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STRAND

INCORPORATED

ULTIMATION 2000®
THEATER AUTOMATION
AND
CONTROL SYSTEM
SETUP MANUAL

P. O. Box 73 • Rossford, Ohio 43460 • (419) 666-3266
2573 Tracy Road • Northwood, Ohio 43619 • Easy Link 62008970

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INTRODUCTION

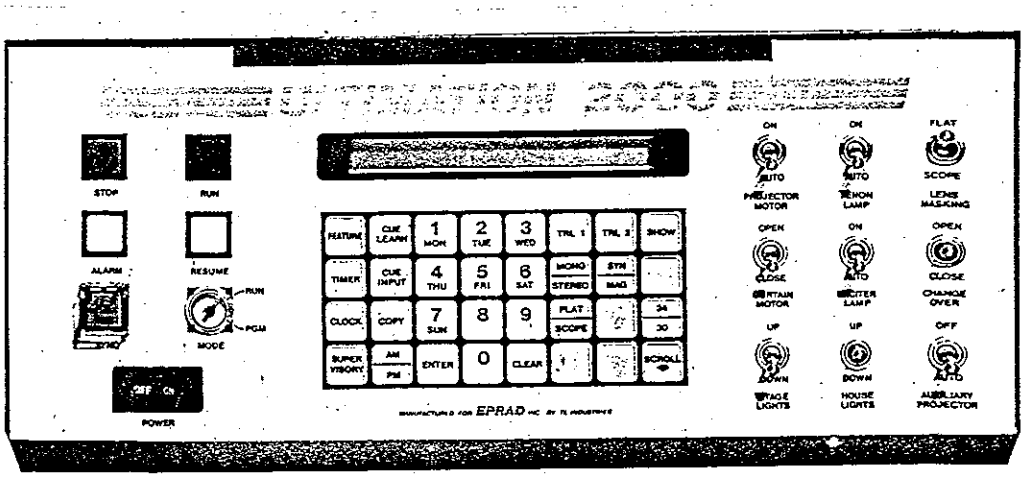
The EPRAD Ultimation 2000® is the most advanced and innovative theatre automation system ever invented. It represents the ultimate in theatre automation for the year 2000 and beyond. It represents a tool by which the projectionist will become more efficient while improving the quality of the day-to-day presentations.

The unit is simple to use. Carefully read the OPERATIONS MANUAL and practice the PROGRAMMING and RUN sequences detailed in it. You will find the operation of the Ultimation 2000® to be easily learned in one sitting.

This manual covers the programming of the supervisory functions. The supervisory functions initialize the Ultimation 2000® system and customize it to support the peripheral equipment at your installation.

We have developed a reference sheet which is stored in the back of the Ultimation 2000®. It may be useful when you first begin using the system. It should be completed with your specific supervisory values for program backup and quick reference.

The control panel is laid out logically with a keyboard and related screen in the center, and with control switches on either side, as shown in the figure below.



EPRAD ULTIMATION 2000® CONTROL PANEL

POWER UP SYSTEM

RUN OR PROGRAM MODE

When power is first applied to the system, the screen will show a message like this:

```
VERSION  1.000     CHECKSUM 12345
```

This message is displayed for 2 seconds when the system is first powered up. VERSION 1.000 indicates the VERSION number of the software being used in the system. The CHECKSUM number is the result of an internal memory test. It should be recorded on the card in the slot, and visually compared with the checksum displayed each time the system is powered up. If they do not match, check the TROUBLESHOOTING Section at the end of the OPERATIONS MANUAL.

ENTERING SUPERVISORY (PROGRAM) MODE

STOP — Please note that at this point you should have completed the entire installation procedure. If you have not, return and complete it before proceeding.

To enter the SUPERVISORY MODE do the following:

STEP 1 — Turn the MODE keylock switch to PROGRAM and press SUPERVISORY.

PRESS	SCREEN DISPLAYS
SUPER VISORY	SELECT FUNCTION _1

You are now in the SUPERVISORY MODE. The screen will display SELECT FUNCTION _1 with the "_1" blinking if the supervisory function has not been previously accessed since power up. If any functions have been programmed previously, the function number on the screen will be one higher than the last function number selected.

A list of these function numbers and their description follows:

FUNCTION	DESCRIPTION
1	SET DAY OF WEEK
2	SET TIME OF DAY
3	SOUND CHANGEOVER DELAY
4	HOUSE LIGHTS DELAY TRAILER 1
5	STAGE LIGHTS DELAY TRAILER 1
6	OPTIONAL DIMMER DELAY TRAILER 1
7	HOUSE LIGHTS DELAY SHOW
8	OPTIONAL DIMMER DELAY CREDITS
9	HOUSE LIGHTS DELAY END
10	STAGE LIGHTS DELAY END
11	FAILSAFE BOBBLE DELAY
12	CUE WINDOW FACTOR #1
13	CUE WINDOW FACTOR #2
14	CUE WINDOW FACTOR #3
15	CUE WINDOW FACTOR #4
16	SYNC/INTERLOCK DELAY
17	CHANGEOVER PULSE
18	CURTAIN CONTACTS PULSED OR MAINTAINED
19	LIGHT CONTACTS PULSED OR MAINTAINED
20	LENS AND MASKING PULSED OR MAINTAINED
21	SOUND PULSED OR MAINTAINED
31	ACCUMULATED RUN HOURS
32	MAINTENANCE SCHEDULE A
33	MAINTENANCE SCHEDULE B
34	MAINTENANCE SCHEDULE C
35	MAINTENANCE SCHEDULE D

SETUP of SUPERVISORY FUNCTIONS

At this point you have the ability to:

1. Enter any specific function number
2. Use the SCROLL key to step through the function descriptions, one at a time
3. Exit by pressing FEATURE, CLOCK, COPY, or changing MODE switch to RUN.

The functions have been organized in a logical pattern. To set up the various function values, we recommend starting with function 1.

Enter the desired function number by pressing the numbered keys, then press ENTER. After entering data, pressing ENTER or SCROLL will save valid data and bring up the next FUNCTION number. If an entry is incorrect, press CLEAR and reenter.

The list of functions and their programming range is shown below.

FUNCTION 1:
SET DAY OF WEEK

This function is used to set the system's internal clock to the current day of the week. This initializes the CLOCK AUTOSTART program so that different features can be programmed for each day of the week.

Press the numbered key corresponding to the day of the week and then press ENTER.

FUNCTION 2:
SET TIME OF DAY

This function is used to set the system's internal clock to the current time of day so a schedule of feature start times can be programmed.

Enter the current time in the blinking field and press ENTER. Select AM or PM by pressing the AM/PM key, and ENTER.

