

**SCHAFFER MODEL 1200 AUTOMATION  
INTERIM INSTRUCTIONS**

WIRELESS INSTRUCTIONS

SCHAFFER MODEL 1200  
BROADCAST AUTOMATION SYSTEM

Technical assistance  
may be obtained at  
any time by contacting:

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The information contained in this publication is from a portion of the Schafer Operation and Maintenance Manual. When the entire Manual, containing both operation and maintenance information, is published, it will be supplied to users of the MODEL 1200 equipment. At that time, the Interim Instructions publication may be discarded.

The operations described in this publication  
are concerned with the units of the Master  
Control Rack.

From the top to the bottom of the Rack, the  
units are identified as follows:

Top Unit	-	METER PANEL
#2 Unit	-	CONTROL PANEL contains: Control Unit Clock Unit Sequence Selection Unit
#3 Unit	-	CUE PANEL
#4 Unit	-	AUDIO SENSE PANEL
Bottom Unit	-	RELAY PANEL

## INSTALLATION

### Unpacking the Equipment

All of the equipment, except the Seeburg playback units, is shipped ready for immediate use. It may be located, set up and operated by plugging in the interconnection cables provided and connecting the unit to a source of AC power.

The only units that require unpacking are the Seeburg record playback units. They may be readily unpacked by following the instructions that accompany them.

**CAUTION:** Failure to follow unpacking instructions may result in serious damage to the Seeburg units.

### Placement

The individual units of the System may be placed in any convenient location if enough interconnection cable is available. Twenty foot cables are supplied as original equipment but extra lengths may be ordered separately if greater unit separation is desired.

Certain general care should be observed in the placement of these units. Prior to permanent placement, be certain that a 115 volt, AC 60 cycle, 10 ampere power circuit is available to supply equipment requirements. Preliminary relocation of the equipment might be preferable to the installation of extension power wiring.

Care must be taken to allow sufficient access to the rear doors of the equipment. Routine maintenance may require access to both the rear doors and the front panel at the same time.

Should the equipment be placed in some location where access is through another room or closet, the routine maintenance may become complicated and time consuming. Location of the equipment in a main control room also may complicate maintenance, set-up or other associated procedures. Such location is not necessary if done primarily to allow observation of the equipment. The System does not require constant observation of its operation.

#### Connection of the Equipment

Inside the rear door of the Master Control Rack, two inter-connection plug boxes are located at the bottom of the Relay Panel. (The bottom unit on the Rack.) The plug box on the left is designed to receive female Cannon connectors (for audio inter-connection) from the individual playback units. In addition, a LINE OUT connector provides the audio output of the System.

The plug box on the right is designed to receive multi-pronged male Jones connectors (for control circuitry) from the playback units. In addition, a REMOTE connector is provided for connection to the Automation Remote Control Box.

**NOTE:** The Automation will not operate unless the Remote Control box is plugged in or a suitable jumper plug is made up.

1. Plug audio and control cables from Seeburg #1 into connectors labelled "1" on plug boxes.
2. Repeat this procedure with the audio and control cables from Seeburg #2 unit, plugging them into connector "2".
3. In succeeding steps, plug the cables from the Ampex Units on the Ampex Rack into these connectors:

Top Ampex into connectors #3  
Middle Ampex into connectors #4, and  
Bottom Ampex into connectors #5.  
Plug the connectors from the Ampex Unit on the  
Program Preparation Rack into connectors #6.  
The other connectors in the plug boxes are provided as spare input and control circuits.

4. Plug audio output cable into the LINE OUT connector. Connect the cable to any standard 600 ohm INPUT circuit you plan to feed from the Automation.
5. Plug Automation Remote Control Box cable into REMOTE connector. (Automation will not operate if not connected.)
6. Plug the 115 volt AC power cord into a source of power.

The equipment is now ready to be set up for operation.

EQUIPMENT OPERATIONGeneral

All controls used in the normal operation of the System are listed in the following tables. Other controls which are not used in normal operation are listed in the maintenance section of this Manual.

Most push button switches used in the System are dual functioning "switch lights". They act as a combination switch and pilot light; the pilot light being contained in the opaque body of the switch.

