INTRODUCTION

Purpose of this Manual

This manual was designed to accomplish three objectives.

First to introduce you to the equipment you will be working on. To show you how it is assembled, how each individual piece operates, and how it functions as a whole unit.

Secondly, through use and reference to the manual along with practice on the equipment itself, to help you develop into accomplished operators capable of delivering accurate, timely and informative programming to your designated audience.

Finally, it is intended that you retain this manual as a constant reference source. Something that you can go back to, and obtain information and reinforcement from, into the future.

Manual Methodology

The material in the manual will be taught by working through each section and then completing a short quiz at the end. The quiz will ensure that you have not missed any of the critical pieces of information in the section, and to ensure that you understand each area that is covered.

In addition, by reading, taking a break for the quiz, then discussing the answers, it gives you, as the student, an opportunity to question any aspects you may not understand. You are encouraged to do this. No question is invalid if you do not know the answer.

Instructor/Student Obligations

Both the instructor and the students have obligations to meet during this learning exercise.

It is the obligation of the instructor to ensure that the information conveyed by the training process is understood by the students. This may mean repetition or varying the medium of the message or whatever it takes to ensure that knowledge transfer occurs.

It is the obligation of the student to make sure that a clear understanding of the knowledge has been received. If you do not understand some point, or wish further clarification, you are obliged to let the instructor know. Only you can tell when you have reached a comfort level that you understand the information. Do not be afraid to ask questions.

Retaining the Knowledge and the Manuals
As each quiz is completed, the instructor will review the questions and supply confirmation of the correct answers. At that time you should correct any errors or omissions on the quiz sheet. It is intended that you retain and use this manual as a working guide. Therefore it is important that it contain only correct and accurate information. Do not be shy about creating your own notes and comments for future reference. Note pages are provided for this at the back of the manual.

If you are working through the manual alone and you have questions, or there is something you do not understand, do not hesitate to contact us at wantok@mb.sympatico.ca or (204) 434-6423 for assistance.

Let us now work forward through the manual to a new and rewarding learning experience.

SECTION I

THE BROADCASTING CONSOLE

Purpose

The Broadcast console provides a number of necessary functions.

(1) It provides a standard layout for the equipment that is the same for all operators and permits the standardization of training and procedures. Just as one does not have each keyboard operator coming and changing the arrangement of keys on a computer keyboard, so too, we cannot have each radio announcer coming in and shifting the equipment around to suit his or her own particular desires. The present layout is that recommended by experienced broadcasters as being the most efficient for operational periods over an extended period of time.

(2) The sound production equipment has two connection points. The mixer has many. All of these connections are either power or audio connections. Switching equipment around may result in incorrect connections.

(3) It is amazing how much wire accumulates when you begin tying equipment together to work in a coordinated manner. If no console is provided all the wiring must lay on the operating table or be fed down through holes drilled in the operating table. By utilizing a console we keep unsightly wiring out of view and away from the danger of being inadvertently snagged and pulled out of the equipment or broken off by accident.

(4) If equipment is removed from the console to gather interviews or information, it should be returned to it's same location after news gathering or editing. If you begin utilizing the equipment outside the studio for other than broadcasting purposes, it is almost guaranteed that inexperienced hands will damage it operationally or it will become lost. It will also void any warranties under which it may have been provided. There is a place for each piece of equipment and each piece of equipment should remain in its place.

Layout of Equipment

The layout of the equipment is designed to have the low profile CD players forward for easy access. Discs should be handled carefully by the edges only, this is to avoid marking the playing surface. Also, the discs are top loaded with little but the hand and eye to guide them to correct placement. Therefore, the operator must have a good visual perception of placement. There are liquid crystal diode (LCD) readouts on the disc players in small print. This also dictates that they be up front and easily read.

The tape players are directly behind the disc players. These units are a front entry feed device where the tape cassette slides into place on guide rails. While this requires some visual ability in placement, the guide rails provide most of the placement requirements. It is easily loaded in its present location.

The left front portion of the console contains the mixer with it's cue/control knob, mono/stereo switch, monitor jack, slider feed controls and the important visual indicators of the outgoing signals condition. Situated in front of the operator, it permits the use of both hands to control the outgoing signal level while simultaneously cuing and preparing the next piece of material to be played. It puts the critical over-modulation display directly in the operators range of vision to permit constant monitoring.

Directly behind the mixer is a platform holding the announcers microphone which has a flexible neck. This location permits microphone adjustment to suit all operators and leaves them "hands free" to operate the mixer and other program sources. The platform is large enough to hold a second microphone or a microphone mixer box for additional microphone connection.

Note: Do not forget - other wiring and components lie under the console. If you are drilling into the platform at any location to mount another device or change entry points of power and audio, ensure you do not damage other components.

Power Distribution

All units are plug connected into the console and power is supplied from the voltage regulator board beneath the console tray. By plugging a 12 Volt source into the back of the console, power is distributed to all units at the proper level required. This avoids the need of the announcers to become "technicians" for replacement of power systems or inadvertently making incorrect power connections that could damage the equipment.

Note: Proper polarity must always be maintained when connecting power. If you substitute a different CD or tape player always ensure you have the right polarity and voltage.

Fuse/Breaker Protection

Always be careful when connecting power to the console that you observe the correct polarity. The newer consoles have a small breaker switch which acts as a fuse. It is located beneath the console on the Audio/Power distribution board. A small red dot should be visible on the breaker if it is in the correct position. If you connect power to the console but no power is reaching the on/off switch and light, check your connections for proper polarity and then check the small breaker switch for correct position of the switch.

Do not lay cigarettes, coffee, soft drinks or food on the console or on the equipment. It can only result in damage to the equipment.

Maintenance

Routine maintenance on equipment is an ongoing responsibility of the announcer/operators. It is a simple matter of keeping the equipment and programme materials as clean and free of dirt and dust as you possibly can.

Technical maintenance, such as repairs to equipment would normally be done by a qualified technician. Replacement of equipment, however, is fairly straight forward. If you have to replace a unit, the following procedures are recommended.

(1) Shut off and disconnect all power to the console.

(2) Unplug the defective unit. Replace it with a new one. If the audio connection points are in a different physical location, make new holes.

(3) If you intend to attempt repairs on the replaced equipment, move it to a workbench. Do not attempt to do technical repairs in the console workplace area.

(4) If you have to rewire power for polarity reasons or to repair broken wiring, lift the console from the front to an approximate 45 degree angle and brace it there. Do not try to hold it up with one hand and work with the other. That is almost a guarantee that it will be dropped. As the tape cassette players and CD players are loose, it is a good idea to remove them.

(5) To reverse polarity, you can do it either at the connector or at the power distribution board. It is a matter of reversing the wires at one end or the other. Pick the easiest. Always check the case of the unit you are plugging in to make sure the polarity is correct.

(6) Once the repairs or changes have been made, reconnect the connectors , apply power and test the unit’s operation.

Console Repairs

The console itself is made of ABS plastic material. It is the same material as water pipes are made from. It will withstand normal use without damage, however, particularly in cold climates, a sharp blow may cause a crack. If this occurs, a can of plastic pipe cement will usually provide an effective repair.

We suggest the following procedure:

(1) Apply the plastic cement to the cracked surfaces.

(2) Close the cracked portion as tightly as you can, tape it closed from the top. Wipe off any excess pipe cement that may have squeezed out.