FUNCTION 3:
SOUND CHANGEOVER DELAY

The sound changeover delay is the time from the start of the projector to when the sync sound source is turned on.

The programming range is 0 to 59 seconds.
The recommended setting is 5 or 6 seconds.

FUNCTION 4:
HOUSE LIGHTS DELAY - TRAILER 1

The house lights delay for trailer 1 is the time from the start of trailer 1 to the start of dimming the house lights.

The programming range is 0 to 59 minutes and 59 seconds.
If you are starting with half lights, the recommended setting is 3 seconds.
If you are starting with full lights, choose the setting which you feel allows your patrons time to be seated.

FUNCTION 5:
STAGE LIGHTS DELAY - TRAILER 1

The stage lights delay for trailer 1 is the time from the start of trailer 1 to the start of dimming the stage lights .

The programming range is 0 to 59 minutes and 59 seconds.
The recommended setting is 1 or 2 seconds.

FUNCTION 6:
OPTIONAL DIMMER DELAY - TRAILER 1

The optional dimmer delay for trailer 1 is the time from the start of trailer 1 to the start of dimming the optional lights.

The programming range is 0 to 59 minutes and 59 seconds,
The recommended setting is 1 or 2 seconds.

FUNCTION 7:
HOUSE LIGHTS DELAY - SHOW

If the house lights have been dimmed to half down for the trailers, this function sets the delay from the show cue at the end of trailer 2 to the start of dimming to low.

The programming range is 0 to 9 minutes and 59 seconds.
The setting depends on the effect you wish to create.

FUNCTION 8:
OPTIONAL DIMMER DELAY - CREDITS

The optional dimmer delay for credits is the time from the credits cue to the start of the dimmer increasing the optional lights.

The programming range is 0 to 59 minutes and 59 seconds.
The setting depends on the effect you wish to create.

FUNCTION 9:
HOUSE LIGHTS DELAY - END

The house lights delay is from the end cue to the start of the dimmer increasing the house lights.

The programming range is 0 to 59 seconds.
The setting depends on the effect you wish to create.

FUNCTION 10:
STAGE LIGHTS DELAY - END

The stage lights delay is similar to the house lights delay in function 9.

The programming range is 0 to 59 seconds.
The setting depends on the effect you wish to create.

FUNCTION 11:
FAILSAFE BOBBLE DELAY

This delay is needed when the film take up mechanism does not react fast enough to prevent film pile up on the start up procedure or during normal operation and generates an erroneous failsafe fault signal.

The programming range is 0 to 59 seconds.
The recommended setting is 1 or 2 seconds.

FUNCTION 12:
CUE WINDOW FACTOR NUMBER 1

The cue window factor is a function of the cue number and the cue times measured in the CUE LEARN MODE. Briefly, in the CUE LEARN MODE, the system measures the cue times produced using the normal cue foils. Thereafter, if cues are missing, the system automatically supplies electronic cues at the end of a time window.

The width of the window is calculated using the cue window factor and is centered around the normal cue time. (Refer to the CUE LEARN MODE on page 12 in the OPERATIONS MANUAL). Using this system, the projectionist does not have to be concerned about any missing or errant cues.

The cue window is calculated to be sufficiently wide to accommodate any timing variations due to changes in motor speed caused by power line voltage or frequency fluctuations.

The Cue Window Factor is calculated by the following equation:

Cue Window = (CWF value) x (expected movie length).

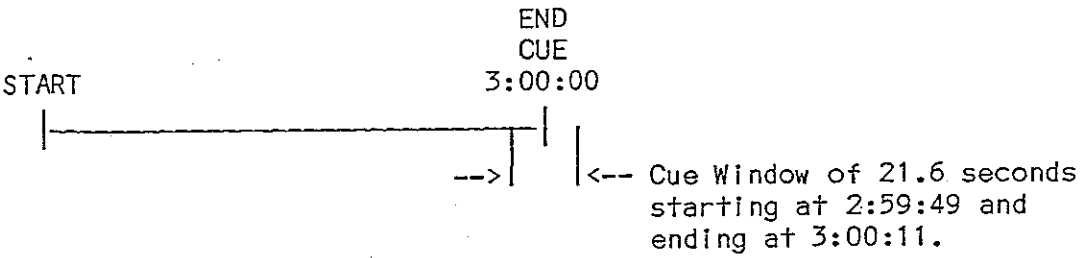
Example: CWF value = 0.002, expected movie length = 3 hours.

Cue Window = 0.002 x 3 hours or 180 minutes or 10,800 seconds.

Cue Window = 0.006 hours = 36 minutes = 21.6 seconds.

The Cue Window would be interpreted as follows. Given a 3 hour movie presentation and a CWF value of 0.002 chosen, the Ultimation 2000® would memorize the cue locations and wrap them in a 0.002 window. If an end cue was sensed at the 3 hour mark, the window would be 3:00:00 ±10.8 seconds for a total window of 21.6 seconds.

Illustrated it would look like this:



Given a normal 3 hour presentation with four cues, we could establish a table indicating their respective time locations.

NAME	CUE	TIME FROM START
TRAILER 2	1	0:02:15
SHOW	2	0:06:32
CREDITS	3	2:48:26
END	4	3:00:00

Utilizing the same CWF value for each cue, the Ultimation 2000® would construct a cue window table.

			CUE WINDOW		
NAME	CUE	TIME FROM START	START	END	SIZE
TRAILER 2	1	0:02:15	0:02:15	0:02:15	0.3 sec.
SHOW	2	0:06:32	0:06:31	0:06:33	0.8 sec.
CREDITS	3	2:48:26	2:48:06	2:48:46	20.2 sec.
END	4	3:00:00	2:59:49	3:00:11	21.6 sec.

Under normal conditions the Ultimation 2000® will only recognize cues within the four established windows. If none are sensed it automatically inserts one at the end of the window which maintains your professional presentation. If cues are sensed outside of the windows, they are assumed false and ignored.

The size of the cue window is determined by analyzing your local utility company's power fluctuations. This is done with the Ultimation 2000®. Simply keep the unit in the CUE LEARN MODE for several days. After each presentation of the same show, record the four cue values displayed on the screen.

To analyze the values, determine the maximum fluctuation in overall run time.

Example:

LEARNED CUE VALUES

	SHOW 1	SHOW 2	SHOW 3	SHOW 4	etc.
CUE 1	0:01:00	0:01:02	0:01:01	0:01:03	-------
CUE 2	0:04:00	0:04:08	0:04:04	0:04:12	-------
CUE 3	2:05:00	2:09:10	2:07:05	2:11:15	-------
CUE 4	2:15:00	2:19:30	2:17:15	2:21:45	-------

The widest fluctuations would be between readings 1 and 4. To estimate the CWF value, calculate the average fluctuation in run time by simply subtracting the low overall run time from the high overall run time (2:21:45 minus 2:15:00) and divide by 2. Then divide this number by the average run time [(2:2145 + 2:15:00) divided by 2].

