on being trained by the Training Coordinator or training staffer. We have found that many staff members who have been trained by Format Producers or other general staff members demonstrate an inability to operate the station in a legal manner.

Electronic equipment is sometimes temperamental. A particular unit might develop little quirks. Its operation may require one to do something different than the procedure outlined here. If the Production Director and/or Training Coordinator should contradict the written word, follow their instructions. They will have the latest information.

Part 8 is a complete guide to keeping all the logs at WMUL-FM. Because one can find almost every log situation right here, poorly kept logs will not be tolerated. The Federal Communications Commission demands that our operational logs reflect the station's operation with 100 percent accuracy.

Reader's Notes

Please note that the use of the production equipment goes beyond the scope of this manual. Detailed instructions for doing production work may be obtained from the Production Director or Training Coordinator. Copies of the instruction manuals for equipment not covered here are available. Training on individual pieces of equipment is readily available to all staff members when they are ready to learn about them.

REMEMBER

You must be checked out by the Training Coordinator for each separate piece of equipment you wish to operate in Studio A.

You must be checked out by the Production Director for production studio equipment.

6.A.1. Before Your First Shift

Read through parts 7 and 8 before your first shift. (If your shift is during business hours, you can skip 7.C. Accessing the Station Outside Normal Business Hours.)

You do not need to know this material by heart. The Training Coordinator will cover everything you need to know. The more familiar you are with the material when you walk into the studio, the faster and easier the Training Coordinator can fill in the gaps.

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Welcome to the broadcast world of WMUL-FM, West Virginia's first public radio station and the leading collegiate radio station in the Mountain State. Since November 1, 1961, the day WMUL-FM went on the air, the station's dedicated staff has produced over five decades of innovative programming for Marshall University and the surrounding community.

The Marshall University Board of Governors is the licensee of WMUL-FM, which is operated by Marshall University students, faculty, staff and community volunteers. The station is on-air and online 24 hours a day, seven days a week with music, news, sports and informative programming.

I hope that you will become an active participant on the radio staff in bringing innovative programming to our university and community and the enjoyment of radio to your life.

Charles G. Bailey, Ed. D.
Professor of Radio-Television Production and Management
Professor of Sports Journalism
Faculty Manager of WMUL-FM

MARSHALL UNIVERSITY
A STATE UNIVERSITY OF WEST VIRGINIA

6.C. Greeting From the Student Board of Directors

Reader's Notes

Whether you are a broadcasting major hoping to someday work in professional radio or a student/community volunteer enjoying the unique activity afforded by WMUL-FM, we welcome you to the station. All of us on the Student Board of Directors hope that you'll grow to love the work that goes on here as much as we do.

Although WMUL-FM may be considered by some as "just" a college radio station, our organization is thoroughly professional. Sometimes it seems as if there are a lot of rules and regulations, but good reasons lie behind every condition that is placed upon your work at WMUL-FM. Here are a few:

1. It literally pays to be a professional. Most of the Student Board of Directors and many of the student volunteers plan on careers in broadcasting. The rigorous training at WMUL-FM has proved to serve us well. The people who do the hiring at professional stations have repeatedly told the Faculty Manager that many of the best trained employees they hire are former WMUL-FM staff members.
2. Legal constraints impose many of the regulations on us. If it is a Federal Communication Commission regulation, then it is the law. We must obey these laws or jeopardize our license. Everything you need to know to comply with FCC regulations, as they apply to WMUL-FM, is in this manual. Therefore, claims of "I didn't know that" are not acceptable when something goes wrong.
3. The equipment used at WMUL-FM (and at all radio stations) is expensive. Only trained operators may use it. The sound cards in the computer playback workstations, for example, cost more than most home computers. But if you are willing to learn, we are willing to teach you.
4. Sometimes common sense just is not enough, especially in radio. Switches and buttons often do things you would not expect them to do. The FCC may have a rule against saying your favorite expression over the air. The good news: you will not be expected to learn everything overnight. This manual will give you the information you need to know to get started at WMUL-FM. But you must read it, and continually refer to it.

Reader's Notes

We all started out at WMUL-FM knowing little about the station's operation. Today we produce award winning college radio. So can you. There is a learning curve, but as Dr. Bailey says, "This isn't rocket science!" Working at WMUL-FM has been fun for us. It can be fun for you, too. Enjoy!

6.D. A Brief Introduction to Policies

Reader's Notes

This chapter is included as part of the New DJ Guide. It briefly summarizes some of the critical policies you need to understand before your first DJ shift.

6.D.1. Indecency, Commercials

Start with the FCC policies on Indeceny, Commercial Announcements, Payola, and Plugola which are explained in the "FCC FAQ and Station Policy Sheet". You were given a stapled copy of this handout. A copy is also available in 4.A.3. Station and FCC Policy Sheet in Volume I. The four pages of the FCC FAQ cover the FCC's policies on indecency, commercial announcements, payola, and plugola.

TOO LONG / DIDN'T READ VERSION

Don't curse.

Don't tell people to buy something or to go to a business.

Expanded versions of these policies are available in the following locations in Volume I.

- **Indecency:** 4.C. Inappropriate Program Material Policy.
- **Payola, Plugola:** 4.B.7. Payola and Plugola
- **Commercial Announcements:** 4.B.4. Commercial Announcements

6.D.2. Station Identification

The complete version of this policy is in 4.B.1. Station Identification Policy in Volume I.

The FCC requires WMUL-FM to identify itself once an hour at the top of the hour. WMUL-FM policy requires the Legal ID (or station ID) to air between :58 and :04. E.G. The Legal ID for the 3 o'clock hour should air between 2:58 and 3:04. If this cannot be done, then the ID must be made "as close to the hour as feasible, at a natural break in program offerings."

The station ID cuts and rotators under the LID category are the proper way to do an identification. The Legal ID is automatically included in the computer playback system's playlist. The computer is programmed to re-sync at the top of the hour and play the Legal ID after the currently playing song ends.


THE HERD
5

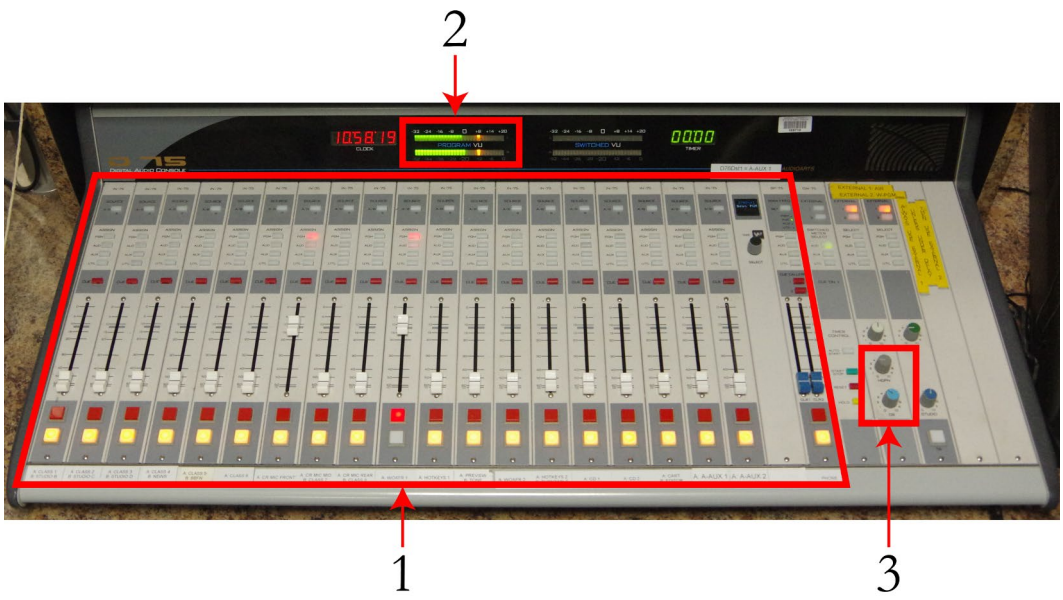
7. Introduction to Station Operations

Reader's Notes

7.A. Introduction to the Equipment

7.A.1. AudioArts D-75 Audio Console

The AudioArts D-75 console is the wide two-tone gray device with all the slide-faders, lights, and buttons. The audio console is covered in more detail later. 9.A. AudioArts D-75 Audio Console on Page 51.



Use the faders (1) to control the audio levels of everything played on-air. The two faders you will likely use for your first DJ shift are the microphone and the computer playback system. The main DJ microphone is labeled "CR Mic Front". It is the seventh (7th) fader from the left. The computer is labeled "RIVDELL 1". It is the tenth (10th) fader from the left.

You can control the volume of the speakers and headphones with two knobs on the right-hand side of the console (3). The knob for the speakers is labeled "CR" and the knob for the headphones is labeled "HDPN".

The VU meters (2) on the top of the console show the level of the audio going through the console. Adjust the faders up or down to keep the meters between -16 and 0 on the top scale.

Reader's Notes

7.A.2. On-Air Microphone

The microphone is the announcer's tool. Professionals know about different mic types, how they work, and most of all, how to talk into a mic for maximum effect and impact. Do not worry about all this yet. At WMUL-FM your job will be to turn the mic on and off so when you want your voice to go out over the air, it will and when you do not want your voice to go out over the air, it will not. Other skills will come to you as you get more experience.

The on-air microphone is controlled by channel #7-A on the D-75 console. Make certain that when you do speak you have the mic potted up to a level that shows between -16 and 0 on the VU meters. If you have never opened this mic before, start at the shaded gray mark(-12) on the fader. Once you begin using this mic, you will discover your correct level.

7.A.2.a. How to Operate the Microphone

Here is the best way to turn the microphone on so you can speak.

1. Put your headphones on near the end of the programming (song, PSA, etc.) after which you will be talking. Make certain the headphone volume knob on the right side of the D-75 console is turned up. It usually needs to be slightly louder than your normal listening volume. You want to make certain that it is loud enough for you to hear yourself through the headphones and not through your skull.
2. Make certain the yellow off button under channel #7 is illuminated and that the fader is all the way down at -∞ (minus infinity).
3. The mic is still off, so clear your throat now! Do this every time and you will not get phlegm in your throat while you are on the air.
4. Just before the end of the programming, press the red on button under channel #7. This mutes the monitor speakers so do not worry if you cannot hear the speakers. This is why you have on the headphones.
5. As the programming ends, slide fader #7 up to the level at which you usually work. If you forget the number, slide the fader to the shaded gray mark (-12). The microphone is live as soon as you begin fading it up.
6. Say what you want to say, then begin the next piece of programming.
7. As the programming begins, slide fader #7 all the way down. Press the yellow off button under channel #7.

Reader's Notes

Starting the mic at the -∞ position prevents an annoying rush of noise from the studio environment that would occur if the channel were already faded up when channel was turned on.

7.A.3. Computer Playback (Automation)

The majority of the recorded audio played over WMUL-FM plays through the computer automation system. The system WMUL-FM uses is called "Rivendell Radio Automation" or just "Rivendell".

This section introduces you to the computer playback. The instructions here are a quick introduction to the major parts you will need for your first DJ shift. Complete instructions are in Volume III - Computer Playback (Automation) Manual. Everything written in this section is repeated in 14. Computer Playback (Automation) - On-Air Operations. You will not miss anything if you decide to skip this section and go straight to part 14.

The instructions for off-air operations, such as ingesting new audio and creating special logs are in 15. Computer Playback (Automation) - "Behind the Scenes" Operations.

NOTE

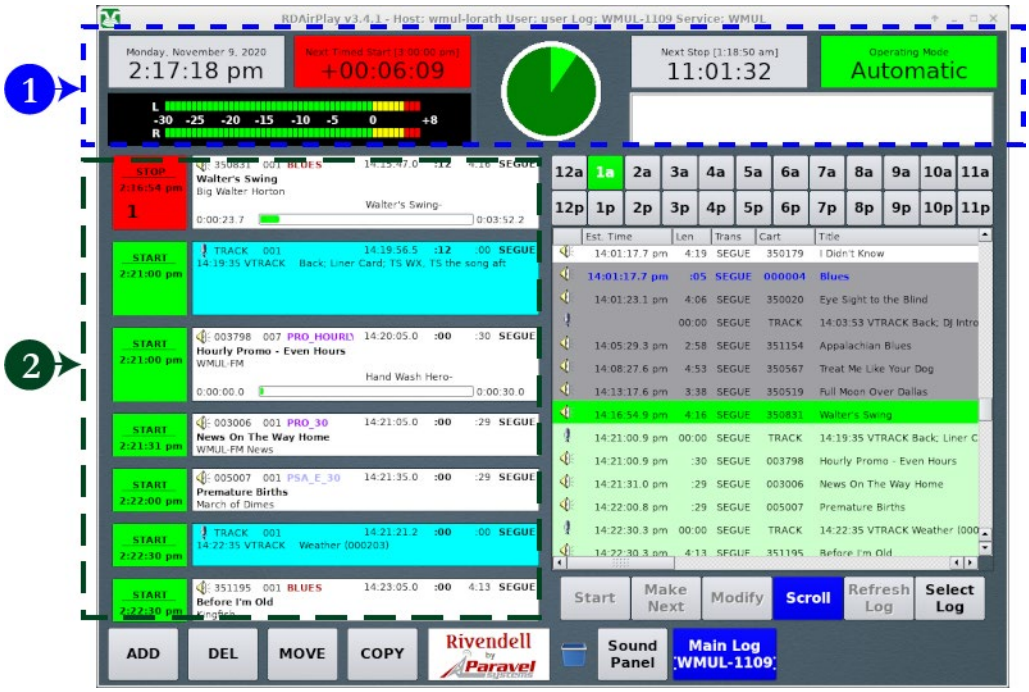
When On-Air or on the phone, never refer to the computer as "the automation". Say "computer", "computer player", or "music library".

When you say the word "automation", people hear "This is a six month old recording from three states away".

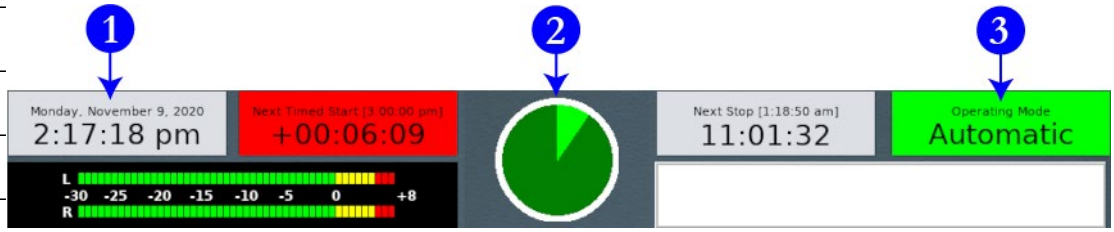
Reader's Notes

7.A.3.a. RD AirPlay

Most of the audio played through Rivendell plays through RD AirPlay. This module plays the songs from the log. Songs from RD AirPlay play through the "RIVDEL 1" channel on the board.



1. **Top Bar:** contains seven (7) widgets that describe the state of the log and of the song that is currently playing.
2. **Button Log:** shows the currently playing playing song (or the next scheduled song if the log is stopped), and the next six songs. A button allows each song to be started and stopped.



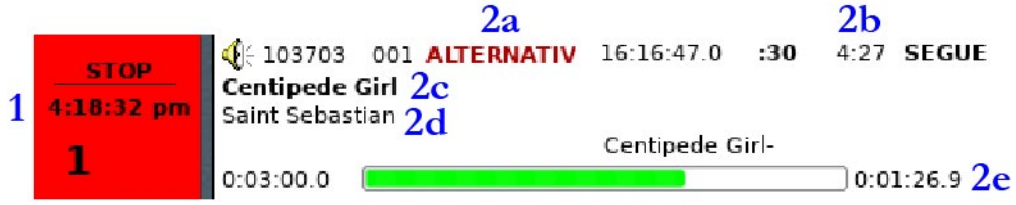
The top bar has seven (7) widgets that describe the state of the log and the song that is playing. Three will be covered here: (1) Wall Clock, (2) Pie Wedge, (3) Mode Indicator button.

Reader's Notes

1. **Wall Clock:** Displays the current date and time. Click it to toggle between 12-hour AM/PM time and 24-Hour time. Toggling the time display changes all the times displayed in RD AirPlay, not just the time displayed in the wall clock.
2. **Pie Wedge:** Displays a pie chart showing the amount of time remaining in the song. The time elapsed will be colored bright green and the time remaining will be colored dark green.
3. **Mode Indicator Button:** This widget displays the current automation mode. Click it to toggle among the modes. The three modes are "Automatic", "Manual", and "LiveAssist".
   - **Automatic:** In this mode, the system will keep playing until it hits a "Stop" transition.
   - **Manual:** In this mode, the system will stop after each song plays. It will remain stopped until you manually start another song.
   - **Live Assist:** WMUL-FM does not use this mode.

The Button Log widget takes up the left side of the window. It consists of seven (7) rows displaying the current song (or the next scheduled song when the log is stopped), and the next six (6) songs.

Each row of the button log has a start button to the left (1) and cart label



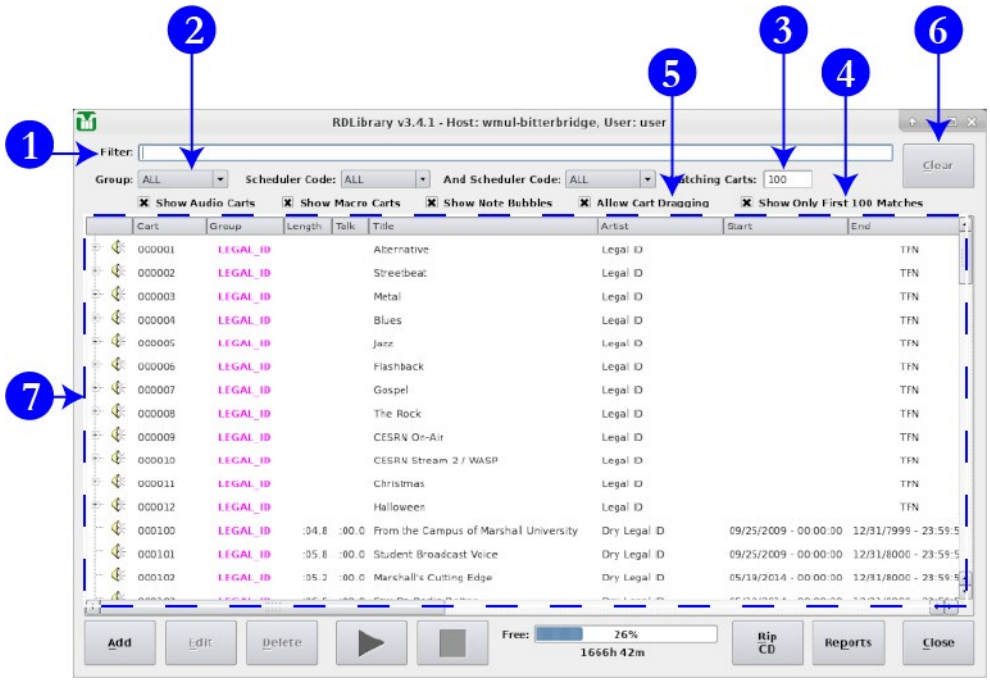
(2) to the right.

a. Group
b. Duration
c. Song Title
d. Artist
e. Time Remaining

Reader's Notes

7.A.3.b. RD Library

RD Library allows you to search and manage the library of carts. You can search for a specific song or just browse everything within a particular group or by a particular artist.



1. **Filter Bar:** Type here to search the library.
2. **Groups Box:** Use this box to search a particular Rivendell group or all groups.
3. **Matching Carts:** Displays a count of how many carts match the search. It will max out at 100 if "Show Only First 100 Matches" (4) is checked.
4. **Show Only First 100 Matches:** When this box is checked, RD Library will show only the first 100 matches. Checked is the default state for this control. It is recommended to keep this checked, because the search is greatly slowed down when this box is unchecked.
5. **Allow Cart Dragging:** Whether or not to allow carts to be dragged-and-dropped from RD Library into other modules such as RD AirPlay.
6. **Clear:** Clears the "Filter" field, while leaving all other search options alone.
7. **Search Results:** All the carts that match the search entered into the search fields.

Reader's Notes

7.A.3.c. Searching within RD Library

The library will match text in the search bar against artist, title, and several other metadata fields. The search results include partial and full matches in any of those fields.

Searching for "Queen" returns the artists "Queen", "Queensryche", and "Queens of the Stone Age", as well as the song "Dancing Queen", and many others.

While it is not possible to search just within a specific meta-data field, you may narrow the search to a specific group using the Group (2) field.

7.A.3.d. Editing the Log

> HELPFUL TIP!
>
> In the beginning, follow this guideline when editing the stack.
>
> Every time you add a song to the stack, delete another song from the stack.
>
> Following this guideline will help keep your program well scheduled.

7.A.3.e. Adding Songs to the Log

1. Use RD Library to find the song you want.
2. Make certain "Allow Cart Dragging" is checked in RD Library.
3. Select the song in RD Library.
4. Drag and drop it onto a cart label in the Button Log in RD AirPlay.
   The newly selected song will be inserted in that location. The song that you dropped it onto will be pushed down.

7.A.3.f. Removing Songs from the Log

1. Click the "Del" button. The button will begin blinking purple, the start buttons in the Button Log will turn purple and display "Delete?"
2. To delete a song from the Button Log, click the "Delete?" button.
   That song will be deleted and the "Del" button will return to its normal light gray.

Reader's Notes

7.A.3.g. Moving Songs in the Log

1. Click the "Move" button. The button will begin blinking purple and the start buttons in the Button Log will turn purple and display "Move?".
2. To select a song from the Button Log, click its purple "Move?" button.
3. The "Move" button will begin blinking yellow, the start buttons in the Button Log will turn yellow and display "To?".
4. To insert the song in the Button Log, click the "To?" button of a song. The song will be inserted in that location. The song that you clicked on will be pushed down.

7.A.3.h. The Full Log Widget

The Full Log widget on the right-hand side allows the user to view and edit the log. Part 14 in Volume III covers the Full Log completely. For now, just know that you can scroll through the log and see the songs that have played earlier and the songs that are scheduled later.

7.A.4. Music Selections for Webcasting

The station must not play, within a three-hour period, more than three selections by the same artist, and not more than two in a row.

The above policy is to comply with federal restrictions on the musical selections made by webcast stations such as WMUL-FM.

Use the Full Log widget to look at the hours before and after your program. Make certain that the artists you select will not cause WMUL-FM to violate the above rule. The computer will not prevent you from making this error. It is up to you to be aware of the artists that have played and the artists that are scheduled.

See 4.B.2. "Sound Recording Performance Complement" Policy in Volume I for complete details.

7.A.5. What to do if a song in the computer contains questionable material.

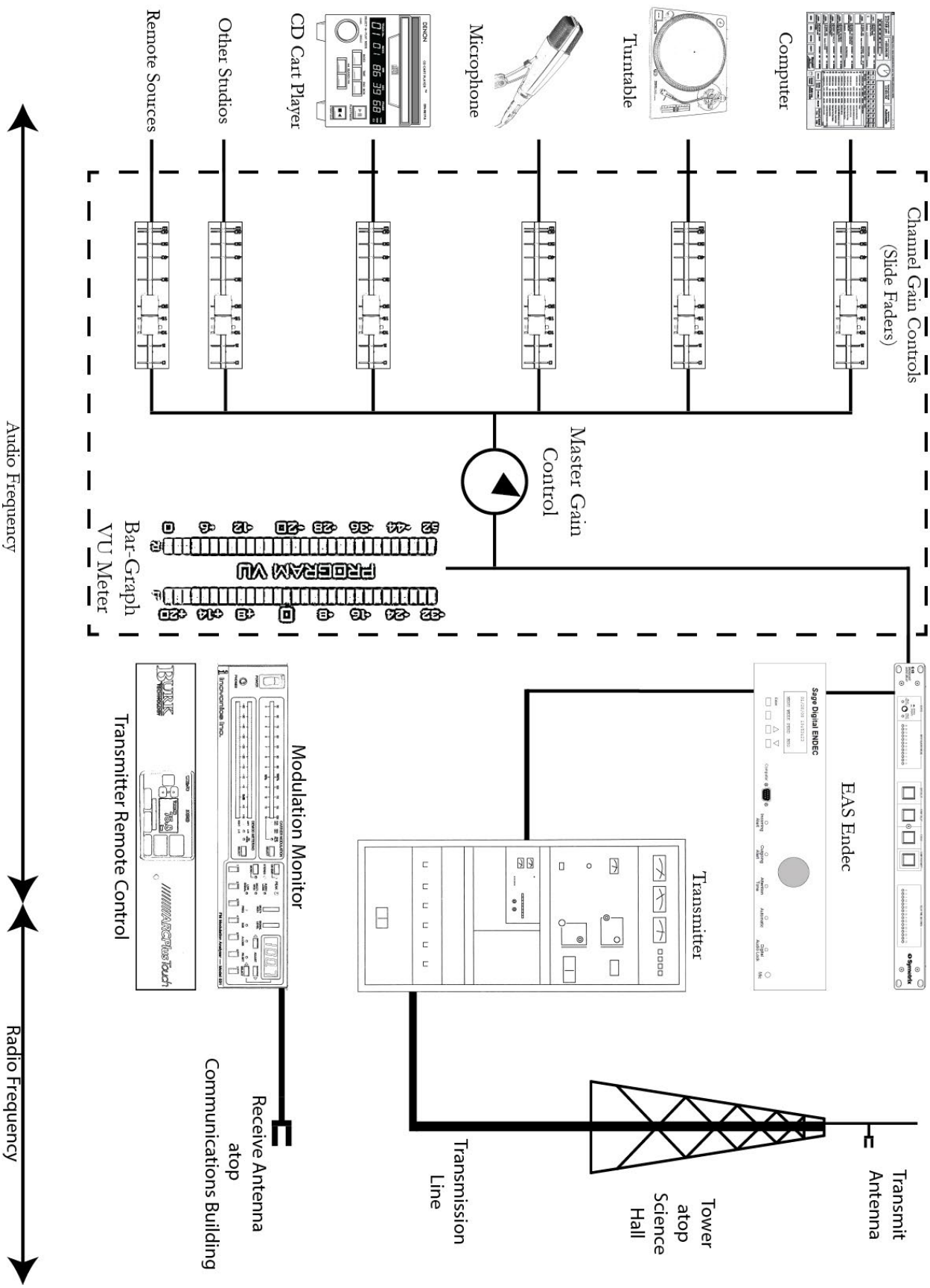
Reader's Notes

An ingestion clerk may occasionally miss something. If that happens, this is what to do.

1. Skip to the next song. Do not draw attention to the event by apologizing.
2. Get in contact with the music director and let that person know what happened. If the music director is unavailable, contact any other director.
3. If you cannot reach any director:
    a. Copy the song from the computer and put it in the music director's folder on the Z: drive. Give it a name that includes the words "DO NOT AIR" in all caps. 15.B.7. Exporting a Cut to a File in Volume III.
    b. Delete the song from the computer playback system so it cannot be played again until the music director reviews it. 15.B.8. Removing Audio in Volume III.

If you play a song that has been marked as clean, whether from the computer playback system or a CD, you are not at fault provided you follow the steps above.

7.B. Elements of Station WMUL-FM



7.C. Accessing the Station Outside Normal Business Hours

Reader's Notes

If your DJ shift is before or after regular business hours or during holidays, the station may be locked. After-hours access to the station is granted through electronic locks with swipe card access.

An authorized staff member can swipe that staffer's Marshall University ID card to access the station. A limited number of cards are available to be checked out to community volunteers.

The main doors to the station (CB 201, CB 202, and CB 204) are equipped for swipe card access. All DJs, all students enrolled in certain classes, and certain other staffers are added to the access list for these doors.

Access to Smith Hall is through the sliding glass doors on the bridge to the second floor, on the Old Main end of Smith Hall. The door is on a separate access list than the station doors. Directors, all students enrolled in certain classes, and after-hours operators are added to this access list.

You must have permission from the Student Manager to do a DJ shift. You cannot just go on the air whenever the notion strikes you. If you are doing your regularly scheduled air-shift, you need not get permission to go on air as scheduled.

7.C.1. Leaving the Station After Business Hours

If you are leaving the station after normal business hours, check around the station for other personnel. If no-one else is around, lock up the station.

1. Leave the doors to Studios A, B, C, and the Newscenter (CB 202A, B, C, and D) open. It keeps heat from building up. However, do turn off the lights in those rooms.
2. Close and lock the following doors, and turn off the lights in each room:
    a. Studio Hallway (CB 202)
    b. Classroom Studio (CB 201)
    c. Studio D (CB 200)
    d. Traffic (CB 203)
    e. Staff Room (CB 204)

Reader's Notes

7.D. Emergency Alert System

A complete explanation of the emergency alert system and its function at WMUL-FM can be found in 12.B. Emergency Alert System (EAS) on Page 130. The two key operations you may need to perform during your shift are the Daily EAS Receiver Check and the Required Weekly Test.

For instructions on the Daily EAS Receiver Check, see 8.C.2. How to Complete the Daily EAS Receiver Check on Page 34.

7.D.1. How to Send a Required Weekly Test

A version of these instructions is posted on the wall in Studio A.

1. Press the button under the word "WEEK".
2. Enter the password "1, 2, 3".
3. Press "PROCEED". The weekly EAS test will commence for about ten seconds. It consists of six digital blips, three of one sound and three shorter ones.
4. Resume scheduled programming. Audio will automatically resume its path from the console to the WMUL-FM transmitter.