(3) Lift the console from the front and apply a layer of cement from beneath along both sides of the cracked area.

(4) Allow 30 minutes minimum to dry at normal room temperature. One hour or more if temperatures are quite low. (It is dry when the cement is no longer tacky to touch).

(5) After the cement has dried, remove tape from the top of the console and resume normal operation.

SECTION I - QUIZ

(1) The broadcasting console provides three main functions. It_____ _____; It lessens the chances of_____ _____ provides a neater appearance with less chance of _____.

(2) The equipment layout was suggested by experienced broadcasters as being the most_____ over extended _____.

(3) Do not place _____, _____, or _____ on the operating console or on the equipment.

(4) Routine operator maintenance consists primarily of _____.

(5) If you are going to do any maintenance work on the console or equipment, rule number one is _____.

(6) Physical repairs may be effected to a damaged console by using _____.

SECTION II

AUDIO MIXER

General

The audio mixer provided was designed specifically for use on a small community broadcast station. It can also be used effectively as a field mixer; As a switching device for Studio Transmitter Links (STL's), or as a community access console on existing networks.

It has two microphone inputs. One is high impedance the other low impedance. (Note: two microphones of the same type may be used, it just means the slider positions will be different).

It also has four line inputs to accommodate two CD players and two cassette tape player/recorders. Each microphone and player component has it's own slider to control the level of output from the mixer.

This mixer has cue and control which lets you cue up a track ready for play. It also provides two means of monitoring the signal that is being fed to the transmitter. One method is aural via the headphones plugged into the mixer with a 1/8th inch monitor jack. The other method is visual, through an LED light display. One slider switch is dedicated to controlling the output level to the headphones for operator comfort.

Installation

The mixer is entirely a plug in unit. All connections are standard RCA type plugs and jacks with the exception of the +12 volts power input. The power input is a standard DIN power connector.

When connecting the mixer, microphones are plugged into their numbered positions. Plug the audio input devices into their respective numbered line inputs. Plug the mixer output to the transmitter into the bottom of either the Hi or Lo output (depending on required transmitter level) and operate the mixer in the stereo position.

Power

The audio mixer operates on 13.8 volts. (Nominally called a 12 Volt supply) It is connected with a standard DIN jack with +13.8 Volts on the centre pin. The mixer derives it's power directly from the 12 volt supply via the regulator board.

Purpose of the Audio Mixer

The purpose of the audio mixer is to take multiple separate audio sources and feed a final source to the transmitter input. In the process, by use of the slide levers, you can blend, mix, fade or add voice-over to the audio that you wish to transmit. Music can be faded in and out rather than just switched off and on.

A five position cue & control knob is supplied. This lets you switch from one audio source to another and listen to each individual audio before you feed it to the transmitter. This process is called "cueing" and simply means getting one piece of music "cued up" or lined up behind another for playing in sequence.

We will cover much more on the actual "hands on" operation of the mixer and other audio components in the operating section of this manual. For now, it is sufficient that you understand the principle of each piece of equipment and what it's features are.

Monitoring

To avoid sending a distorted signal to the transmitter, we have both an audible and a visual method of monitoring. As noted above, the cue & control knob lets you listen to the audio from the source in the headphones before feeding it to the mixer slider controls. At the point where you have assured yourself that the audio source is the correct one, at the correct location, that it is not distorting and you are not over driving the signal, you are ready to send it to the transmitter. You may switch to any one of the four line input audio sources and monitor it's output aurally, independent of what is being transmitted at the time. The cue positions are not affected by the position of the line slider controls. Only the monitor control slider affects the cue signals.

To reiterate; there are seven slider controls on the mixer. Two control the microphone outputs. Four sliders control the audio outputs. The seventh slider controls the audio monitor level.

It stands to reason then that you seldom, or never want more than one of the first six sliders in the forward position, unless you are trying to mix two or more audio sources together. Always make sure you bring your microphone down as you bring your audio source up. You never want your microphone left "live" . Microphone sliders are marked in red to help you avoid this.

The visual LED display works in conjunction with the first six slider controls. As you advance a control, you will see the display flash farther across the screen. It should be operated so that only the occasional high peaks reach the full display level. Operating with the Mono/Stereo switch in the Stereo position gives you a dual display.

LED displays were chosen because they are solid state devices with no moving parts. This permits more portability of the unit without concern for damaging sensitive moving meter parts such as the Vu meters found in professional broadcast studios.

Impact of Improper Levels

If you operate with improper levels, particularly levels that are too high, you risk damage to the audio amplification equipment in both the mixer and in the transmitter. In addition, your signal will be badly distorted, rendering it unusable to the listener.

Likewise, when the signal is too low, the listener cannot hear clearly. Either way you risk losing your audience. You must always remember that you are not there to provide your own listening satisfaction, but the listening satisfaction of others. This applies not only to the adjustment levels of the equipment but the materials transmitted as well. A radio announcers activities may sound spontaneous, but they require much planning and practice to be properly conducted.

Maintenance

Routine maintenance consists of keeping the audio mixer clean and as dust free as possible. A cloth covering the equipment when it is not in use is a good idea. If the equipment becomes dirty, wipe the exterior with a damp cloth. **Do not attempt to wash it or permit water to get inside the unit.**

Technical maintenance and repairs on the mixer should be attempted only by a qualified technician equipped with the proper electronic repair equipment to diagnose and repair the problem. Do not take a screw driver and begin tightening or loosening screws.

Replacement, on the other hand is a fairly simple process which may be readily completed by plugging the unit in with the RCA connectors from the console.

Replacing A Mixer

If you have to replace a mixer, we suggest you follow these procedures:

(1) Shut off all power to the console.

(2) Remove the existing mixer from it's position by lifting up the lower edge and pulling it gently toward you.

(3) As it comes forward, you will note the plugs coming with it. Pull it forward so that you have all the slack in the wires taken up. The mixer should be about a quarter of the way out of the tray. It may be necessary to loosen the clips holding bunched wires beneath the console to get adequate length. Simply remove the wires from the cable clip if this is necessary.

(4) Take the new mixer, hold it next to the mixer you are removing and change the plugs over one at a time to their identical location on the new mixer. (In any event, they are all numbered inputs, so you are not likely to get confused).

(5) Check your connections to make sure they are good. Slide the new mixer back into the tray making sure that the wire feeds back in under the console. You do not want it to kink up and interfere with mixer positioning in the console.

(6) Input an audio source from each unit in turn. The visual display should light up as you slide the levers forward for each particular unit. Check the microphones the same way by speaking into the microphone and watching the display as you advance the respective microphone sliders.

(7) When satisfied that all units are plugged in correctly, resume normal operations.

SPECIFICATION SHEET

AUDIO MIXER UNIT

Input Sensitivity

Microphone ..... 1 mV

Line Input ..... 100 mV

Output Level @ 1KOhm load ..... 1 mV

Input Overload

Microphone ..... More than 250 mV

Line Input ..... More than 6 V

Distortion ..... Less than 0.5%

Signal-to-Noise Radio ..... Better than 55 dB

Frequency Response ..... 20-20,000 Hz +/- 2 dB

Power Requirements

DC ..... 12 Volts

SECTION II - QUIZ

(1) The audio mixer was specifically designed for small _____ stations.

(2) The audio mixer may be effectively used for _____; _____: Or a _____.

(3) The mixer has _____ slider controls for microphones; _____ slider controls for audio input devices and _____ slider control for audio monitoring.