INDICATORS - TABLE 1

<u>Units</u>	<u>Indicator Name</u>	<u>Range</u>	<u>Function</u>
METER PANEL	MULTIMETER	0-100	Indicate relative voltages of selected circuits.
	VU METER	0-43	Indicates audio signal levels in selected circuits.
ALL UNITS ON MASTER CONTROL RACK	SWITCH-LIGHT	Lit or Out	Indicate activation of associated circuitry.



CONTROLS AND FUNCTIONS - TABLE 1

<u>Unit</u>	<u>Control Name</u>	<u>Positions</u>	<u>Function</u>
METER PANEL	MULTIMETER SELECTOR Rotary Switch	Off 1 (Silence Sense) 2 (Time Constant) 3 (24 Volts ) 4 (48 Volts ) 5 (48 Volts #1 ) 6 (48 Volts #2 ) 7 (Silence Sense Pulse ) 8 (25 Cycle Amp- litude ) 9 (Gain Reduction Amp. Bias ) 10 (Spare )	Selects circuit to be observed with MULTIMETER
	VU METER SELECTOR	Off #1	Output Level

<u>Unit</u>	<u>Control Name</u>	<u>Positions</u>	<u>Function</u>
Control Section	MASTER START	Momentary	Places Automation in operation.
	MASTER STOP	Momentary	Stops Automation, but awaits completion of channel being played.
	RESET	Momentary	Resets circuitry to start operation sequence at Sequence Selection Switch #1.
	PANIC	Momentary	Switches to next function.
	POWER	Push-Push	Turns primary AC power on and off.

<u>Unit</u>	<u>Control Name</u>	<u>Positions</u>	<u>Function</u>
Clock	READY	Off	Light indicates Clock ready to play next. Push switch and Clock will cancel.
	SELECTOR Rotary Switch	R (Reset) S (Skip) 1 2 3 4 5 6 7 8 9	Determine the operation to be performed by Clock "Ready" circuitry. "R" position results in an Automation reset to start operation sequence at Sequence Selection Switch #1. "S" position causes the "Ready" circuitry to skip Clock operation.
	CLOCK GATE SET #1 #2 #3 #4 #5 #6 #7 #8 #9	Off-On	In the "Off" position, (with pilot light out) the Clock will not operate after the channel, associated with the GATE SET SWITCH, has been operating.  In the "On" position, the Clock circuitry will operate normally.
	Locking Push Button		
	TRIP-PINS (On Clock face)	For insertion in holes in Clock face.	Operates switch that will "ready" Clock circuitry.
	PUSH BUTTON (Below Clock face)		Will "ready" Clock circuitry.
	CLOCK		Provide timing mechanism for operating READY switch.

<u>Unit</u>	<u>Control Name</u>	<u>Positions</u>	<u>Function</u>
Sequence Selection Section	SEQUENCE SELECTION SWITCHES #1 thru #24 Rotary Switch	R (Reset ) S (Skip ) 1 (Channel #1) 2 (Channel #2) 3 (Channel #3) 4 (Channel #4) 5 (Channel #5) 6 (Channel #6) 7 (Channel #7) 8 (Channel #8) 9 (Channel #9)	To select the channel and playback unit that will operate when operation sequence reaches the selector switch involved. "R" position resets operation sequence to start operation at Sequence Selector #1. "S" position will skip operation sequence to the succeeding Selector switch.
	SEQUENCE HOMING SWITCHES #1 thru #24	Momentary	Resets to the channel, associated with the HOMING SWITCH.

<u>Unit</u>	<u>Control Name</u>	<u>Positions</u>	<u>Function</u>
CUE PANEL	CUE CHANNEL Rotary Switch	Off Line 1 (Channel #1) 2 (Channel #2) 3 (Channel #3) 4 (Channel #4) 5 (Channel #5) 6 (Channel #6) 7 (Channel #7) 8 (Channel #8) 9 (Channel #9)	Select circuitry applied to input of Cue Panel Amplifier.
	CUE LEVEL Potentiometer	0 - 10	Cue Panel Amplifier gain control.
AUDIO SENSE PANEL	S.S. THRESHOLD Potentiometer	0 - 10	Adjusts input level to sensing circuitry.
	S.S. DELAY Potentiometer	0 - 10	Adjust length-of-silence response of sensing cir- cuit.
RELAY PANEL	TOGGLE SWITCHES #1 to #9	Silence Sense Stop  Auto Cue Stop	Determine the mode of operation of the stop circuitry.