7.E. Starting and Ending Your Shift

Reader's Notes

7.E.1. At the Start of Your Shift

Remember that you signed an agreement that you would arrive ten minutes before your shift begins. This is to give you enough time to prepare your music. Consistent lateness diminishes the quality of your program because you are scrambling to select music when your air shift starts.

1. Enter the studio quietly and begin selecting music for your shift.
2. At the top of the hour, sign on to the logs. Make certain the station ID plays from the computer playback system. For the next one or two hours you are in charge.
3. Do not talk immediately after the station ID or the outro of the program that preceded your shift. Go directly into a song.

You have the right to tell the person you are relieving to clean up any mess that person made and to put away all music or other program materials.

7.E.2 At the End of Your Shift

When your shift is ending, follow this procedure for a smooth transition.

1. Start putting your music and other program material away except for the last few selections. Do not expect the next person to clean up your mess.
2. Give your goodbye and go into a song. Do not go directly from you speaking into the station ID or a program intro.
3. Sign off the logs with your actual time off duty.
4. If it is after normal business hours (9 AM - 5 PM, Monday-Friday), check throughout the station for other staff members. If no-one else is around, lock up the station. 7.C.1. Leaving the Station After Business Hours on Page 19.

7.E.3. If Your Shift is Immediately Before or After a Special Program

Do not talk immediately before a program intro or after a program outro. The pattern is always.

DJ Talking ► Song(s) ► Program Intro (and/or Legal ID)

Program Outro (and/or Legal ID) ► Song(s) ► DJ Talking

Reader's Notes

7.F. Common Problems

7.F.1. In the Rare Event that You Do Not Hear the Station in the Studio Monitors

1. Make certain that there are levels on the audio console. No levels means nothing is playing.
2. Make certain that the yellow "off" buttons are illuminated at the bottom of all three microphone channels: "CR Mic Front"; "CR Mic Middle" and "CR Mic Rear".
3. Make certain that either "External 1" or "External 2" are selected on the board module with "CR-75" at the top.
4. Make certain that the "CR" knob is turned up to approximately "5".
5. Check the Modulation Monitor for levels. 9.E. Modulation Monitor on Page 71. If there are no levels on the Modulation Monitor, no audio is getting to the transmitter.
6. Check the router and patch panel. Make certain that Studio A is routed to the transmitter and that there are no patches sending something else to the transmitter. 10.A. Digital Router on Page 75 and 10.B. Patch Panel on Page 78.
7. If none of the above steps worked, you have an engineering emergency. Now you may call the Operations Manager.

Reader's Notes


WMUL-FM 88.1 MHz
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8. WMUL-FM's Operator Logs

Reader's Notes

All the logs kept at WMUL-FM will be error-free, either because the operator did it right the first time, or because the operator came in later to correct the errors.

Paperwork is part of any business. This is especially true of broadcasting because radio stations are federally licensed. Even if you are a volunteer working at a non-commercial, educational station such as WMUL-FM, you must abide by the same rules as professionals. If you learn the right way to keep the logs, the paperwork will take a small percentage of your air time. Experience has shown that correcting log errors - and they must be corrected - wastes more of YOUR time than getting it right from the start. Most log errors are the result of carelessness. The log error correction policy is posted inside Studio A and on the Traffic office door (CB 203).

The WMUL-FM logs were designed to meet the needs of the entire volunteer staff. Many of the staff do not anticipate a career in broadcasting and, therefore, find it difficult to keep complex records. The station has endeavored to make the logs as simple as possible while still collecting the needed data.

WMUL-FM utilizes two (2) Operator Logs. Each Operator completes these logs during each airshift. First, the Program / Announcer log provides a record of who was on the air and what type of programming the operator produced. Second, the Operations Log provides a record of transmitter power and the daily Emergency Alert System receiver check.

Every operator will use both of these logs during even the briefest of DJ shifts. There is a separate bundle for each day and the logs roll over at midnight. The logs can usually be found in the on-air studio. If you cannot locate the logs in Studio A, then look in the New Logs bin located in the studio hallway, adjacent to the Newscenter door. 8.I. Location and Description of the Logs Bins on Page 46.

Reader's Notes

The Operator Logs are on different colored paper for each day of the week.

- Monday - Green
- Tuesday - Gold
- Wednesday - White
- Thursday - Pink
- Friday - Canary Yellow
- Saturday - Blue
- Sunday - Purple

This section will have examples of each of the Operator Logs alongside a brief description. The section then explains how to complete the logs for the most common scenarios.

Each page of the Operator Logs has a standard header. The top left hand corner is the pre-printed day of the week. Top right hand corner is a space for the Traffic Director or operator to hand-write the date. Immediately below the date is the Eastern Standard Time / Eastern Daylight Time indicator. The Traffic Director or Operator should circle the appropriate entry.

8.A. Keeping the Logs at WMUL-FM

Reader's Notes

The first thing to do when you sit down in the studio is to check that the available logs are the ones for today. In addition to the color code described on the opposite page, the day of the week is printed in a large font in the upper left-hand corner of each page. The specific date is handwritten in the upper right-hand corner of each page.

If today's logs are not available in the studio, retrieve them from the New Logs bin. 8.I. Location and Description of the Logs Bins on Page 46.

Complete the headers of the pages you are using. Make certain the day, date, and the standard time / daylight time indication are filled out.

When completing the logs, always use a blue or black ballpoint pen. Pencils, markers, felt-tip or roller-ball pens, or ball-point pen colors other than blue or black are off limits and will result in a log error.

If you need to make a correction, the proper way to do this is to strike-through the incorrect entry with a single line, write the correct information right above or below, and then initial and date beside the correction.

When writing the time, always write AM or PM. to indicate the exact time because these logs cover an entire 24-hour day.

IMPORTANT

Never write a time-off duty before actually going off duty. This is "working ahead" of the logs and is a violation of station policy. You may sign your name ahead of time, but do not write a time until you actually go off duty.

NOTE

Nothing is to appear on the Program / Announcer, or Operations logs other than required information - no song requests, no doodles, no phone numbers, no filling in "o's".

Reader's Notes

8.B. The Program / Announcer Log

This log provides a record of the type of programming you produced during your shift. If the shift is a music program, write in the music format. If the shift was anything else, such as the news or a sporting event, write in the title of the program.

8.B.1. How to Complete The Program / Announcer Log

An entry on the Program / Announcer Log should consist of the two signatures (on and off), program start and end times, and the title of the program or music format. There should be one entry for each operator and program.

If you operate more than one program in a row, there should be a separate entry for each program. For example: if you operate "Sportsbuzz" and then "Sportsview", you would have a separate entry for each program.

If you board-op part of a program and then another person board-ops the other part, each of you will make an entry for your own segment. This situation often occurs with "Sportview". The program is divided into two 30-minute segments and each segment has its own individual board-operator.

WEDNESDAY _____ __, 20__

WMUL-FM 88.1 MHz
Marshall University Board of Governors
One John Marshall Drive
Huntington, WV 25755-2635
(304) 696-6640
Power: 1400 Watts Stereo

WMUL-FM

PROGRAM / ANNOUNCER LOG

(Circle One): EASTERN STANDARD TIME

EASTERN DAYLIGHT TIME

Sign On (or "cont")	Program Start (AM/PM)	Program Title / Music Format	Program End (AM/PM)	Sign Off (or "cont")

TO BE COMPLETED BY TRAFFIC DIRECTOR: Page: _____ of _____

Reader's Notes

8.B.2. How To Log a Single Program

1. Start at the far left hand column and sign on to the log.
2. Enter the exact time your program starts in the second (2nd) column. This time is when you actually take control of programming in the studio. If you are late for your program, the log should show this. If you begin your 11:00 a.m. program at 11:10 a.m. then the log should say "11:10 a.m.".
3. In the third (3rd) column, write in the name of the program or music format you are playing. In most cases, this entry will be the music format listed on the format sheet. Generally only non-musical programming will make an entry other than a music format. Do not use abbreviations or initialisms. Write out the full name of the format or program. Write "Alternative" not just "Alt". Write "Streetbeat" not just "SB".
4. When your program or shift is over write the end time of your program in the fourth (4th) column. Do not write this time in before the program or shift actually ends.
5. Sign off the log in the fifth (5) column.

Sign On (or "cont")	Program Start (AM/PM)	Program Title / Music Format	Program End (AM/PM)	Sign Off (or "cont")
A. Ba	11:00Am	Alternative	12:00pm	A. Ba

8.B.3. How To Log Multiple Programs

Reader's Notes

On rare occasions, one person board-operates more than one program in a row. One example would be a sports-night board-op who operates "Sportsbuzz" and then "Sportsview". When that happens, it is necessary to complete multiple lines of log.

1. Begin the first program the same way by signing on, writing the start time, program title, and end time.
2. In the sign off column, write the word "cont", short for continue.
3. On the next line, start with "cont" in the sign on column.
4. Finish the line for the second program, signing off in the last column.

Sign On (or "cont")	Program Start (AM/PM)	Program Title / Music Format	Program End (AM/PM)	Sign Off (or "cont")
A Bu	7:00pm	Sportsbuzz	8:00pm	cont
cont	8:00pm	Sportsview	8:30pm	A Bu

Reader's Notes

8.C. The Operations Log

This log provides a record of transmitter power output and of the EAS receiver. In the upper right hand side, below the date and time information, are two (2) lines for the daily EAS receiver check. In the center of the page are spaces for the transmitter meter readings. At the bottom of the page are spaces for the operators' signatures.

8.C.1. How to Complete the Operations Log

You will sign onto and off of the Operations Log at the beginning and end of you shift. The start and end times of your airshift will be accurately recorded. The times should match the start and end times on the Program / Announcer Log.

If you board-op more than one program consecutively, then the times should reflect the full time you were on duty. Operations time on must match the time the first program began. Operations time off must match the end time of the final program.

Take a transmitter meter reading every hour between :50 and :59 in the hour. You have a nine minute window to take and record the reading. If you run out of room on one page, sign both pages of the log. Sign off the first page with the time "cont" and sign on to the second page with the time "cont".

A Daily EAS Receiver Check must be completed at least once every day. The first operator of the calendar day is the first person responsible for the receiver check. If the first operator fails to complete the check, the duty falls to the next operator, and so on. Usually, the first operator of the day is the midnight operator. If the station has been operated in automatic mode since midnight, then the first operator will be the DJ who first signs onto the daily log.

WEDNESDAY _____ __, 20__

(Circle One): EASTERN STANDARD TIME EASTERN DAYLIGHT TIME

WMUL-FM 88.1 MHz
Marshall University Board of Governors
One John Marshall Drive
Huntington, WV 25755-2635
(304) 696-6640
Power: 1400 Watts Stereo

WMUL-FM
OPERATIONS LOG

Daily EAS
Receiver Check:
Time: _____
Initial: _____

Federal law requires this record. See FCC R&R 73.267

Exact Time	AM PM	Plate Voltage V	Plate Current A	Effective Radiated Power W	Remarks (Show any adjustment)	Xmit Room Temp (F)

Time On (AM/PM)	Sign On	Sign Off	Time Off (AM/PM)

TO BE COMPLETED BY TRAFFIC DIRECTOR: Page: O_____ of _____

Reader's Notes

8.C.2. How to Complete the Daily EAS Receiver Check

Look at the spot for the EAS Receiver Check at the beginning of your shift. If the check has not been completed, it now becomes your duty to complete it.

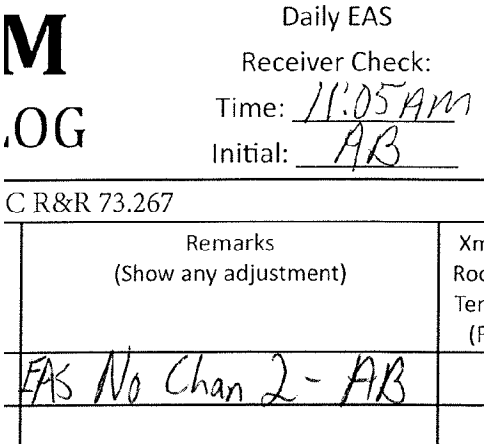
1. Go to the EAS receiver in Studio A. It is in the counter-top equipment rack on the left hand side of the console. The receiver consists of a series of LEDs, a speaker, channel knob, and volume knob.

   Context:

   Close-Up:

2. Rotate the channel knob to channel one (1) and turn up the volume knob. Country music from "The Dawg" should now be playing from the speaker.
3. Rotate the channel knob to channel two (2) and you should hear sports/talk programming from AM-930.
4. Rotate the channel knob to channel three (3) and you should hear the National Weather Service's robot reading the weather.
5. Turn down the volume knob.

6. If you heard all three (3) stations: write the time and initial at the EAS Receiver Check lines.
7. If one or more stations are silent: make a clear note of it in the "remarks" column of the operations log and initial the note. You will still write the time and initial the EAS Receiver check lines. The time and initial indicates that you DID the check. Your note in the remarks column indicates that the check had a problem.


M
.OG

Daily EAS
Receiver Check:
Time: 11:05 AM
Initial: AB

C R&R 73.267

Remarks (Show any adjustment)	Xm Roc Ter (F
EAS No Chan 2 - AB	

Reader's Notes

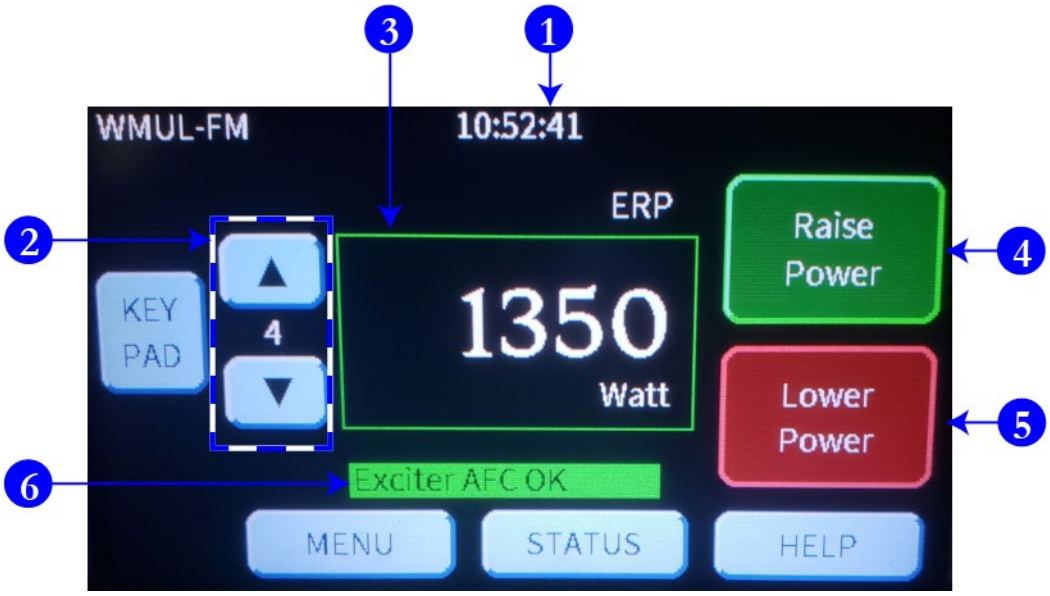
Reader's Notes

8.C.3. The Transmitter Remote Control

Meter readings are taken using the Transmitter Remote in Studio A. It is in the counter-top equipment rack on the right hand side of the console. It is above the CD players and below the Delay Box. The device displays several different channels of data about WMUL-FM's transmitter.

8.C.3.a. Remote Control Screen

Reader's Notes



1. Time (24 hr) [10:52:41]
2. Channel up / down buttons with channel number in between. [4]
3. Channel reading [ERP, 1350 Watt]
4. Raise Button
5. Lower Button
6. Channel Status [Exciter AFC OK]

Reader's Notes

8.C.4. How to Take a Transmitter Meter Reading

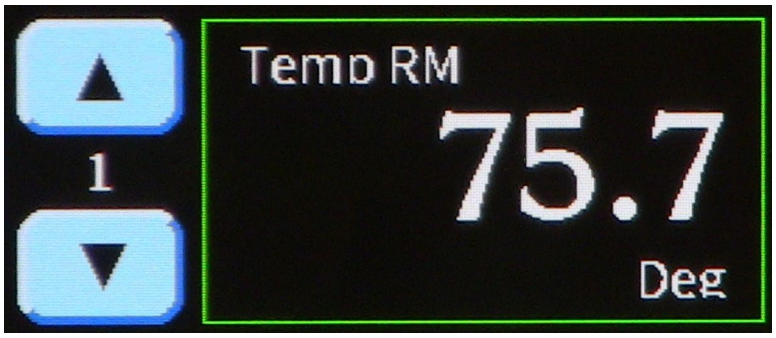
The majority of the page is used for meter readings. Meter readings are measurements about how much power WMUL-FM's transmitter is outputting. Station policy requires that meter readings be taken every hour, between :50 and :59 minutes into the hour.

Numbers in parentheses (2) refer to the labels on the pictures on the previous page.

1. If the screen is black, the unit is asleep. Touch anywhere on the screen to awaken it.
2. Write the current time on the log in the first column and either a.m. or p.m. in the next column. Remember that the remote control displays the time in 24 hr format. Use the clock on the console if you are not comfortable doing the conversion yourself.

Exact Time	AM PM	Plate Voltage V	Plate Current A	Effective Radiated Power W	Remarks (Show any adjustment)	Xmit Room Temp (F)
2:29	pm					

3. Using the "Channel Up / Down" buttons (2), scroll to Channel 1. This is labeled (3a) "Temp RM". Write the temperature in the final column, marked "Xmit Room Temp". Record the temperature to the nearest full degree.



Exact Time	AM PM	Plate Voltage V	Plate Current A	Effective Radiated Power W	Remarks (Show any adjustment)	Xmit Room Temp (F)
2:29	pm					76°

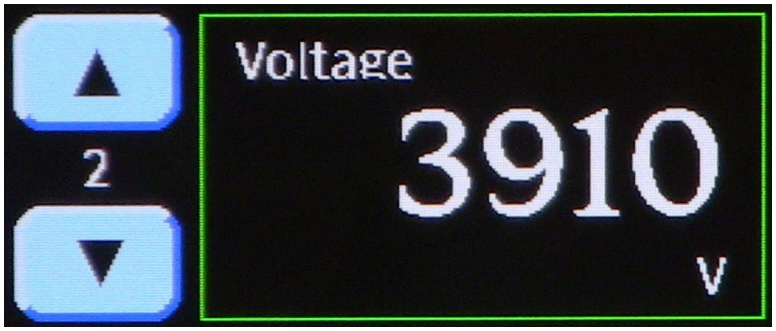
Reader's Notes

The temperature is critical if it goes above 90 degrees.

If that happens, contact the Operations Manager immediately!

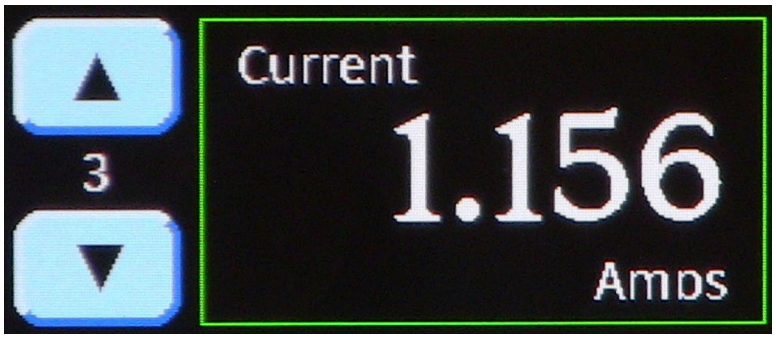
The Operations Manager's phone number is posted as part of the directors' contact information page. Copies of this page are posted on the wall in Studio A, on the door to the studio hallway, and next to the phone in the staff room.

4. Scroll to channel 2 - "Volts". Write the voltage in the third column, marked "Plate Voltage". Record the voltage to the nearest 10 volts.



Exact Time	AM PM	Plate Voltage V	Plate Current A	Effective Radiated Power W	Remarks (Show any adjustment)	Xmit Room Temp (F)
2:29	pm	3910				76°

5. Scroll to channel 3 - "Amps". Write the amps in the fourth column, marked "Plate Current". Record the amps to the nearest hundredth of an amp.



Exact Time	AM PM	Plate Voltage V	Plate Current A	Effective Radiated Power W	Remarks (Show any adjustment)	Xmit Room Temp (F)
2:29	pm	3910	1.16			76°

Reader's Notes

6. Scroll to channel 4 - "ERP". Write the ERP in the fifth column, marked "Effective Radiated Power".

Exact Time	AM PM	Plate Voltage V	Plate Current A	Effective Radiated Power W	Remarks (Show any adjustment)	Xmit Room Temp (F)
2:29	pm	3910	1.16	1392		76°

7. Compare the ERP to the limits of WMUL-FM's legal power. If the ERP is less than 1260, WMUL-FM's power is too low and needs to be raised. 8.C.5. How to Raise the Transmitter Power on Page 41. If the ERP is more than 1470, WMUL-FM's power is too high and needs to be lowered.
8.C.6. How to Lower the Transmitter Power on Page 41.

8.C.5. How to Raise the Transmitter Power

Reader's Notes

If WMUL-FM's ERP is less than 1260 watts, it is necessary to raise the power to bring WMUL-FM's transmitter back into legal operation.

1. Go back to the remote control and scroll to Channel 4, "ERP".
2. Press and hold the green "Raise Power" button for one second.
3. Wait for 5 seconds.
4. If the reading is still less than 1260, repeat the procedure from step 2.
5. Once the reading is more than 1260, and still less than 1470, take a new meter reading. Write "Raised Power" in the remarks column.

Exact Time	AM PM	Plate Voltage V	Plate Current A	Effective Radiated Power W	Remarks (Show any adjustment)	Xmit Room Temp (F)
2:50	pm	3950	1.03	1252		72
2:51	pm	3950	1.05	1276	Power too Low, Raised -ms	72

8.C.6. How to Lower the Transmitter Power

If WMUL-FM's ERP is more than 1470 watts, it is necessary to lower the power to bring WMUL-FM's transmitter back into legal operation.

1. Go back to the remote control and scroll to Channel 4, "ERP".
2. Press and hold the red "Lower Power" button for one second.
3. Wait for 5 seconds.
4. If the reading is still more than 1470, repeat the procedure from step 2.
5. Once the reading is less than 1470, and still more than 1260, take a new meter reading. Write "Lowered Power" in the remarks column.

Reader's Notes

8.D. Shows that Cross Midnight

If your show crosses midnight, there are a few things that you will do differently. You will sign the logs for both days. After you have finished signing off the previous logs, place the previous day's logs in the old logs bin. Retrieve the new day's logs from the new logs bin.

On the First Day's Log

Sign off of each page of the log. Do not put a time in the time-off spot. Instead of a time, write "cont" (short for "continue").

On the Second Day's Log

Sign on to the second day's logs with the time on "cont". Complete the rest of the logs as normal.

Example:

You have a show that runs from 11 PM Tuesday to 1 AM Wednesday.

Sign onto Tuesdays logs at 11:00 PM. Write your program name on the Program-Announcer Log. Do the 11:50 PM meter reading. Sign off of Tuesdays' logs with the time-off "cont".

Get Wednesday's log and sign on to each log with the time-on "cont". Write your program title on the program log. Do the 12:50 PM meter reading.

8.F. Logging Voice-Tracked Shows

If your program is voice-tracked, make a single entry on the Program / Announcer log. Write the time your program began and ended. Append " - VTK" to the end of the program title. E.G. "Alternative - VTK". Place this entry on the log as soon as reasonably practical after your voice-tracked program airs.
You don't have to rush into the station in the middle of the night, but the entry should generally be made within twenty-four (24) hours.

8.G. Logging Quick Reference

Reader's Notes

- Make certain that you are completing the correct day's log. Pay attention to the color code, the printed day-of-week, and the handwritten date.
- Make certain the header is complete on any page that you use.
- Use blue or black ball-point ink.
- Sign on and off with the exact begin and end time of your shift.
- When writing the time, always write AM or PM. These logs cover the entire 24-hour day.

Program / Announcer Log

- Write the full program title.
- One entry per program and announcer.

Operations Log

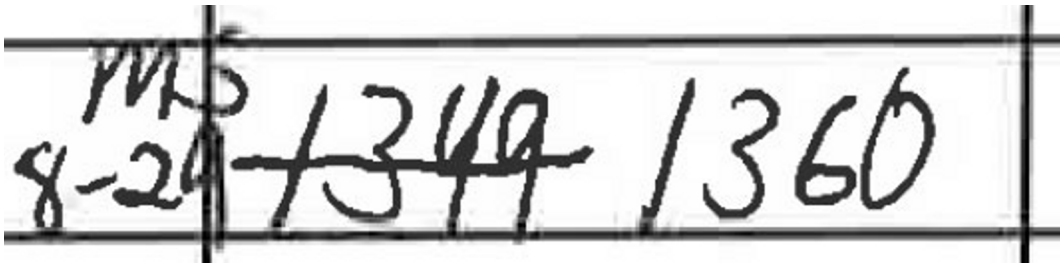
- Check if someone before you has performed an EAS Receiver Check. If no-one has performed the check, it is now your responsibility.
- Take a meter reading every hour between :50 and :59 in the hour.
- Adjust the transmitter's power as necessary to stay within the range 1260 to 1470 watts ERP.

Reader's Notes

8.H. Common Log Errors

These are the common types of errors made by the Operators at WMUL-FM. Read through and understand this list and you will not make the same mistakes others have made.

- **Blue or Black ballpoint pens only:** pencils, markers, felt-tip, roller-ball, and gel pens are off limits. Colors other than blue or black are off limits.
- **Correct Day:** Make certain you sign the correct day's log. A day's logs start at midnight and end at 11:59:59 P.M. Midnight Operators in particular should pay particular attention to which day the log is valid.
- **Corrections made correctly:** The proper way to make a correction:
  a. Strike through the incorrect entry with a single line.
  b. Write the correct information as close as possible.
  c. Initial and date beside the correction.



- **AM/PM:** When writing the time, you must always indicate whether that time is a.m. or p.m. You should do so by writing out the letters "a.m." or "p.m.". Do not circle the ("AM/PM") reminder in the time column. Capitalization and punctuation are not important here.
- **Sign On and Off:** You must sign onto and off of every log each and every time you operate the station.
- **Programs that cross midnight:** The first day's logs should be as normal except that the time-off will be "cont" on each page. The second day's logs time-on will be "cont".

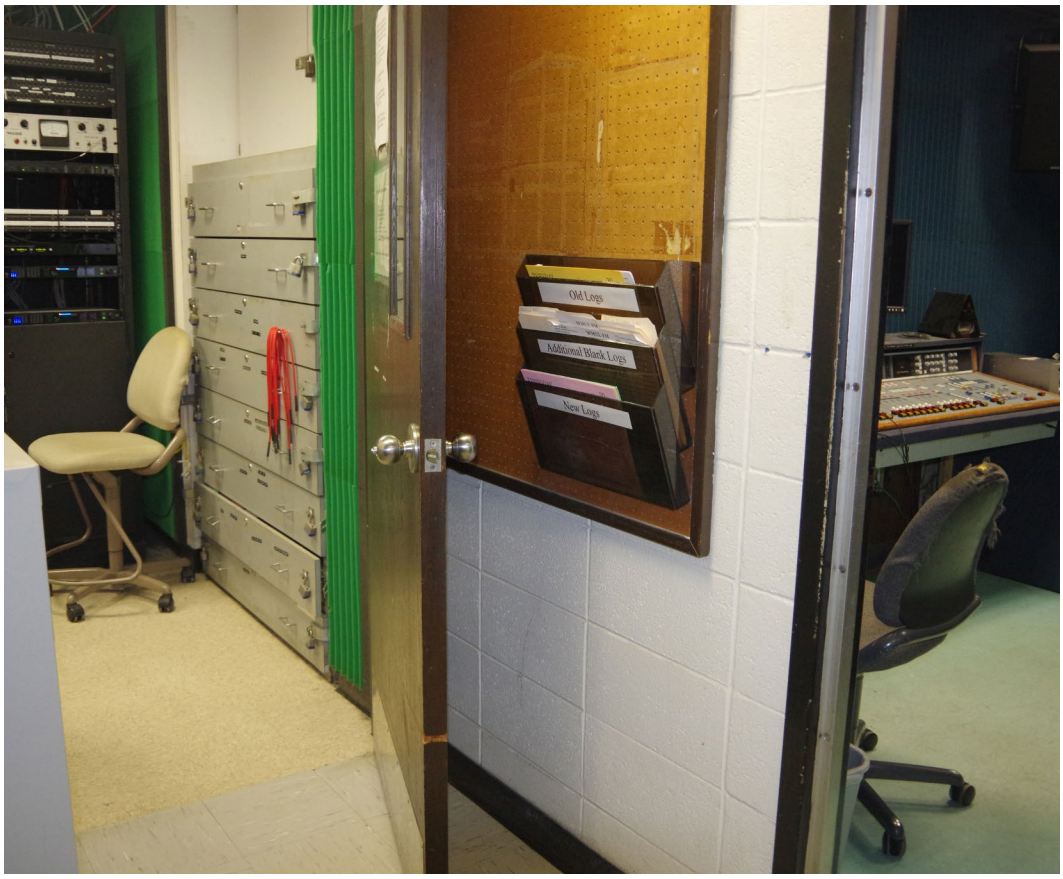
Reader's Notes

- **Entry for Every Program and Operator:** The Program / Announcer Log should have a separate entry for every individual program and operator.
  - If you operate two programs, each program should have a separate entry. The first program will have an end time, but the signature off will be "cont". The second program signature on will also be "cont".
  - If you produce part of a program, and another person produces another part, each of you will have a separate entry.
  - If you and another person produce a program together, only one of you will make an entry on the log.
- **One Operator at a Time:** Even if your air-shift is a multi-person program, only one of you may sign onto the logs at a time.
- **Daily EAS Receiver Check:** Every time you sign onto the logs, make certain the Daily EAS Receiver Check has been completed that day. If it has not been done, it is now your responsibility to perform the check.
- **Meter Readings:** You are required to take a meter reading each hour between :50 and :59. A meter reading must note the exact time, including a.m./p.m., Volts, Amps, ERP, and Transmitter Room Temperature.
- **Signing Multiple Pages:** When you need multiple pages of Operations Log, you must sign onto and off of each page. The time off on the first page will be "cont" and the time on on the second page will be "cont".
- **Voice-Tracked Program:** If your program is voice-tracked, you will make an entry in the Program / Announcer log only. You will do so as soon as is reasonably practical after your shift airs. The entry may be out of sequence with the surrounding shows. Include the string " - VTK" at the end of the program name.