(4) The general purpose of the audio mixer is to _____ and _____ the audio signals being sent to the transmitter.

(5) The potential impacts of poor operating levels include damage to the _____, damage to the _____ and loss of_____ _____.

(6) The mixer is completely _____, requiring no_____ _____.

SECTION III

CONSOLE MICROPHONE

General

The console microphone provided is a Uni-Directional Dynamic Microphone mounted on a flexible neck mount to permit adjustment to the announcer/operators individual liking. This leaves both hands free to operate audio source units and cue and control the console mixer.

A uni-directional microphone was selected to cut down the transmission of other background noise in the studio. Not all units will be located in enclosed soundproof booths. Although the microphone is fairly directional, you will note side screening on the microphone head. This permits reception in an approximate 55 degree arc. This means live voice studio interviews can be accomplished as opposed to taping in advance. Conducting live broadcast interviews includes it's own inherent risks. No broadcast delay devices are included with the unit.

The microphone is thread mounted to an XLR connection on a pedestal on the console. This thread mount permits easy removal which is required for shipping. Otherwise the microphone should be removed by plugging it in and out of the XLR connector. Each microphone is provided with a slider volume control for easy audio control and blending of voice-over on tapes or discs being played.

These dynamic type microphones do not have an internal battery power source. All amplification provided to this microphone comes from an amplifier circuit in the mixer. Powered lapel microphones that have their own internal power source, such as an internal battery, may cause distortion in the mixer. If you must use a powered microphone, ensure that it is configured in an unbalanced, two wire configuration, with the audio on the centre pin, or tip. If power from the microphone is 9 volts, or exceeds 9 volts, it should not be used. Damage to the mixer may result.

Some models of microphones, such as the Yoga GM-9 model, may also have an on/off switch on the microphone head. This is normally left in the "on" position and the microphone output and level are controlled by the slider on the mixer.

EXTENSION MICROPHONES

Some locations have identified a need for a second or 3rd microphone that can be removed from the console area and extended to an adjacent table for group interview or discussion purposes.

The microphone provided is a dynamic microphone with a cardioid (heart shaped) pickup pattern as this provides the best performance to include a group, but still eliminate extraneous unwanted noise.

This type of microphone allows greater distance between the microphone and the sound source. The somewhat directional pattern also helps to reduce feedback problems that might otherwise occur.

Features

(1) Wire mesh screen to reduce wind noise or breathing noise;

(2) A built in ON/OFF switch to control the microphone from the recording location;

(4) Approximately three metres of extension cord;

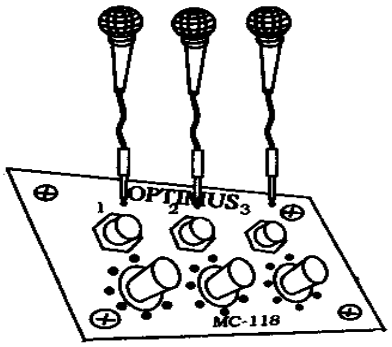
(5) An XLR connector that snaps into the microphone with a standard 3/4 audio jack that plugs into the microphone mixer box on the console.

(6) A light plastic prop stand to raise the microphone off the table.

MICROPHONE MIXER BOX

A microphone mixer box with the capability of handling up to three extension microphones is included in the console. The microphone mixer box is controlled by microphone slider #2 on the mixer and by three individual volume controls for each microphone. We provide one extension microphone and additional units are available as optional extra's

The operator can control the output of each microphone from the console with the slider and the individual volume controls and the user can control the output with an on/off switch on the extension microphone itself.



These are also a dynamic type microphone and come with a simple plastic prop stand. The prop stands can be given an identifying coloured dot to correspond with the colour on the microphone mixer box. This helps the operator at the console identify who's microphone is active permitting him control over the output. The extension microphones offer an opportunity for the station to provide "guest" speakers or "round table" discussion over the community radio station.

Keep in mind that this will be live broadcasting and no "time delay" switching is provided.

SPECIFICATION

CONSOLE MICROPHONE

Impedance ..... 600 Ohms

Directivity .....Uni-directional 55 degrees

Bandwidth ..... 90-10,800 Hz

SPECIFICATION

EXTENSION MICROPHONES

Type ..... Dynamic

Impedance ..... 600 Ohms

Directivity ..... Uni-directional 55 degrees

Sensitivity ..... -76 dB (0 dB = 1 V/u bar)

Frequency Response ..... 50 - 15,000 Hz

SECTION III - QUIZ

(1) What do we mean when we say a microphone is “Uni-Directional” as opposed to being “Omni-Directional?

_____
_____
_____

(2) What is the purpose of having a slider control on the microphone as opposed to an simple on-off switch?

_____
_____

(3) The Dynamic microphone that we use has no power of it’s own. Where does it get it’s amplification, or “gain” from?

_____
_____

(4) Do not substitute a self _____ Hi Gain microphone for the consol mic or plug one in to the mixer if the voltage is greater than ____ Volts. Damage may result to both _____ and _____.

SECTION IV

COMPACT DISC/MP3 PLAYERS

General

All Compact Disc (CD) players utilize a laser beam to read the information on the disc. This means that any significant amount of vibration will cause the beam to mis-read or "skip" part of what is being read. If it is music, for example, blank spots of interruption will be heard. To minimize this effect the turntable of the CD player is mounted on both steel spring and rubber shock absorbers. Given that it is tray mounted as well in a studio type situation, little vibration effects should be experienced. You should however be aware of their effect.

The CD's we supply also have an anti-shock memory. When turned on, this permits the CD player to read and store bits of information before sending it to the output. When a shock occurs, it simply plays the stored information into the skipped location and no interruption is observed unless the shock or vibration is severe.

MP3 Format Recorder/Players

We have recently converted over to a player that will read both standard compact disc recorded format and will also read MP3 format. This permits playback of materials downloaded directly to disc in MP3 format and also permits the storage of a great deal more material on a disc. By utilizing MP3 format, large quantities of educational materials can be stored on a single disc and played over the community radio station.

In addition to having all of the features of the normal CD player, the CD/MP3 player we now employ also has up to 500 seconds (approximately 8 minutes) of digital voice storage on board the player itself. Thus you are able to record into each unit a certain amount of digital reproductive material for playback.

This capability may be very useful for repetitive information like your station "sign on" and "sign off" that you use every day or for those accepting advertisements, it can be utilized in this fashion, much like the old tape "Cart" or cartridge machines were used in early commercial broadcasting.

Installation

The units are placed into the appropriate pockets in the console tray. Power is plugged in at the power connection and audio into the audio jack. The connectors are different and cannot be accidentally mixed up. The locations of these ports may differ from CD to CD and it may be necessary to make new entry points if you substitute a different unit. If the units are removed, they should be returned to their original locations. They should not be used for non broadcast purposes as they may fall into inexperienced hands, be damaged, lost or otherwise rendered inoperable. If you are recording into the CD/MP3 units, it is sometimes more convenient to have them out of the console as it is easier to plug in the microphone, etc. .

Laser Safety Warning:

As noted, this unit employs a laser. Only qualified service personnel should remove the cover or attempt to service this device, due to possible eye injury. Always follow the operating instructions and do not dis-assemble the unit.