The result is as follows:

Average fluctuation = (HIGH VALUE - LOW VALUE) divided by 2
= (2:21:45 - 2:15:00) divided by 2
= (0:06:45) divided by 2
= 0:03:22 or 3 minutes and 22 seconds.

The average run time is simply calculated as follows:

Average run time = (HIGH VALUE + LOW VALUE) divided by 2
= (2:21:45 + 2:15:00) divided by 2
= 4:36:45 divided by 2
= 2:18:22 or 2 hours, 18 minutes and 22 seconds.

The deviation is calculated as follows:

$$\text{Deviation} = \frac{\text{AVERAGE FLUCTUATION}}{\text{AVERAGE RUN TIME}}$$

$$= \frac{0:03:22}{2:18:22} \quad \text{(convert to seconds)}$$

$$= \frac{202 \text{ seconds}}{8302 \text{ seconds}}$$

$$= 0.02433$$

Your Cue Window Factor should not be less than the deviation. In our example the Cue Window Factor should not be less than 0.025.

We recommend adding 0.002 to the calculated three digit value. In our example the value in three digits is 0.025. A logical CWF value would be 0.027.

The CWF value of 0.027 is logical in light of actual conditins. If you find lights coming up early at credits, you may wish to open the credit window up with a larger value. Remember, every 0.001 equals an increase in the window size of 3.6 seconds for every hour of movie length. For our example a 0.002 increase to 0.027 would increase the window size by 8.3 seconds.

Our investigation indicates that power fluctuations normally represent a speed fluctuation of less than 0.1 percent (CWF value of less than 0.002). Our recommended cue window values based on our tests are as follows:

CUE WINDOW	CWF value
1	0.004
2	0.004
3	0.010
4	0.010*

Cue window 3 is purposely larger to insure that the show is not interrupted by an implanted cue bringing lights up prematurely in an abnormally long running feature.

*Cue window 4 is shown for normal film tranport devices. Endless loop systems should use a value of 0.002.

Analyze your power company. Local load and supply considerations may require an increase in your values.

FUNCTION 13:
CUE WINDOW FACTOR NUMBER 2

See function 12.

FUNCTION 14:
CUE WINDOW FACTOR NUMBER 3

See function 12.

FUNCTION 15:
CUE WINDOW FACTOR NUMBER 4

See function 12.

FUNCTION 16:
SYNC/INTERLOCK DELAY

The sync/interlock delay adjusts the delay in the start of the second projector which is running the same copy of a film in synchronous mode.

The delay required in seconds is the distance between the two machines, in inches, divided by the film speed in inches per second. Measure the distance from film gate A to film gate B. Round off the calculated delay to the nearest second.

At 24 FPS, the film speed is 18 inches per second.
At 30 FPS, the film speed is 22.5 inches per second.

If the delay is accurately set for 24 FPS and there is a film which is to run at 30 FPS, change the frame rate to 30 by pressing the 24/30 key while programming the feature values. The system will automatically compensate the delay setting for the change in film speed.

The programming range is 0 to 59 minutes and 59 seconds.

FUNCTION 17:
CHANGEOVER PULSE

The pulse width of the changeover must be long enough to latch the solenoid and is set with this function.

The programming range is 0 to 9 seconds.
The recommended setting is 1 to 2 seconds.

FUNCTION 18:
CURTAIN CONTACTS PULSED OR MAINTAINED

This selection depends on whether the curtain actuator requires continuous contact closure or needs only a pulse to latch.

Select either pulsed or maintained contact. Toggle with any number key.

FUNCTION 19:
LIGHT CONTACTS PULSED OR MAINTAINED

This selection is similar to the curtain contacts in function 18.

Select either pulsed or maintained contact. Toggle with any number key.

FUNCTION 20:
LENS AND MASKING PULSED OR MAINTAINED

This selection is similar to the curtain contacts in function 18.

Select either pulsed or maintained contact. Toggle with any number key.

FUNCTION 21:
SOUND PULSED OR MAINTAINED

This selection is similar to the curtain contacts in function 18.

Select either pulsed or maintained contact. Toggle with any number key.

FUNCTION 31:
ACCUMULATED RUN HOURS

This screen is a display only, showing the number of hours the system has been running; no data is entered.

If for some reason the run hours and the 4 maintenance timers must be reset, call the factory at (419) 666-3266. Loss of main power and battery power at the same time will result in loss of all user functions programmed into memory and reset all maintenance timers.

FUNCTION 32, 33, 34 and 35:
MAINTENANCE SCHEDULES A, B, C and D, (respectively)

The maintenance schedules are setup for the convenience of the user as a reminder of user defined maintenance to be performed at regular intervals.

The programming range for all four maintenance schedules is 0 to 9999 hours.

Maintenance forms have been provided for identifying the equipment and service required for each schedule. The forms can be stored in the rear of the Ultimation 2000®.

MAINTENANCE SCHEDULE A

EQUIPMENT	MAINTENANCE REQUIRED

MAINTENANCE SCHEDULE B

EQUIPMENT	MAINTENANCE REQUIRED

MAINTENANCE SCHEDULE C

EQUIPMENT	MAINTENANCE REQUIRED

MAINTENANCE SCHEDULE D

EQUIPMENT	MAINTENANCE REQUIRED

FEATURE SETUPS

WEEK ENDING _____

FEATURE 1

	SOUND	LENS/MASKING	SPEED
Trailer 1			
Trailer 2			
Show			

FEATURE 2

	SOUND	LENS/MASKING	SPEED
Trailer 1			
Trailer 2			
Show			

FEATURE 3

	SOUND	LENS/MASKING	SPEED
Trailer 1			
Trailer 2			
Show			

CLOCK VALUES

WEEK ENDING _____

MONDAY

PROGRAM NO.	TIME	FEATURE NO.
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

TUESDAY

PROGRAM NO.	TIME	FEATURE NO.
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

WEDNESDAY

PROGRAM NO.	TIME	FEATURE NO.
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

THURSDAY

PROGRAM NO.	TIME	FEATURE NO.
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

FRIDAY

PROGRAM NO.	TIME	FEATURE NO.
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

SATURDAY

PROGRAM NO.	TIME	FEATURE NO.
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

SUNDAY

PROGRAM NO.	TIME	FEATURE NO.
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Note: Indicate AM or PM with time values.