Reader's Notes

8.I. Location and Description of the Logs Bins

If you are the first operator of the day, you will need to get the day's logs out of the New Logs bin. If you are the last Operator of the day, you are responsible for depositing the day's logs in the Old Logs bin. The bins are in the studio hallway, outside the Newscenter door. The bottom bin contains the new logs. The top two bins are for the old logs. The second bin from the bottom contains additional blank logs.



8.J. Additional Blank Operator Logs

Reader's Notes

The additional blank logs cover the station when, for whatever reason, the Traffic Director does not create a log bundle for a given day. They may also be used when the log bundle runs out of pages.

The additional blank logs are similar to the regular logs except that they are not day-of-the-week specific. There are not color-coded and they have a blank for the day of the week instead of it being pre-written.

The additional blank logs are kept in the additional blank logs bin. This bin is between the New Logs and Old Logs bins located outside the Newscenter door. Binder clips are attached to the side of the additional blank logs bin to keep the logs together until the Traffic Director can staple them.

8.K. Music Logs

Some formats at WMUL-FM require each DJ to keep a music log of all songs played and to submit that log with the other logs. The music log may indicate the rotation that you must play. Rotations are carefully chosen by your producer and the music director. Failure to follow the rotation set forth by the music director and format producer will result in disciplinary action.

Music logs may also be required by WMUL-FM's contracts with the performance rights organizations: ASCAP, SESAC, BMI, and Sound Exchange.

Marshall University
One John Marshall Drive
Huntington, WV 25755-2635
(304) 696-6640
www.marshall.edu/wmul

Log Error Correction Policy

1. On-Air staff have two weeks to correct log errors. This two weeks begins after the first shift after the error has been posted. In other words, if one commits a log error on Monday the 1st and the list is posted on Friday the 5th, and one's next shift is Monday the 8th, then one has until Monday the 22nd to correct that error. Accommodations will be made to those who have air-shifts cancelled due to sports or other specialty programming. If that Monday the 8th shift was cancelled and one's next shift was the 15th, then one has until the 29th to correct one's errors.
2. After those two weeks the Traffic Director will flag those errors on the most recent updated Log Error List. Air-staff have one week from the time the list is posted to correct the errors.
3. If the staff members have not corrected the errors at this point, they will receive phone calls from the Traffic Director informing them that they have three days to correct their errors or arrange a prompt appointment to do so. These phone calls serve as verbal warnings to the staff members. The Traffic Director will document these and the DJs will not be permitted to do their shifts again until the errors are corrected.
4. If the persons do not correct their errors or arrange an appointment to do so within the three days given, they will receive their written warning and be suspended from on-air duties for one week.
5. Further action will be taken, including dismissal, if log errors remain uncorrected.

MARSHALL UNIVERSITY
A STATE UNIVERSITY OF WEST VIRGINIA

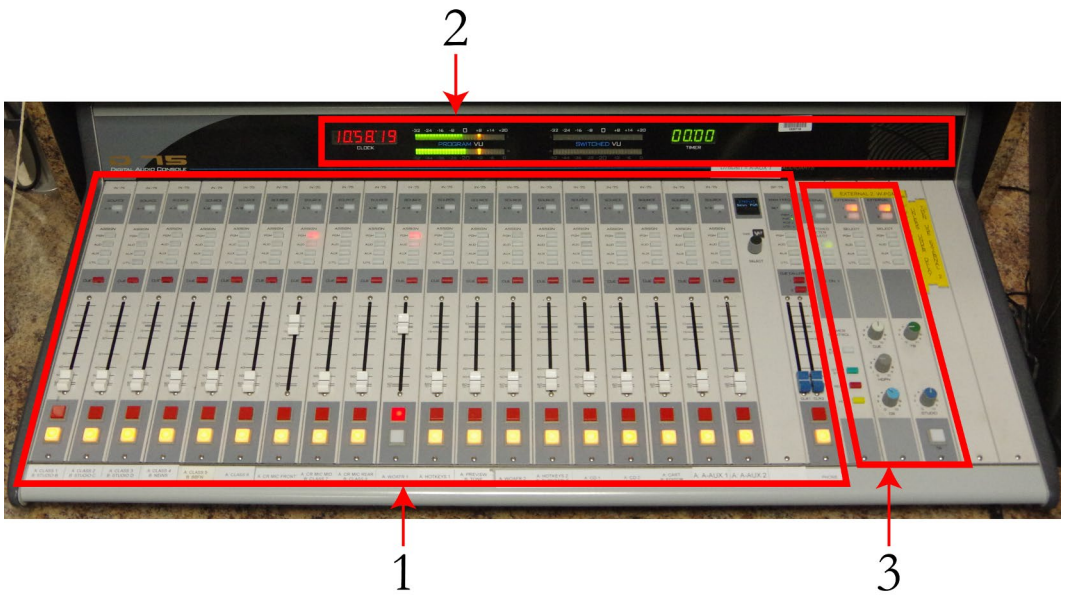
9. Station Operations

Reader's Notes

This part covers in detail the equipment that every operator will use during a DJ shift. The next part covers the equipment that only a subset of operators will use.

9.A. AudioArts D-75 Audio Console

The AudioArts D-75 console is the wide two-tone gray device with slide-faders, lights, and buttons. It sits on top of the counter in front of the window in Studio A. The D-75 is an audio mixer commonly known as "the board" or "the console". It is the hub for all audio within Studio A. If you want to play or record something; it has to go through the console. The console seamlessly mixes audio from multiple sources together.

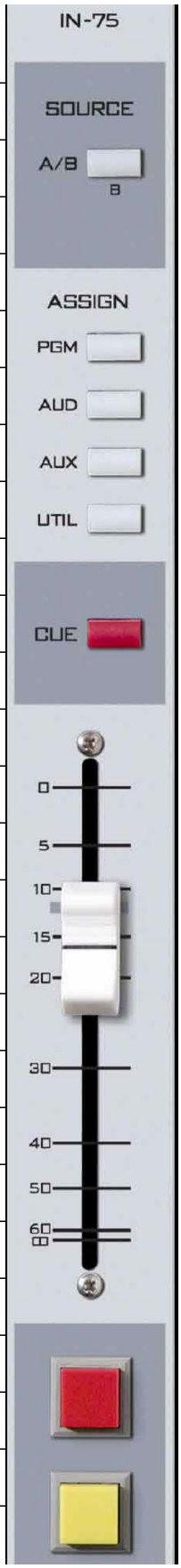


The console consists of three major sections: the nineteen source channels (1), the monitoring controls (3), and the meter bridge (2).

Each source is connected to a channel on the console. Each channel consists of an A/B Source button, four buss assignment buttons, cue assignment button, slide-fader, and on/off buttons.

The meter bridge consists of two sets of LED bar-graph VU meters, a clock, cue speaker, and a timer. One VU meter is fixed to the Program (PGM) buss, the other switches between different busses.

Reader's Notes



The monitoring controls allow the operator to adjust the volume of the headphones, control room speakers, studio speakers, and the cue speaker. Other controls allow the operator to use the timer, change which signal plays through the various speakers, and talk to the classroom studio.

> TECHNICAL NOTE
> The audio consoles in Studios C and D are smaller (12 channel) versions of the same console. Except for the number of inputs, everything that applies to the Studio A console applies to the Studios C and D consoles as well.

9.A.1. Source Channels on the Console

The nineteen (19) source modules take up the bulk of the console. Each module controls a single audio channel.

- **A/B Source:** This button allows the station to connect two different sources (A and B) to the channel and allows the user to toggle between them. The button illuminates when the B source is selected. The button will be dark when the A source is selected.

  Example: Channel #4 has Classroom Mic 4 connected to source A, and the PGM output of the Newscenter console connected to source B.

  For brevity, this manual will say Classroom Mic 4 is on #17-A and the Newscenter is on #17-B.
- **Buss Assignment:** These four buttons allow you to assign the channel to the different output busses. The D-75 has four output busses. The important one for DJs is the Program (PGM) buss. This is the buss that is sent to the transmitter. Any source you want to go over the air must be assigned to the Program (PGM) buss. Assigning a channel to a buss is called putting it "in" that buss. E.G. "in Program" or "in Audition".

- **Cue:** This button toggles the channel in and out of the cue buss. The cue buss allows an operator to preview a piece of audio, such as a song, off-air before playing it for the general public. A channel can be both in cue and on-air. If you want to listen to something only in cue, the channel has to be off.
- **Slide-Fader:** The fader adjusts the level of the audio going through the channel. Sliding the fader upward increases the level, sliding it downward decreases the level.

  For most sources, the fader should be set at or near the shaded gray mark (-12). (But do not forget to watch the VU meters, they tell the real story.)
- **On / Off Buttons:** The red button turns the channel on and places it on-air. The yellow button turns the channel off and removes it from the air.

For technical reasons, you should turn off any channel you are not using for your program. Every active channel adds a tiny amount of noise to the audio mix.

TECHNICAL NOTE

The four output busses are PGM, AUD, AUX, and UTIL.
These are pronounced Program, Audition, Auxiliary, and Utility.

Reader's Notes

Reader's Notes

9.A.2. VU Meters on the Console

Watching your VU (volume unit) meter levels is the most basic procedure in any type of radio, television, or recording situation. Your job is to ensure that the levels of the broadcast stay consistent.

Every sound broadcast over WMUL-FM from Studio A is measured on the two Program VU meters on the D-75 console. The console has two pairs of LED bar-graph VU meters. The left-hand set is solely for the Program (PGM) buss. The top bar-graph is the left channel and the bottom is the right channel.

The meters are marked with two scales. The top scale runs from -32 to +20. The bottom scale runs from -52 to 0. The different scales reflect differences in the way audio is scaled when it is analog versus digital. You do not need to worry about these differences, focus on the top scale. The LEDs are green below 0, yellow/amber from 0 to +16, and red above +16.

The VU meter shows both VU and "peak". The meter pictured above is displaying approximately -2 VU and approximately +8 peak. The reading of interest is the VU reading, -2.

> NOTE
> When this manual makes reference to VU levels,
> it will always refer to the top scale, -32 to + 20.
>
> Every signal fed into these meters should read between -16 and 0.

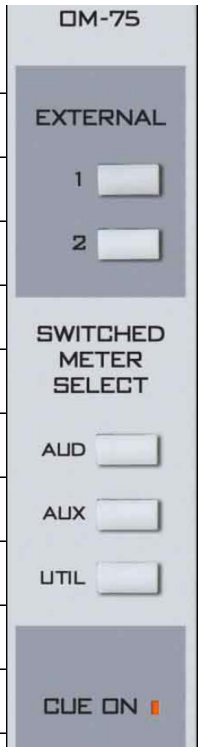
9.A.2.a. Controlling the Levels

Reader's Notes

- Each white fader on the D-75 console controls the levels of one piece of equipment at any one time.
- Different pieces of equipment send out signals of different strengths.
- Two different cuts, CDs, records, or carts will send out signals of different strengths, even when played on the same machine.
- Two different people talking into microphones will send out signals of different strengths.
- The levels should be adjusted manually to compensate for these differences.
- The VU meters must stay generally between -16 and 0. It is okay if they jump around and occasionally bounce past those limits. Only a steady tone (a sine wave) will keep the meters hovering in one place.
- If the meters are in the yellow or red areas, slide the fader controlling the piece of equipment in use DOWN until the meters stay between -16 and 0.
- If the meters are generally below -16 on the scale, slide the fader controlling the piece of equipment in use UP until the meters stay between -16 and 0.

As you gain experience, you will learn how to see any problems with your levels with just a glance and a quick slide of the fader. At first, though, you will have to make a conscious effort to keep the levels within the -16 to 0 range.

Reader's Notes



9.A.3. Switched VU Meters

The right-hand set of VU meters are the switched meters. They can show the levels of either the AUD, AUX, UTIL, or Cue busses.

The controls for the Switched VU Meters are on the right-hand side of the console, above the controls for the timer. They are in the fifth module from right, counting the blank modules. The label at the top of the module reads "OM-75".

Any time any source is in cue, the meter will show the levels of the cue buss. The "CUE ON" LED will illuminate when this is happening. If nothing is in cue, then the levels of the selected buss are shown.

External 1 and 2 may also be selected; however, nothing is connected to these externals. The VU meters will give no reading if one of the externals is selected.

9.A.4. Using the Cue

If you want to listen to an audio source without placing it on-air, you can put the source in cue. Instead of going over the air, the audio will play through a small speaker built into the meter-bridge.

1. Press the yellow or white off button to make certain that the channel is not on-air. A channel can be both in cue and on-air. Press the off button to make certain that does not happen.
2. Press the red "cue" button just above the fader. The button will illuminate.
3. Adjust the "Cue" volume knob to approximately '5'. It is on the right-hand side of the console, above the CR (Control Room) and HDPN (Headphone) volume knobs, in the fourth module from the right (including the empty modules).
4. Play the audio you wish to preview. It will emanate from the cue speaker on the right-hand side of the meter-bridge.
5. When you are finished using the cue, press the red "cue" button again. You can also place the item directly on-air by pressing the red "On" button. The channel will be automatically taken out of cue when the channel is turned on.

Reader's Notes

9.A.5. Using Cue with the Computer Playback (Automation)

The computer playback system has a dedicated channel on the console for previewing audio. It is channel #12-A "Preview". One preview serves both Rivendell 1 and Rivendell 2 in Studio A. See 14.L. Previewing Audio Before Playback in Volume III.

9.A.6. Using the Monitor Speakers and Headphones

Two monitor speakers are located near the console. They are controlled from the Control Room module on the right-hand side of the console. It is the fourth module from the right, with three volume knobs. The label at the top reads "CR-75".

The "CR" knob controls the volume of the monitor speakers. Turn it up to about "5".

The "HDPN" knob controls the volume of the headphones. Start this control at "3" and adjust from there.

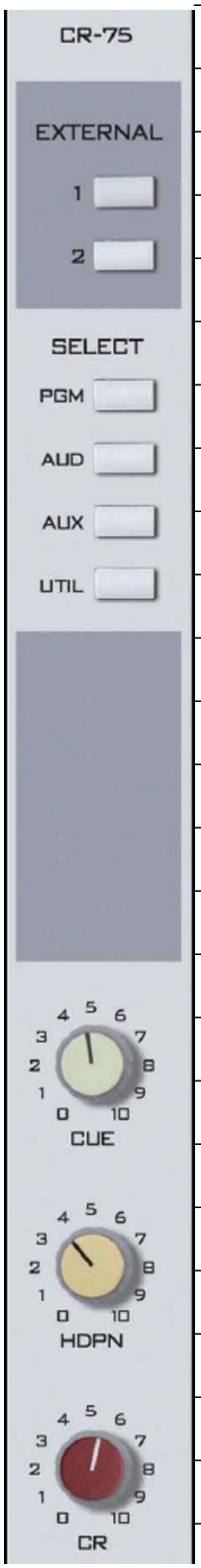
The speakers will automatically mute any time an operator turns on one of the "Control Room" or "CR" microphones. This prevents feed-back from occurring between the speakers and microphones.

The six buttons at the top control which source you are listening to through the monitor speakers and through the headphones. Always select "External 1" (the button will illuminate) unless the Delay Box is in use. When the Delay Box is in use, select "External 2".

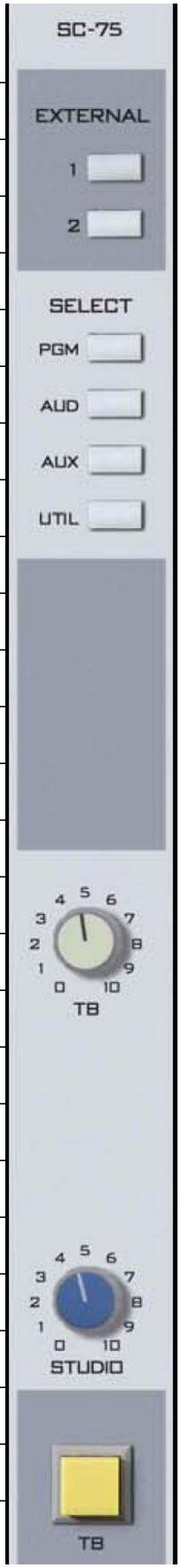
"External 1" is the station's AIR signal: the station's audio after it has been transmitted over the air. "External 2" is the W-PGM signal, the audio being sent to the transmitter but before it goes through the Delay Box.

If you come in and anything other than "External 1" is selected, let the Student Manager or Operations Manager know. Leave one of them a note in the appropriate mailbox. "External 2" will be selected only when the Delay Box is in use.

It is an FCC requirement for each station to monitor its AIR signal whenever the Delay Box is not in use.



Reader's Notes



9.A.7. Using the Classroom Studio Speakers and Headphones

Two speakers are mounted in the ceiling of the Classroom Studio (CB 201). They are controlled by the console in Studio A and by an amplifier in the classroom.

Headphones are available on the public affairs table. 11.C. The Public Affairs Table on Page 112. The console controls which audio goes to the headphones. Volume controls are on the public affairs table.

The Studio module on the right-hand side of the console controls both speakers and headphones. It is the third module from the right, with two knobs labeled "Studio" and "TB". The label at the top reads "SC-75".

The "Studio" knob controls the volume of classroom speakers.

The Classroom Studio speakers will mute any time that any of "Class Mic" 1-6 are active. They will not mute if only Class Mic 7 or 8 are active.

The six buttons at the top control which source plays through the speakers and the headphones. Always select "External 1" (the button will illuminate) unless the Delay Box is in use. When the Delay Box is in use, select "External 2".

"External 1" is the station's AIR signal, the station's audio after it has been transmitted over the air. "External 2" is the W-PGM signal, the audio being sent to the transmitter but before it goes through the Delay Box.

TERMINOLOGY

Control Room is the room containing the audio console

Studio is an attached room with additional microphones.

These definitions have their basis is the history of radio. Historically, the announcer and the person running the board were different people in different rooms.

9.A.8. Talking Back to the Classroom Studio

It is possible to talk to the classroom studio through the microphone in Studio A without going over the air. Your voice will be heard in both the speakers and the headphones in the classroom studio.

1. "CR Mic Front" must be turned off.
2. Turn the "TB" knob on the Studio module up to approximately "8".
3. Press and hold the yellow "TB" button at the bottom of the Studio module.
4. Speak into "CR Mic Front".
5. When you have finished speaking, release the "TB" button.

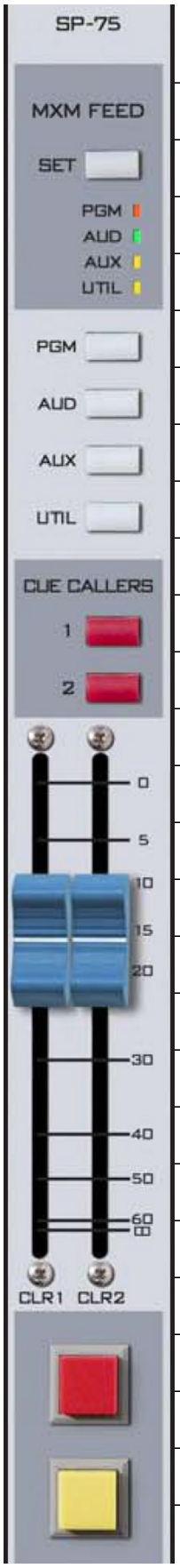
9.A.9. The SuperPhone Module

The SuperPhone module is a special module that makes it easier to bring in sources such as phone callers, remote broadcasters, and other studios. It is the sixth (6th) module from the right, counting the empty modules.

It has capability to place two callers on-air simultaneously. It automatically generates a "Mix-Minus" feed for each caller. Each caller gets a feed of the station and the other caller, but not themselves.

The "MXM Feed" and "Set" buttons at the top control which of the console's busses is the source for the mix-minus feed. Use the "Set" button to rotate through the different feeds. Typically, the station uses either the PGM or AUD buss. Whatever channels one wants to send to the caller must be in the selected buss.

The "cue callers" buttons allow the operator to speak with the callers before placing them on the air. Any time a caller is in cue, and "CR Mic Front" is turned off, the audio from the "CR Mic Front" is routed to the caller(s) in cue.

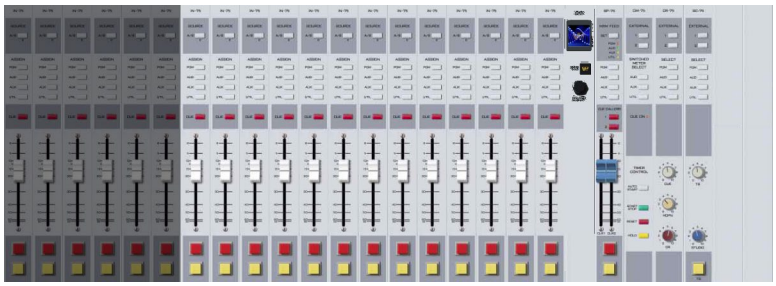


Reader's Notes

9.A.10. A Brief Tour of the Studio A Console Inputs

This section briefly goes through the studio inputs in order from left to right. A graphic before each subsection puts the inputs in context.

Inputs 1-6: Classroom Mics



Input #	1	2	3	4	5	6
A	Class Mic 1	Class Mic 2	Class Mic 3	Class Mic 4	Class Mic 5	Class Mic 6
B	Studio B PGM	Studio C PGM	Studio D PGM	Newscenter PGM	BBFN	

Class Mics 1-6 are the microphones on the public affairs table. 11.C. The Public Affairs Table on Page 112.

The inputs from the production studio PGM busses allow each production studio to be easily placed on-air.

BBFN is for connected an auxiliary audio source for Basketball and Baseball Friday Night.

Inputs 7-9: Control Room Mics

Input #	7	8	9
A	CR Mic Front	CR Mic Middle	CR Mic Rear
B		Class Mic 7	Class Mic 8

CR Mic Front - The microphone next to the console and window.

CR Mic Middle - The microphone on the right side, next to the front, right equipment rack.

CR Mic Rear - An extra microphone jack at the back of the counter-top.

7.A.2. On-Air Microphone on Page 10.

Inputs 10-14: Computer Playback

Input #	10	11	12	13	14
A	Rivdell 1	Panel 1	Preview	Rivdell 2	Panel 2
B			Tone		Turntable

Rivdell 1, Panel 1, Preview, Rivdell 2, Panel 2 - See 14. Computer Playback (Automation) - On-Air Operations in Volume III.

Tone - A 1000 Hz tone used for testing and calibration.

Turntable - 10.H. Turntable on Page 90.

Inputs 15-17: Other Playback

Input #	15	16	17
A	CD 1	CD 2	Editor
B			

CD 1, CD 2 - 10.I. CD Players on Page 93.

Editor - The digital editor in Studio A. The use of digital editing equipment is beyond the scope of this manual.

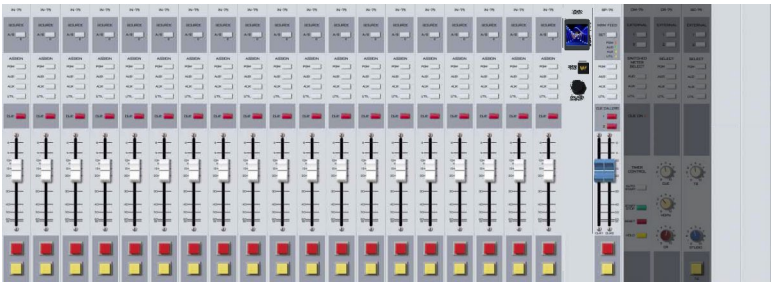
Input / Modules 18-21: Remote Sources

Module #	18	19	20	21
A	A-Aux 1	A-Aux 2	IP-75	SuperPhone
B				

A-Aux 1, A-Aux 2 - Remote channels that receive audio from the router. 10.A. Digital Router on Page 75.

IP-75 - A component of the router. Read the technical details in 12.C. Digital Router on Page 133.

SuperPhone - Module to easily bring in phone callers. 9.A.9. The SuperPhone Module on Page 59 and 11.G. Gentner DH22 Digital Hybrid on Page 117.



Modules 22-24: Control Modules

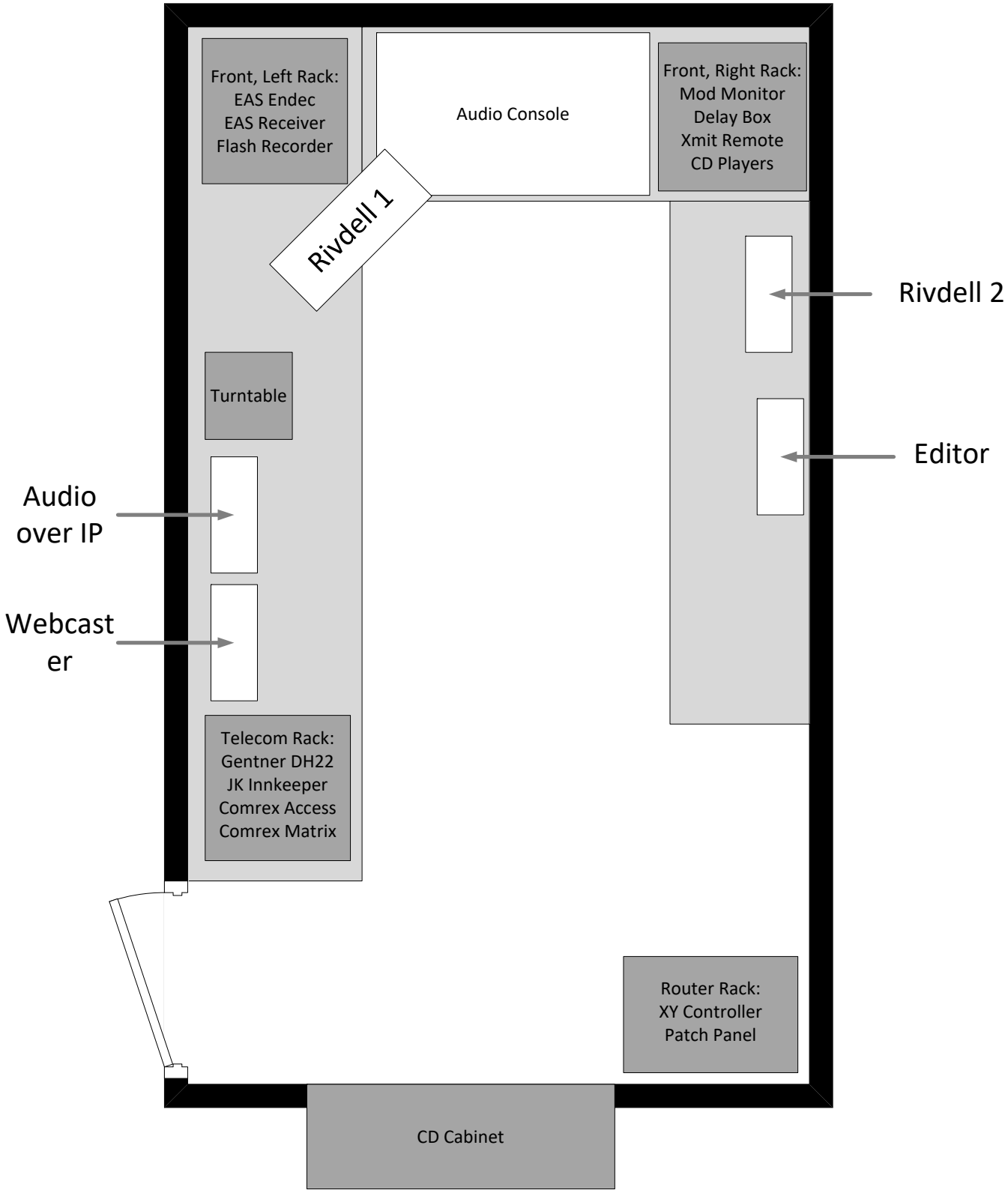
Module #	22	23	24
	Output	Control Room	Studio

Output Module - Controls the timer and the switched VU meters. 9.A.3. Switched VU Meters on Page 56.

Control Room Module - 9.A.6. Using the Monitor Speakers and Headphones on Page 57.

Studio Module - 9.A.7. Using the Classroom Studio Speakers and Headphones on Page 58.

9.B. Layout of Studio A



Reader's Notes

9.C. On-Air Microphone

The on-air microphone is covered in complete detail in 7.A.2. On-Air Microphone on Page 10.

In addition to CR Mic Front, Studio A has a second microphone for a second DJ. That is CR Mic Mid (Middle). It is on Channel #8-A.

A jack for a third microphone is at the back, right corner of the counter-top. You will need to connect a microphone to it to use it. It is on Channel #9-A.