Power

The CD players provided are plug connected into the console voltage regulator board with the correct polarity. They operate at 4.5 Volts from the regulated 6 Volt power distribution board mounted beneath the console. The CD/MP3 players also have their own voltage regulator within the unit. They are able to take the 6 Volt input and provide a steady 4.5 Volts to the operating sections of the units.

Examination of the CD will reveal a battery compartment. **Do not leave batteries in these units.** They are intend to, and wired to operate from, the console voltage provided. If you have them out of the console operating on batteries, ensure that you remove the batteries before you return them to the console.

Likewise, a charger switch may be noted at the rear or beneath some units. Always leave the charger switch in the “off” position. It has no applicability to your application.

You may also notice a switch marked “Hold”. This locks up the CD player at it’s present settings. You do not need this feature. **Leave any “Hold” button in the “Off” position.** (It may be tempting to create chaos with your relief operator by playing with such switches - this kind of horse-play generally gets out of hand sooner or later and usually results in damaged equipment. Avoid this kind of activity at all costs. As the announcer/operator you are in a responsible position, always try to act responsibly).

The power On/Off switch should be left in the “On” position. The console power switch should be used to control power to all the units in the console. This ensures that when you shut down operations , all units are shut off at the same time and no motors are inadvertently left running. This procedure may cause some replacement CD players to start their motors automatically when the power is turned on, this requires you then shut each one off till you are ready to begin operation. This may be a bit of a nuisance, but it is preferable to leaving units running all night, unattended.

Audio Output and Levels

Audio feed is taken from the phono jack on the CD. This ensures ability to control the audio output with the audio volume control - if required. Under normal operating conditions, the same undisturbed setting would be used for cue and control and audio power to the transmitter would be controlled by the slide control on the mixer. However, if you replace a unit, line levels may be different. Thus to maintain inter-changeability of equipment, the audio amplifier in the CD player is utilized. While it is true that line output may give slightly better reproduction, it needs much higher amplification from the mixer. Not all commercial units put out the same line level requirements.

Operating Features

Most commercial models of consumer CD/MP3 players are very versatile. They have excellent features to assist in cueing up sections or tracks of the disc for playing. These features may include:

(1)	Memory/Time	Which provides a track number and elapsed time left to play.
(2)	Audible Search	Permits monitoring a track to ensure the correct starting location.
(3)	Skip/Search	Permits the operator to jump from track to track on the disc.
(4)	Pause & Cue	Permits you to pause on a given track , or pause and skip tracks.
(5)	Intro Scan	Allows the operator to listen to the first ten seconds of each track.
(6)	Repeat Play	Permits repeat of a single track, or repeat of a whole CD.
(7)	Random Play	The CD will play all tracks in random order.
(8)	Programmed Play	The operator can program up to 20 tracks in any specified order.

And of course, there is the manual selection of any track you wish.

The CD/MP3 Player supplied by Wantok will support a maximum 256 directory MP3 disc or a maximum 512 track (file) MP3 disc. Later in the workbook we will deal with the detailed operation of all the studio units, for now it is sufficient to know their capabilities.

Maintenance

Routine maintenance consists of keeping the CD/MP3 players clean and as dust free as possible. Dust and dirt can cause premature wear on parts. Cover the equipment when it is not in use.

When cleaning, use a damp cloth only. **Do not use chemical cleaners.** Do not get water inside the players. Liquids contain minerals that corrode the electronic circuits.

A dirty CD lens will cause sound skipping and, if the lens is very dirty, the CD may not work at all. Open the disc cover and clean the lens as follows:
(1) Using a camera lens brush/blower, blow on the lens a couple of times;
(2) Wipe it lightly with the brush to remove dust.
(3) Blow on the lens once again.
If you do not have a small light brush or camera blower, use your mouth and a soft Q-tip, but be careful not to get moisture or lint back on the lens.

The discs themselves must be kept in their jackets when not in use and be kept dust free. Dirt and scratches on the discs surface may prevent the laser beam from correctly reading the digital information. Always handle the discs by their edges. Do not put thumb and finger prints on the discs as body oils are particularly difficult to clean off.

Keep your discs dry. A water drop can act as a lens and affect the laser beam focus. To clean the discs, use a clean, lint free cloth. (Compact disc. cleaner kits are available, but they are fairly expensive and not required)

If a CD player undergoes a fairly rapid temperature change, for example if brought in from -20 degrees into a warm building, the laser lens will likely fog over. You will simply have to wait for an hour for the unit to come up to temperature. You may speed up the process by gently fanning the unit to move the air around the lens and motor.
In tropical areas of high humidity where temperature drop in the early morning hours, the same "fogging" may occur if a window has been left open and adequate temperature change to cause condensation occurs. The same application of simply warming the unit slowly by air movement will resolve the problem.

Do not place anything except a standard 5-inch or 3-inch compact disc in the disc tray. Doing so may damage the drive mechanism of the CD player.

During play, a sudden shock or jolt (like bumping the console hard with your elbow) could make the CD's rotation speed change suddenly. This could produce some noise. It is not a malfunction of the unit. The following table provides a trouble shooting guide for assistance if problems occur.

TROUBLE SHOOTING
COMPACT DISC PLAYERS

SYMPTOM	PROBABLE CAUSE	SOLUTION
CD player will not turn on	Power Disconnected "HOLD" switch is on	Check power connections Check Power "On" Turn off "HOLD"
Disc will not play	Disc inserted incorrectly "HOLD" switch is on Defective Disc CD compartment not closed Moisture has formed inside the CD deck You are in the wrong format	Reinsert with label side up Turn off "HOLD" Try a new disc Close lid securely Remove CD and leave the lid up to speed drying, fan gently Change formats
No sound available from headphones	Headphone plug not inserted properly Monitor slider set too low Volume Control on CD too low Defective disc	Reinsert headphone plug into the headphone jack Advance monitor slider Advance volume control Try another disc.
Sound is skipping	Compact disc is dirty Pick-up lens is dirty Strong vibration of the player	Clean disc or replace disc Clean the lens Provide additional shock protection (ie: foam pad under console)
Disc plays but is scratched and quality is poor	Damaged and scratched disc through careless handling	Press DIR/REC button once. This improves the effect but shortens the ESP time

SPECIFICATION SHEET

COMPACT DISC PLAYERS

Audio

Frequency Response (+/- 1 dB) ..... 20-20,000 Hz
Dynamic Range ..... 85 dB
Signal-to-Noise Radio ..... 80 dB
Harmonic Distortion at 1 kHz 0.05%
Phone Output (10% THD at 32 Ohm) ..... 10 mW + 10 mW
Line Output ..... 0.80 V

Disc

Diameter .....Standard 5 and 3 inch CD's

CD Signal Format

Sampling Frequency ..... 44.1 kHz
Over sampling ..... 4 times
Quantization Number .....16-Bit Linear/Channel
Transmission Bit Rate ..... 4.3218 Mb/Second
Signal Processing Rate .....176.4 kHz
ESP Time ..... 5 Seconds Average

MP3 Signal Format

Maximum MP3 Directories 256
MP3 Sampling Frequencies .....32 KHZ, 44.1 KHZ, 48 KHZ
Baud Rate ..... <224 Kbit/Sec
Maximum MP3 Track (File) Directories 512
ESP Time ..... 45 Seconds

Pick-Up

Tracking System ..... 3 Beam Tracking Servo Type
Object Lens Drive System ..... 2 Dimensional Parallel Drive
Optical Source ..... Semiconductor Laser
Wavelength ..... 780 nm

Power

Power Requirement ..... Minimum 6 V
Power Consumption ..... 3-5 Watts

SECTION IV - QUIZ

(1) CD/MP3 Players are more susceptible to _____than tape cassette players.