ULTIMATION 2000®
THEATER AUTOMATION
AND
CONTROL SYSTEM
OPERATIONS MANUAL

TABLE of CONTENTS

INTRODUCTION

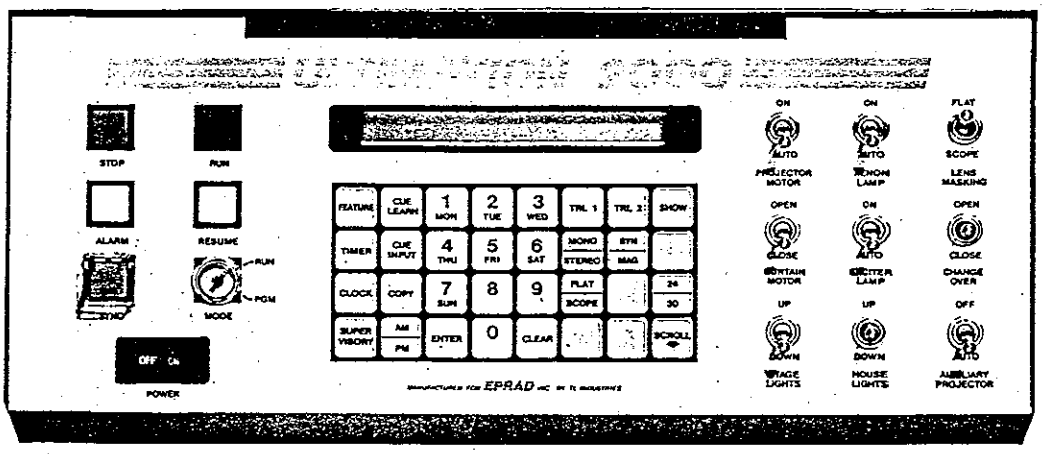
The EPRAD Ultimation 2000® is the most advanced and innovative theatre automation system ever invented. It represents the ultimate in theatre automation for the year 2000 and beyond. For you, the projectionist, it represents a tool by which you will become more efficient while improving the quality of your day-to-day presentations.

The unit is simple to use. Carefully read the OPERATIONS MANUAL and practice the PROGRAMMING and RUN sequences detailed in it. You will find the operation of the Ultimation 2000® to be easily learned in one sitting.

This manual is laid out in an orderly fashion. The first section covers POWER UP, the second details the PROGRAM mode while the third itemizes the RUN mode.

We have also developed a reference sheet stored in the Ultimation 2000®. It may be useful when you first begin using the system.

The control panel is laid out logically with a keyboard and related screen in the center, with control switches on either side as shown in the figure below.



EPRAD ULTIMATION 2000® CONTROL PANEL

POWER UP SYSTEM

RUN OR PROGRAM MODE

When power is first applied to the system, the screen will show a message like this:

VERSION 1.000 CHECKSUM 12345

This message is displayed for 2 seconds when the system is first powered up. VERSION 1.000 indicates the VERSION number of the software being used in the system. The CHECKSUM number is the result of an internal memory test. It should be recorded on the card in the slot, and visually compared with the checksum displayed each time the system is powered up. If they do not match, check the TROUBLESHOOTING Section at the end of this manual.

PROGRAM MODE

PROGRAMMING THE FEATURE VALUES

Ultimation 2000® allows the operator to program up to three different features. Each feature may consist of 2 types of Trailers and the Show or Feature presentation. The Trailer 1, Trailer 2 and Show segments can each be programmed to allow the maximum impact and versatility for you and your customers.

Each trailer and show is programmed separately from the full range of options listed below:

FEATURE .....Trailer 1, Trailer 2, Show
SOUND .....Stereo, Mono, Magnetic, Synthesized stereo
LENS/MASKING ...Flat, Scope
SPEED .....24, 30 frames per second (This output is driven from the logic board. Currently unused, the 24/30 FPS output can be used for other purposes. Contact the factory.)

For example, Feature 1 may be a presentation consisting of two types of trailers and THE RAVEN as the Show. The programming for Feature 1 may be organized in chart form like this:

Feature 1	THE RAVEN		
	SOUND	LENS/MASKING	SPEED
Trailer 1	mono	scope	24
Trailer 2	stereo	flat	24
Show	magnetic	flat	30

The screen has a single line display so each segment in the feature is programmed individually.

PROGRAMMING SEQUENCE

To program a feature, turn the PGM—RUN keylock switch to "PROGRAM" and press the "FEATURE" key on the keyboard.

PRESS	SCREEN DISPLAYS
FEATURE	FEATURE ?

Now enter the feature number to be programmed. For example, enter 1 on the keyboard.

PRESS	SCREEN DISPLAYS
1	FEATURE 1 TRL 1 MONO FLAT 24

The current TRAILER 1 program values will come up on the screen. In this example TRAILER 1 had been set up for mono sound, flat lens and masking and a 24 frames per second speed. You easily select the desired formats for your current films from the membrane keyboard. All changes immediately show on the display.

PROGRAM MODE (continued)

PROGRAMMING THE FEATURE VALUES (concluded)

Pressing the MONO/STEREO key changes the setup from MONO to STEREO. Pressing the MONO/STEREO key again changes it back to MONO. Pressing the SYN/MAG key changes the setup from MONO or STEREO to SYN or MAG.

Pressing the FLAT/SCOPE key changes the setup from FLAT to SCOPE. Pressing it again changes it back to FLAT.

Pressing the 24/30 key changes the setup from 24 to 30 frames per second. Pressing it again changes it back to 24.

This completes the programming for FEATURE 1 TRAILER 1. Pressing any key saves the "TRAILER 1" programming so the operator can proceed to program the setup for "TRAILER 2" and SHOW, using the same procedure as for "TRAILER 1".

To verify successful programming of FEATURE 1 values, press FEATURE and 1 again and the Trailer 1 values just programmed will be displayed on the screen. Press the SCROLL key to see the Trailer 2 and SHOW values.

When finished with FEATURE 1, press FEATURE and 2 to program the second FEATURE if needed. Reference sheets are provided for your use. We suggest noting the film formats as you make them up. This allows quick and error free programming.

PROGRAM MODE (continued)

PROGRAMMING THE FEATURE CLOCK START TIMES

This function permits the operator to program or examine the current feature clock start times for as many as ten programs for each day, for every day of the week. After programming the feature values, as described in the previous section, the operator can set up a week's programs for a clock autostart sequence so the whole schedule can be automated.

If a complete schedule of MONDAY's programs could be displayed at one time, they might look like this:

DAY	PROGRAM NO.	TIME	FEATURE NO.
MONDAY	1	1:00 AM	FEATURE 1
"	2	3:00 AM	" 1
"	3	9:00 AM	" 3
"	4	11:00 AM	" 3
"	5	1:00 PM	" 3
"	6	3:00 PM	" 2
"	7	5:00 PM	" 2
"	8	7:00 PM	" 1
"	9	9:00 PM	" 1
"	10	11:00 PM	" 1

PROGRAMMING SEQUENCE

To program or check the start times for the features, turn the keylock switch to "Program" and press "CLOCK".