## INITIAL ADJUSTMENT

### General

The few initial adjustments necessary to prepare the System for operation involve the setting of audio signal levels. The program audio signal provides information to "guide" the System's automation switching circuitry and must be set within certain values for reliable operation. These levels are set by adjusting playback output controls and setting the controls on the AUDIO SENSE PANEL.

### Preparation to Set Playback Levels

To provide audio for the set-up procedure, records must be placed on the record playback units and tape material placed on each tape playback unit. Then proceed as follows:

1. On CONTROL PANEL, depress POWER switch. This lights the switch light and indicates the primary power is on.
2. Observe the MASTER STOP switch light. This lights approximately 45 seconds after step #1 has been completed and indicates the application of DC relay power.
3. Depress each CLOCK GATE SET switch light that may be off on the CLOCK PANEL. This will turn it on.
4. On the Sequence Selection Unit, set #1 Sequence Selection switch to #1 position. The playback unit that is plugged into channel #1 will start, once the System is put into operation.
5. Set #2 Sequence Selection switch to #2 position.
6. Set each of the next four Sequence Selection switches to 3, 4, 5 and 6 in turn.
7. Set Sequence Selection switch #7 on R (Reset) position.
8. Depress RESET switch on Control Unit.
9. On CUE PANEL, set CUE CHANNEL selector to LINE position and set CUE LEVEL control to a mid position.

10. On METER PANEL, set VU switch to 1 and MULTIMETER switch to #1 position.
11. On the AUDIO SENSE PANEL, set S.S. DELAY CONTROL to 10.
12. On the AUDIO SENSE PANEL, set S.S. THRESHOLD CONTROL to 10.

Setting Levels

1. On Control Unit, depress MASTER START switch. The playback unit connected to channel #1 will operate.
2. Adjust CUE LEVEL control for desired speaker volume.
3. On the playback unit that is operating, adjust GAIN control and set output level so that VU on METER PANEL reads "Zero" level.

NOTE: All records are not recorded at the same levels. When setting GAIN controls on the Seeburgs, it will be necessary to play several records; observe GAIN setting that is correct for each record; and then set the GAIN to an average of these settings.

4. Press PANIC switch. This will switch Automation to next sequence.
5. On the playback unit operating, repeat GAIN control adjustment to set output level to Zero on the VU METER. (Step #3)
6. Repeat steps #3 and #4 until the GAIN control settings of all playback units have been established.
7. On CONTROL PANEL, depress MASTER STOP switch.
8. On AUDIO SENSE PANEL, turn the S.S. THRESHOLD control on "0" until playback operation stops and then return the control to "10".
9. On CONTROL PANEL, depress RESET switch.

Set Up of the Audio Sense Panel

The set up of the Audio Sense Panel involves the adjustment of the S.S. THRESHOLD control and the S.S. DELAY control.

Adjustment of the Audio Sense Panel must be made while using the audio signal from a Seeburg playback unit. This adjustment is necessary to compensate for the higher background noise level of records. (As compared to tape noise levels.)

Once the Audio Sense Panel has been set, using the Seeburg's audio signal, it will work properly when used with tape recordings.

The adjustment of the Audio Sense Panel involves finding the proper setting of the S.S. THRESHOLD control. This setting for the control is at a "balance" point between a high setting, where record end-groove noise prevents automation switching, and some lower setting where low audio passages permit improper automation switching. Once properly set, the Audio Sense Panel will allow a playback to continue playing even over the lowest record passage but will stop its operation when the record ends.