(2) CD's must be _____ and _____ for proper playback from a laser.

(3) Eye damage can occur from the _____ within the CD player if operated in a disassembled condition.

(4) Power for the CD/MP3 Players is supplied from the console _____.

(5) All warranty will be void on CDMP3 players if _____ for other purposes.

(6) To avoid leaving the console units turned on for unnecessary periods, all power to the units is controlled by the _____ on the consol.

(7) Under normal operating conditions, the audio output level from the CDMP3 players is not adjusted and remains at a _____ level.

(8) List 8 operating features of the CD players. (Refer to your workbook if you wish to).
(a) _____ (b) _____ (c)_____
(d) _____ (e) _____ (f)_____
(g) _____ (h) _____

(9) Never use _____ when cleaning a CD player.

(10) Routine maintenance on a CD player consists of keeping it _____ and _____.

(11) Speed changes may occur when playing a CD if the CD player receives _____ during play. Noise generated at that time is_____.

Section V

Supplementary Information

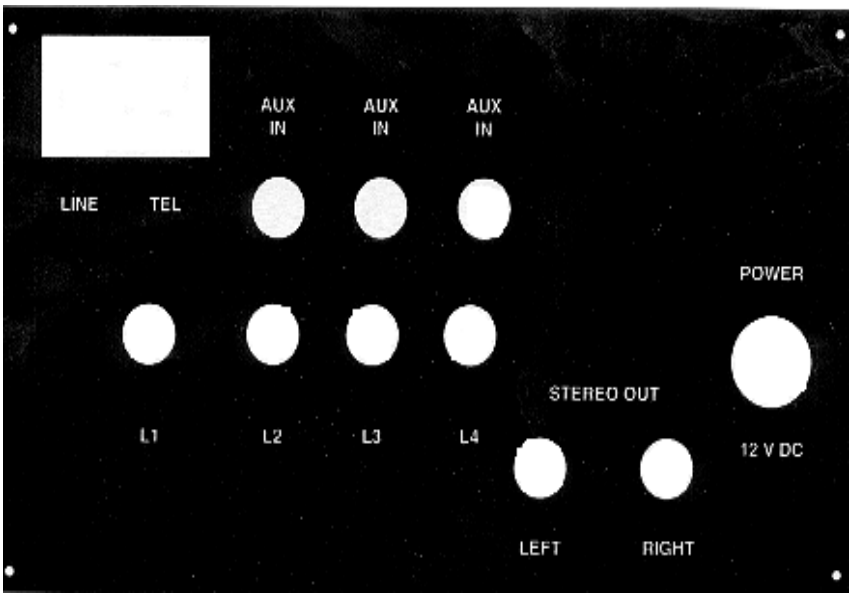
CD Changers or CD Stackers

Some community broadcast stations are purchasing CD “changers” or “stackers”. Some of these units will randomly select and play up to 20 or more CD’s without interruption. This permits un-interrupted music throughout lengthy periods of time without the requirement of an operator. These units are readily accommodated by the Wantok console by utilizing the auxiliary inputs on the back of the console tray.

Computers

Other community radio stations have started using computers with audio storage and program selection capabilities that permit them to store large amounts of music and information and have them played at designated times. Computers work well with the console and their audio output may be connected directly into the console through one of the auxiliary input jacks.

Auxiliary Audio Input & Power Distribution Board



Beneath the console is the power distribution and audio interconnect board. Mounted on the back of this board is an auxiliary input board which faces outward with access through holes in the back of the console.

The auxiliary input board contains a row of four switches. By changing the position of these switches we can cut off audio from the tape cassettes and CD/MP3 players in the console and accept audio going to the mixer from 3 RCA jacks and a telephone interconnect jack on the back of the console.

This means that by simply moving a switch we can accept audio from a CD stacker, a satellite receiver, short wave receiver, or any other audio device into the mixer and through to the transmitter. This permits the re-broadcast of satellite or short wave received transmissions from other locations, internet streamed audio from internet radio stations or the audio from any other source.

Some agencies have requested the ability for accepting phone calls and broadcasting them over the air. Wantok Enterprises has met this need through the auxiliary input board. The telephone interconnect is no longer an optional device. It is included at no additional cost to the purchaser as part of the Wantok console.

The telephone jack is a standard RJ11 4 wire input jack and effectively places the console mixer in parallel with an incoming telephone call. This permits telephone call-in radio programs where the facilities are available or desired.

Caution: Remember that if the switch is in one position you get your audio feed from the audio sources in the console. If it is placed in the other position, you get your audio from the external input on the back of the console. If you are getting no sound from your console units - check the switches to make sure they are in the correct position.

Remember also that this board also provides the power to the various units in the console. Recent models have been equipped with a small breaker switch. This switch acts as a fuse to prevent equipment from being damaged by improper connections etc. As the equipment is often subjected to vibration from being flown in aircraft, it is a good idea to check this breaker switch if you are not getting power to your equipment. Switch it back and forth, leaving it with the red dot showing.

Auxiliary Power Output Board

Also located on the back of the console is the auxiliary output power board. This board provides 5 Volt, 6 Volt, 9 Volt and 12 Volt DC outputs at 1 Amp to be used by auxiliary input devices. Many communities cannot afford batteries to keep shortwave and satellite receivers operating. This board permits them to use the main primary power source to supply power to the other devices required for re-broadcast purposes.

Power Protection

To counter incorrect battery connections, shorted wiring and other activities that happen which may short out components and put stations off the air, a need for some form of fusing on the console was identified.

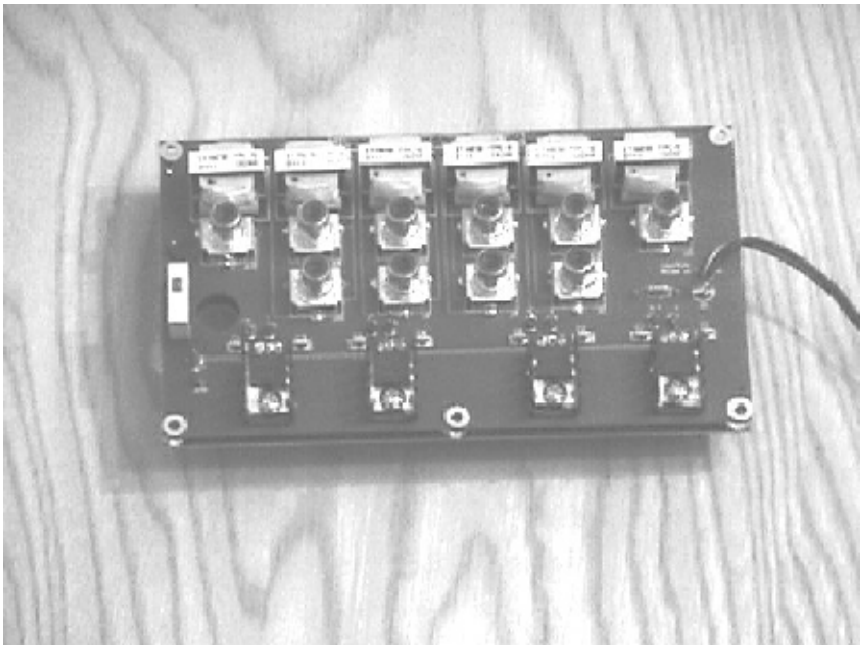
As fuses are not always available for replacement, it was decided to utilize a 1.5 Ampere breaker switch in place of a fuse.