PRESS	SCREEN DISPLAYS
CLOCK	DAY ?

Press the key corresponding to the desired day, for example, Monday.

PRESS	SCREEN DISPLAYS
MON	MONDAY 1 11:00 PM FEATURE 1

The screen shows the programming for program number 1 on Monday, with the time blinking. To change the start time, enter the time on the numbered keys until the screen displays the desired time. For example, if the time should be 1:30 AM, press keys 1, 3, 0, AM and ENTER. If the entry is valid, the time will stop blinking and the FEATURE # will blink. IF AN INVALID TIME IS ENTERED, THE ENTRY CANNOT BE SAVED; the time will continue to blink and the operator cannot proceed with the programming.

PRESS	SCREEN DISPLAYS
1	MONDAY 1 0:01 PM FEATURE 1

PROGRAM MODE (continued)

PROGRAMMING THE FEATURE CLOCK START TIMES (continued)

PRESS

3

SCREEN DISPLAYS

MONDAY 1 0:13 PM FEATURE 1

PRESS

0

SCREEN DISPLAYS

MONDAY 1 1:30 PM FEATURE 1

PRESS

AM

SCREEN DISPLAYS

MONDAY 1 1:30 AM FEATURE 1

If an error in the time is noticed before pressing ENTER, just press CLEAR and the screen will show all zeros in the time field.

SCREEN DISPLAYS

MONDAY 1 0:00 AM FEATURE 1

Enter the correct data and press ENTER. If an error is found after pressing ENTER, press CLOCK and start again, or scroll around and back to the incorrect program number.

After correctly entering the time, FEATURE 1 will be blinking. If FEATURE 1 is the correct entry, just press ENTER. If not, press the desired feature number and then ENTER. This will save the data and cycle to the next program number with the time blinking.

PRESS

2

SCREEN DISPLAYS

MONDAY 2 1:30 AM FEATURE 2

Continue programming entries 2 through 10 as indicated above.

The data is always saved on exit from screen.

PROGRAM MODE (continued)

PROGRAMMING THE FEATURE CLOCK START TIMES (concluded)

SCROLL — Pressing "SCROLL" repeatedly allows the operator to step quickly through the 10 possible program entries for the day. This comes in handy when you wish to make a quick check or change a start time or feature #.

PRESS	SCREEN DISPLAYS
SCROLL	MONDAY 2 1:00 PM FEATURE 1

NEXT DAY PROGRAMMING — Once all the programs are set for Monday, for example, Tuesday can be programmed by repeating the FEATURE CLOCK START TIMES sequence followed for Monday.

Press CLOCK; the screen responds with DAY?. Press Tuesday and the screen responds with the day, TUESDAY, program number 1, a blinking time, and FEATURE 1. Continue programming utilizing the above procedure.

If most or all of the days programs are duplicates, they may be copied using the COPY DAY TO DAY FEATURE TIMES procedure as described in the next section.

IMPORTANT REMINDER — CLOCK VALUES SHOULD BE VERIFIED TO INSURE THAT THEY HAVE BEEN ENTERED IN ASCENDING CHRONOLOGICAL ORDER. IF A TIME HAS BEEN ENTERED OUT OF SEQUENCE, THE COMPUTER WILL SIMPLY SKIP THE INCORRECT VALUE AND LOOK FOR THE NEXT VALID TIME.

EXAMPLE —

DAY	PROGRAM NO.	TIME	FEATURE NO.	
MONDAY	1	1:00 AM	1	
"	2	3:00 AM	1	
"	3	9:00 AM	3	
"	4	8:00 AM	3	<-- Value entered out of chronological sequence.
"	5	1:00 PM	3	
"	6	3:00 PM	2	
"	7	5:00 PM	2	
"	8	7:00 PM	1	
"	9	9:00 PM	1	
"	10	11:00 PM	1	

The computer, after running the third show (9:00 AM), will skip program four (8:00 AM) because the day clock would have a greater value than 8:00 AM. The next valid time would be 1:00 PM.

NOTE: The computer evaluates the table of values for the current day. If there are no valid values, the computer will check the next day until it finds the next valid start time.

PROGRAM MODE (continued)

COPY DAY TO DAY FEATURE TIMES

This function allows the operator to quickly copy a full days program times and features to another day. Any day may be copied to any other day. If a full days program of features has been set up for Monday, for example, and the same schedule is valid for other days, the program can be copied from Monday to Tuesday, from Monday to Wednesday, from Monday to Thursday, etc. This function eliminates the unnecessary tedium of duplicating programming for each day.

PROGRAMMING SEQUENCE

First, turn the keylock switch to PROGRAM and press the COPY key to bring up the screen display which blinks the DAY to be copied.

PRESS	SCREEN DISPLAYS
COPY	COPY DAY ? TO DAY ?

Press the key for the day you want to copy from. The selected day is displayed and the second DAY will blink.

PRESS	SCREEN DISPLAYS
1	COPY MONDAY TO DAY____

Press the key for the day you want to copy to.

PRESS	SCREEN DISPLAYS
3	COPY MONDAY TO WEDNESDAY

Press ENTER; the screen will flash COPY COMPLETE and return to COPY DAY ? TO DAY ?.

Repeat the COPY procedure as often as required. For example, if the program for Tuesday, Wednesday and Thursday is the same as Monday, the COPY procedure would be performed three times.

If incorrect data are entered, repeat the procedure with the correct information. The last copy entry is always the value retained in memory.

We suggest you always review your entries to insure that they are correct.

Once the week's programming is completed, if the next week is the same, no additional programming is required. The clock will continuously repeat the week's programming until it is changed.

PROGRAM MODE (concluded)

PROGRAMMING SUPERVISORY FUNCTIONS

Programming the supervisory functions initializes the Ultimation 2000® system and customizes it to support the peripheral equipment at the customer's installation. A complete list of the supervisory functions is presented below. These functions should be programmed before using the system so that all the delays, etc., operate in the desired manner. Programming of the supervisory functions is described in the SETUP MANUAL.