9.D. Getting the Weather

Reader's Notes

The weather is some of the most important information that WMUL-FM delivers to its audiences. Our listeners make plans, pick out clothing, and carry or do not carry umbrellas based on what is heard during our weather forecasts.

The current board operator is responsible for obtaining the most recent forecast. Any weather forecast more than six (6) hours old should be replaced. WMUL-FM obtains weather information in three ways.

1. The easiest way to get weather is from the NewsReady. You may edit and print a complete forecast in just a few minutes. 9.D.1. Getting the Weather from NewsReady on Page 66.
2. The next way to get the weather is from the National Weather Service's website at www.weather.gov . 9.D.2. Getting the Weather from Weather.gov on Page 67.
3. You may also get weather from the National Weather Service's NOAA Weather Radio. 9.D.3. Getting the Weather from NOAA Weather Radio on Page 70.

All three sources yield identical forecasts. Choose the method you find easiest, or are most comfortable using.

> **IMPORTANT**
> Never get the weather from weather.com, AccuWeather, or any source other than NewsReady or the National Weather Service. Use of those other sources requires a license that WMUL-FM does not have.

Keep the forecasts fairly short. Do not give wind speeds at WMUL-FM unless they are so high as to be of concern. Only give three time periods: Today, Tonight, and Tomorrow. For nighttime forecasts, give Tonight, Tomorrow, and Tomorrow Night. People want to know if they are going to get wet TODAY and what they can expect tomorrow.

Post the information on the cork board located above the console in Studio A. Be certain to include the date and time in which you recorded the forecast. The operators after you need to know if the forecast is current or not.

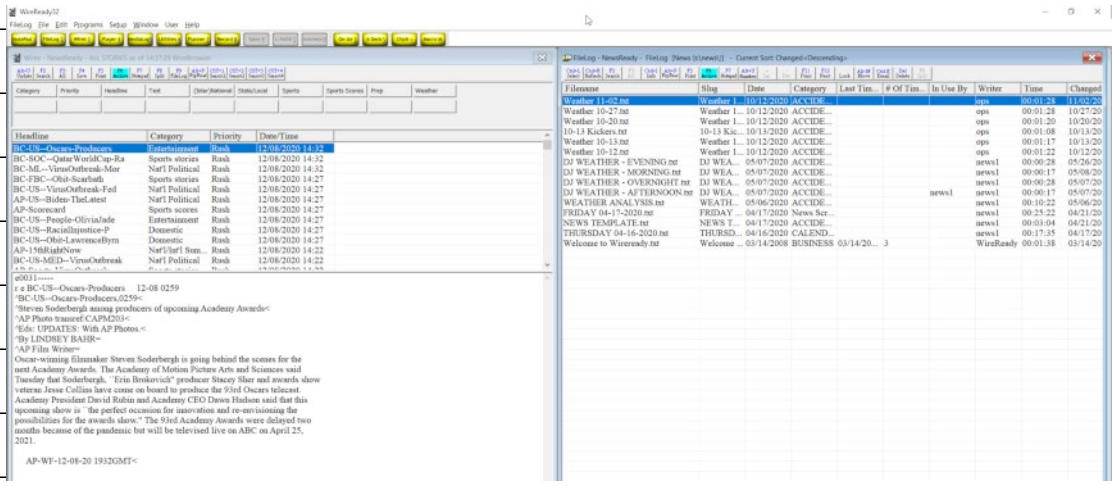
Reader's Notes

9.D.1. Getting the Weather from NewsReady

NewsReady / WireReady is a program that grants access to WMUL-FM's Associated Press newswire feed. It is installed on all workstations at the station, except the computer playback workstations.

1. Double-click the NewsReady icon on the desktop.

2. A splash screen will appear for a couple of seconds before being replaced with the WireReady32 window.

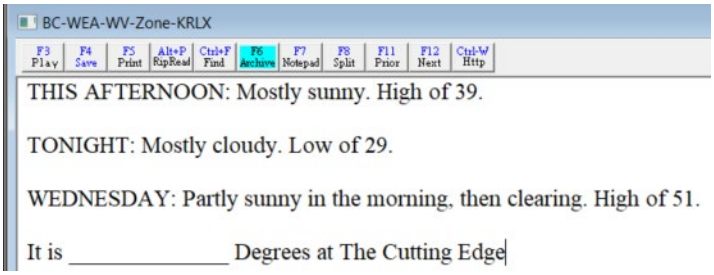


3. The left-hand side of the screen is the wires browser. It shows all of the stories that have come across the Associated Press newswire.
4. At the top of the Wires browser are a set of search buttons. Click the one marked "Weather" to search for the weather forecasts. The stories shown in the Wires browser will filter to just the weather forecast.

5. Double-click on one of the forecasts to open it for editing. This story will contain dozens of forecasts covering most of the state. Fortunately, the forecast for Huntington is the second one. The one for Huntington will begin with "Cabell- Including the city of Huntington".
6. Delete the forecasts for the cities that aren't Huntington.

Reader's Notes

7. Delete all the long-range forecasts. Keep only the forecasts for today, tonight, and tomorrow. (Tonight, Tomorrow, and Tomorrow Night if it is already "Tonight".)
8. Reformat the forcast by deleting all the extraneous periods and references to wind.
9. Change the high and low temperature forecasts to a specific temperature. The AP story will give a vague prediction such as "High in the upper 30s". Change that to a specific temperature such as "High of 39".
10. Add the tag line about the temperature.
    "It is _____ degrees at The Cutting Edge".
11. The forcast should now look something like this one.



12. Print the forcast. Date and time-stamp it and post it in the studio.

9.D.2. Getting the Weather from Weather.gov

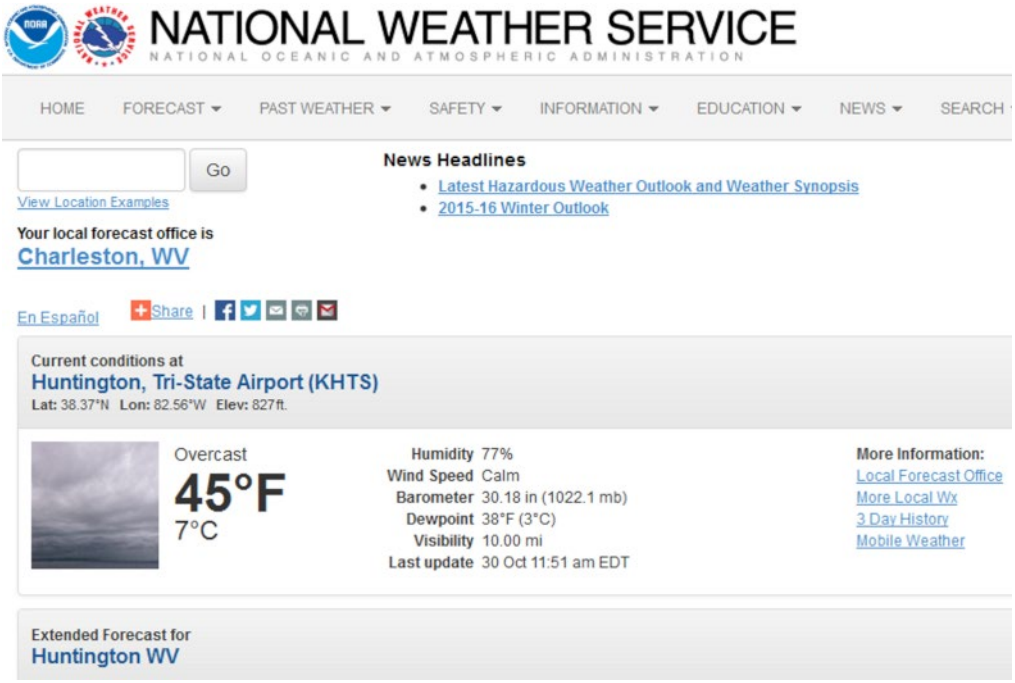
> NOTE
> You may notice that the forecasts in this section differ from the forecasts in the previous section. That is because the screenshots were taken on different days.

1. Open Microsoft Word and a web browser.
2. Navigate the browser to www.weather.gov . Note: The url is weather.gov, not weather.com. Weather.com is a commercial website operated by The Weather Channel. Weather.gov is a U.S. government website operated by the National Weather Service.

Reader's Notes

3. Enter Marshall's zip code (25755) into the textbox labeled 'Local forecast by "City, St" or ZIP code'. An autocompletion box will appear below the textbox with the city, state, and country.

4. Click the "Go" button or press the "Enter" key. If you press "Enter", you may have to press it two or three times before the website responds. Clicking works the first time. A page will load displaying a variety of weather information about Huntington, both current and forecasted conditions.



Reader's Notes

5. Scroll down until you see the left-hand box labled "Detailed Forecast". There will usually be a map to the right.

6. Highlight and copy the forecasts for today, tonight, and tomorrow. (Tonight, Tomorrow, and Tomorrow Night if it is already "Tonight".)
7. Paste the forecasts into a Word document.
8. Reformat the forcast to be easy to read. Make the font 12 or 14 points.
9. Delete references to wind.
10. Add the tag line about the temperature. "It is ____ degrees at The Cutting Edge."
11. The forcast should now look something like this one.

This Afternoon Partly sunny, with a high near 55.

Tonight Mostly clear, with a low around 37.

Saturday Partly sunny, with a high near 62.

It is _____ degree at The Cutting Edge.

12. Print the forcast. Date and time-stamp it and post it in the studio.

Reader's Notes

9.D.3. Getting the Weather from NOAA Weather Radio

A variety of different forecasts are rotated by this service. The forecast you want is given every five to ten minutes so you may have to wait a bit to hear it. This means you will have to start listening well before your next scheduled weather break.

1. Get paper and pen ready:
2. Locate the multi-position knob labeled "Source" on the EAS receiver.
3. Move the "Source" knob to position three (3).
4. Gently turn up the knob labeled "Volume" directly to the right of the "Source" knob until the forecast is audible.
5. Wait until you hear the announcer specifically say "Here is the forecast for the Huntington area" or something similar.
6. Write down as much information as possible. ABBREVIATE.
7. Type up a well-formatted forcast using the notes.
8. Add the tag line about the temperature.
   "It is ____ degrees at The Cutting Edge."
9. Print the forcast. Date and time-stamp it and post it in the studio.

9.E. Modulation Monitor

Reader's Notes

The following chapter contains a somewhat technical description of the Inovonics 531 Modulation Analyzer. It is located at the top of the rack to the right of the AudioArts console.

Your job is to periodically observe certain readings and lights on this monitor. They tell you if you have your levels up too high. There is nothing for you to write down as there is with the meter readings, just fade your audio down until everything is okay. You also must notify the indicated person when certain adverse conditions occur.

Read through this entire section. Do not worry if you do not understand all the technical jargon. The observations you must make are indicated. Be familiar with them and watch your levels. The major problems described here occur rarely and you will soon learn how to take in the information you need with just a glance at the unit.

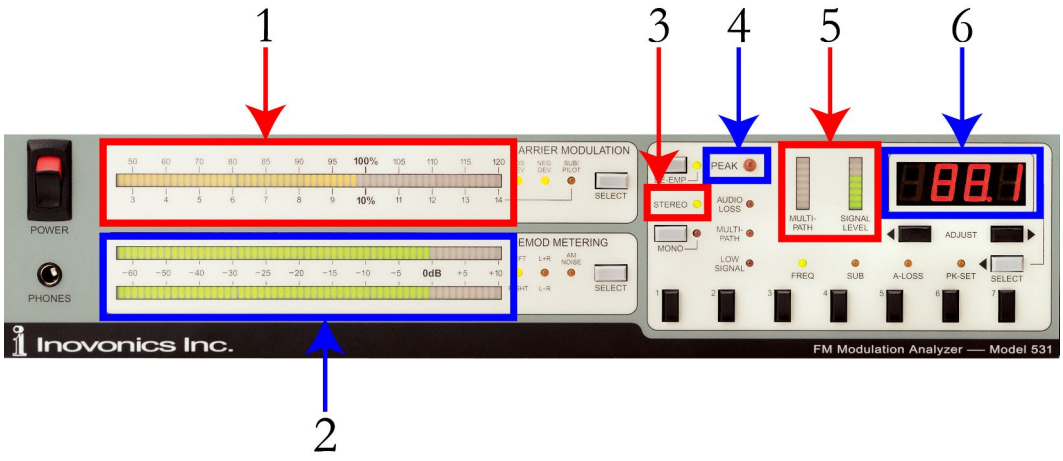
The Inovonics 531 Modulation Analyzer is essentially a highly specialized radio receiver tuned to 88.1 MHz. The unit continually samples WMUL-FM's transmitted signal.

The Inovonics 531 separately displays the left and the right channels of the stereo signal as well as the composite or mono signal. FCC Rules 73.1570(b)2 specifies that WMUL-FM must not modulate its carrier by more than 105 percent. The Inovonics 531 permits the operator to monitor the total modulation of WMUL-FM's carrier.

TECHNICAL NOTE

The rules normally limit modulation to 100 percent. WMUL-FM uses an Radio Data System (RDS) encoder to send text to the audience's radios. The text is the station's call letters and slogan, and eventually "now playing" information. When the RDS is in use, the rules permit an additional 5 percent modulation.

Reader's Notes



Six (6) functions are performed passively by the Inovonics 531. (Numbers correspond to the diagram above.)

1. **Total Modulation Meter:** This horizontal bar-graph meter displays the total modulation of the carrier as a percentage. The highest recent peak is held as a "dot" at the end of the bar graph.
2. **Left and Right Modulation Meters:** These horizontal bar-graph meters display the level of program audio of each channel. The top meter displays the left channel. The bottom meter displays the right channel.
3. **Stereo Pilot Light:** Anytime WMUL-FM is on the air this lamp should be illuminated. If the lamp is not lit, please contact an engineer as soon as possible.
4. **Peak Light:** This light will illuminate whenever total modulation exceeds 100 percent. It is OK if this light flashes occasionally. If it flashes more than a couple of times a minute, the audio is distorting during transmission. Fade down the audio source (computer, microphone, etc.) until the peaks flash rarely.
5. **Multi-Path and Signal Level:** These two vertical bar-graph meters show the strength and quality of the signal being received by the Inovonics 531. The signal level should be at or near 100 percent. Multi-Path should be at or near zero.
6. **Frequency:** This displays the frequency to which this receiver is tuned. It should always read 88.1.

10. Auxiliary Studio Equipment

Reader's Notes

This part explains how to use some of the equipment that only a subset of operators will use.

10.A. Digital Router

WMUL-FM's Wheatstone WheatNet-IP digital audio router is a powerful piece of equipment. The router allows many of the signals coming into or going out of the radio station to be re-routed. Operators make such alterations to accomplish a specific production or on-air goal. This piece of equipment allows the user to reconfigure WMUL-FM's studios and equipment in many ways. It can provide the user with many additional ways in which to use WMUL-FM's facilities. Therefore, it is important for station personnel to be able to operate the router.

> IMPORTANT
> Do not attempt to use the router until the Training Coordinator has trained you on its operation.
>
> It is possible to accidentally take the station off the air, or create an on-air feed-back loop if one does not know what one is doing.

Different components of the router are located throughout the station. See 12.C. Digital Router on Page 133 for the deep technical details. The component you will use to control the router is the X-Y Controller.

The router is divided into sources (outputs from equipment) and destinations (inputs to equipment). The table on the next page lists all of WMUL-FM's sources and destinations. A technical limitation of the router is that display names are limited to eight (8) characters. Thus, some of the short, cryptic names on the table. A copy of this table is posted in Studio A on the side of the rear, left-hand side equipment rack (the telecom rack).

Two of the sources require further explanation. "WPGM Pre" is the Pre-Delay W-PGM signal. The same signal heard from the console's External 2 source. "WPGM Pst" is the signal after it has gone through the delay box (post-delay).

Reader's Notes

10.A.1. XY Controller

The XY Controller is the user interface for the router. It is located in the free-standing equipment rack in the rear of Studio A, next to the CD Cabinets. It is below the patch panel.

The XY Controller has five (5) controls.

1. **Source Select Knob:** Rotate to select different sources.
2. **Source Display:** Displays the currently selected source.
3. **Take Button:** Press this button to "Take" the currently displayed route. The selected source will be routed to the selected destination. When the button is illuminated, the selected source is different than the one that is currently router to the selected destination.
4. **Destination Display:** Displays the currently selected destination.
5. **Destination Select Knob:** Rotate to select different destinations. As each destination is selected, the Source Display will show the source routed to that destination.

10.A.2. How to Use the Router

1. Consult the list of sources and destinations to determine what source you want and where you want it to go (destination).
2. Rotate the Destination Select Knob (5) until the desired destination is displayed. The source that is currently routed to that destination will appear in the Source Display (2).
3. Rotate the Source Select Knob (1) until the desired source is displayed. The Take Button (3) will illuminate
4. Press the Take Button. The chosen audio source is now going to the chosen destination. The light on the Take Button will extinguish.

WARNING!
Do not attempt to route anything if you are uncertain about any of the above steps!

10.A.3. Router Sources and Destinations

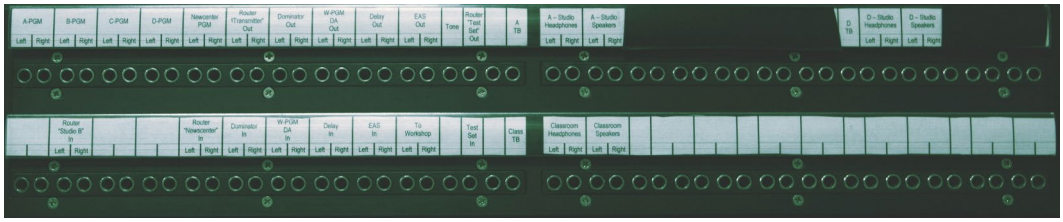
Sources			Destinations	
Long Name	Display Name		Long Name	Display Name
Studio A PGM	A PGM		Studio A Aux 1	A-Aux 1
Studio A AUD	A AUD		Studio A Aux 2	A-Aux 2
From Studio A Phone 1	A Phn 1s		To Studio A Phone 1	A Phn 1d
From Studio A Phone 2	A Phn 2s		To Studio A Phone 2	A Phn 2d
Studio B PGM	B PGM		Studio B Aux 2	B-Aux 2
Studio B AUD	B AUD		Studio B Aux 3	B-Aux 3
Studio C PGM	C PGM		Studio C Aux 1	C-Aux 1
Studio C AUD	C AUD		Studio C Aux 2	C-Aux 2
From Studio C Phone 1	C Phn 1s		To Studio C Phone 1	C Phn 1d
From Studio C Phone 2	C Phn 2s		To Studio C Phone 2	C Phn 2d
Studio D PGM	D PGM		Studio D Aux 1	D-Aux 1
Studio D AUD	D AUD		Studio D Aux 2	D-Aux 2
From Studio D Phone 1	D Phn 1s		To Studio D Phone 1	D Phn 1d
From Studio D Phone 2	D Phn 2s		To Studio D Phone 2	D Phn 2d
News PGM	News PGM		News Aux 1	N-Aux 1
News AUD	News AUD		News Aux 2	N-Aux 2
From News Phone 1	N Phn 1s		To News Phone 1	N Phn 1d
From News Phone 2	N Phn 2s		To News Phone 2	N Phn 2d
From TV-A	TV-A s		To TV-A	TV-A d
From Audio over IP 1	AoIP 1s		To Audio over IP 1	AoIP 1d
From Audio over IP 2	AoIP 2s		To Audio over IP 2	AoIP 2d
From Gentner	Gentnr s		To Gentner	Gentnr d
From JK Innkeeper	Innkpr s		To JK Innkeeper	Innkpr d
From Comrex Matrix	Matrix s		To Comrex Matrix	Matrix d
From Comrex Access 1	Acces 1d		To Comrex Access	Acces 1d
Henderson Center	Hendersn		Stream 2	Stream 2
Marti	Marti		Stream 3	Stream 3
WMUL PGM Post-Delay	WPGM Pst		Basketball Friday Night	BBFN
WMUL PGM Pre-Delay	WPGM Pre		Music Stream	Mux Strm
WMUL AIR	WMUL AIR		Transmitter	Xmitter
Tone	Tone		Test Set	Test Set

Reader's Notes

10.B. Patch Panel

The companion to the router is the patch panel. While the router is an active electronic device, the patch panel is passive. That means the patch panel is less prone to glitches and failures than the router.

The patch panel has only a limited selection of sources and destinations. Its purpose is to allow WMUL-FM to bypass the router, and other parts of the air-chain, when one of those parts requires maintenance.



The patch panel consists of the top row of source jacks (1-48) and the bottom row of destination jacks (49-96). Patches are made with a patch cable. A set of ten patch cables are available in Studio A. The cables are red with black ends. The end connector is similar in design to the 1/4" or mini headphone connector. In terms of size, the connector is approximately half-way between the 1/4" and mini connector. The cables hang from a hook on the side of the rack.

Reader's Notes

An important property of the patch panel is "normalling". The source on the top row connects (normals) to the destination directly below it on the bottom row. Inserting a patch cable into either the source or destination breaks the normal.

Example: The source "Router 'Xmitter' Out Left" is normalled to the destination "Dominator In Left". If one plugs a patch cable into either jack, the normal (connection) is broken.

10.B.1. How to Use the Patch Panel

1. Consult the list of sources and destinations to determine what source you want and where you want it to go (destination).
2. Select a patch cable.
3. Plug one end of the patch cable into the source jack.
4. Plug the other end of the patch cable into the destination jack.

> WARNING!
> Do not attempt to patch anything if you are uncertain about any of the above steps!

10.B.2. Patch Panel Sources and Destinations

#	Source		Destination	#
1	Studio A - PGM Left			49
2	Studio A - PGM Right			50
3	Studio B - PGM Left		Router “B PGM” In Left	51
4	Studio B - PGM Right		Router “B PGM” In Right	52
5	Studio C - PGM Left			53
6	Studio C - PGM Right			54
7	Studio D - PGM Left			55
8	Studio D - PGM Right			56
9	Newscenter - PGM Left			57
10	Newscenter - PGM Right			58
11	Router “Xmitter” Out Left		Dominator In Left	59
12	Router “Xmitter” Out Right		Dominator In Right	60
13	Dominator Out Left		W-PGM DA In Left	61
14	Dominator Out Right		W-PGM DA In Right	62
15	W-PGM DA Out Left		Broadcast Delay Box In Left	63
16	W-PGM DA Out Right		Broadcast Delay Box In Right	64
17	Broadcast Delay Box Out Left		EAS Endec In Left	65
18	Broadcast Delay Box Out Right		EAS Endec In Right	66
19	EAS Endec Out Left		To Workshop Left	67
20	EAS Endec Out Right		To Workshop Right	68
21	Tone			69
22	Router “Test Set” Out		Test Set In	70
23				71
24	Studio A - Talkback		Classroom Talkback	72

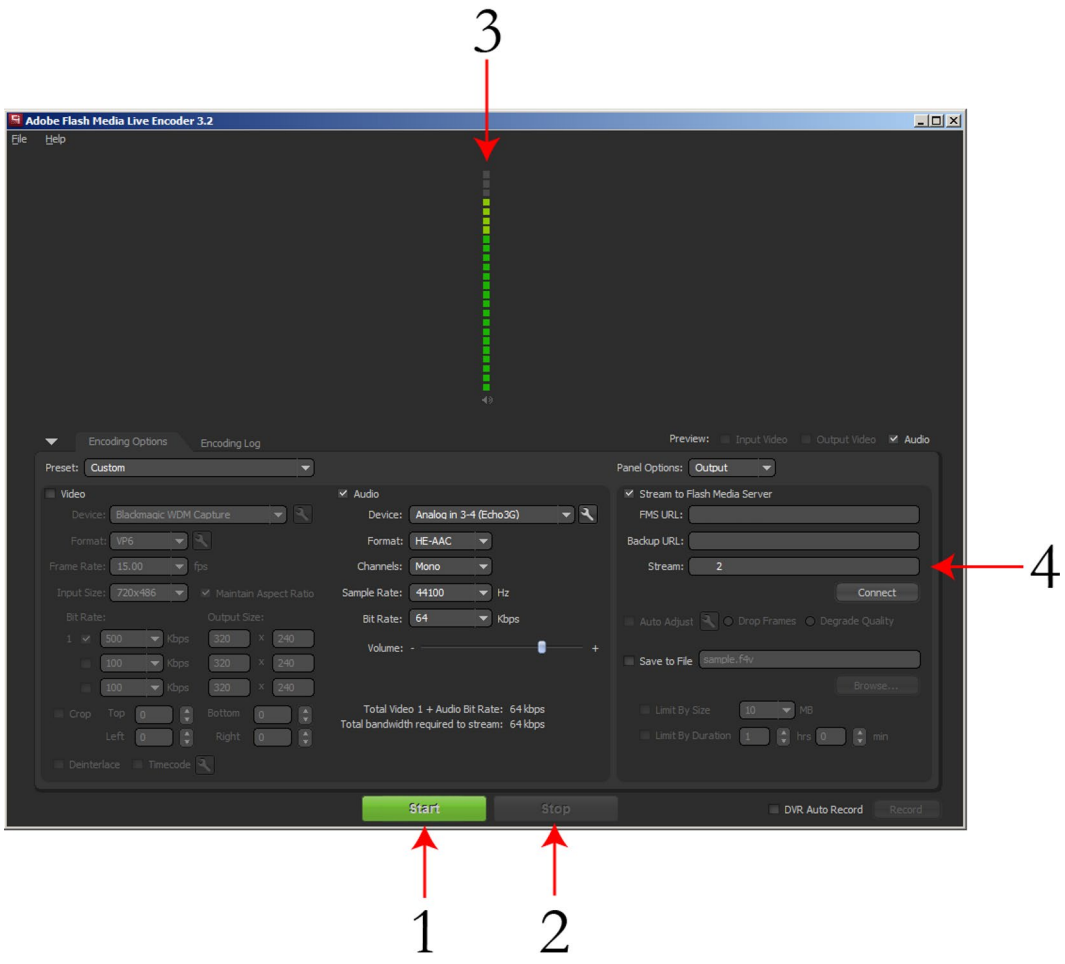
#	Source		Destination	#
25	Studio A - Studio Headphones Left		Classroom Headphones Left	73
26	Studio A - Studio Headphones Right		Classroom Headphones Right	74
27	Studio A - Studio Speakers Left		Classroom Speakers Left	75
28	Studio A - Studio Speakers Right		Classroom Speakers Right	76
29	Studio B - Talkback			77
30	Studio B - Studio Headphones Left			78
31	Studio B - Studio Headphones Right			79
32	Studio B - Studio Speakers Left			80
33	Studio B - Studio Speakers Right			81
34	Studio C - Talkback			82
35	Studio C - Studio Headphones Left			83
36	Studio C - Studio Headphones Right			84
37	Studio C - Studio Speakers Left			85
38	Studio C - Studio Speakers Right			86
39	Studio D - Talkback			87
40	Studio D - Studio Headphones Left			88
41	Studio D - Studio Headphones Right			89
42	Studio D - Studio Speakers Left			90
43	Studio D - Studio Speakers Right			91
44	Newscenter - Talkback			92
45	Newscenter - Studio Headphones Left			93
46	Newscenter - Studio Headphones Right			94
47	Newscenter - Studio Speakers Left			95
48	Newscenter - Studio Speakers Right			96

Reader's Notes

10.C. Webcasting

WMUL-FM freely streams all of its programming over the World Wide Web. Anyone who wishes may listen to the station's programming. The music stream (Stream 1) is always active and encodes from dedicated hardware.

WMUL-FM operates two additional streams for times when multiple live events are occurring simultaneously. Streams 2 and 3 originate from the Webcast encoder computer. These streams are activated only when needed.



Reader's Notes

10.C.1. How to Use Streams 2 and 3

To use Stream 2 or 3: (These instructions will refer to Stream 2, just replace Sream 2 with Stream 3 if using Stream 3).

1. On the Router:
   <Studio>-PGM ► Stream 2
2. On the Webcast encoder, double click on the "Stream 2" icon on the desktop. Adobe Flash Media Live Encoder will launch.

3. If audio is being sent to the encoder, the VU Meter (3) will show those levels.
4. Click "Start" (1) when you are ready to begin streaming.
5. When the program is over, click "Stop" (2).
6. Close Adobe Flash Media Live Encoder.

10.C.2. How to Distinguish Between the Stream 2 and 3 Encoder Windows

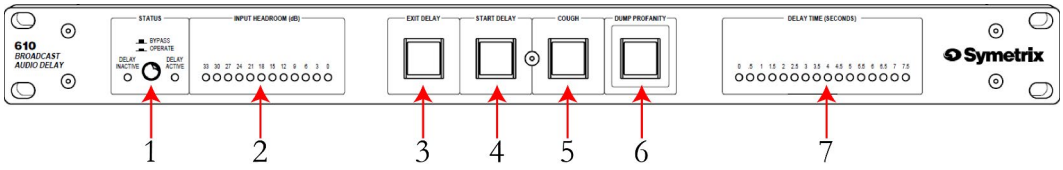
When both Stream 2 and Stream 3 are used, the operator must take care not to stop the wrong encoder at the end of a webcast. The most reliable way to distinguish between the encoder windows is by looking at the "Stream" field (4). Stream 2 will display "wmul2" in this box. Stream 3 will display "wmul3".

Reader's Notes

10.D. Broadcast Delay Box

The Symetrix 610 Broadcast Audio Delay Box provides up to 7.5 seconds of delay to protect against on-air callers who use inappropriate language. While it can just as easily be used for inappropriate language spoken by announcers, it is not necessary to do so, because announcers will not use inappropriate language.