This 1.5 Ampere breaker switch will trip if incorrect current flow is received. It can then be re-set and utilized again as a safety feature. Unlike a fuse which burns out and is finished.

The breaker switch is mounted on the Input/Output board where the power comes into the console. It can be observed by lifting up the front of the console to determine the status of the switch.

When properly set, a small red dot is visible on the switch. If you are getting no power to the console, tip the console deck up and check this switch.

To re-set the switch, simply flick it upward all the way and then down again and a small red dot will be visible indicating current will again flow through the switch. If you re-set the switch and it flips off again, then there is a short in your power input or you have an incorrect connection of the power. Disconnect the power and re-check your power connections and wiring.



SECTION VI

CASSETTE TAPE RECORDER/PLAYERS

General

Like the CD players, Cassette Tape Recorder/Players change frequently in style as they are commercial consumer products. The tape units we use are rugged units intended for use both in-studio and as a field unit for collecting news, interviews or covering other events of interest. These units are not complex to use and require limited maintenance.

Installation

Unlike the other units in the console, The tape recorder/players are intended to be removed from the console and utilized elsewhere for recording or playing purposes. Their use as recorders can provide a valuable source of local programming for the station.

The tape recorders are a simple plug and play operation. When they are in the console as player units, they will operate from the console power board as do the CD players. However, when utilized outside the radio station, they will operate from 4 standard 1.5 Volt C batteries or from a 6 Volt AC/DC adapter. To permit their utilization both in the studio and outside the studio, additional slack cable is available to permit lifting them in and out of the console with ease.

To remove the cassette units from the console, follow these steps:

(1) Pick the unit up from the tray, tipping the right side up slightly;
(2) Disconnect the audio plug which is toward the front of the unit;
(3) Disconnect the power plug which is toward the back of the unit;
(4) Slide the battery cover free. Insert 4 standard C cells into the unit as indicated in the case.
(5) Verify that you have power by inserting a tape. Turn up the volume and listen through the built in speaker on the unit;
(6) If it does not work, check the direction of your battery installation and ensure that the batteries are correctly inserted;
(7) If it still does not work, check the batteries to ensure they are good and fully charged.
(8) You can check to ensure the machines are working with an AC/DC wall adapter if you have no other way of checking the batteries.

Operation of the cassette unit both as a player and as a recorder will be covered in more detail under the section on OPERATING. For this section of the manual we are concerned only with teaching you how to remove and re-install the units into the station console.

The station will operate normally with whatever CD or Cassette units are left in the console while you have one or both of the cassette units away on field assignment. When you return from a field trip and wish to put the cassette unit back into the console for normal operating purposes, please follow these steps in this sequence.

(1) Slide open the battery compartment and **remove the batteries from the unit;**
(2) Slide the battery compartment cover back in place;
(3) Take the console audio plug and insert it in the cassette "phone" jack. Do not plug the audio into the auxiliary audio jack. (Position of the plugs normally prevents this);
(4) Take the console power plug and insert it into the 6 Volt DC input jack;
(5) Carefully place the cassette unit back in it's tray, feed any excess wire through the hole into the console. If kinked wire is left under the cassette it is more susceptible to damage by movement of the cassette unit during play operations.

Note: Do not leave batteries in the cassette units when they are placed back in the console. A voltage will be placed across the terminals which could result in the battery exploding or rupturing, causing injury to personnel &/or destroying the cassette and console.

Power

The Player/Recorder must have a minimum of 6 Volts to operate properly. Always ensure that the correct polarity is observed. It sometimes changes from model to model and if you are substituting another type of player, correct polarity must be observed. On the units provided, the DC plug from the cassette's will not fit the CD players or vice versa. However, if you substitute another unit, or substitute tape machines for the CD players, **make sure you get the polarity and voltage for the new machines correct.** Though we provide desk top model units with all of the control buttons on top for easy access, any cassette player may be used with the console.

General Features

Some of the general features of the supplied cassette units are as follows:

(1) Portable, easy to move around with a handle for carrying.
(2) Reliable, rugged construction.
(3) Ease of use, not complicated to operate.
(4) Will operate on C cells, wall adapters, or any 6 Volt DC source.
(5) Capable of both play and record modes.
(6) Mechanical tape counters help you locate items on the cassettes.

Operating Features

Some of the specific operating features of the cassette recorder/player units include:

(1)	Automatic Stop	Protects the tape and tape handling parts by automatically stopping the tape when it reaches the end;
(2)	Automatic Level Control	(ALC) Circuitry is built in, to ensure quality recording by automatically setting the proper recording level;
(3)	Record/Battery Indicator	For use on field work. The indicator flickers while you record as an indicator and will light steadily when the batteries need replacing. (Not available on GE models)
(4)	Condenser Microphone	Built in condenser microphone with high sensitivity for recording sessions such as conferences, etc;
(5)	External Microphone Jack	A separate jack is provided to connect a directional microphone with remote on/off switch which controls the recorder. Desirable for doing one-on-one interviews &/or gathering news material, etc;
(6)	Auxiliary Input Jack	This jack will let you connect a radio, second tape deck, CD player or other sound device for transferring information, music, etc;
(7)	Erase/Edit cord	A Sony-Sony cable that plugs into the external microphone jack so you can erase a cassette tape by recording silence, or the cable can be used to connect two units from output to input for edit and transfer purposes.

Note: Editing will be covered in the operational section of the manual.

Maintenance

We can not repeat too often that routine maintenance of all operating equipment consists of keeping it clean and dry.

Tape recorders have electro-magnetic heads for record and playback. Because of the voltages on these heads, they tend to attract dirt and dust particles. Also, over time, the material on the tapes

becomes deposited on the heads resulting in a deterioration of recording and playback quality. To prevent deteriorating playback quality from happening, take a cotton swab and a cleaner like denatured alcohol, and clean the heads after approximately every 40 hours of use. More often, if you observe signs of deteriorating sound performance.

Cleaning Electro Magnetic Heads

The following steps are recommended to clean the electro-magnetic heads:

(1) Remove the batteries or disconnect the power by turning off the console power;

(2) Open the cassette compartment cover by pressing Stop/Eject;

(3) Press “Play” to expose the tape handling parts;

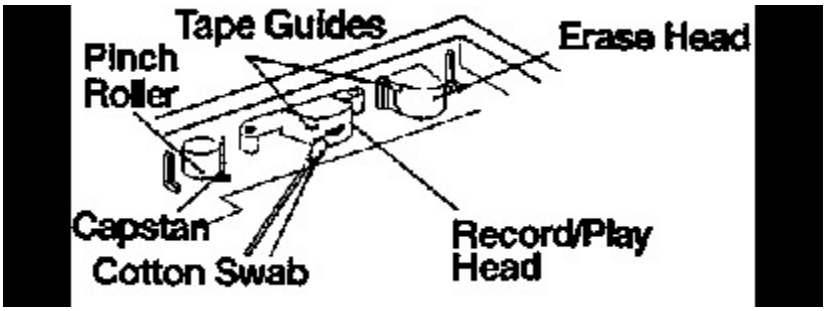
(4) Using a dry cotton swab or one dipped in tape head cleaning solution or denatured alcohol, gently apply it to clean the capstan, pinch roller, tape head and tape guides. (Note: Do not use gasoline or any cleaner with additives. Denatured alcohol is best.