FUNCTION	DESCRIPTION
1	SET DAY OF WEEK
2	SET TIME OF DAY
3	SOUND CHANGEOVER DELAY
4	HOUSE LIGHTS DELAY TRAILER 1
5	STAGE LIGHTS DELAY TRAILER 1
6	OPTIONAL DIMMER DELAY TRAILER 1
7	HOUSE LIGHTS DELAY SHOW
8	OPTIONAL DIMMER DELAY CREDITS
9	HOUSE LIGHTS DELAY END
10	STAGE LIGHTS DELAY END
11	FAILSAFE BOBBLE DELAY
12	CUE WINDOW FACTOR #1
13	CUE WINDOW FACTOR #2
14	CUE WINDOW FACTOR #3
15	CUE WINDOW FACTOR #4
16	SYNC/INTERLOCK DELAY
17	CHANGEOVER PULSE
18	CURTAIN CONTACTS PULSED OR MAINTAINED
19	LIGHT CONTACTS PULSED OR MAINTAINED
20	LENS AND MASKING PULSED OR MAINTAINED
21	SOUND PULSED OR MAINTAINED
31	ACCUMULATED RUN HOURS
32	MAINTENANCE SCHEDULE A
33	MAINTENANCE SCHEDULE B
34	MAINTENANCE SCHEDULE C
35	MAINTENANCE SCHEDULE D

RUN MODE

The Ultimation 2000® system offers the operator the advantage of three start sequences — MANUAL START, TIMED AUTOSTART and CLOCK AUTOSTART. These sequences are described in the following sections.

MANUAL START SEQUENCE

The conventional manual start sequence is very simple to initiate, requiring only that the feature values be preprogrammed. All the operator must do is press the FEATURE key, enter the desired feature number, and press the RUN key.

EXAMPLE —

With the MODE keyswitch in the RUN mode, a manual start sequence is initiated by pressing "FEATURE". The screen will flash "MANUAL START MODE" and then display a prompt for the feature number.

PRESS	SCREEN DISPLAYS	
FEATURE	MANUAL START MODE	(1 second message)
	FEATURE 1 READY TO RUN	

If you want to start a feature other than the feature whose number is shown on the screen, press the number of the desired feature

PRESS	SCREEN DISPLAYS
3	FEATURE 3 READY TO RUN

and then press the green RUN button just beyond the upper left corner of the keyboard. The equipment will start and the screen will display the feature number and Trailer 1 setup.

PRESS	SCREEN DISPLAYS	
RUN	FEATURE 3 TRL 1 MONO FLAT 24	(Running)

When the FEATURE ends, the screen displays "FEATURE 3 READY TO RUN" <u>if the film transport device is an endless loop</u>. If the film transport device is not an endless loop platter, the film will run out and activate the failsafe. The screen will display "FAILSAFE". Once the machine is rethreaded for the next show, the screen will automatically return to the manual start mode and display -

SCREEN DISPLAYS
FEATURE 3 READY TO RUN

Continue by pressing the RUN button.

RUN MODE (continued)

TIMED AUTOSTART SEQUENCE

This sequence allows the operator to enter a time delay and feature number. When the time delay counts down to zero, the selected feature will start automatically.

EXAMPLE —

Pressing "TIMER" causes the screen to flash the message "TIMED START MODE" for one second and then display the time field (blinking) and feature number.

PRESS	SCREEN DISPLAYS	
TIMER	TIMED START MODE	(1 second message)
	TIME TO START 0:00 FEATURE #	(Waiting)

Enter the desired time delay by pressing the numbered keys. For example, to set a delay time of one hour and five minutes, press the 1, 0, 5 and ENTER keys.

Now the feature # is blinking, indicating to the operator that a feature # entry is required.

Program the feature number by pressing the desired feature number and ENTER.

The time begins to count down only after both a time and feature have been selected. The colon in the time field will blink to show that the clock is running.

TIME TO START 0:53 FEATURE 3	(Waiting)

At the end of the delay time, the feature automatically starts and the screen shows the trailer 1 setup.

FEATURE 3 TRL 1 MONO FLAT 24	(Running)

If you press timer and a feature is already running, the screen will display "TIMED START MODE" and then shows the current setup of the feature running.

When the feature ends, the screen displays the "TIME TO START 0:00 FEATURE #" message <u>if the film transport device is an endless loop platter</u>. If the film transport device is not an endless loop platter, the film runs out, activates the failsafe, and the screen displays "FAILSAFE". When the unit is rethreaded for the next show, the screen displays the "TIME TO START 0:00 FEATURE #" message and prompts the operator for an input.

RUN MODE (continued)

CLOCK AUTOSTART SEQUENCE

In the RUN mode, this sequence automatically starts the features at the times programmed in the Feature Start Time operation. Since it is automatic, there is no action required by the operator to start the feature. The operator can also use this sequence to verify the day, program number and start time the next feature is scheduled to run.

EXAMPLE -

Pressing "CLOCK" causes the screen to flash the message "CLOCK START MODE" for one second and then display the day, program number, time the next feature is scheduled to run and feature number.

PRESS	SCREEN DISPLAYS	
CLOCK	CLOCK START MODE	(1 second message)
	FRIDAY 7 8:00 PM FEATURE 3	(Waiting to run)

NOTE: If you want to change the time values, enter PROGRAM mode and reprogram. To reprogram Clock Autostart values, refer to PROGRAMMING THE FEATURE CLOCK START TIMES on page 4.

At the displayed programmed time, the FEATURE starts automatically*, the alarm sounds for 1 second, and the screen shows the feature number and setup for trailer 1. The alarm indicates the start of the show, allowing the projectionist to check focus and other operating conditions if desired.

FEATURE 3 TRL 1 MONO FLAT 24	(Running)

When the feature ends, the screen displays the next scheduled start time <u>if the film transport device is an endless loop platter</u>. If the film transport device is not an endless loop platter, the film runs out, activates the failsafe, and the screen displays "FAILSAFE". When the unit is rethreaded for the next show, the screen automatically displays the next scheduled start time.

FRIDAY 8 10:00 PM FEATURE 3	(Waiting to run)

* This feature can be configured to sound the alarm only, and not start the show. Contact the factory for details.

RUN MODE (continued)

CUE LEARN MODE

The CUE LEARN MODE is a technique (patents pending) designed to assist the operator in putting on a professional presentation each and every time. In use, the CUE LEARN MODE is activated during the first run of a feature.

Assuming all cue foils are present and sensed, an internal system clock measures the time from the beginning of the presentation to the detection of each cue and records it in memory, using a mathematical algorithm. Electronic time windows are centered around the time to each cue signal and stored in the system. (Refer to the SETUP MANUAL for cue window development.)

Once the computer stores the cue times in memory, the CUE LEARN MODE is deactivated, and the operator is no longer dependent on the presence or condition of the cues. The system will ignore any misplaced or false cues during succeeding runs.

In subsequent operation, the feature is started and run normally, with the system waiting for cues. If a cue is faulty and the cue signal does not appear during the programmed window time slot, an electronic cue signal replaces the missing cue in time to keep the presentation running properly.

The CUE LEARN MODE may be used in MANUAL START, TIMED AUTOSTART or CLOCK AUTOSTART sequences.