1. Switch MULTIMETER on METER PANEL to #2 positions.
2. On CONTROL PANEL, press MASTER START switch. Playback unit #1 will operate.
3. Observe that the MULTIMETER on the METER PANEL falls to a "Zero" position when the audio begins.
4. On the AUDIO SENSE PANEL, slowly reduce the setting of the S.S. THRESHOLD control. Observe that the MULTIMETER starts to move from its "Zero" position during low audio passages. The proper setting of the control will allow this slight movement only on very low audio passages, or during short pauses in the music.
5. Press REJECT control on the operating playback unit to simulate the end of a record. When the audio stops, observe that the MULTIMETER is in mid-scale position. The automation circuitry is now stepping to start the next playback unit.



NOTE: If the MULTIMETER fails to rise to mid-scale position, and the automation circuitry fails to work, the S.S. THRESHOLD control setting is too high. Reduce the control setting slightly. On subsequent operations of the playback equipment, repeat the operations mentioned and if necessary, reduce the S.S. THRESHOLD control setting again.

6. Depress MASTER STOP switch on the CONTROL PANEL. If a playback unit is operating, it will complete its playback function and then the System will stop its operation.

The S.S. DELAY control on the Audio Sense Panel must be adjusted with the System in operation; audio is necessary for this adjustment. This control determines the timing response of the silence-sensitive circuitry of the Audio Sense Panel. If the S.S. DELAY control is set for too short a time period (maximum counter clockwise control position), the automation circuitry may switch on an ordinary silence such as found in the normal pauses within a recording. If the control is set for too long a time period (maximum clockwise control position) there may be a sustained pause in the audio before the next recording begins. Proper adjustment of the control will depend upon the type of program material used and the length of silence desired between functions.

#### Setting the CLOCK PANEL

The CLOCK PANEL permits the insertion of program material into a normal program sequence on a time controlled basis. When set, the clock will trip a switch to "ready" the operation of a pre-selected channel for the required insertion. This "ready" state is held until the operating playback unit finishes. Following that conclusion, the "ready" circuit operates to start the required playback unit; the insertion is made and the normal program sequence

resumes.

This circuitry is normally used for the insertion of station identification announcements and time signals.

Should the occasion arise when an insert would be inappropriate, (as when a station identification may try to follow a record announcement), the CLOCK GATE SET circuitry may be used to delay the insert until after the introduced record has been played. When the CLOCK GATE SET switch light is "Off", this delay will occur. The identifying number of the CLOCK GATE SET switch indicates the number of the playback unit that will not be followed by such an insert. For example, if the CLOCK GATE SET switch light #3 is not lit, an insert will never follow the operation of the playback unit associated with the #3 audio channel.

1. Set the CLOCK CHANNEL switch to the channel number that is to be operated by the Clock.
2. Set the TRIP PINS into the threaded holes on the Clock face at the time desired for operation of the Clock circuitry.
3. Pressing the small switch below the Clock dial will ready the Clock circuit without waiting for normal operation.

If the operation of this Clock Unit is not desired, the Unit may be disabled by setting the CLOCK CHANNEL SELECTION switch to the "S" (Skip) position.

The Clock is a 60 minute continuous "timer" type of clock. It may be operated as a timer with the clock circuitry operation occurring a pre-set number of minutes from the setting time. In the alternate, it may be synchronized with local station time with the clock circuitry operation coinciding with local time.

This type of operation is set by loosening the knurled knob on the Clock face; setting the number of minutes on the indicator to coincide with the number of minutes past the hour that the station's Clock indicates and retightening the knurled knob.

Turning power "off" to the Automation does not turn the Clock off.

OPERATION WITH TYPICAL SET UP-PROCEDURES

General

The settings of the SEQUENCE SELECTION switches, in the procedures that follow, were determined for use with equipment having playback units connected in a "standard" manner. That latter consists of having interconnections as follows:

Seeburg Unit #1 plugged into Channel #1 input  
Seeburg Unit #2 plugged into Channel #2 input  
Top Tape Playback #3 plugged into Channel #3 input  
Center Tape Playback #4 plugged into Channel #4 input  
Bottom Tape Playback #5 plugged into Channel #5 input  
Tape Unit on Make-Up #6 plugged into Channel #6 input

NOTE: Power Switch on Make-Up Unit must be off before Automation will operate it.

As a part of such "standard" operation, the units are presumed to be used for playing announcements as follows:

Top Playback Unit #3 used for record introduction announcements.  
Center Playback Unit #4 used for commercial announcements.  
Bottom Playback Unit #5 used for station identifications.