5) When you have finished cleaning, press “Stop/Eject” and close the compartment.
A “Cleaning Cassette” is also available commercially. This cassette contains small brushes which spin by the heads and capstan. You simply apply the cleaning solution to the cassette and place it in the unit. Press “Fast Forward” and/or “Rewind” and the brushes clean the heads.

While the cleaning cassette is a useful tool, a good workout with a swab also provides a better opportunity to inspect the inside of the unit for dirt not picked up by the brushes on the commercial cleaner. If no cleaning solution is available, dry swab the capstan and tape heads and blow the dust out as a maintenance minimum.

Tape cassettes need a bit more maintenance than the other components, particularly if they are being used in both field and studio as well as for edit purposes. Notwithstanding, many hours of good use will be obtained if care is taken in handling the units and keeping them clean and dry.

SPECIFICATION SHEET



CASSETTE TAPE RECORDER/PLAYERS

Track System ..... 2- Track Monaural

Tape Speed ..... 4.76 cm/sec

Recording System ..... Magnetic Erase, AC Bias

Frequency Response ..... 125 - 6.3 kHz +/- 6 dB

Signal-to-Noise Ratio ..... 55 dB

Wow and Flutter 0.35%

Power

Power Requirements ..... Minimum of 6 Volts

Adapter Current ..... Minimum of 300 ma

Average Power Consumption ..... 2 Watts

SECTION VI - QUIZ

(1) The tape cassette units may be _____ from the console and utilized on field recording exercises.

(2) While in the console, the cassette units operate from the _____. While in the field they operate from _____ or _____.

(3) Both audio and power connections to the cassette units have _____ to allow them to be removed easily from the console.

(4) When removing or replacing cassette units it is a good idea to follow the _____ provided for each operation in the manual.

(5) Never have batteries in the cassette when _____.

(6) Applying power from the console power board to the cassette unit with the batteries still in the cassette unit may result in _____.

(7) There are _____ general and _____ specific operating features of the cassette units.

(8) Describe the five maintenance steps involved in cleaning the tape cassette unit. (Use your manual for reference if you wish).

(1)_____

_____

(2)_____

(3)_____

(4)_____

_____

(5)_____

SECTION VII
POWER SUPPLY
ASTRON MODEL SS -12/SS-18

Power Supply

A single AC to DC switching power supply is used to supply power to both the transmitter and the console. An absolute minimum for a 30 watt transmitter and the console is 10 Amps of current. You may see power supplies rated at 10 Amps duty cycle. Such a unit will only deliver approximately 8 Amps continuous. If your minimum is 8 Amps, get a 12 Amp duty cycle power supply which will provide 10 Amps continuous leaving you a margin for safety of the power supply unit. Never operate any equipment at it's all out maximum performance. Always try to leave a margin for cooler operation. It will pay off in maintenance in the long run.

We supply a 10 Amp continuous 12 Amp duty cycle for our transmitters up to 30 Watts. For 50 Watt transmitters we supply a 15 Amp continuous, 18 Amp duty cycle. For the 100 Watt transmitters it is advisable to use two power supply systems. An SS-18 for the 100 Watt amplifier and a separate SS-12 for the 30 Watt driver and the console. If you attempt to run them both, they will operate off a single SS-18 supply, but the power output may drop down to 85 Watts.

Switching Power Supply

Power Supply's may be either transformer type or a switching or oscillator principle type supply. Switching power supplies, like the one we are using, are practical for our purpose. They are light in weight, small in size and deliver a steady voltage and current supply to the units. Also, they are very forgiving of unstable input voltages.

These power supplies are switchable for use from either 115 Volts or 230 Volts AC. Always make sure you have the switch on the back of the power supply in the correct position for the input voltage at your location . The only drawbacks to switching power supplies are that they generate some radio frequency noise. Also, as they operate on the oscillator principle, they should not be operated without a load. Lengthy operation at no load can result in the oscillator circuit burning out. So as a precaution, make sure your power supply is not left in the "On" position for any lengthy period of time without either the console or the transmitter being connected and turned on to present a load for the power supply.

If you attempt to take a voltage reading at the terminals of a switching power supply, you may get no reading. The unit may be working, but the meter is not a sufficient load to cause current flow. You may have to connect a load in order to get a reading.

Maintenance

To clean the power supply, wipe it with a damp cloth. Do not use chemical cleaners and do not immerse or run water through the interior of the unit.

Operate the unit in an area where a free flow of air is permitted to pass through the vents. Do not place objects on top of the power supply. Paper or other objects act like a thermal blanket and could cause overheating of the power supply unit.

POWER SUPPLY SPECIFICATIONS

ASTRON MODEL SS-12

Input Power

AC voltage from 90 - 132 Volts AC or from 180 - 264 Volts AC

Frequency from 45 to 65 Hz

Output Power

13.8 Volts

10 Amps Continuous Operation / 15 Amps Continuous Operation

12 Amps Duty Cycle ICS 33% / 18 Amps Duty Cycle ICS 33%

Fused

3 Amp - 250 Volt

SECTION VII - QUIZ

(1) Both Console and Transmitter may receive their power from a _____.

(2) Always allow a margin for _____ supply to avoid overloading the power supply.

(3) The Astron power supply is switchable from ____ Volts to _____ Volts supply sources.

(4) Advantages of switching power supplies:
(1)_____ (2)_____
(3)_____ (4)_____

(5) Disadvantages of switching power supplies:
(1)_____ (2)_____

(6) If you measure the output terminals of a switching power supply you may get ____ Volts even thought the unit may be turned on because the meter does not supply sufficient load alone.

(7) Maintenance of the power supply consists of keeping it _____ and _____ and not running it under _____ conditions.

(8) Always allow _____ around the power supply and do not _____ as this may cause overheating.

SECTION VIII

LOGGING RECORDERS

Logging Recorders

Certain jurisdictions require that a logging recorder be available to continuously monitor the output of the broadcast station.

A cassette recorder that runs at a slower speed than normal is available as an optional item for those jurisdictions where it is required. Such units are generally quite expensive.

A third standard cassette player , plugged into one of the remaining three audio outputs from the mixer and using C120 tapes is a much less expensive option and will generally meet the regulators requirements.

The monitor recorder, (if/when) required can be set up outside the console tray, out of the way, and the audio feed allowed to run out under the tray by simply cutting a notch for the cable at the back of the tray base.

SECTION IX
OPTIONAL DEVICES

GAIN ANTENNAS

By utilizing power matching devices and varying the length and shape of the radiating element(s) it is possible to realize a stronger radiated signal over a designated area. A gain in signal strength. An optional 3dBi gain antenna, which effectively increases the radiated signal power, is available for areas where greater coverage is required. Gain antennas improve the signal coverage without requiring additional power input. This is particularly useful in areas where transmission power is obtained from solar panels and batteries.

The length of these antennas needs to be adjusted with each change in frequency.