Cue Preparation and Placement

The system is based on a 4 cue design. The cue foil can be 2" long or more but 2.5" is recommended. It can be an inboard, an outboard or a cross cue and placed at the following locations:

1st cue placed 2' 6" before the beginning of trailer 2.

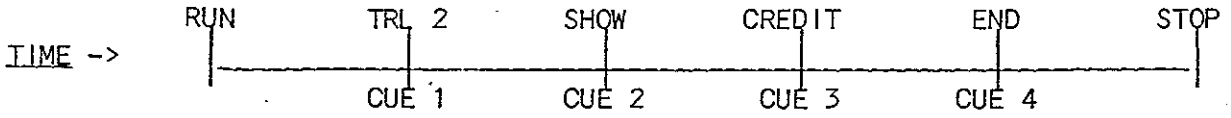
2nd cue placed 2' 6" before the beginning of the show.

3rd cue placed at the start of the credits.

4th cue placed 10' 6" before the end of the show.

Please note: The Ultimation 2000® requires all 4 cues!

Cue placement is illustrated by the diagram below:

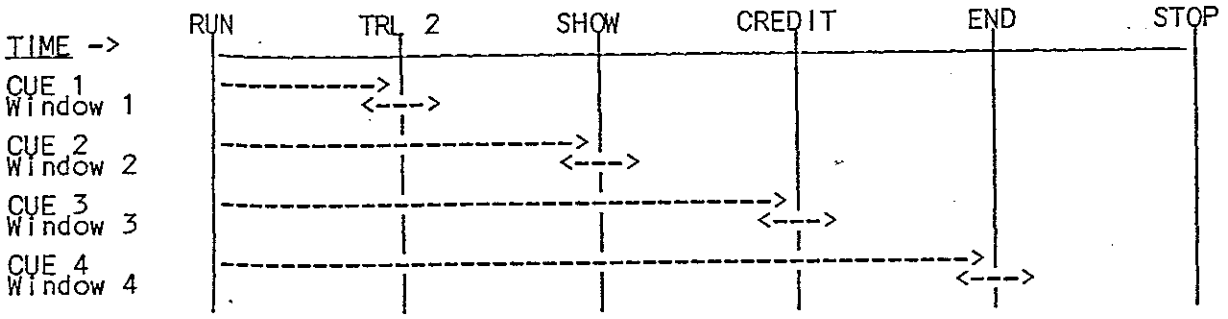


RUN MODE (continued)

CUE LEARN MODE (continued)

The cue and cue window timing is illustrated by the diagram below:

CUE and WINDOW TIMING



If a cue should occur outside the window(s), it is ignored.
If a cue occurs within the window, the system proceeds normally.
If no cue appears in the window, the system generates a cue.

Using the CUE LEARN MODE

The CUE LEARN MODE is used in both the activated and deactivated states:

When activated, it measures the cue times.
When deactivated, it supplies electronic cues to replace any missing cues.

The CUE LEARN MODE should be activated before the start of the first run of the presentation. Do this by pressing the CUE LEARN key. Activation is confirmed by an L appearing at the right end of the screen in the last character position. Start the presentation and the screen will display:

SCREEN DISPLAYS

FEATURE 2 TRL 1 MONO FLAT 24 L

At the end of the presentation, the screen will display the four measured cue times.

SCREEN DISPLAYS

CUES 3:19 5:22 98:51 100:07

The cue times display is cleared by pressing CLEAR. The screen display returns to the feature start sequence used for the CUE LEARN MODE.

The cue times are then used to calculate the window factors which are programmed in functions 12 through 15 using the supervisory mode.

In operation, false (extra) cues will be ignored if they do not fall in a cue window. The Ultimations 2000® allows only one cue per window. In this way, false cues will not inadvertantly advance the presentation.

NOTE: If a cue is missed while in the CUE LEARN MODE, the system will continue to look for it as in a normal operation. The projectionist must correct the show

RUN MODE (continued)

CUE LEARN MODE (concluded)

presentation and activate CUE LEARN again during the next presentation. Refer to the CUE INPUT MODE below for correcting missed cues in the presentation.

Once the four cues are measured accurately, deactivate the CUE LEARN MODE by pressing the CUE LEARN key again. The Ultimation 2000® then takes control, guaranteeing a perfect presentation.

ELECTRONIC CUE INPUT

The CUE INPUT mode is a means of manually supplying electronic cues. It is provided for manually inputting cues to either catch up a show in the LEARN mode, or to replace the traditional pickoff input if desired. Once a feature has started, if a cue input is missed due to an input failure or for any other reason, the cue can be created manually by pressing the "CUE INPUT" key. This key also serves as a useful tool when setting up the Ultimation 2000®. It allows the installer to easily advance the presentation manually to verify the setup sequence.

RUN MODE (continued)

FEATURE STOP FORMATS

In the event of a fault, the system will stop and enter the fault mode. The screen display helps the operator identify the trouble so that it can be cleared rapidly and minimize any interruption in the operation.

The following are currently defined faults:

FAILSAFE - End of film. The screen shows "FEATURE 1 FAILSAFE".

SCREEN DISPLAYS
FEATURE 1 FAILSAFE

When another film is threaded, the screen shows the next feature number and "READY TO RUN"

SCREEN DISPLAYS
FEATURE 2 READY TO RUN

FAILSAFE - Film break or platter bobble greater than bobble delay during presentation. The screen shows "FEATURE 1 FAILSAFE".

SCREEN DISPLAYS
FEATURE 1 FAILSAFE

When the fault is cleared, the screen will show "READY TO RESUME"

SCREEN DISPLAYS
FEATURE 1 READY TO RESUME

FAULT - SYNC STOP - This message indicates a fault on another machine when running in the synchronous mode. The fault must be cleared before either machine can be started.

SCREEN DISPLAYS
FEATURE 1 FAULT - SYNC STOP

When the fault is cleared, both machines' screens will show "READY TO RESUME"

SCREEN DISPLAYS
FEATURE 1 READY TO RESUME

Pressing the RESUME key on either machine will restart the show.

RUN MODE (continued)

FEATURE STOP FORMATS (concluded)

STOP BUTTON or REMOTE STOP - The screen shows "READY TO RESUME". This message indicates the feature has been stopped purposely, either locally or at a remote location. No faults are present and the feature may be resumed by pressing the "RESUME" key just to the left of the keyboard.

BETWEEN FEATURE FAULT MESSAGES

SCREEN DISPLAYS
LOW BATTERY - REPLACE

This message indicates a low battery condition and potential loss of all user functions programmed into the memory. The battery installed in this unit should last the design life of the system if the system is powered down a nominal 12 hours per day.