When setting up a program sequence using the Seeburgs, be certain that successive records do not immediately follow one-another from the same Seeburg. This unit requires a certain time period for performing its "changing and seeking" function. Schedule successive records in alternate Seeburgs.

To start System operation for any of the following sequences, depress the MASTER START switch on the CONTROL PANEL. To stop the System operation, depress the MASTER STOP switch on the same panel.

Operation with a Live Announcer

This procedure uses the Automation circuitry for starting and stopping of Seeburgs without the inclusion of any recorded announce-

ments.

The procedure consists of the following:

1. Load records desired on alternate Seeburgs.
2. Set SEQUENCE SELECTION switch #1 on Channel #1.
3. Set SEQUENCE SELECTION switch #2 on Channel #2.
4. Set SEQUENCE SELECTION switch #3 on R (Reset).
5. On CONTROL PANEL depress RESET switch so that sequence will begin at SEQUENCE SELECTION switch #1.
6. On CONTROL PANEL depress MASTER START switch. Observe that Seeburg #1 begins to operate.

When Seeburg #1 completes playing, the equipment circuitry "steps" to the next SEQUENCE SELECTION switch to start Seeburg #2. Upon completion of the record in Seeburg #2, the circuitry "steps" to SEQUENCE SELECTION switch #3; resets to SEQUENCE SELECTION switch #1 and starts Seeburg #1 again. This operation continues until stopped by the operator. For such a stop, depress the MASTER STOP switch on CONTROL PANEL. The record playing will conclude and the System's operation will stop.

Operation with Full Automation - Clock Controlled Station Identification

The procedures described in this section provide a simple, basic program sequence. Although few stations would use this sequence, a mastery of its set-up procedure will provide the experience necessary for setting up any of the other sequences.

Begin this set-up at the Sequence Selection Unit:

1. Set SEQUENCE SELECTION switch #1 on Channel #1.
2. Set SEQUENCE SELECTION switch #2 on Channel #2.
3. Set SEQUENCE SELECTION switch #3 on Channel #4.
4. Set SEQUENCE SELECTION switch #4 on Channel #1.
5. Set SEQUENCE SELECTION switch #5 on Channel #2.
6. Set SEQUENCE SELECTION switch #6 on Channel #5.
7. Set SEQUENCE SELECTION switch #7 on Channel 8 (Reset).
8. On CONTROL PANEL depress (Reset).
9. On CONTROL PANEL depress MASTER START switch.

When in operation, the System will play two records; give a commercial (from Channel #4); play two more records; play a station identification announcement (from Channel #5) and then reset to begin the sequence anew at SEQUENCE SELECTION switch #1.

To expedite the completion of this practice operation, simulate the record endings by turning the S.S. THRESHOLD CONTROL on the Audio Sense Panel to "0"; hold it until the automation stops; then restore it to the original control setting.

The set-up just concluded provides a somewhat unpredictable operation with regard to timing of the station identification announcements. To permit a controlled operation, such a sequence may be changed by modifying the set-up used. The new set-up ties the

operation of the playback connected to Channel #5 (the unit playing station identifications) to the control of the CLOCK UNIT.

Set-up as follows:

1. Set SEQUENCE SELECTION switch #6 to R (Reset).
2. On the Clock face, insert TRIP PINS in the hour and half hour holes.
3. Set the Clock's CHANNEL SELECTION switch to Channel #5.

#### Clock Control of Program Material

By Clock usage, a positive control is obtained over both the number of commercials played and their "close approximate" starting times within a program sequence. Use of the Clock Unit permits the playing time to be within a minute of the time actually scheduled for a certain announcement. Such results are obtained without devoting time to compute the lengths of the various recordings involved.

The control is obtained by setting the Clock TRIP PINS for the desired program segment length, ie every 15 minutes, every  $\frac{1}{2}$  hour. The Clock circuitry will then reset the SEQUENCE SELECTION unit to start a new program segment at SEQUENCE SELECTION switch #1. With that switch set to operate Channel #5 for station identifications and the succeeding SELECTION switches set to the other desired channels, the entire program sequence is controlled by the CLOCK UNIT.