SPECIFICATIONS

Frequency ..... 88 - 108 MHz
Impedance ..... 50 Ohms
Gain ..... 3.4 dBi
VSWR ..... < 1.5:1
Maximum Power ..... 200 Watts
Length ..... 2.32 metres
Weight ..... 1.1 kg

STACKED DIPOLE ANTENNA

As part of every complete station sold, Wantok Enterprises includes a stacked Dipole antenna. This type of antenna provides a near doubling of the radiated signal. This is excellent for locations where the power source is Solar power. By using a gain antenna, we effectively double the radiated power effects without having to generate more input power.
The stacked dipole is broad band across the FM assigned portion of the spectrum and does not need to be re-tuned or adjusted each time the frequency of the transmitter is changed.

SPECIFICATIONS

Frequency ..... 88 - 108 MHz
Impedance ..... 50 Ohms
Gain ..... 2.7 dBi
VSWR ..... < 1.5:1
Maximum Power ..... 100 Watts
Length ..... 2.8 metres
Weight ..... 2 kg

Section X
THE TRANSMITTER
VERONICA TRANSMITTERS

Important Notice to Owner

The owner of the radio transmitter is responsible for it's operation in full compliance with existing National and International regulations. These regulations govern the use of radio transmitters and emission of electromagnetic waves.

General

The Veronica line of transmitters currently being used by Wantok Enterprises Ltd. are very versatile units. They are designed to be set up in the field with a minimum amount of effort and experience on the part of the purchaser, yet still provide adequate radio coverage for the job at hand.
Given that many parts of the world still do not have access to AC power sources, these units and all components associated with them will operate on voltages of 13.8 Volts. This means it will operate from any regular vehicle battery. Such batteries may be charged from a variety of sources such as a solar panel, charging generator, wind generator or even from a vehicle generator or alternator. In those areas where AC power is available, the equipment will operate from an AC/DC converter under a wide range of voltage and frequency.

In keeping with it's versatility, the operating frequencies of the Veronica transmitters are fully synthesized to permit operating frequency selection by the positioning of a series of switches within the unit.

The FM radio channels are established by international agreements and transmitters will move in steps across all the designated channels. This is not something that would be done by the operating staff, but falls within the purview of the engineer or technician responsible for installation and on-going maintenance of the equipment. The process for frequency change is covered in a separate technical manual supplied with the unit.

The Veronica transmitters are designed to provide an output power of 30 Watts, 50 Watts and 100 Watts. Power is fully adjustable from 1 Watt to the designated top of any given unit. This permits the unit to operate well within the performance parameters of the components comprising it's construction. In so doing, component failure and the need for technical maintenance are significantly reduced. It is not recommended that any adjustments be made to the power settings. As with frequency control, this is the area of the engineers and technicians.

The unit is designed to operate over a wide temperature range reflecting temperatures in most of the world's populated areas from the Canadian High Arctic to the most tropical of islands. In addition, it features a low current drain fan assembly to ensure that it operates at a cool temperature.

As noted earlier, the antenna supplied with the unit is an omni-directional, 2.7dB gain, stacked dipole antenna. This means that it will radiate a "line of sight" signal equally well in all directions (barring a reflected path obstruction). Any 50-52 Ohm impedance matched antenna may be connected to the unit provided it is matched to the frequency of operation.

Higher gain antennas may be used to obtain wider coverage, or you may go to a more powerful transmitter. The more powerful transmitter requires more power input, which leads to larger solar charging systems, etc. Wherever possible, your least expensive option is to go with a gain antenna if that is feasible. Higher gain antennas increase the coverage through control of what radiation is being emitted by the transmitter, they are passive as far as power consumption increases are concerned.

Note: If you are required to change your operating frequency, then the antenna must changed to the length appropriate for the new frequency. You may also use a "broad band" antenna that covers the FM frequency band. This type of antenna does not need to be adjusted when the frequency is changed.

When an antenna is mounted on it's pole and the lead-in is brought to the transmitter, ensure that a "drip loop" is provided where it enters the building. This is simply a half loop below the entry point to prevent water from running directly down the cable to the transmitter.

Signal delivery in the FM band is primarily a factor of line-of-site. If you raise your antenna to a height sufficient to give it a clear view of an area, even a 1 watt output power can provide a very useable signal.

Maintenance

Routine operational maintenance of the transmitter includes a daily visual inspection to ensure that the signal is being properly radiated. This is determined by the front panel lights. During proper operation, the red light is off, the middle green light is on, and the yellow power lights are lit.

The transmitter should be kept clean, dry and well ventilated to prevent over heating. Ensure it is kept out of direct moisture applications such as rain or sprayed water.

The Antenna should be inspected visually daily to ensure it is still well mounted, all radials are in place and the antenna cable is securely fastened.

***** CAUTION *****

BEFORE CONNECTING A POWER SOURCE

(1) Never connect a voltage source to any transmitter or operate a transmitter without the proper antenna correctly installed and connected. Damage to the transmitter could result.

(2) Ensure the “Power On/Off” switch is in the “Off” position on your power supply before connecting the power adapter plug to the rear panel receptacle. Then turn the power on.

(3) When connecting power to the transmitter, always make sure the correct polarity is maintained.

(4) Ensure the transmitter is located in a clean, dry location that permits good ventilation to the unit.

SPECIFICATION SHEET

VERONICA 30 WATT TRANSMITTER

Features and Specifications

Frequency Range ..... 87.51-108 MHz

Frequency Selection .....via Internal Dual In-line Pin (DIP) Switches on assigned 100 kHz steps

Phase-Lock-Loop Circuitry .....Ensures high stability operating frequency -25' to +45' C

Deviation ..... +/- 75 kHz

Distortion ..... < 0.5 %

Input Impedance ..... 600 Ohms

Antenna Impedance ..... 50-52 Ohms

Audio Frequency Response .....30 kHz to 15 kHz +/- 0.5 dB

PLL Lock Time ..... 3 Seconds

Power

Input Power ..... 12 Volts DC

Output Power ..... 30 Watts

The 50 Watt and 100 Watt units adhere to the same specifications as the 30 Watt units. These transmitters use broad band amplifiers to increase the output power. The 50 Watt amplifier is driven by a 12 Watt transmitter and the 100 Watt amplifiers use a 30 Watt transmitter with the above specifications as driver transmitters for the amplifiers.

SECTION X - QUIZ

(1) The owner of the transmitter is responsible for making sure that the transmitter is operated in adherence to _____.

(2) The Veronica transmitters operate from any _____ Volt source.

(3) Normal operating output of these units are ___; ____; and ____ Watts.

(4) Never operate the transmitter without an _____ connected.

(5) Always check the _____ of the power connections before connecting.

(6) Gain antennas consume _____ power for a given coverage area.

(7) Someone should be designated to make daily _____ inspections of the transmitter and antenna.

(8) A simple safety precaution to ensure rain water does not follow the antenna down into the transmitter is to provide a _____ outside the wall entry point.

SPECIFICATION SHEET

STUDIO/TRANSMITTER CARRYING CASE

FEATURES

Exterior

Features a composition exterior that is washable and extremely durable. Moulded composite construction throughout.

Multiple hinged; Multi clasp closure on lid.

Double, reinforced lock hasps.

Purge valve. (As the unit becomes air tight on closure, changes in altitude require that a valve be installed to permit air entry and reduction of interior vacuum so the lid may be opened).

Indented cover plate area for location name and/or inventory number of the unit.

Interior

“O” ring seal on lid to prevent any moisture or dust entry.

Four layers of custom hi-density packing foam.

Precut graphed packing areas for custom fit to desired equipment.