The main unit is located in the front, right-hand side equipment rack in Studio A. It is above the transmitter remote control It is a black unit with four colored buttons and two rows of round LEDs.



1. The STATUS button toggles the unit between BYPASS and OPERATE mode. In BYPASS mode the incoming signals are directly routed to the outputs, bypassing any internal circuitry. In BYPASS mode, the front panel and remote controls have no effect on the operation of the unit. In OPERATE mode, the incoming signals are processed through the unit's circuitry. All front panel and remote controls are fully functional.
2. The INPUT HEADROOM(dB) LED bar-graph display indicates the headroom in decibels before the input begins clipping.
3. The EXIT DELAY button initiates the gradual reduction of delay time. The unit will incrementally reduce the delay time until no delay remains
4. The START DELAY button initiates the gradual increase in delay time. The unit will incrementally increase delay time until it accumulates 7.5 seconds of delay.
5. Pressing the COUGH button mutes the incoming signal while continuing to play from internal memory. The unit will continue to play from memory while the button is pressed. When the COUGH button is released the unit resumes recording into memory and splices out the silence. The unit automatically rebuilds the lost delay time. If the COUGH button is held for more time than is stored in the unit, it will continue to mute the signal until released.
6. Pressing the DUMP PROFANITY button on WMUL-FM's unit will erase 3.75 seconds of audio from its memory. The unit automatically rebuilds the lost delay time.

Reader's Notes

7. The DELAY TIME (SECONDS) LED bar-graph display shows exactly how much delay time has accumulated. The bar-graph is in half-second steps.

When the delay box is in use, the headphones and monitor speakers need to be set to the pre-delay signal. To do this, set the "CR-75" control room module and "SC-75" studio module to "External 2". Otherwise, the board-operator will be hearing the audio on a 7.5 second delay.

10.D.1. Delay Box Remote Control

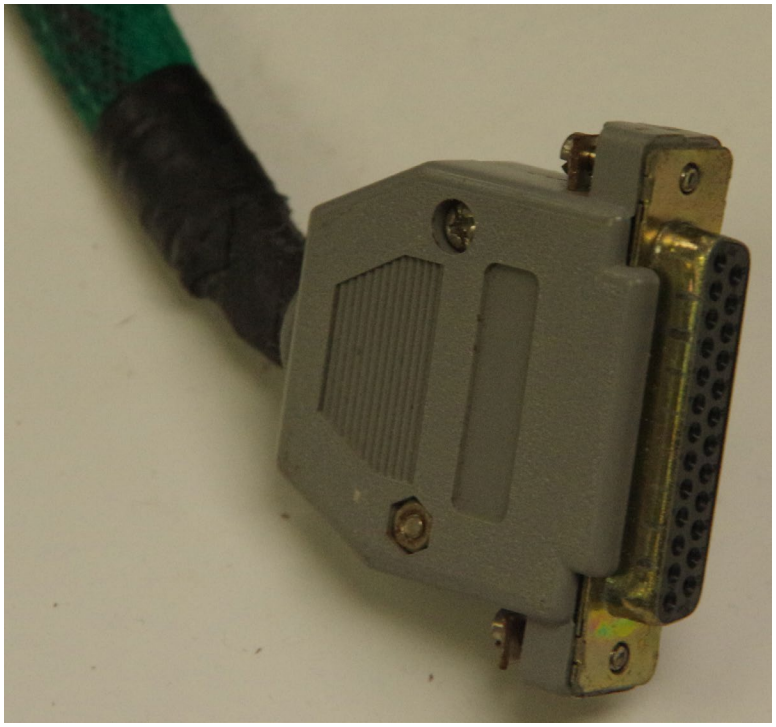
The delay box remote control is a box that sits on the public affairs table. It allows the host of a program to operate the delay box, including dumping profanity. That means there are two staff members who can act in the event that a caller says something inappropriate.

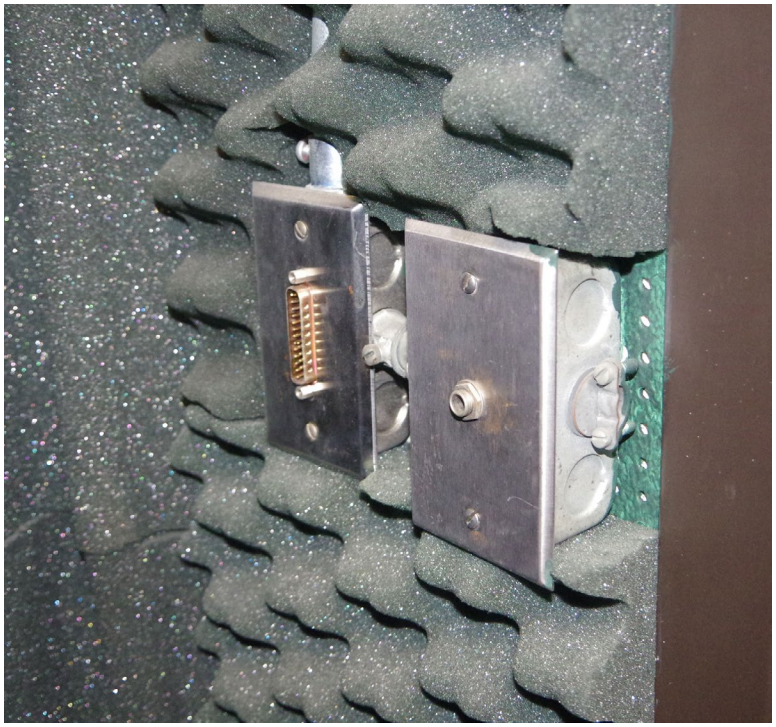
> CRITICAL!
> Dump that profanity!
> Do not presume that the other person will hit the button. It is better for both of you to hit the button and dump a little extra audio than to have inappropriate audio go over the air.

WMUL-FM's Broadcast Delay Remote Control unit operates the same way as the front panel buttons with two exceptions. There is no STATUS button, and the accumulated delay is only given as either ≥3.75 seconds or 7.5 seconds.

Reader's Notes

The remote control connects to a DB-25 connector on the wall of the classroom, between the Studio A window and the corner. Be certain to line up the pins with the holes so as not to bend them. Be careful.



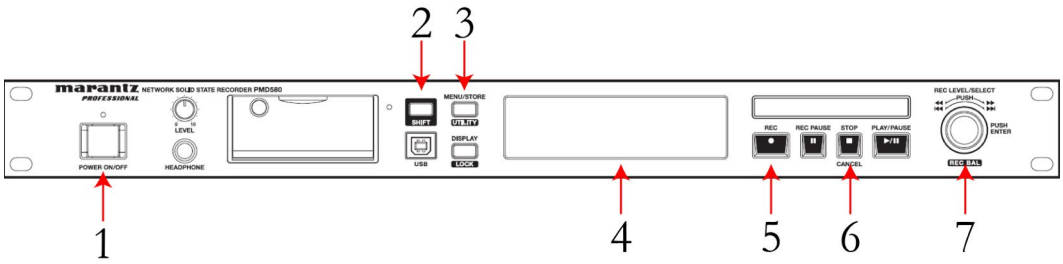


10.E. Using the Flash Recorder in Studio A

Reader's Notes

The Marantz PMD-580 flash recorder is Studio A records the W-PGM audio. (W-PGM is the audio that is going to the transmitter, but before it runs through the delay box.) It records to an internal Compact Flash card and copies the finished recording to the file server. WMUL-FM uses it to record programming such as news and sports. It is available to use whenever someone wants to record one's live program.

The flash recorder is located in the front, left equipment rack in Studio A. (The rack that is usually covered by the WOAFR 1 monitor). It is the bottom most piece of equipment in the rack. It is the silver in color.



10.E.1. How to Record

1. Turn the recorder on with the Power button (1). After several seconds, the display (4) will show the time remaining.
2. Press the Record button (5). The display will change to show the time elapsed. The device is now recording.
3. At any time during the recording, you may press the record button (5) again to begin a new recording
4. Once your program is over, press the Stop button (6). The recording will stop.

Reader's Notes

10.E.2. Moving The Recorded File to Your Folder

After stopping the recording, the recorder will begin copying the file over to the X:\MMPGLANG1\ folder. (The exact number of "M"s may vary).

The files will have a name similar to: "160520_140245_DRN110.wav". The first six digits are the date the file was started, in YYMMDD format. The second set of six digits are the time the file was started, in 24-Hr HHMMSS format. Make a note of this filename, you will need it in a minute.

The size of the file can be estimated. Each thirty (30) minutes of recording requires approximately 150 MB. Depending on the size of the file, it may take several minutes to copy.

Move the file from the X: drive to your folder on the Y: drive or your department's folder on the Z: drive. Once you have moved the file, you may rename it.

10.E.3. Deleting the Original File From the Card

Once you have copied the file from the X: drive to your folder, you need to delete the original from the flash card.

1. Go back to the recorder in Studio A.
2. Press and hold "Shift" (2) and then press "Menu/Store" (3).
   The display will change.
3. Scroll to "U11: Track Delete".
4. Press the select knob (7). The display will show a flashing file name.
5. Scroll to your file.
6. Press the select knob. The file will be deleted.

10.F. Using the Skimmer

Reader's Notes

The skimmer is a device that continuously records what is on WMUL-FM's airwaves. It records to an uncompressed .wav file. The previous day's files are copied from the skimmer itself to the file server beginning at 12:05 A.M. Copying the files takes up to ninety (90) minutes. The mp3 versions are created beginning at 2:00 A.M. The mp3ing process takes up to an additional ninety (90) minutes.

The files of the skimmer are located in U:\Skimmer\On-Air and are available to all staff members to critique their own work. The entire U: drive is write-protected to prevent unauthorized deletions.

Each day has one or two folders containing the recordings from the skimmer for that day. Each file is fifteen (15) minutes long.

Each folder name is in the format "YYYY-MM-DD". The folders ending in "_mp3" contain 96 kbps mp3 recordings. The folders without that ending contain the original .wav files. The .wav files are kept for fourteen 14 days before being automatically deleted.

Reader's Notes

10.H. Turntable

Studio A does not usually have a turntable. One or two can be installed for special events like Vinylthon. A turntable is a sensitive and delicate piece of precision equipment. These are the rules.

1. Nothing is to be placed on the clear plastic dust cover.
2. Do not touch any tracking or weight settings. This turntable is ready to go as is. The only seven (7) parts of the turntable you are allowed to touch are the cue lever, the tonearm, the power switch, the speed selector, the start/stop button, the side of the platter, and the 45 adapter.
3. There will be no "scratching" or other manipulations of the turntable to produce special effects. "Scratching" damages both the record and the stylus. The penalty is dismissal if you are caught. This is your only warning.

10.H.1. How To Operate the Turntable

1. Carefully lift the clear plastic dust cover up from the front. Do not slam it back or the hinges will break.
2. Place your record on the turntable. Make certain the correct side of a record is facing up, you do not want to accidentally play an unedited song. E.G. Hip-Hop records may have the radio edit on Side A, Track One and the unedited version on Side B, Track One.

   If you are going to play a 45 RPM record with a large center hole, place the adapter on the spindle before placing the record over the adapter. The adapter can be found on the turntable itself in the left rear corner. If you don't know how a large hole 45 record works, ask before playing one.
3. The turntable is on channel #14-B. Make certain that the B input is selected and that the channel is in cue and off-air. Cueing up a record over the air sounds really dumb. Many of us have done it, so we know!
4. Make certain the power switch on the turntable is set to ON. It is the round knob located on the left front of the turntable. A little red light will glow.
5. The speed is set at 33 RPM when the unit is turned on. Be certain to change the speed to 45 RPM for such recordings. Some large "singles" with small center holes look like 33 RPM records but are really 45's. Read the label.

6. Lift the tone arm with the cueing lever. The cueing lever is the thin metal bar with the plastic tip located on the right side of the tonearm near where the tonearm is attached to the turntable base. The tonearm will rise up about an inch and stay there until you lower it again with the cue lever. Never try to push it down by hand. Always use the lever. You are now ready to cue the record.
7. Gently push the now elevated tonearm until it is over the beginning of the cut you want to play. Lower the tonearm to the record surface with the cue lever.
8. Gently turn the platter by hand until you hear the first note of the song you want to play through the cue speaker. You might need to rotate the platter backward and forward a bit to find the exact spot. You can turn the platter by putting your finger on the bumps on the sloped edge of the platter and pushing.
9. Now turn the platter counterclockwise for 1/4 turn. Turn it gently so that the stylus (needle) does not jump out of the groove. This will put the stylus far enough ahead to give the turntable time to come up to speed before the music starts.
10. Press the red "on" button for channel #14.
11. Fade channel #14 up to the shaded gray area (-12). The turntable is now "live" and ready to play the record over the air. You may have to adjust the fader to achieve the appropriate levels after the music starts just as you would for a CD.
12. When you are ready to begin playback, press the rectangular start/stop button near the power switch.
13. When the song is over, immediately press the yellow "off" button under channel #14. This will get you off the air before the next cut starts. Begin your next song from the CD player or computer. You cannot play two records in a row at WMUL-FM with only a single turntable.
14. Stop the turntable by pressing the rectangular start/stop button.
15. Lift the tone arm with the cue lever and push it gently to the right. With the cue lever, lower the tonearm onto its stand.
16. Remove the record and start the whole process again.

Reader's Notes

Reader's Notes

10.H.2. If The Record Skips or Otherwise Messes Up

1. If for any reason the record will not play properly, get the defective record off the air.
   a. Fade down the turntable immediately.
   b. Start a CD or computer playback.
   c. Press the white "off" button under channel #14.
   d. Stop the turntable.
2. Use the cue lever to lift the tonearm off of the record. Do not grab the tonearm in a panic; it is very easy to snap it off. If you have pressed the yellow "off" button under fader #14 no weird sounds will be going out over the air - so you can proceed calmly.
3. Remove the record and put it aside. Notify your producer that it is defective.
4. Try another record. If a second record will not play abandon the turntable and play CDs or the computer. Fill out a discrepancy report in the white discrepancy binder. See 5.F.4. Equipment Discrepency Form in Volume I.

10.I. CD Players

Reader's Notes

Two Denon 951-FA CD cart players are in the rack to the right of the D-75 console. These machines will ONLY play CDs that have been put into special cartridges. You will find empty carts in your music format's cabinet or lying near the D-75 console. Always use a CD cartridge.

CRITICAL
Never put an un-carted CD into the CD player.

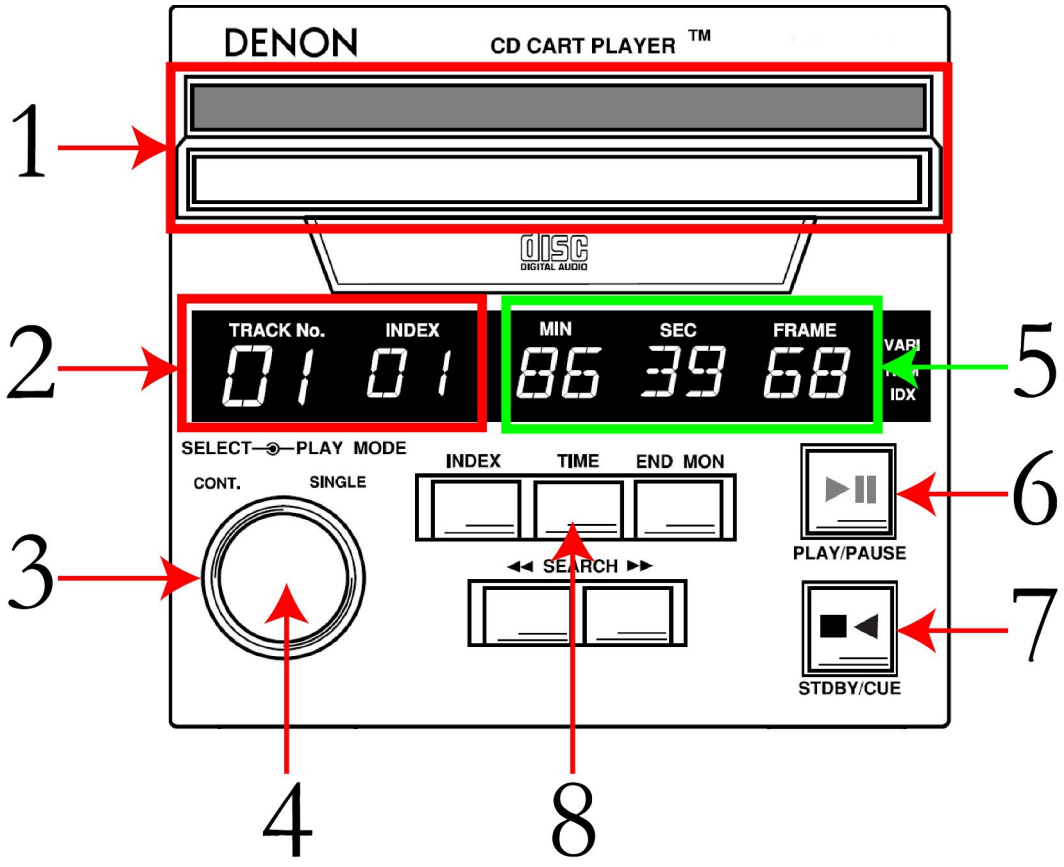
CD player #1 (left) plays through channel #15-A and CD player #2 (right) plays through channel #16-A.

For technical reasons it would be better if you faded down the CD players after each use (it would also make you appear to be more professional). However, if you think that you might forget to fade the CD players up again, you may leave them faded up.

Remember that you may preview material on a CD by using the cue.

The Denon 951-FA compact disc players are capable of a number of functions for which air staff ordinarily have no need.

Reader's Notes



1. CD Tray
2. Track Number, Index Number - Some CDs have their tracks further split into indexes. None of the music CDs you will encounter are likely to have indexes.
3. Play Mode Select Ring - A ring around the Track Select Knob that allows the user to select SINGLE play or CONTinuous play. In single play, the machine plays a single track and stops. In contiuous play, the machine continues and plays the following tracks.
4. Track Select Knob
5. Time Display - Defaults to show "Time Remaining"
6. Play / Pause Button
7. STDBY/CUE Button - Also works as a "stop" button.
8. Time Button - Press this button to toggle the Time Display between "Time Remaining" and "Time Elapsed".

10.I.1. How To Operate the CD Player

Reader's Notes

1. Make certain that the Play Mode ring is set to SINGLE. It usually will be set to SINGLE, but check anyway.
2. Before inserting the CD cartridge:
    a. Make certain the CD cartridge is right side up. You will be able to see the top of the actual CD itself through the clear plastic door. If you cannot, then the CD is upside down.
    b. Make certain you are inserting the correct edge of the CD cart. There are tiny arrows on the top of the cart. Insert it in the direction of the arrows. If you cannot find the arrows: the top of the CD cart is in two clear plastic sections. Insert the edge that is alongside the smaller of the two sections.
3. Now insert the CD cart into the tray, pressing on the middle of the protruding edge of the cart. Never push a CD cart from its side; always push it in straight. The tray you are pushing the CD cart into will make a snapping sound when you have reached the right spot and the whole tray will drop down a fraction of an inch.
4. Make certain the edge of the CD cart is level. If one side is higher, the tray is stuck. Never play a CD cart that has not been properly seated in the tray.
    a. GENTLY push down on the higher side of the CD cart until the edge of the cart is level.
    b. If it will not level out, lift the CD cart up from the middle. It will slide out a bit.
    c. Try again from the beginning of step 3. Never get angry at the machine and try to force it to work. If you have any problems getting the CD cart in, abandon that CD player until you can notify management.
5. Make certain the red "on" button is illuminated under the fader that corresponds to the CD player you are using. The left-hand CD player is CD 1 (#15-A). The right-hand CD player is CD 2 (#16-A).
6. Slide the fader up to the shaded gray area (-12). CDs are funny. Some may need to faded above the gray aread, some below. Just watch those levels.

9.A.2. VU Meters on the Console on Page 54.

Reader's Notes

7. Once the CD cart is in, it will cue up to the first cut. When a cut is ready to be played, the STDBY/CUE button will show a steady yellow light. The Time Display will show how much time remains in the selection. One may also press the Time button to view an elapsed time for the CD playing.
8. If the first cut is the one you want to play, you do not have to do anything further to cue up that cut.
9. If you want to play a selection other than the first one, turn the Track Select Knob to the right (clockwise). Each click takes you to the next cut. If you go past the cut you want, turn the knob to the left (counterclockwise) until you get back where you want to be. Wait for the STDBY/CUE button light to glow a steady yellow.
10. To play the selected cut, press in the PLAY/PAUSE button. It will glow a steady green as the cut plays. When there are 10 seconds left, the PLAY/PAUSE button will begin to blink green. Have something else ready to play before this happens.
11. When the selection is over take the CD cart out. The Time Display will be blank to remind you that cart has already been played.
    a. Make certain the edge of the CD cart is level before trying to pull it out. If one side is higher, the tray is stuck.
        i. GENTLY push up on the lower side of the tray until the edge of the CD cart is level and the CD slides out a little.
        ii. If the tray will not level out, push the cart down from the middle. It should re-seat.
    b. Lift up the MIDDLE of the cart tray. Do not lift the tray from the side and do not bang it. A gentle lift will do. There will be a snapping sound when you reach the right spot and the cart will slide out a bit. If you have any problems getting the CD cart out, abandon that CD player and notify the engineering staff or the Operations Manager.

IMPORTANT

Never insert anything into the CD cart player in an attempt to remove a stuck cartridge, you may seriously damage the unit.

10.J. Signing the Station On and Off the Air

Reader's Notes

10.J.1 Signing The Station Off the Air

WMUL-FM operates 24 hours a day, 7 days a week. However, it is occasionally necessary to sign off the transmitter and cease on-air operations. During these times, programming will continue on the webstream. Someone from the engineering staff will direct you to sign the station off when needed.

These instructions presume that programming is playing through Studio A - Rivendell 1.

1. Place Rivdell 1 in AUD.
2. On the router:
   A - PGM ► Mux Strm
   A - AUD ► Xmitter
3. Place Panel 1 in AUD only, fade it up, and turn it on.
4. Locate the sign-off cut in the computer playback system library. Three different sign off cuts exist for different sign-off durations. If you are uncertain which cut to use, play the "A Few Hours" cut.
   - MISC - 040001 - One Hour
   - MISC - 040002 - Two Hours
   - MISC - 040003 - "A Few" Hours
5. Load the sign-off cut into a sound panel button.
6. Take a meter reading within 5 minutes of sign off.
7. When the song ends, take Rivdell 1 out of AUD. This will stop music from going to the transmitter. Music will continue on the webstream.
8. Look at the Modulation Monitor. Make certain that the left and right channels are showing zero.
9. Play the sign-off cut from the sound panel.
10. On the Transmitter Remote:
    a. Scroll to Channel 6 - On / Off
    b. Press the Red "Xmit Off" button for 1 second. The voltage displayed should drop to zero over a few seconds.
    c. Check the Modulation Monitor. The "Multipath" meter should read full and the signal level meter should drop to zero.
    d. If needed, push the button again.

Reader's Notes

11. Inform the engineering staff that the station is signed off.
12. Make a note in the remarks column on the Operations Log that station was signed off and the time. Initial the note.
    E.G. "Sign Off: 1:33 pm - MS".
13. Turn off the modulation monitor to prevent the silence alarm from blaring through the station.

10.J.2. Signing the Station On the Air

After maintenance is completed, the engineering staff will direct you to sign the station back on.

The first three steps should still be completed from the sign-off, but check them to make certain.

1. Place Rivdell 1 in AUD.
2. On the router:
   A - AUD ► Xmitter
3. Place Panel 1 in AUD only, fade it up, and turn it on.
4. Turn on the modulation monitor. Give it several seconds and confirm that the "Multipath" meter reads full and the signal level meter is zero.
5. On the Transmitter Remote:
   a. Scroll to Channel 6 - On / Off
   b. Press the Green "Xmit On" button for 1 second. The voltage displayed should raise to approximately 3900 volts over a few seconds.
   c. Check the Modulation Monitor. The "Multipath" meter should drop to zero and the signal level meter should go to full.
   d. If needed, push the button again.
6. Give the transmitter a few minutes to warm up.
7. Locate the sign-on cut in the computer playback library. It should be MISC - 040000.
8. Load the sign-on cut into a sound panel button.
9. Play the sign-on cut from the sound panel button.
10. When the cut finishes, put Rivdell 1 in AUD. This will cause music to resume playing over the air.
11. Make a note in the remarks column on the Operations Log that the station was signed on and the time. Initial the note.
    E.G.: "Sign On: 2:48 pm - MS"
12. Take a meter reading within 5 minutes of signing on.

13. On the router:

    A - PGM ► Xmitter

    WMUL Pst► Mux Strm

14. Take Rivdell 1 and Panel 1 out of AUD.

Reader's Notes


U-HAUL
SAVE!
U-HAUL
SAVE!

11. News, Sports, and Remotes

Reader's Notes

News and sports broadcasting play a big part in the WMUL-FM schedule. From the daily "5:00 P.M. Edition of Newscenter 88", to the weekly "Sportsview" call-in show, to play-by-play coverage of Marshall's Thundering Herd, WMUL-FM has repeatedly won awards for doing a great job. To give everyone on the news and sports teams that competitive edge, we present a brief guide to board-operating news and sports on WMUL-FM.

If you join the news or sports staffs, you may be called upon to run the board ("board-op") a news or sportscast. The procedure for board-operating is largely the same, regardless of whether the program is a newscast, talk show, or a live event (such as sports play-by-play).

The few key differences are:

- **Talent Location:** In a newscast or talk show, the talent will be in the studio complex with you. You will be able to more directly communicate with them before, during, and after the program. In a remote event, the talent will be at a remote site. Communications will be limited to talk-back through the console.
- **The Program Clock:** In a newscast, you will be given a detailed script that specifies everything the anchors will say and when each package and break is to play. A talk show will have a clock that says approximately when breaks are to occur and may specify general topics for each segment. A remote program will have only a general clock. The course of the program will be subject to the progress of the event.

You will complete the same logs as you would be a DJ shift.

8. WMUL-FM's Operator Logs on Page 25.

Remote equipment allows for WMUL-FM's programming to originate at locations outside the main studio. WMUL-FM has originated remote programming from nearby places such as the first floor of Communications Building and the Memorial Student Center Plaza, to distant places such as Cancún, Mexico, and El Paso, Texas.

Reader's Notes

11.A. Board-Operating (Producing) a Talk Show or Sportscast

These instructions are to give you a basic run-down of the process of board-operating an unscripted talk-show or sportscast. Specific programs may have additional steps, but these generic instructions will give you a solid foundation that will apply to any program.

11.A.1. Approximately One Hour Before Program Start

1. Create the program episode log for this program. 15.A.3. Creating a New Log Based on an Existing Log in Volume III.
2. Load the program episode log. 14.E.5. The Select Log Dialog Box in Volume III. If you are board-operating from Studio A, use Studio A - Rivendell 2. If you are in any other studio, use the sole Rivendell workstation in that studio.
3. Set up the talent.
   a. If the program talent is on the Public Affairs Table, see 11.C. The Public Affairs Table on Page 112.
   b. If the program talent is in the Newscenter, see 11.D. Board-Operating (Producing) a Program in the Newscenter on Page 115.
   c. If the program talent is in Studio D, see 11.E. Board-Operating (Producing) a Program in Studio D on Page 115.
   d. If the program talent is remote, connect the talent following the instructions for that remote source later in this part.

11.A.2. A Few Minutes Before Program Start

4. Start the delay box. 10.D. Broadcast Delay Box on Page 84.
5. Place Rivendell 2 in PGM, turn the channel on, and fade it up.
6. The talent should be in cue at this point. You may be able to talk to them through the board using the talk-back function. Press the "TB" button on right-hand side of the board and speak into CR Mic Front.
7. Communicate with the talent about when to start the program. Near to the scheduled start time, let the talent know how much time is on the current song and the next song.

Reader's Notes

8. Shortly before the program begins, start the recording.
   10.E. Using the Flash Recorder in Studio A on Page 87.
9. When it is time to start the program, toggle Rivendell 1 into "Manual" mode.
   - If the program start is soft-timed, allow the song to finish playing.
   - If the program start is hard-timed, fade down Rivendell 1 at the appointed time.

11.A.3. Program Start

10. Click the start button on the program intro on Rivendell 2.
11. After the intro "tosses" to the talent, fade up the talent. The intro tosses to the talent with a line similar to, "Let's go live to the F-M eighty-eight sports team".
12. After the intro finishes, the computer will stop.
13. Adjust the levels of the talent as needed.
14. Take breaks when the talent cues you. The host will say something such as "We'll be back with more <program> on eighty-eight-point-one W-M-U-L-F-M." The exact wording of the cue to break will depend on the program.
    a. If there is a break bed, start it when cued.
    b. Fade out the talent.
    c. If there is a bread bed, let it finish. The computer will continue playing the breaks after the bed finishes. If there was not a break bed, click the start button on the break. The break will begin playing.
    d. Place the talent in cue so that the talent can speak to you during the break. The program may need a longer break than is built into the playlist. Or the talent may want you to end the break early. Add or delete breaks from the log as needed by the talent. Do not fade a promo early though. Once a promo has started playing, it must be allowed to finish.
    e. When the break is over, take the talent out of cue and fade the talent back up. The computer will stop when it hits a stop transition at the end of the break.