The procedure that follows provides for a one-half hour program that contains five commercials and approximately eight records. This would then be repeated until changed.

Operating practice has shown that a more accurate time control may be obtained by placing the TRIP PINS to "ready" the circuitry about one minute before the time actually desired. This

method usually results in a reset within 20 seconds before or after the desired time, when a record is playing at the time the Clock sets.

1. Set 2 TRIP PINS at  $\frac{1}{2}$  hour intervals.
2. On CLOCK PANEL, set CLOCK SELECTOR switch to R (Reset).
3. Set SEQUENCE SELECTION switches to channel identifying number indicated:

SEQUENCE SELECTION SWITCH	CHANNEL NUMBER
1	5
2	1
3	4
4	2
5	1
6	4
7	2
8	4
9	1
10	2
11	4
12	1
13	4
14	2
15	1
16	2
17	1
18	2

The program material after the last commercial (step #13) is provided as "fill" material. This will insure the presence of music until the Clock "readies".

Automation Control - Record Introductions Used

When record introduction announcements are added to a program sequence, records must be loaded in alternate Seeburgs in the sequences called for by the announcement sequence.

The operation of the Seeburgs, when set on the Sequence Selection Unit, must be such that the opening record announced will



play first, usually #1.

An alternate type of introduction announcement may be used that does away with the need for special care. This type is a "neutral" announcement which does not name the record. It merely comments in a general way. For example: "Now here's a recent one you'll enjoy."

This set up is for a one-half hour format sequence with a station identification announcement at the hour and half hour. The program contains music, introductions and commercial announcements.

1. On CLOCK UNIT turn CLOCK GATE SET switch light #3 off.
2. On CLOCK PANEL, set CLOCK SELECTION switch to R (Reset).
3. Set SEQUENCE SELECTION switches as follows:

SEQUENCE SELECTION SWITCH	CHANNEL NUMBER
1	5
2	3
3	1
4	2
5	1
6	4
7	3
8	1
9	4
10	3
11	2
12	R (Reset)

4. Be certain that all CLOCK GATE SET switches are lit, except #3.

The operation of Channel #5 is now controlled by Clock circuitry. When the TRIP PINS activate the circuitry, the operating channel will finish and then the Clock will reset and start the first sequence which is channel 5. This will then play the station

Automation Control - Using Open and Closing Themes

The playback unit connected to Channel #6 is often used to play open and closing theme music in addition to playing Public Service announcements. If themes are used for every program, the set-up is easily made. If themes are used only occasionally, the tape must be prepared to carry themes when need and Promotional or Public Service announcements at in-between times. This tape will be played regularly during each sequence whether themes are needed or not.

The sequence is set up with the SEQUENCE SELECTION switch #1 set on the Channel #6 position. The first program sequence must be started on SEQUENCE SELECTION switch #2; this provides initial station identification announcements. The automation circuitry then moves to SEQUENCE SELECTION SWITCH #3 to play the opening theme. At the end of the first program period, the Clock will reset automation circuitry to SEQUENCE SELECTION switch #1 to play the closing theme. From there on, closing themes (or announcements) will play when the Clock has reset automation circuitry to start a new program sequence. Programming can be started on #2 SEQUENCE position by pressing the #1 SEQUENCE switch light before starting the Automation.

1. On CLOCK PANEL, check CLOCK GATE switch #3 to be certain it is off. (Light is out.)
2. Set CLOCK CHANNEL switch to R (Reset).
3. Set SEQUENCE SELECTION switches to channels indicated:

SEQUENCE SELECTION SWITCH	CHANNEL NUMBER
1	6
2	5
3	6
4	3
5	1
6	4
7	3
8	2
9	4
10	3
11	1
12	4
13	3
14	2
15	4
16	3
17	1
18	3
19	2
20	3
21	1
22	3

4. On Sequence Selection Panel depress "IDMING" switch light associated with SEQUENCE SELECTION switch #1. This will reset circuitry to start program sequence with the station identification announcement.

It will be noted that the usual "fill" records with intros are included to insure that the program sequence will end with music.