Reader's Notes

11.A.4. Program End

15. When the program is over, fade out the talent and place them in cue.
16. Jump the music log on Rivendell 1 to the current time.
17. When the outro finishes, Rivendell 2 will stop playing.

    Click the start button on the song on Rivendell 1 to begin the music.
18. Toggle Rivendell 1 into Automatic mode.
19. Stop the recording. Once it has copied to the X: drive, copy it over to the correct folder on the Z: drive.

11.B. Board-Operating (Producing) Newscenter 88

Reader's Notes

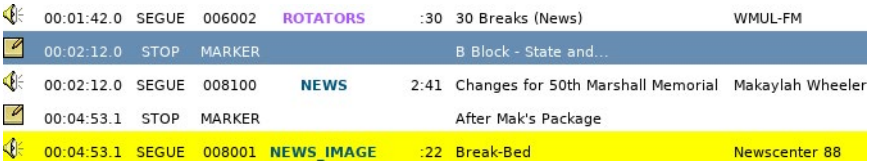
Board-operating an edition of Newscenter 88 is a process with many steps. This is one of those situations where a program requires more attention of the board-operator than the generic talk-show or sportscast.

You will be in control of the station during this program; therefore, you will complete the logs. 8. WMUL-FM's Operator Logs on Page 25. Make certain to sign on and off each log, and take a meter reading if the newscast runs betweeen :50 and :59.

7.A.3. Computer Playback (Automation) on Page 11 for a quick introduction to the computer playback if you are not already familiar.

11.B.1. Approximately One Hour Before the News

1. Ingest all the packages and the weather. See 15.B.2. How to Ingest New Audio in Volume III.
   a. The source files will be in the folder:
      Z:\News\Packages, Sports and Weather\
      <day of week>\<date>
   b. Use the "NEWS" group.
2. Create the program episode log. 15.A.3. Creating a New Log Based on an Existing Log in Volume III.
3. Insert the Packages and Weather into the program episode log. 15.A.5. Editing a Log in Volume III.
   a. Talk to your anchors about where to place news packages.
      Ask them which block the stories are in, and in what order. It will be indicated in the script, if the script is complete.
      The different blocks will be indicated through notes in the log.
      Insert the first package after the block note.
   b. Insert a note after the package. Give it a "STOP" transition. Give it a title that you will understand. This note with a STOP transition will prevent the computer from continuing on to the break bed after the package.



00:01:42.0	SEGUE	006002	ROTATORS	:30	30 Breaks (News)		WMUL-FM
00:02:12.0	STOP	MARKER			B Block - State and...		
00:02:12.0	SEGUE	008100	NEWS	2:41	Changes for 50th Marshall Memorial		Makaylah Wheeler
00:04:53.1	STOP	MARKER			After Mak's Package		
00:04:53.1	SEGUE	008001	NEWS_IMAGE	:22	Break-Bed		Newscenter 88

Reader's Notes

c. Sports Packages go under "FM88 Sports Report", which is another note in the log. If there is more than one sports package, check with your sports anchor to find out what order the packages are to air.

d. Weather goes after WX Two Punch and before the block marker.

4. Load the program episode log in Studio A on Rivendell 2.

14.E.5. The Select Log Dialog Box in Volume III.

11.B.2. Five to Ten Minutes Before News

5. Begin to fade things up in Studio A.
   a. Put Rivendell 2 in PGM and fade it up, but leave it turned off.
   b. Find which microphones on the table correspond with your anchors. The anchors will usually seat themselves at Mics 1 and 2, or 1 and 6. Put the microphones in PGM, fade up, and place in cue.

11.C. The Public Affairs Table on Page 112.

6. Make certain that the anchors have given you a copy of the script.

11.B.3. Immediately Before News

7. Sign onto the Program / Announcer Log and the Operations Log. Do not put a time yet.
8. Start the recording.

10.E. Using the Flash Recorder in Studio A on Page 87.

9. Alert the anchors that the news is about to start. Press the yellow button labeled TB on the right hand side of the board and speak into the CR Mic Front. They will be able to hear you in the classroom speakers and in their headphones. You will be able to hear them so long as you have them in cue.
10. Turn on Rivendell 2 on the board.
11. Toggle Rivendell 1 to "Manual".
12. Precisely at 5:00 P.M., fade down Rivendell 1.

11.B.4. During The Newscast

13. Click the start button on the Newscenter 88 Intro. The intro will play. There will be a Legal ID followed by a voice over music. The voice-over introduces Newscenter 88.
14. Turn anchors' microphones on when the voice-over tosses to them. It will say "And now... the Newscenter 88 team."

Reader's Notes

15. After the anchors begin speaking, finish signing onto the logs by writing in the exact time the program began.
16. Make certain you are following the script. You are given one for a reason, even if it seems unnecessary. Turn the anchors' individual microphone on and off as they progress through their stories.
17. Rolling Breaks
    - On the script, it will say "ROLL BREAK BED".
        i. You will fire the break bed then by clicking the start button on the break bed. A music bed will begin playing and the anchor will talk over the it.
        ii. Once the anchor has completed the toss to break (which you can determine by following the script), turn the anchor microphones off. Place them in cue so that the anchors can communicate with you during the break.
    - Breaks are scheduled for one minute. The real target is the time on the clock. See 11.B.7. Timing the Newscast on Page 110. Add or delete breaks to come close to the scheduled time.
    - Use the talk-back to give your anchors 30 second and 10 second warnings. When the break is over, turn their microphones back on.
18. Rolling Packages
    - You treat rolling a package the same way you would rolling a break.
        i. Click the start button on the package on Rivendell 2.
        ii. Turn the microphones off.
        iii. Make certain your anchors are aware of the time remaining on the package.
        iv. Turn microphones back on after the package ends.
19. During the Break before the weather:
    a. Jump the Rivendell 1 log to 5:30 P.M. or as close as possible before that time (E.G. A song that starts at 5:28 P.M.). This makes certain that the correct music or programming plays after news. See 14.F.7. Jumping the Playlist in Volume III.
    b. Toggle it back into Automatic mode.
    c. Fade up the Rivendell 1 channel on the board.

Reader's Notes

20. FM-88 Sports Report
    - The sports anchor will enter the classroom studio during the break immediately before the weather.
    - The sports anchor will give you a copy of the sports script.
    - The sports anchor normally uses Mic 5 or 6. Check to be certain. Turn this microphone on the same as the news microphones.
    - There will almost always be sports packages. These are rolled the same as any other package. Follow along with the sports script.

11.B.5. Ending The News

21. The final segment is known as "Kickers". There will be variable number of stories in this segment. Some days there will be only one (1), other days there might be five (5) or six (6). There might not be time remaining in the newscast for all of the stories. Let the anchors know how many stories you expect they will have time for. Adjust the final break and the number of kickers so that the outro rolls as close to 29:15 as possible. See 11.B.7. Timing the Newscast on Page 110.
22. Anchor 2 will read the first story out of the break. The two anchors will trade off reading each story. This may or may not be properly shownin the script. You have to pay attention to when one story ends and the next begins.
23. Roll the outro. Whichever anchor is supposed to read next will read the farewell, no matter what the script says. The script may say that Anchor 1 will read the farewell, but if Anchor 1 just read a story, then Anchor 2 will actually read the farewell. The farewell will conclude the newscast and thank everyone involved and will end with a thought of the day.
24. Once the anchor is finished, turn all microphones off.
25. Allow the outro to finish playing.
26. Once the outro finishes, click the start button on the first song on Rivendell 1. Make certain that it is in "Automatic" mode.

11.B.6. Final Steps

27. Stop the recording.
28. Sign off the Program / Announcer Log and Operations Log.
29. Turn off Rivendell 2 on the board, fade it down, and take it out of PGM and AUD.
30. Unload the newscast log from Rivendell 2.

Reader's Notes

31. It is your responsibility to pull the recording of the news off the recorder. It will take several minutes for the file to copy from the recorder to the file server (X: drive). It will only copy the file when the recording is stopped. If there is another program immediately after the newscast (E.G. Sports Night), you may have to wait until later in the evening or the next day to retrieve the recording.
    a. Go to any digital editor computer.
    b. Navigate to X:\MMPGLANG1 .
    c. The recording of the newscast will usually be the most recently created file. It should be between 120 MB and 170 MB.
    d. Copy and paste this file into the newscasts folder.
        Z:\News\Newscasts\<semester and year> .
    e. Rename the file to: "NC88 - Date - Anchor names (W-Weather Anchor, S-Sports Anchor, RP-Reporters, SR-Sports Reporters, P-Producer)". Use the date format YYYY-MM-DD so that the files are naturally sorted in the folder.
        E.G. "NC88 - 2020-11-13 - Zane Bowles and Makaylah Wheeler (W-Nick Matawa, S-Nick Verzolini, RP-Makaylah Wheeler, P-Mike Stanley)".
    f. Go into Studio A and erase the original file off the card.
        10.E.3. Deleting the Original File From the Card on Page 88.

Reader's Notes

11.B.7. Timing the Newscast

Part of your duties as producer is to time out the newscast, first by extending or reducing the lengths of the breaks, and then by figuring out how many kickers will air in the final segment. The News Director or an experienced anchor may supervise this, especially when you are new.

Each break is scheduled for a duration of one (1) minute, but the real target is the time on the clock. You want to come out of each break near a specific time. Add or delete breaks to come close to the scheduled time. Use the next stop timer to determine when on the clock the break will end. See 14.D.5. Next Stop Counter (5) in Volume III. The timing targets are as follows.

- Break 1 - 06 minutes into the newscast.
- Break 2 - 11 minutes into the newscast.
- Break 3 - 16 minutes into the newscast.
- Break 4 - 21 minutes into the newscast.
- Break 5 - 27 minutes into the newscast.
- Outro - :29:15 into the newscast.

Break five is a more fluid target than the others. It depends on how many kickers are in the script. Backtime from 29:15 and budget 00:45 seconds for each story. If there are only 2 kickers, that's 01:30, so the break needs to end closer to 27:45. Prefer to end the newscast a bit over 30 minutes rather than a bit under.

You may also have to cut some kickers on the fly during the final segment. If it is already past 29:00 when the anchor finishes a story, go ahead and roll the outro, even if there are still stories in the script. Don't roll the intro in the middle of a story, even if the story is running long.

You may have to pre-emptively shorted or eliminate the final break.

- If the FM-88 Sports Report runs past :27:00, go ahead and cut the final break down to 00:30 seconds.
- If the Sports Report runs past :27:30, eliminate the break entirely and communicate to the anchors to go straight to the kickers after the sports report..
- If the Sports Report runs past :29:00, eliminate even the kicker and roll the outro after the sports report.

11.B.7. Final Thoughts

Reader's Notes

The most important things to remember are:

- Breathe. We appreciate what you are doing, and know you are trying your best.
- If you don't know, ask. You can always contact the News Director, Training Coordinator, or Student Manager.
- We truly do appreciate your contribution to the news, and that you are working with us. Please remember that we are here to help you.

Reader's Notes

11.C. The Public Affairs Table

The Public Affairs Table located in the Classroom Studio (CB 201) allows up to six additional announcers to be easily on the air. Its use is typically restricted to news, sports, and public affairs programs. However, DJ shifts with more than one announcer, or with a guest may also use the table, provided it has not been booked by another staff member. See 3.D.2. Guidelines for Studio Reservation in Volume I.

> REMEMBER
> Permission to operate with more than one announcer must be obtained in advance from station management.
>
> Requests to have a guest must be made at least 24 hours in advance. See 5.B.1.a. Additional Guidelines for DJs in Volume I.

The table has six microphone / headphone positions on top and an additional two microphone inputs underneath. Microphone 1, typically the host's position, is in the middle-front. Microphones 2-6 continue clockwise from the host's position.

The microphones correspond to "Class Mic 1" through 8 on the Studio A and Studio D consoles. The other studios are not yet connected.

11.C.1. Headphone Controller

Reader's Notes

Each position has a Henry Engineering Guest Pod to control the headphones, provide mic tally and cough function. Both a 1/4" and a mini headphone jack are provided, and both can be used simultaneously. One volume knob controls the level of both headphone jacks.

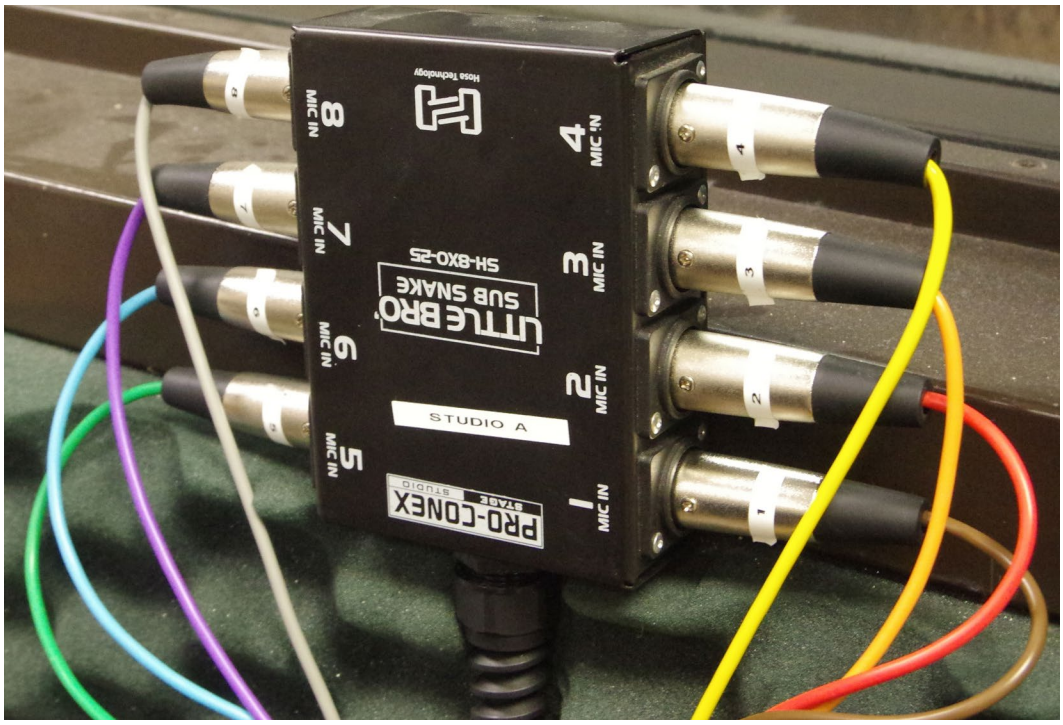
The "MIC" LED is a tally light that alerts the announcer that the microphone is on. It only works with Studio A.

Holding down the "COUGH" button mutes that microphone. On Microphone 1, the "COUGH" button has an additional function. Holding it allows the host to speak to the board-operator through the cue speaker. These functions also only work with Studio A.

Reader's Notes

11.C.2. Connecting the Public Affairs Table

The Public Affairs Table can be connected to either Studio A or Studio D. It is usually connected to Studio A. A cable-snake from the Public Affairs Table connects to stage-boxes attached to the windowsill of Studio A.



The stage-box on the right-hand end of the window connects to Studio A. The stage-box on the left-hand end of the window connects to Studio D.

To change which studio the Public Affairs Table is connected to, unplug the cable-snake from one stage-box and plug it into the other. The cable ends and boxes are labeled as to which microphone connects where.

11.D. Board-Operating (Producing) a Program in the Newscenter

Reader's Notes

The Newscenter studio can also be used to produce programming, much as the Public Affair table. The Newscenter has three guest mics (Mics 1-3). Mic 1 is the microphone facing the mirror. Mic 2 is the microphone to the right of Mic 1 and Mic 3 is to the right of Mic 2. A producer/host mic (CR Mic B) is to the left of the console.

The Newscenter also has a Rivendell workstation (Rivendell, Panel, and Preview) and a digital editor (Editor).

The program from the Newscenter can be recorded to either the flash recorder in the studio or to the digital editor. The program can be streamed by routing News PGM to the appropriate webstream. Finally, the program can be aired directly by turning on the News channel (#4-B) on the Studio A console.

11.E. Board-Operating (Producing) a Program in Studio D

Studio D can also be used to produce programming. It has two microphones in the studio (CR Mic Right, CR Mic Left). It also has inputs from the Public Affairs Table (Class Mic 1-8).

The Public Affairs Table is not normally connected to Studio D. 11.C.2. Connecting the Public Affairs Table on Page 114.

Studio D has a Rivendell workstation (Rivendell, Panel, and Preview) and a digital editor (Editor).

The program from the Studio D can be recorded to the flash recorder in the studio. The program can be streamed by routing Studio D PGM to the appropriate webstream. Finally, the program can be aired directly by turning on the Studio D channel (#3-B) on the Studio A console.

Reader's Notes

11.F. Introduction to the Telephone Interfaces

The telephone interfaces allow telephone audio to be sent to WMUL-FM's audio consoles and for audio from the consoles to be sent back to the telephone. This allows callers to be placed on the air.

WMUL-FM has two telephone interfaces, the Gentner DH22 (usually just called the "Gentner", hard "G"), and the JK Audio Innkeeper 1 (the "Innkeeper"). A special telephone interface, the Comrex Matrix (the "Matrix"), can be used with a remote unit to provide a high-quality connection for remotes. The Comrex Access (the "Access") and the Audio over IP use an internet connection to make high-quality audio connections.

Be mindful of the rules about recording and broadcasting telephone conversations. See 4.B.3. Recording and Broadcasting of Telephone Conversations in Volume I. Ask for the caller's consent to broadcast.

The Gentner and JK are mainly for call-in shows and telephone interviews. The Matrix, Access and Audio over IP are used for remote broadcasts whenever possible due to the improved audio quality of those systems.

11.F.1. Routing a Telephone Interface to an Audio Console

11.F.1.a. Routing to Any Studio Other Than B

Instructions presume Studio A - Phone 1 and the Gentner.

A Phn 1s ▶ Gentnr d

Gentnr s ▶ A Phn 1d

11.F.1.b. Routing to Studio B

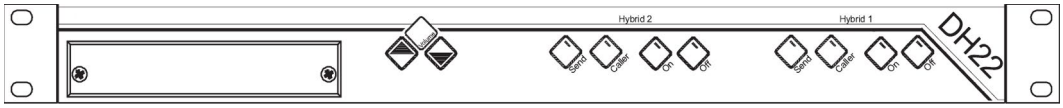
B AUD ▶ Gentnr d

Gentnr s ▶ B-Aux 1

11.G. Gentner DH22 Digital Hybrid

Reader's Notes

The Gentner DH22 Digital Hybrid is the gray piece of equipment located in the rear, left equipment rack in Studio A (the telecom rack). It is the second piece of equipment from the top. It is the preferred telephone interface.



The Gentner is connected to two separate phone lines (304-696-2293 and 304-696-3605). The desk phone sitting atop the telecom rack is 304-696-3605. The wall phone in the Newscenter is 304-696-2293. Either line may be used.

ROUTER

The Gentner is listed as:

Source: Gentnr s

Destination: Gentnr d

11.G.1. Connecting a Call With the Gentner

If the call is long distance, you will need a long distance code before placing the call.

1. Pick up the desired phone.
2. Dial "9" for an outside line.
3. Wait one second.
4. Dial the number. Include the area code, even for local calls.
5. If the number is long distance you will hear three short "dah" sounds. Enter the long distance code after the sounds.
6. Speak to the person on the other end of the line. Confirm that the person is present and ready to go on-air.
7. Tell the person that you are going to sieze the line and that they will hear you speaking from the studio in a moment.
8. Press the "On" button on the Gentner that corresponds to the phone line you are using. A white-noise burst will be sent over the telephone. This is the Gentner programming itself to the phone line. As soon as the burst is over, the phone line is connected to the console.
9. Hang up the receiver.
10. When the call is over, press the "Off" button to hang up the line.

Reader's Notes

11.H. JK Audio Innkeeper 1 Digital Hybrid

The JK Audio Innkeeper 1 is the black piece of equipment located in the rear, left equipment rack in Studio A (the telecom rack). It is the third piece of equipment from the top.

The Innkeeper is connected to a single phone line (304-696-3605). The desk phone sitting atop the telecom rack is 304-696-3605.

It has problems with duplex audio (when audio is being sent from the studio to the phone at the same time someone on the line is speaking). It gets echoey in those situations. It's fine for pre-recorded interviews, but should be avoided for direct on-air use.

ROUTER

The JK Innkeeper is listed as:

Source: Innkpr s

Destination: Innkpr d

11.H.1. Connecting a Call With the Innkeeper

If the call is long distance, you will need a long distance code before placing the call.

1. Pick up the desired phone.
2. Dial "9" for an outside line.
3. Wait one second.
4. Dial the number. Include the area code, even for local calls.
5. If the number is long distance you will hear three short "dah" sounds. Enter the long distance code after the sounds.
6. Speak to the person on the other end of the line. Confirm that the person is present and ready to go on-air.
7. Tell the person that you are going to sieze the line and that they will hear you speaking from the studio in a moment.
8. Press the "Call" button on the JK. The phone line is now connected to the console.
9. Hang up the receiver.
10. When the call is over, press the "Drop" button to hang up the line.

11.I. Comrex Matrix Codec

Reader's Notes

WMUL-FM uses the Comrex Matrix POTS Codec to encode the audio before it is sent across the phone lines. (POTS stands for Plain Old Telephone Service). The Comrex Matrix doubles the frequency bandwidth of the audio. The audio is almost the same quality as if it were coming from the next studio. Using the Matrix requires that the remote crew have the Matrix Portable with them.

The Matrix in Studio A is the black piece of equipment with the small LCD screen and two rows of numbered buttons. It is located in the rear, left equipment rack (the telecom rack). It is the top piece of equipment in the rack.

If the phone lines at the remote site are of extremely poor condition, the Matrix will not be able to maintain a connection. WMUL-FM will have to use an ordinary phone connection through the Gentner or JK Innkeeper.

Unless the Matrix is being used in conjunction with a local remote, it will be necessary to place the phone call from the studio end. When receiving calls, the Matrix is programmed to automatically answer incoming calls.

ROUTER

The Comrex Matrix is listed as:

Source: Matrix s

Destination: Matrix d

11.I.1 Dialing the Matrix

1. Go to the Matrix in the Telecom rack.
2. Connect to the remote site. If the remote is in the Huntington area, the phone call can be made from the remote site. If the remote is from outside the Huntington area, the phone call must be placed from the studio due to the long-distance charges.
3. If the call is to be placed by the remote site:
    a. The remote crew will contact you when they are ready to connect.
    b. The remote site will dial. The Matrix will automatically answer the phone call when it has been placed.

Reader's Notes

c. While the Matrix is connecting, modem noises will play through the cue. Once the connection has been established each side will hear the other. When the unit has successfully connected, the display will show "Connected at XX,XXX"

4. To place the call from the studio:
   a. The remote crew will contact you when they are ready to connect. They will give you the number to dial.
   b. Press "enter" on the Matrix. The screen will display "1)Dial 2)Answ 3)Test 4)Config 5)More".
   c. Press "1" for "Dial". The screen will display "1)Keypad 2)Ext Phone".
   d. Press "1" for "Keypad". The screen will display "Dial Number:" The Matrix will not actually dial the number until the "enter" button is pressed. If a mistake is made while entering the number, the cancel button acts as a backspace.
   e. Enter a "9".
   f. Press "Q-dial" to insert a two-second pause in the dialing process. This pause will be represented on the screen by a comma ",".
   g. Enter the area code and phone number of the remote site. If the call is being made on-campus, then only the last five digits of the telephone number are needed.
   h. If the call is long distance: press "Q-dial" twice to insert a four-second pause. Then enter the six digit long distance code. It can be obtained from the sports director or operations manager.
   i. Press "enter". The unit will now place the phone call and connect to the portable Matrix at the remote site.
   j. While the Matrix is connecting, modem noises will play through the cue. Once the connection has been established each side will hear the other. When the unit has successfully connected, the display will show "Connected at XX,XXX"
5. Confirm that the remote site can hear you and vice versa.

11.J. Comrex Access

Reader's Notes

The Comrex Access permits high-quality audio connections to be made over the public internet. The remote device connects to the studio device from the remote end. No action is required on the studio end.

ROUTER

The Comrex Access is listed as:

Source: Access s

Destination: Access d

11.K. Audio over IP (Skype)

WMUL-FM uses Microsoft Skype to create a high-quality audio connection over Internet connections.

Skype is avaiable on the Audio over IP 1 and Audio over IP 2 computers. Audio over IP 1 is in Studio A. It is the right-hand computer on the left-hand countertop. Audio over IP 2 is in the Newscenter. It is the computer closest to the mirror.

The software is also available on the Studio A and Newscenter editors.

ROUTER

Source: AoIP 1s

Destination: AoIP 1d

Reader's Notes

11.L. "Always On" Remote Sources

This chapter collects the few "always on" remote sources. These sources are always connected and require little work on the part of the board-operator to place them on-air.

11.L.1. The Henderson Center Direct Loop

During remotes from the Cam Henderson Center, the signal can be brought into Studio A over a dedicated phone line called a direct loop. The direct loop does not provide a means of sending return audio. The remote crew will either have to listen to the station's air feed, or receive return audio by another means.

ROUTER
Source: Hendersn

11.L.2. Marti RPU

The Marti RPU is a portable transmitter used by WMUL-FM for remotes. The signal from this transmitter is received by an antenna located on the roof of Smith Hall and sent by wire to the router in Studio A. As with the Henderson Center direct loop, the Marti RPU provides no means of sending return audio.

ROUTER
Source: Marti

11.L.3. TV Studio A

While the TV Studio is only one floor away, it is considered a remote source for audio routing purposes. Both a source and destination feed are connected to the audio console down in the TV control room.

ROUTER
Source: TV-A s
Destination: TV-A d

12. Technical Details

Reader's Notes

This part describes equipment in a detail that goes beyond what the board-operator needs to know to operate an air shift. The information is presented so that anyone interested in this equipment will be aware of its nature and capabilities.

You will be more confident as a broadcaster if you have an idea of what equipment is actually broadcasting your voice and the music out to the station's listeners.

While long lists of specifications may be boring to non-engineers, the equipment behind those specifications is what enables you, the on-air announcer, to broadcast over WMUL-FM. This means you have a personal stake in our transmitter and its peripherals. Whatever satisfaction and enjoyment you receive by working as a volunteer at WMUL-FM depends directly on the equipment operating properly. If the antenna fell down or the transmitter blew up, you and the rest of us would be off the air.

To the listening audience, you are the heart and soul of WMUL-FM. So please spend a few minutes with the brains and brawn of the station.

12.A. Transmitter Remote Control

The Burk ARC Plus Touch remote control system is a flexible broadcast transmitter control system. It allows for unattended and walk-away control for radio stations utilizing broadcast automation applications, as well as a full-time control system for stations which prefer live control.

Per FCC mandate (73.1350 and 73.1400), all broadcast stations must have complete control over their transmission equipment. In addition, each station must have accurate measurements demonstrating legal operation from its transmission network.

The Burk remote control gives WMUL-FM control and metering of the transmitter's operation. Control and metering are available at both the studio and transmitter room, via telephone, and computer.

For the WMUL-FM Operator, the Burk ARC Plus Touch is crucial in operating WMUL-FM within FCC prescribed legal parameters.

The remote control features metering, status, and control channels. These grant the operator control over specific functions of the WMUL-FM transmission network.

Reader's Notes

WMUL-FM's Burk ARC Plus Touch is configured as follows:

Metering Channels:

1. WMUL-FM transmitter room temperature in degrees Fahrenheit
2. The final plate voltage of WMUL-FM's transmitter
3. The final plate current of WMUL-FM's transmitter
4. The calculated Effective Radiated Power from WMUL-FM's antenna
   This channel also allows the operator to adjust the power level
5. The measured power output, as a percentage, of the final radio stage of WMUL-FM's transmitter
6. This channel allows the operator to turn the transmitter on and off.
   It displays the same plate voltage as channel 2. The voltage will go to zero when the transmitter is turned off.
7. The AC Line voltage of the AC power in the transmitter room.

Status Channels:

1. Transmitter Room Door Open / Closed
2. Transmitter VSWR Fault / Clear
3. Exciter Cooling Fault / OK
4. Exciter Automatic Frequency Control Fault / OK
5. Transmitter Blower Fault / OK

The Burk ARC Plus Touch uses a back-lit touch-screen LCD to display meter values and user interface. It displays a running five-second average for each channel. This running average keeps the display smooth and prevents frequent jumps in the channel reading.

All calibrations are the sole responsibility of the WMUL-FM Engineering staff.

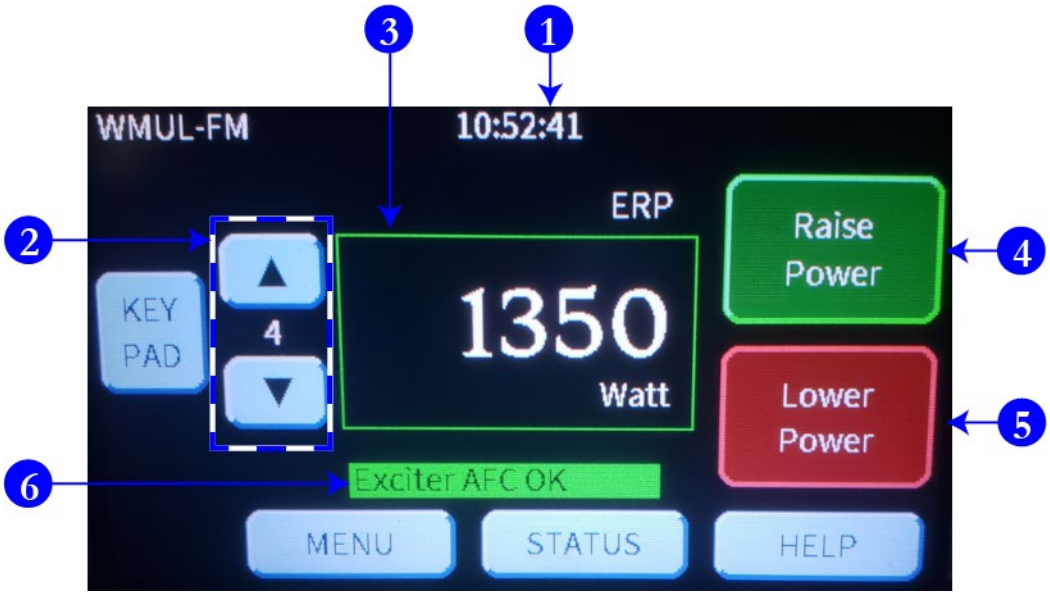
The touch-screen reduces the number of controls the operator needs to use. The average operator will only need to be concerned with the channel buttons (2), and the red and green "raise" and "lower" buttons (4 and 5).

The operator uses the up and down buttons (2) to scroll through the specific control channels. The "raise" (4) and "lower" (5) buttons are used with channel 4 to adjust the transmitter power. They are used with channel 6 to turn the transmitter on and off.

Per WMUL-FM's operating guidelines, an operator must record a meter reading each hour, within a nine minute window at the top of each hour (:50-:59).

8.C.4. How to Take a Transmitter Meter Reading on Page 38.

Remote Control Screen Layout



1. Time (24 hr) [10:52:41]
2. Channel up / down buttons with channel number in between. [4]
3. Channel reading [ERP, 1350 Watt]
4. Raise Button
5. Lower Button
6. Status Indicator [Exciter AFC OK]

Reader's Notes

Reader's Notes

12.A.1. Interpolation Chart

The chart on the opposite page serves three purposes.

1. It provides a written and posted record of the following data:
   a. The limits of WMUL-FM's authorized effective radiated power (1260-1470 watts), "ERP" for short.
   b. The Transmitter Efficiency Factor (70.9% or 0.709), called "F".
   c. The Transmission Line Efficiency (94.1% or 0.941), called "TLE"
   d. Antenna Power Gain (0.4611), called "APG".

   With this data, one only needs the Plate Voltage (Ep) and Plate Current (Ip) readings from the transmitter to determine whether WMUL-FM's transmitter is operating within licensed parameters.

   ERP = Ep * Ip * F * TLE * APG

   ERP = Plate Volts * Plate Amps * 0.709 * 0.941 * 0.4611

   If that value falls between 1260 and 1470, WMUL-FM's effective radiated power is within legal limits.

   The grid at the bottom provides the results of the calculations for you.
2. It provides the occasional "check" on the calculated ERP presented by the Transmitter Remote Control.
3. It provides operators in the transmitter room (usually the engineering staff) with the calculations when taking readings directly from the transmitter.

WMUL-FM

Effective Radiated Power (ERP)
Interpolation Chart

FCC Rules and Regulations, 73.267, states that the operating power of each FM station must be in a range of 90% to 105% of Authorized Power.

WMUL-FM's Authorized Power is **1,400 watts** on the horizontal and vertical plane. The absolute limits of WMUL-FM's operating power are **1260 watts** low and **1470 watts** high.

The formula for determining transmitter ERP in watts is: ERP(watts) = Ep * Ip * F * TLE * APG

Where:	Ep	=	DC input voltage of final radio stage
	Ip	=	Total DC input current in amperes of final radio stage
	F	=	Transmitter efficiency factor
	TLE	=	Transmission line efficiency
	APG	=	Antenna power gain

WMUL-FM's Harris 3.5kW HT FM transmitter's efficiency is 70.9% The 1 5/8" air dielectric Wellflex coaxial cable has a transmission line efficiency of 94.1%. The Harris FML-1E single bay antenna has a power gain of 0.4611.

		Ep (Volts)																		
		3800	3810	3820	3830	3840	3850	3860	3870	3880	3890	3900	3910	3920	3930	3940	3950	3960	3970	3980	3990
Ip (Amps)	1.01	1181	1184	1187	1190	1193	1196	1199	1202	1206	1209	1212	1215	1218	1221	1224	1227	1230	1234	1237	1240
	1.02	1192	1196	1199	1202	1205	1208	1211	1214	1217	1221	1224	1227	1230	1233	1236	1239	1243	1246	1249	1252
	1.03	1204	1207	1210	1214	1217	1220	1223	1226	1229	1233	1236	1239	1242	1245	1248	1252	1255	1258	1261	1264
	1.04	1216	1219	1222	1225	1229	1232	1235	1238	1241	1245	1248	1251	1254	1257	1261	1264	1267	1270	1273	1277
	1.05	1227	1231	1234	1237	1240	1244	1247	1250	1253	1257	1260	1263	1266	1269	1273	1276	1279	1282	1286	1289
	1.06	1239	1242	1246	1249	1252	1255	1259	1262	1265	1268	1272	1275	1278	1282	1285	1288	1291	1295	1298	1301
	1.07	1251	1254	1257	1261	1264	1267	1271	1274	1277	1280	1284	1287	1290	1294	1297	1300	1303	1307	1310	1313
	1.08	1263	1266	1269	1272	1276	1279	1282	1286	1289	1292	1296	1299	1302	1306	1309	1312	1316	1319	1322	1326
	1.09	1274	1278	1281	1284	1288	1291	1294	1298	1301	1304	1308	1311	1314	1318	1321	1325	1328	1331	1335	1338
	1.10	1286	1289	1293	1296	1299	1303	1306	1310	1313	1316	1320	1323	1327	1330	1333	1337	1340	1343	1347	1350
	1.11	1298	1301	1304	1308	1311	1315	1318	1321	1325	1328	1332	1335	1339	1342	1345	1349	1352	1356	1359	1362
	1.12	1309	1313	1316	1320	1323	1327	1330	1333	1337	1340	1344	1347	1351	1354	1358	1361	1364	1368	1371	1375
	1.13	1321	1324	1328	1331	1335	1338	1342	1345	1349	1352	1356	1359	1363	1366	1370	1373	1377	1380	1384	1387
	1.14	1333	1336	1340	1343	1347	1350	1354	1357	1361	1364	1368	1371	1375	1378	1382	1385	1389	1392	1396	1399
	1.15	1344	1348	1351	1355	1359	1362	1366	1369	1373	1376	1380	1383	1387	1390	1394	1397	1401	1404	1408	1412
	1.16	1356	1360	1363	1367	1370	1374	1377	1381	1385	1388	1392	1395	1399	1402	1406	1410	1413	1417	1420	1424
	1.17	1368	1371	1375	1379	1382	1386	1389	1393	1397	1400	1404	1407	1411	1415	1418	1422	1425	1429	1433	1436
	1.18	1379	1383	1387	1390	1394	1398	1401	1405	1408	1412	1416	1419	1423	1427	1430	1434	1438	1441	1445	1448
	1.19	1391	1395	1398	1402	1406	1409	1413	1417	1420	1424	1428	1431	1435	1439	1442	1446	1450	1453	1457	1461
	1.20	1403	1406	1410	1414	1418	1421	1425	1429	1432	1436	1440	1443	1447	1451	1454	1458	1462	1466	1469	1473
	1.21	1414	1418	1422	1426	1429	1433	1437	1441	1444	1448	1452	1455	1459	1463	1467	1470	1474	1478	1481	1485
	1.22	1426	1430	1434	1437	1441	1445	1449	1452	1456	1460	1464	1467	1471	1475	1479	1482	1486	1490	1494	1497
	1.23	1438	1442	1445	1449	1453	1457	1461	1464	1468	1472	1476	1479	1483	1487	1491	1495	1498	1502	1506	1510
	1.24	1450	1453	1457	1461	1465	1469	1472	1476	1480	1484	1488	1492	1495	1499	1503	1507	1511	1514	1518	1522
	1.25	1461	1465	1469	1473	1477	1480	1484	1488	1492	1496	1500	1504	1507	1511	1515	1519	1523	1527	1530	1534
	1.26	1473	1477	1481	1485	1488	1492	1496	1500	1504	1508	1512	1516	1519	1523	1527	1531	1535	1539	1543	1547
	1.27	1485	1489	1492	1496	1500	1504	1508	1512	1516	1520	1524	1528	1532	1535	1539	1543	1547	1551	1555	1559
	1.28	1496	1500	1504	1508	1512	1516	1520	1524	1528	1532	1536	1540	1544	1548	1551	1555	1559	1563	1567	1571
	1.29	1508	1512	1516	1520	1524	1528	1532	1536	1540	1544	1548	1552	1556	1560	1564	1568	1572	1575	1579	1583
	1.30	1520	1524	1528	1532	1536	1540	1544	1548	1552	1556	1560	1564	1568	1572	1576	1580	1584	1588	1592	1596

Reader's Notes

12.B. Emergency Alert System (EAS)

The Emergency Alert System (EAS) is a nationwide network of electronic media facilities. The primary purpose of the EAS is to allow the President of the United States to directly address the public in times of emergency. The EAS has never been used for this purpose. The system also provides an outlet for other urgent messages affecting the state and local areas.

WMUL-FM's Sage EAS Endec re-transmits selected alerts to the station's listeners. The Endec will automatically seize the on-air feed and relay those alerts.

Alerts have different codes depending on the nature of the message. The FCC requires every EAS participant to re-transmit all messages received with the following event codes:

- Emergency Action Notification (EAN)
- Required Monthly Test (RMT)
- National Periodic Test (NPT)

Participation in the national alerts and the tests is mandatory. Participation in the State and/or Local EAS is voluntary. WMUL-FM voluntarily relays messages of the "Warning" or "Emergency" type. Those codes include, but are not limited to:

- Flash Flood Warning (FFW)
- Severe Thunderstorm Warning (SVR)
- Winter Storm Warning (WSW)
- Child Abduction Emergency [Amber Alert] (CAE)

A complete list of alert codes is available on the NOAA's website www.nws.noaa.gov/nwr/info/eventcodes.html .

WMUL-FM utilizes a three-tiered approach to choosing which alerts to relay. With two exceptions, WMUL-FM relays all "Warning" and "Emergency" codes for Cabell, W. Va., Wayne, W. Va., Lawrence, Ohio, and Boyd, Ky.

The first exception is the "Severe Thunderstorm Warning" (SVR) code. WMUL-FM relays SVR alerts for Cabell, W.Va. and Wayne, W.Va only. This restriction is due to the extreme frequency and repetitiveness of these alerts. The National Weather Service will often issue a new alert every three to five minutes when a storm is traveling through the area.

Reader's Notes

The second exception is the "Child Abduction Emergency" (CAE). WMUL-FM relays these alerts for all bordering counties. In addition to the four counties listed above, CAEs for Mason, W.Va, Putnam, W.Va., and Lincoln, W.Va. are also relayed.

12.B.1 How Does WMUL-FM Get The Messages?

WMUL-FM receives alerts from four different sources:

- WDGG 93.7-FM (The DAWG)
- WRVC 930-AM (ESPN)
- National Weather Service / NOAA Weather Radio in Charleston
- Integrated Public Alert and Warning System (IPAWS) operated by FEMA. IPAWS is an aggregator service. Any authorized entity can input alerts.

Three entities input alerts relevant to WMUL-FM:

- FEMA / Department of Homeland Security (DHS)
- Kentucky Emergency Operations Center
- Ohio emergency operations center

These assignments are mandated by the "West Virginia Emergency Alert System Operational Plan". This plan outlines the organization and implementation of the Emergency Alert System for all West Virginia radio stations. The plan specifies the monitoring assignments and the schedule of the Required Monthly Test.

Reader's Notes

No Instructional Content on This Page

12.C. Digital Router

Reader's Notes

WMUL-FM's Wheatstone WheatNet router consists of three (3) input/output blades, three (3) console modules, a rack-mount X-Y Controller, and a network switch.

The devices are connected together over a private IP network. Both the audio and the control logic travel over the network.

Two of the blades are IP-88A-3 Analog Blade-3's (Blades 01 and 03). They each have 8 stereo analog inputs, 8 stereo analog outputs, and 12 GPIO ports. The third blade is an IP-88AD-3 Analog/Digital Blade-3 (Blade 02). It has 4 stereo analog inputs, 4 stereo digital inputs, 4 stereo analog outputs, 4 stereo digital outputs, and 12 GPIO ports.

The IP-75 modules are installed in the AudioArts D-75 consoles. Each connects the console to the WheatNet. It takes all four output busses (PGM, AUD, AUX, and UTIL) and sends them to the network. It has two stereo digital audio inputs, and six stereo digital outputs. Two of the outputs are used to provide the Aux 1 and Aux 2 outputs to each console. The IP-75 module also provides 6 GPIO ports.

The XYE-R rack-mount X-Y controller provides the user interface for the router. The Cisco 2960CG-8TC network switch binds the unit together.

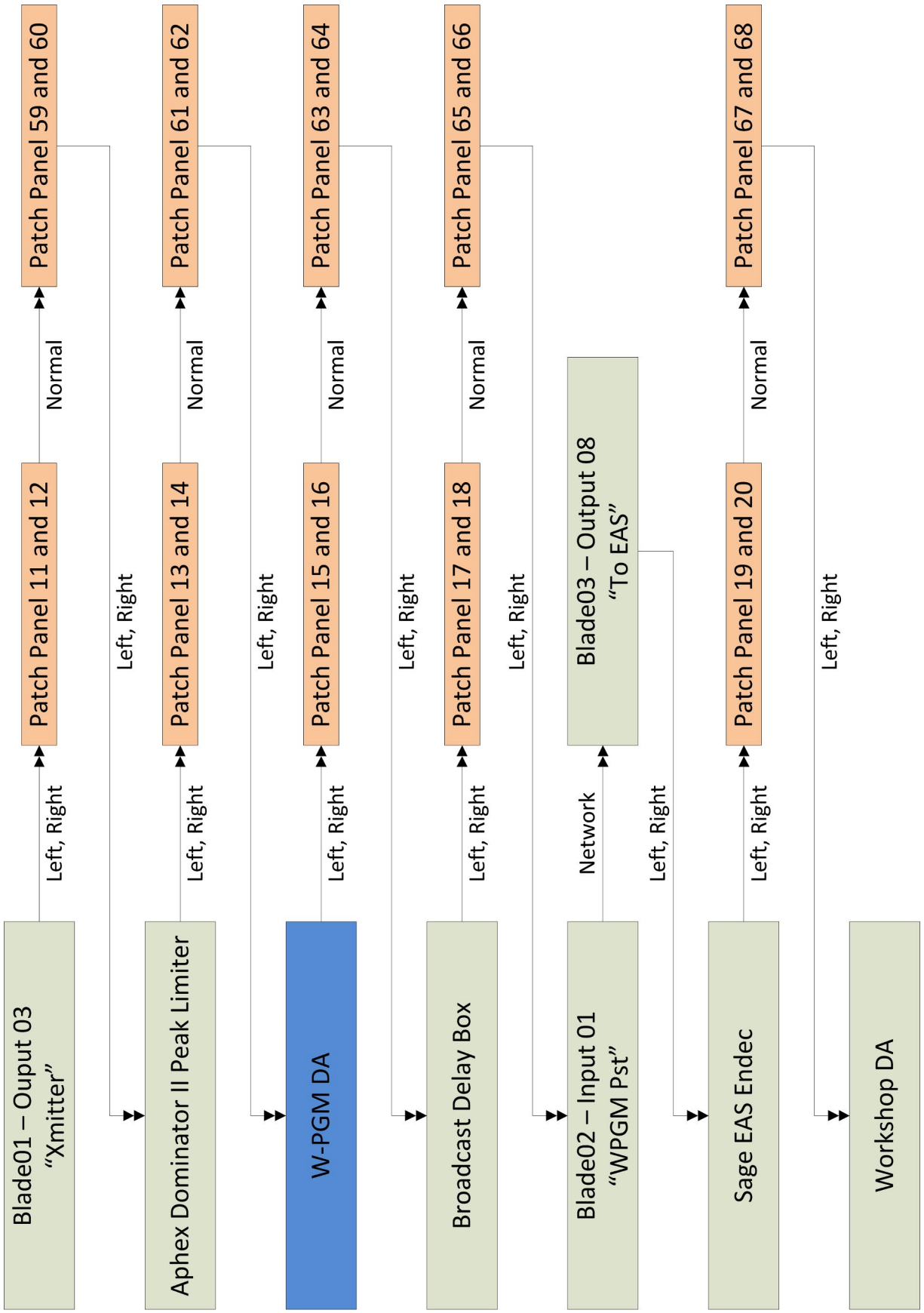
Reader's Notes

12.D. The Air Chain

This chapter describes in some detail the path the audio takes from the Studio A to the transmitter. The diagram on the opposite page shows steps 2-7 of that path.

1. The audio begins its journey in the Studio A console. The PGM buss (A-PGM) output goes through the IP-75 network module, over the WheatNet, to Blade 01.
2. The "Xmitter" output of the router normals through the patch panel and goes into the Aphex Dominator II - Peak Limiter. This device protects the downstream devices from too high audio levels.
3. The output of the Dominator normals through the patch panel and goes into the W-PGM Distribution Amplifier (DA). The DA sends the W-PGM signal to multiple places, including the External 2 sources on the Control Room and Studio modules of the consoles.
4. One of the outputs of the W-PGM DA normals through the patch panel and goes into the Broadcast Delay Box.
5. The output of the Broadcast Delay Box normals through the patch panel and goes into the Blade 02 as the "WPGM Post" signal (Post Delay).
6. The audio goes over the WheatNet to Blade 03, outputs, and goes to the EAS Endec.
7. The output of EAS Endec normals through the patch panel and goes downstairs to the Workshop (CB 101) and goes into another Distribution Amp.
8. An output of the Workshop DA goes into a fiber-optic transmitter.
9. The transmitter sends the audio over fiber to a receiver in the transmitter room in the Science building.
10. The output of the receiver normals through the transmitter room patch panel and goes into the Inovonics David III FM Broadcast Processor.
11. The David III outputs a stereo composite signal which goes into the Harris THE-1 FM Exciter.
12. The Exciter outputs a 3-watt RF signal on 88.1 MHz which is sent to the Harris 3.5 kW HT Transmitter.
13. The transmitter amplifies the signal to its full power before sending it to the Harris FML-1E antenna.

12.D.1. Diagram of the Air Chain



Reader's Notes

12.E. The Transmitter

The equipment in the following chapter is located either in the transmitter room in the Science building or on WMUL-FM's tower atop the Science building.

WMUL-FM uses a Harris 3.5 kW HT Transmitter equipped with a Harris THE-1 FM Exciter and an Inovonics 718 David III FM Broadcast Processor.

12.E.1. Harris 3.5 kW HT Transmitter

The Harris 3.5 KW HT Broadcast Transmitter is a 3,500 watt FM transmitter designed for continuous broadcast operation in the FM Broadcast Band (87.5 to 107.9 MHz). WMUL-FM's transmitter is tuned to operate at 88.1 MHz.

The Harris 3.5 KW HT Broadcast Transmitter can provide any output power from 800 to 4,000 watts. This full range allowed WMUL-FM to select the most effective power to combine with our antenna size, tower height, and transmission line to provide the greatest coverage area possible under legal requirements. The Federal Communications Commission has authorized WMUL-FM to operate at 1,400 watts effective radiated power (ERP).

12.E.2. Harris THE-1 FM Exciter

The Harris THE-1 FM exciter produces a 3 watt output power, frequency modulated signal into a 50 ohm load for WMUL-FM on 88.1 MHz in the FM Broadcast Band. The THE-1 is designed to operate as an exciter for an FM transmitter or as a stand alone transmitter complete with all necessary local and remote metering, and sample RF necessary for transmitter operation. When operated as a stand-alone transmitter the THE-1 is capable of 55 watts power output.

12.E.3. Inovonics David III FM Processor

Reader's Notes

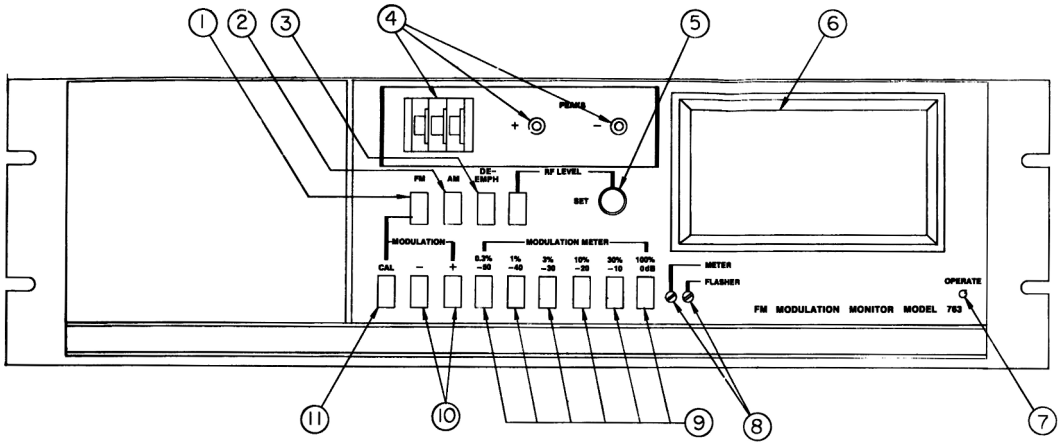
The Inovonics 718 David III FM Broadcast Processor is an integrated signal processing system which replaces conventional compressors, limiters, clippers, and stereo generators. Briefly, the David III performs the following functions (from the user manual):

- Comprehensive PWM audio processing with gain-riding AGC, three bands of compression and limiting, and adjustable bass and brilliance EQ.
- Inovonics' unique Polarity-Independent Peak Processing final limiter, which assures full carrier modulation with all types of program material.
- A stereo-generator section that utilizes digital synthesis techniques for best stereo separation and rock-stable operation.
- A built-in, user-adjustable composite clipper

Reader's Notes

12.E.4. Transmitter Room Modulation Monitor

The TFT 763 FM modulation monitor is a special receiver in the transmitter room that samples the transmitted signals. It provides a meter that indicates the modulation percentage of the composite audio signal.



1. To activate the monitor, three buttons - the FM button, the 100% / 0dB button, and the positive peak, or negative peak button - should be pushed in. The peak button can be used on positive or negative, and it does not matter which one is being used.
2. This monitor has two meters: a smaller receiver meter on the left hand side (unlabeled) and the larger modulation monitor meter on the right hand side (6).
3. The smaller meter on the left tells the engineers that the transmitter carrier is being received. It reads in the white area of the meter.
4. The larger meter on the right tells the engineers the average program modulation percentage. Modulation percentage is the loudness of the audio signal being transmitted. The maximum modulation permitted is 105 percent.
5. The positive and negative lights (4) tell the engineers that peaks are above 105 percent when they light up.
6. To the left of these little positive and negative lights is a thumb-wheel switch with three numbers on it (also 4). The switch should always read 105 percent.

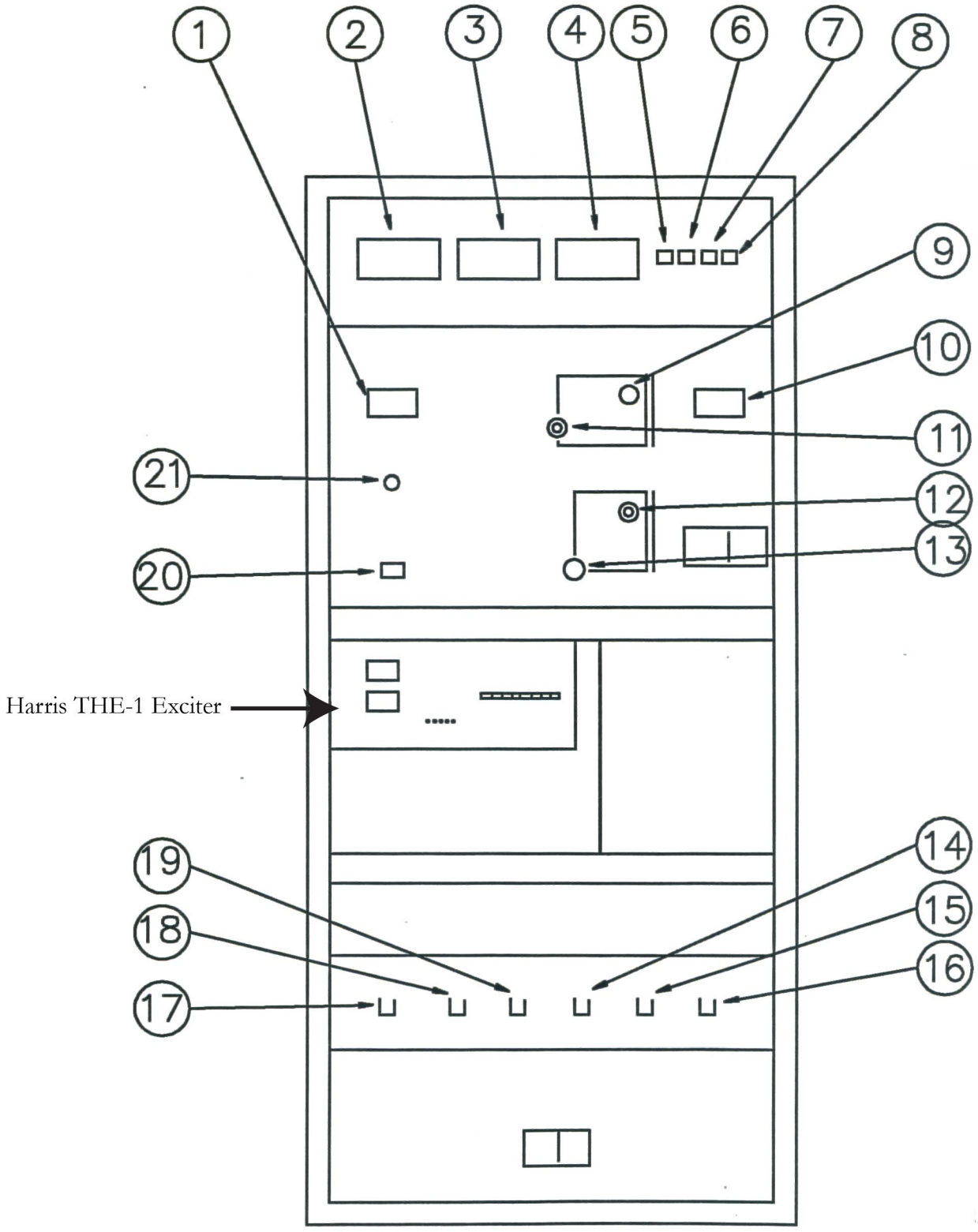
7. The FCC requires radio stations to maintain their audio volume peaks at a specified level. It defines the loudest distortion-free audio signal level as 100 percent total modulation. WMUL-FM's RDS sub-carrier grants an additional 5 percent total modulation. The rule dictates that all stations must maintain volume peaks between 85 percent and 100 percent modulation as measured at the transmitter.
8. The big modulation level meter (6) should be kept as high as possible with the peak lights coming on as infrequently as possible during the transmission of any program material. This holds true for the Inovonics 531 Modulation Analyzer located in Studio A as well.

Reader's Notes

Reader's Notes

12.E.5. Harris 3.5 kW HT Transmitter Diagram

1. **Filament Volts Meter:** Indicates PA Filament Voltage.
2. **Plate Voltage Meter:** Indicates the PA Plate Voltage (Ep).
3. **Plate Current Meter:** Indicates the PA Plate Current (Ip).
4. **Power Meter:** Indicates the RF Output Power or Load VSWR as selected by the Forward / VSWR / VSWR Cal switch on the Controller Panel.
5. **Filament On Push-Button / Indicator:** Enables primary power and indicates voltage is applied to all circuits except the IPA, screen, and plate supplies.
6. **Filament Off Push-Button:** Turns off power to the entire transmitter.
7. **Plate On Push-Button:** Enables power and indicates voltage is applied to IPA, screen, and plate supplies.
8. **Plate Off Push-Button:** Turns off power to IPA, sceen, and plate supplies.
9. **Plate Tune Capacitor:** Adjusts tuning of the PA Plate Circuit.
10. **Multimeter:** Indicates voltage or current selected by the multimeter select switch.
11. **Output Load:** Adjusts PA output loading to antenna or RF load.
12. **Grid Tune Inductance:** Adjusts grid tuning to PA.
13. **Input Match Capacitor:** Adjusts matching of IPA output to grid circuit of PA.
14. **IPA Circuit Breaker:** Provides overload protection for IPA Voltage power supply.
15. **Screen Circuit Breaker:** Provides overload protection for Screen Voltage power supply.
16. **Plate Circuit Breaker:** Provides overload protection for Plate Voltage power supply.
17. **Control Circuit Breaker:** Provides overload protection for Control power supply.
18. **Blower Circuit Breaker:** Provides overload protection for Blower and Filment transformer.
19. **Bias Circuit Breaker:** Provides overload protection for Bias power supply.
20. **Filament Hours Meter:** Indicates accumulated filament hours.
21. **Filament Adjust Rheostat:** Adjusts PA Filament.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Harris THE-1 Exciter

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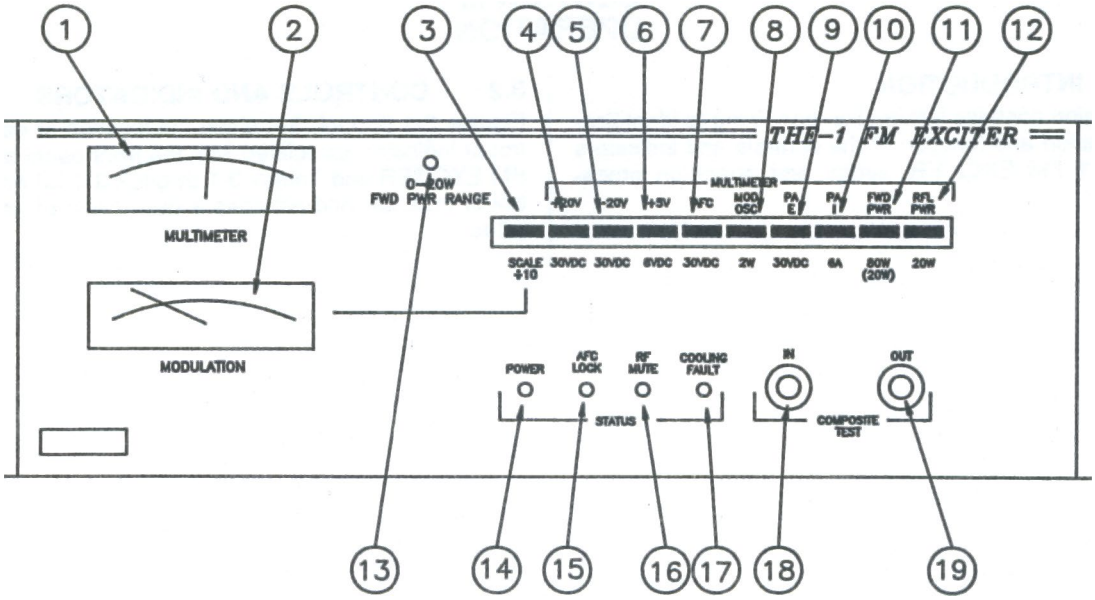
12.E.6. Harris THE-1 FM Exciter Diagram



1. **Multimeter:** Displays voltage, current, or power as selected by the multimeter switch.
2. **Modulation Meter:** Displays the total composite modulation signal as measured at the input of the VCO in the modulated oscillator. This signal will be the sum of the Composite inputs and SCA inputs or mono input and SCA inputs.
3. **Modulation Scale Divide by 10:** When depressed, the modulation meter full-scale indication is divide by 10. Thus a 100 percent indication when the button is depressed equals 10 percent actual.
4. **+20V Multimeter Switch:** Measures the pre-regulated +20 volt DC bus to all module power supply regulators.
5. **-20V Multimeter Switch:** Measures the pre-regulated -20 volt DC bus to all module power supply regulators.
6. **+5V Multimeter Switch:** Measures the regulated +5 volt DC supply to the motherboard aand AFC module.
7. **AFC Voltage Multimeter Switch:** Measures the AFC / PLL module AFC voltage to the modulated oscillator module.
8. **Mod OSC Multimeter Switch:** Measures the RF output of the modulated oscillator module.
9. **PAE Multimeter Switch:** Measures the regulated power supply voltage to the RF amplifier module A1.
10. **PAI Multimeter Switch:** Measures the RF amplifier supply current.

11. **FWD PWR Multimeter Switch:** Measures the forward power output from the exciter.
12. **RFL PWR Multimeter Switch:** Measures the exciter reflected power.
13. **0-20W FWD PWR Range Indicator:** Illuminated to indicate that the FWD PWR multimeter indication should be read on the 0-20W scale. (Green Scale).
14. **Power Indicator:** Indicates that the exciter main AC power has been applied and the power supplies are active.
15. **AFC Lock Indicator:** Illuminates to indicate that the AFC / PLL module is locked to the preset carrier frequency.
16. **RF Mute Indicator:** Illuminates to indicate that the exciter RF output power has been turned off due to an external RF Mute command, AFC unlock condition, or a Cooling Fault (optional).
17. **Cooling Fault Indicator:** Illuminates to indicate that an internal exciter temperature has exceeded the upper allowable limit.
18. **Composite Test Input:** A 10kΩ balanced input to the modulated oscillator for test signal injection. This is a fully functional composite input and can be used in the same manner as the rear inputs.
19. **Composite Test Output:** A buffered low inpedence (1 Vrms at ± 75 kHz deviation) output of the total composite signal as sampled from the input to the VCO in the modulated oscillator module.

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12.F. Antenna

WMUL-FM's Harris FML-1E Low Power Circularly Polarized FM Antenna is of brass tubular construction in the radiating element and uses thick wall brass in the support stem. This provides the antenna the capability to survive under severe weather extremes and withstand wind velocity of 112 miles per hour. The circularly polarized radiation pattern is omnidirectional. The antenna was tuned to 88.1 MHz at the factory. The power gain of the FML-1E is 0.4611.

The FML-1E Low Power Circularly Polarized FM Antenna has the following specifications:

- **Type No.:** FML-1E
- **Power Gain (Power):** 0.4611
- **Power Gain (dB):** -3.3623

  Horizontal and vertical power gain and dB are the same.
- **Type Feed:** End
- **Female 50Ω Input:** 1 5/8"
- **Power Input Capability:** 9 kW

  Power input capability up to 2,000 ft above mean sea level.

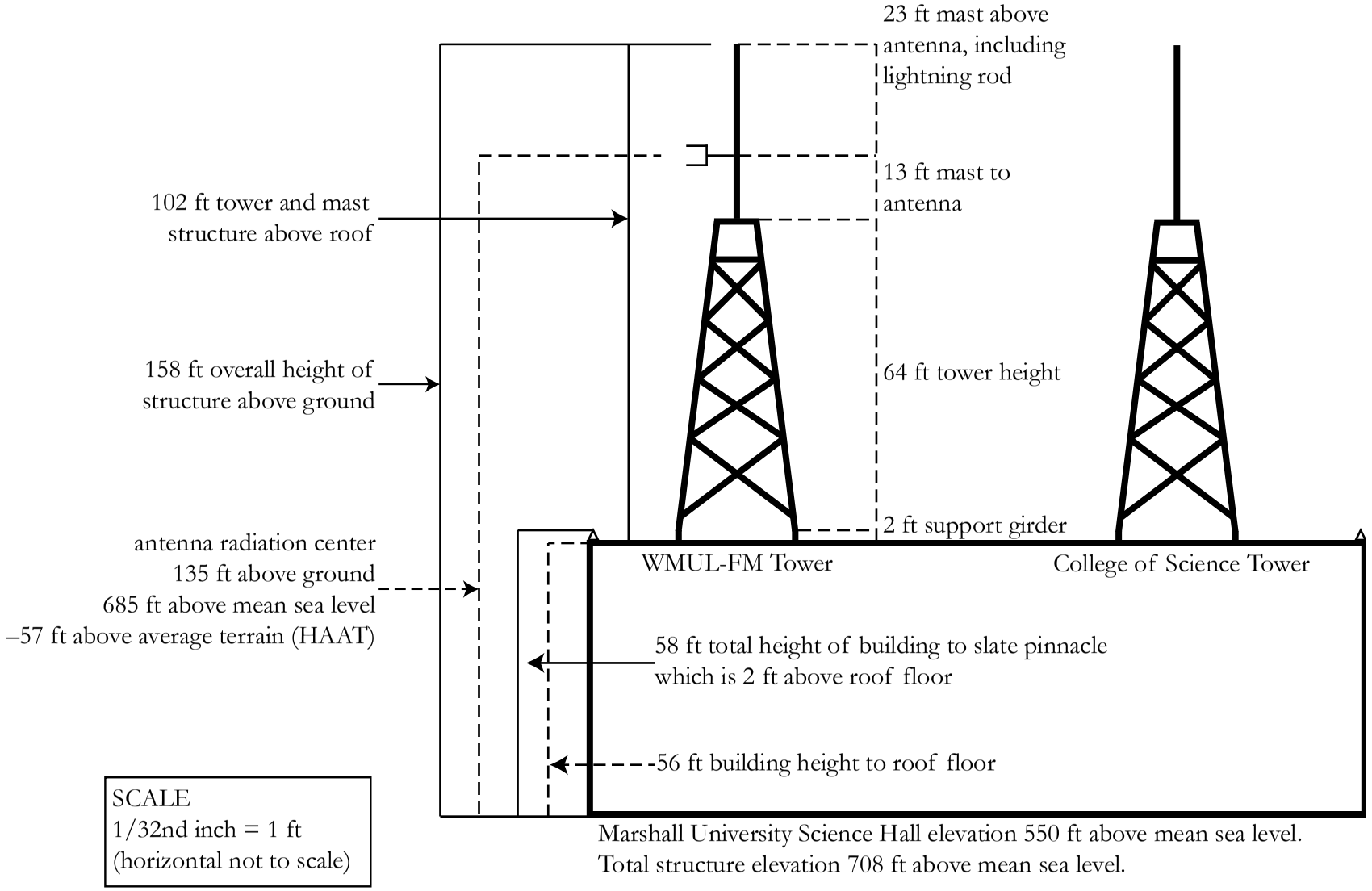
  Derating required above 2,000 ft.
- **Calculated Weight:** 57 lbs
- **Calculated Wind Load:** 102 lbs

  Wind load base on 112 mph wind velocity (50 / 30 psf) and the wind blowing normal to the side of the antenna. Weight and wind load calculations include brackets, interbay line, and the transformer section. Calculations base on the frequency of 95 MHz.

12.F.1. Photograph of the Antenna

12.F.2. Diagram of the Antenna and Tower Structure (US Units)

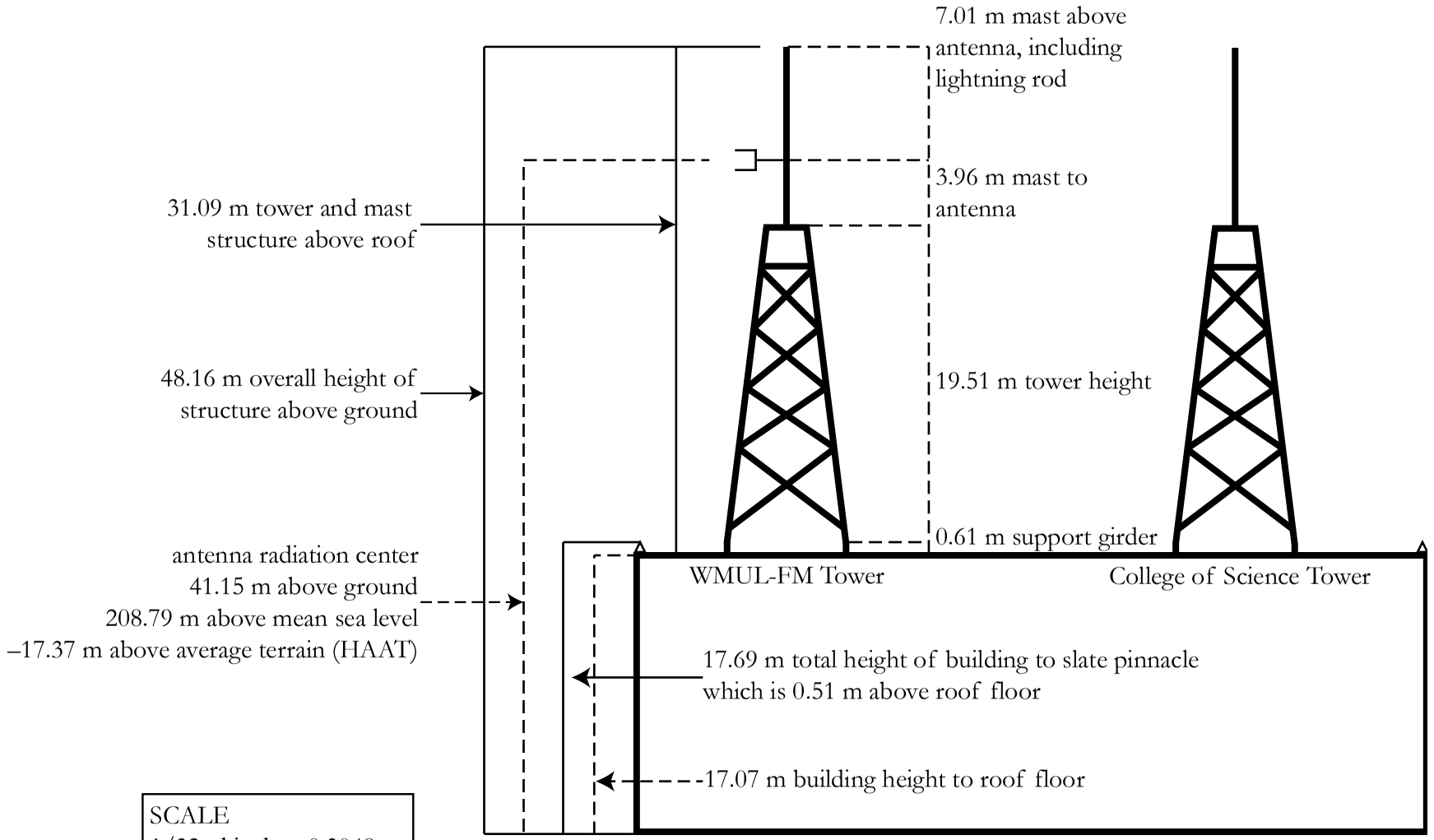
WMUL-FM, Marshall University, Huntington, West Virginia
(US Units)



Marshall University Science Hall elevation 550 ft above mean sea level.
Total structure elevation 708 ft above mean sea level.

12.F.3. Diagram of the Antenna and Tower Structure (SI Units)

WMUL-FM, Marshall University, Huntington, West Virginia
(SI Units)



G. Glossary

Reader's Notes

This glossary is identical to the ones at the ends of the other two volumes. Some terms are included to provide a general reference and knowledge about the field of radio.

Air Check: (1) A recording of an Airshift that focuses on the announcer. Air checks can be used to critique the announcer's performance or as a component of the announcer's on-air portfolio.
(2) The master title of a documentary / public affairs program that is produced by WMUL-FM.

Airshift: A regularly scheduled time in which the operator is on-air, or in control of Studio A. The operator may be DJing or acting as part of a news, sports, or public affairs program to put programming on the air.

AMBER Alert: (America's Missing: Broadcast Emergency Response) A type of EAS message to alert citizens to, and provide information about, missing children. 12.B. Emergency Alert System (EAS) in Volume II.

Analog: In audio, a way of recording, storing, transmitting, and reproducing sound that produces a sound wave similar to the original wave. Phonograph records, standard audio tape, and speaker/headphone systems are examples of analog audio.

Associated Press Wire Service: A news-gathering cooperative to which WMUL-FM subscribes. It provides news, sports, and weather copy. The wire service material is used to supplement WMUL-FM's news gathering resources.

AUD: Pronounced "Audition". One of the output busses of an audio console. Typically used with the phone module and to choose which sources are sent to remote sites. 9.A.1. Source Channels on the Console and 9.A.9. The SuperPhone Module in Volume II.

Audio Console: The device at the center of a radio studio responsible for amplifying, routing, and mixing audio signals. 9.A. AudioArts D-75 Audio Console in Volume II.

Audition: (1) One of the output busses of an audio console. *Also read AUD.*
(2) Assessing material or talent in advance of production.

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Automatic Mode: A mode in WMUL-FM's computer playback system where the system keeps playing songs until it hits a stop transition or runs out of log. *Also read Live Assist Mode and Manual Mode.* 14.D.6. Mode Indicator Button (6) in Volume III.

Back-Announce / Back-Sell: To announce the song that just played.
E.G.: "That was Seven Years by Single-Celled Paramecium."
Also read Front-Announce.

Board of Directors: The group of students who run the day-to-day operations of WMUL-FM. 2.D. Station Hierarchy in Volume I.

Board of Governors: The governing board of Marshall University and the ultimate owner of WMUL-FM. Most of the members of the Board of Governors are appointed by the Governor of West Virginia.

Board-Operate / Board-Op: To run the on-air audio console and computer playback. The term is almost exclusively used for a news or sports program, but DJing is also a form of board-oping.

Board-Operator: A person who is board-oping.

Board, The: *Also read Audio Console.*

Bulletin Board: A pre-recorded announcement listing nearby events that are of interest to the audience.
4.B.6. Community Bulletin Board Policy in Volume I.

Business Hours: The time frame when WMUL-FM is open to the public's business. 9:00 a.m. to 5:00 p.m., Monday-Friday.

Button Log Widget: The Left-Hand side of RD AirPlay. It displays the current and next six songs. 14.E.1. Button Log in Volume III.

Call to Action: Words that direct or encourage someone to do something.
E.G.: "Buy my book!" 4.B.4 Commercial Announcements in Volume I.

Cart:

1. A single song within Rivendell Radio Automation. Can consist of one or more cuts. *Also read Cut.* 14.A. Carts, Cuts, Cart Numbers, Groups, and Scheduler Codes in Volume III.
2. A magnetic-tape based object for storing pre-recorded announcements. No longer used by WMUL-FM.

Cart Machine: A magnetic-tape based device for airing pre-recorded announcements (Which are stored on carts). No longer used by WMUL-FM. *Also read Cart.*

Cart Number: The six (6) digit number that uniquely identifies a Cart within Rivendell Radio Automation. *Also read Cart.* 14.A. Carts, Cuts, Cart Numbers, Groups, and Scheduler Codes in Volume III.

Cassette, Audio / Cassette Deck: A form of audio tape. Historically used by consumers for music and by WMUL-FM for field recordings (news interviews, etc.).

Channel: An input on an audio console, along with the controls for that input. 9.A.1. Source Channels on the Console on Page 91 of Volume II.

Clock: *Read Program Clock and Wall Clock.*

Codec: An abbreviation of coder/decoder. A device or software program that encodes audio into a digital format for transmission over a modem or internet connection.

Commercial: A commercial is an announcement (usually paid) made on behalf of a for-profit entity. E.G. "Drink Tantrum!". 4.B.4 Commercial Announcements in Volume I.

Compact Disk (CD) / CD Player: A device to play back a digitally encoded disk using a laser that reads the code on the disk. 10.I. CD Players in Volume II.

Control Room: (Or "CR") On audio console markings, the room (on-air studio) containing the audio console. E.G. A "CR Mic" is a microphone in the same room as the audio console. *Also read Studio.*

Cue: A special buss on the console attached to a small speaker. It allows the operator to preview a piece of audio before placing it on-air. 9.A.4. Using the Cue in Volume II.

Cut: A single peice of audio inside a cart. *Also read Cart.* 15.B.10. Carts with Multiple Cuts in Volume III.

Dead Air: Silence over the air. At WMUL-FM, an alarm will sound when this happens. The alarm will be audible throughout the complex.

Delay Box: A device that delays the audio before it goes over the air. It allows accidental unacceptable material to be removed from live programs. 10.D. Broadcast Delay Box in Volume II.

Digital: In audio, a way of recording, storing, transmitting, and reproducing sound based on the translation of the original sound source into a binary computer language.

Digital Router: A device that allows audio throughout the station to be re-routed. 10.D. Broadcast Delay Box in Volume II.

Reader's Notes

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Director, Coordinator, Librarian: Different titles for members of the Board of Directors. The different titles reflect slightly different emphasis on the duties of the position. 2.D. Station Hierarchy in Volume I.

Disk Jockey (DJ): An announcer who plays host of a music program.

DJ Shift: An air shift during which the announcer is producing a program of pre-recorded music selections.

EAS: *Also read Emergency Alert System.*

EAS Receiver Check: A once-a-day check of the EAS receiver. 8.C.2. How to Complete the Daily EAS Receiver Check in Volume II.

Emergency Alert System: A federal network for alerting the public of war, natural disaster and other emergency situations. 12.B. Emergency Alert System (EAS) in Volume II.

Equipment Discrepancy Form: A form to alert the Operations Manager of problems with equipment.
5.F.4. Equipment Discrepancy Form in Volume I.

FCC: *Also read Federal Communications Commission.*

Federal Communications Commission: The federal government entity that regulates radio broadcasting (among many other things).

Feedback Loop: Reamplification of a sound, resulting in a loud squeal from a loudspeaker. This is often caused by microphone pickup of the output of a speaker that is carrying the audio from the microphone.

Flash Recorder: A device that can record the W-PGM signal to a computer file and copies that file to the file server. 10.E. Using the Flash Recorder in Studio A in Volume II.

Format: A radio station's programming strategy, utilized to attract a particular audience. The mix of all elements of a station's sound, including the type of music played and style of announcing. *Also read Music Format.* 5.B.10. Station Format in Volume I.

Format Producer: A subordinate to the Music Director. Each format producer is in charge of a specific format. 2.D.4.b. The Student Board of Directors in Volume I.

Front-Announce / Front-Sell: To announce songs before they are played.
E.G.: "Here's The Marionberry Reduction with their new release Redshirts".

Full Log Widget: A component of Rivendell Radio Automation that displays, and allows the user to edit, the full day's log. 14.E.3. Full Log in Volume III.

Group: In Rivendell Radio Automation, songs are organized into groups that represent the different formats. *See also Cart Numbers, Scheduler Codes.* 14.A. Carts, Cuts, Cart Numbers, Groups, and Scheduler Codes in Volume III.

Hertz (Hz): A unit of frequency, also called cycles per second. Named for Heinrich Hertz, whose scientific discoveries made radio transmission possible.

Indecency: Indecent programming contains patently offensive sexual or excretory material that does not rise to the level of obscenity. 4.C. Inappropriate Program Material Policy in Volume I.

Legal ID: An announcement that includes the station's call letters followed by its community of license. Must air every hour at the top of the hour. 4.B.1. Station Identification Policy in Volume I.

Levels: The VU level (volume) of a piece of audio. Adjusted with slide-faders and monitored with VU Meters. *See also VU Meter.* 9.A.2. VU Meters on the Console in Volume II.

Live Assist Mode: A mode in WMUL-FM's computer playback system. WMUL-FM does not use this mode. *See also Automatic Mode and Manual Mode.* 14.D.6. Mode Indicator Button (6) in Volume III.

Logs: *See Operator Logs.*

Manual Mode: A mode in WMUL-FM's computer playback system where the system stops after each song plays. *See Automatic Mode and Live Assist Mode.* 14.D.6. Mode Indicator Button (6) in Volume III.

Marti RPU: A device for sending audio from a remote site back to the station. It uses a 450 MHz radio link. 3.E.1. Marti Remote Broadcast Transmitters in Volume I.

Modulation Monitor: A device for monitoring the actual on-air signal as it is being transmitted. 9.E. Modulation Monitor in Volume II.

MP3 Format: A file format for storing audio files. It uses less space than a WAV formatted file by sacrificing audio quality. MP3s are not to be used at WMUL-FM. The only exceptions are MP3s that come to the Music Director from music promoters, when no other formats for the songs or liners are available.

Music Format: A block of time devoted to a particular type of music.

Reader's Notes

Reader's Notes

Music Log: A record of which songs have played during a particular time period. May be required by the Music Director, a format producer, or by WMUL-FM's contracts with performance rights organizations. 8.K. Music Logs in Volume II.

News Package: A audio cut containing a reporter's voice combined with interview sound bites, and natural sound.

Obscenity: A work, taken as a whole, that has sexual material that lacks serious literary, artistic, political, or scientific interest. 4.C. Inappropriate Program Material Policy in Volume I.

On-Air Operator: A person who is in control of the console in Studio A (Control Room) and is monitoring the transmitter.

On-Air Producer: A person who produces material for airing on WMUL-FM.

Operations Log: One of two operator logs that each on-air operator will complete during every air shift. It provides a record of compliance that the transmitter is operating within its authorized power range (90%-105%). It also records compliance with the daily EAS receiver check. 8.C. The Operations Log in Volume II.

Operator Logs: The pair of logs that each operator will complete during every air shift. These are WMUL-FM's official record of what was aired during a particular broadcast day, and who aired it. *See also Operations Log, Program / Announcer Log.* 8. WMUL-FM's Operator Logs in Volume II.

Over-Modulated: When the level of an audio signal is amplified too high and the signal distorts.

Patch Panel: An auxiliary device that allows certain pieces of equipment in the air chain to be by-passed or routed to other destinations through the use of patch cables. 10.B. Patch Panel in Volume II.

Payola: The practice of giving or accepting undisclosed consideration to influence program selection or content. 4.B.7. Payola and Plugola in Volume I.

PGM: Pronounced "Program". One of the output busses of the audio console. Any channel intended to go over the air must be in PGM. 9.A.1. Source Channels on the Console in Volume II.

PICON: Public Interest, Convenience, Or Necessity. Usually shorted to "the public interest". 4.A. You, WMUL-FM and the FCC in Volume I.

Plugola: Plugola deals with "plugs" by station personnel with respect to services or commodities promoted over the station where the station itself or its

personnel have a financial interest in the object being promoted. 4.B.7. Payola and Plugola in Volume I.

Post: The point in a song where the lyrics begin.

Profanity: Language so grossly offensive to members of the public who actually hear it as to amount to a nuisance. 4.C. Inappropriate Program Material Policy in Volume I.

Program / Announcer Log: One of two operator logs that each on-air operator will complete during every air shift. It provides a record of which programming aired when and who produced it. 8.B. The Program / Announcer Log in Volume II.

Program Clock: The list and description of the major events that are to occur during a DJ shift or program. *See also Wall Clock.*

Programming: The selection and arrangement of music, speech, and other program elements in such a manner that appeals to WMUL-FM's listeners.

Promo: An announcement made by the station that promotes its own programming or events. E.G. "Tune in to Herd Roundup". 3.D.3. Promotional Announcements Policy in Volume I.

PSA: *Also read Public Service Announcement.*

Public File: *Also read Public Inspection File.*

Public Inspection File: A file containing of certain records about the station. The FCC requires that this file be maintained and made available to public inspection. 4.E. WMUL-FM's Online Public Inspection File in Volume I.

Public Service Announcement: An announcement (usually unpaid) made to provide the public with needed information or to promote the public good. E.G. "Don't Drink and Drive". 3.D.4. Public Service Announcements Policy in Volume I.

RD AirPlay: A component of the computer playback system. This is the program through which most audio is played. 14.C. RD AirPlay Overview in Volume III.

RD Library: A component of the computer playback system that allows the operator to search and browse all the available audio. 14.H. RD Library (Searching) and 15.B. RD Library (Managing) in Volume III.

RD Log Edit: A auxiliary software program that is part of the computer playback system. It allows the logs to be editing prior to airing. 15.A. RD Log Edit in Volume III.

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RD Panel / Sound Panel Widget: A component of the computer playback system that allows playing arbitrary audio cuts. 14.F. The Sound Panel and RD Panel in Volume III.

Required Monthly Test: A test of the Emergency Alert System that includes header codes, attention tone, a script, and end-of-message codes. These tests originate outside WMUL-FM and are retransmitted by WMUL-FM. 12.B. Emergency Alert System (EAS) in Volume II.

Required Weekly Test: A test of the Emergency Alert System that includes only header and end-of-message codes. WMUL-FM receives these tests and originates its own tests. 12.B. Emergency Alert System (EAS) in Volume II.

Riding the Gain: The board-operator paying close attention to the volume level of the audio signals to ensure that the program is nor over-modulated for extended periods of time.

Rivendell Radio Automation: The computer playback system that WMUL-FM uses for on-air playback.

SFX: *Also read Sound Effects.*

Skimmer: A digital device that constantly records what is airing and saves those recordings to computer files. 10.F. Using the Skimmer in Volume II.

Sound Effects: Any sound, other than music or speech, that is used to help create an image, evoke an emotion, compress time, clarify a situation, or reinforce a message.

Sound Panel Widget / RD Panel: See RD Panel / Sound Panel Widget.

Sound Recording Performance Complement: A law that restricts the music programming decisions of webcast stations. 4.B.2. "Sound Recording Performance Complement" Policy in Volume I.

Station ID: *Also read Legal ID.*

Studio: When marked on an audio console, "studio" refers to an attached room with additional microphones. (At WMUL-FM, this usually refers to the Classroom / Performance Studio.)

SuperPhone: A module on an audio console that helps connect remote sources including telephone lines. 9.A.9. The SuperPhone Module in Volume II.

Underwriting: Donations to the station to cover operating costs or to a specific program. Can also refer to the announcements made in acknowledgment of the donation. 4.B.8. Underwriting Policy in Volume I.

Voice-Tracking: A pre-recorded a DJ shift using a computer program to insert voice-over segments between musical selections. The shift is played back at a later time, thus eliminating the need for a live DJ to be on duty during that time. 5.E. Voice-Tracking Policy in Volume I and 15.D. Voice-Tracking in Volume III.

Volume Unit (VU) Meter: A component of an audio console that measures the audio going through the console and provides a visual readout of loudness. 9.A.2. VU Meters on the Console in Volume II.

Wall Clock: The actual clock telling what time it is. *Also read Program Clock.*

WAV Format: Digital sound files stored in a Microsoft pulse-code-modulation format. Typical setting for a WAV format at WMUL-FM is 16-bit, 44.1 kHz, stereo.

Widget: A component of the computer playback system.

Working Hours: The hours during which the station is open to staff members for work. 9:00 a.m. - 9:00 p.m., Monday-Thursday, 9:00 a.m. - 5:30 p.m. Friday.

W-PGM: The audio signal that is being sent to the transmitter, but before it goes through the delay box.

WMUL Air: The audio signal after it has been transmitted and received by the Modulation Monitor.

XLR Connector: A type of three-pin connector commonly used with microphones at the radio station. Some connectors have a push-lever mounted on the female connector that locks the connectors in place. It makes a snap when making the connection. To remove, press the lever and remove the male end by the connector; do not ever pull on the wire.

XY Controller: The user interface for the Digital Router. 10.A. Digital Router in Volume II.

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