If the LOW BATTERY message appears, the battery must be replaced to clear the fault and replacement must be accomplished while the system is powered up. Leave the unit powered up until the battery is replaced.

CALL YOUR AUTHORIZED EPRAD SERVICE REPRESENTATIVE TO REPLACE THE BATTERY.

The service representative should refer to the INSTALLATION MANUAL for instructions on battery replacement.

SCREEN DISPLAYS
FEATURE 2 FAILSAFE

This message indicates a local failsafe condition. The condition must be cleared before a start sequence can be initiated.

SCREEN DISPLAYS
SUPERVISORY MEMORY FAULT

This message indicates a checksum error in the Supervisory setup data. Edit and correct the Supervisory setup data to clear the fault.

SCREEN DISPLAYS
FEATURE START TIMES MEMORY FAULT

This message indicates a checksum error in the Feature Start Times setup data. Edit and correct the Feature Times data to clear the fault.

RUN MODE (concluded)

BETWEEN FEATURE FAULT MESSAGES (concluded)

SCREEN DISPLAYS

FEATURE MEMORY FAULT

This message indicates a checksum error in the Feature setup data. Edit and correct the Feature setup data to clear the fault.

SCREEN DISPLAYS

MAINTENANCE SCHEDULE A

This message indicates that maintenance is required for schedule A, B, C, or D. The CLEAR key will reset the timer and clear the fault. Once cleared the message will not reappear until the next scheduled maintenance time. (See the Setup of Supervisory Functions in the SETUP MANUAL.)

SCREEN DISPLAYS

MISSED CUE 1

This message indicates that CUE input 1, 2, 3, or 4 (CUE 1, in this case) was not received and an automatic cue was issued at the end of the cue window. The message notifies the projectionist that the cue foil is missing and should be replaced.

TROUBLE SHOOTING

The EPRAD ULTIMATION 2000® system is designed to provide trouble free service for 20 years or more.

If the unit does not operate properly:

1. First verify that there is power to the system (the red light on the power switch will be lit). If there is no power, call your electrician.
2. If there is power, turn off the power switch and turn it on again. If the unit still does not operate, call your authorized EPRAD service representative.
3. If the unit powers up but the checksum number is different from the number recorded on the reference sheet stored in the unit, the Ultimation 2000® may still operate in a normal manner. However, it indicates there may be a problem and the condition should be reported to EPRAD at (419) 666-3266.
4. Continue the presentation using the 9 Manual Override switches on the right side of the panel. These switches operate without requiring power to or operation of the Ultimation 2000® system. Refer to the description below.

HUMAN INTERFACE - This unit consists of the display, the keyboard and two groups of switches. The interface has no user replaceable parts. On POWER UP, if the Checksum is different from that usually displayed, it indicates there may be a problem. Call EPRAD at (419) 666-3266 with the software Version number and the Checksum number being displayed.

MANUAL OVERRIDE EMERGENCY OPERATION

The nine switches on the right side of the panel duplicate the basic functions of the system and are provided to enable the operator to proceed with a presentation if the Ultimation 2000® system should become inoperative.

These switches control the following:

PROJECTOR MOTOR
XENON LAMP
LENS/MASKING
CURTAIN MOTOR
EXCITER LAMP
CHANGEOVER
STAGE LIGHTS
HOUSE LIGHTS
AUXILIARY PROJECTOR

The switches are external to the Ultimation 2000® system and do not require signals or power from the Ultimation 2000®. They have been assembled in a logical operational sequence from upper left to lower right.

ULTIMATION 2000 THEATRE AUTOMATION UPDATE

The Ultimation 2000 is a microcomputer based automation system which allows software changes to improve its performance. Version 1.011 represents significant improvements over earlier versions providing several new features.

Among the improvements are a curtain call feature, auxiliary projector controls and more feature programs. This update provides information on all software changes since Version 1.002. Dispose of all addendums and replace them with this information.

The original manuals and other reference material will be updated later this year to reflect and incorporate these changes. Notify the factory of any inaccuracies in the current material so that they may be corrected.

SOFTWARE: ULTIMATION 2000
VERSION: 1.011
RELEASE DATE: JUNE 25, 1990

INSTALLATION

Installation of a new EPROM (Erasable Programmable Read Only Memory; the module that contains the program) is fairly simple. It is very important that you proceed in a logical fashion and to handle the new chip carefully.

STEP 1: Record all values stored in the feature, clock and supervisory functions. All entries may be lost in the installation process and will have to be re-entered upon completion.

STEP 2: Remove power to the unit by turning the appropriate service entrance equipment off.

STEP 3: Remove the two (2) rear screws retaining the top panel. Pivot the top panel toward the front of the unit exposing the CPU board.

STEP 4: Remove the old EPROM carefully. The EPROM is located on the top right hand side and is marked with an adhesive backed label indicating the software version number.

STEP 5: Install the new EPROM carefully being sure it is not put in backwards and there are no pins bent. Installing the chip in backwards will destroy it.

THE DIMPLE ON THE EPROM MUST MATCH THE DIMPLE SHOWN ON THE CPU BOARD SILKSCREEN.

STEP 5: Fasten the cover and top and restore power to the unit. The screen should display....

VERSION 1.011 CHECKSUM 54845

STEP 6: If the Ultimation 2000 posts any error messages it will be necessary to re-program the unit.

Error messages you will see:

FEATURE START TIMES MEMORY FAULT
FEATURE MEMORY FAULT
SUPERVISORY MEMORY FAULT
LOW BATTERY - REPLACE

Turn the keylock switch to PGM or program position. Re-enter the feature, clock and supervisory data collected in STEP 1. IMPORTANT NOTE: A PASSWORD HAS BEEN ADDED TO CONTROL UNAUTHORIZED ACCESS TO THE SUPERVISORY DATA. THE PASSWORD IS 31415.

IMPORTANT NOTE: EVEN IF YOU DO NOT USE ONE OF THE FUNCTIONS SUCH AS CLOCK AUTOSTART IT IS NECESSARY TO AT LEAST ENTER THAT FUNCTION TO CLEAR THE FAULT.

STEP 7: Run the equipment with the new parameters to verify operation.

STEP 8: It will be necessary to re-learn cue times. The installation process can effect formerly learned cues.

STEP 9: return old EPROM to factory.

SOFTWARE MODIFICATIONS

The following information contains the user based software changes found in Version 1.011. The descriptions indicate operational and setup information for each function.

1.) AUTOSTART ALARM - in both the clock and timed autostart modes an alarm output is generated prior to the execution of the run command. This serves to notify your personnel that the show is about to start. When either the timed start timer counts to zero or the clock autostart time matches the real time clock value, The Ultimation 2000 sounds the local (projection booth) alarm for 3 seconds and the remote station alarm for 2 seconds. At the end of the 3 seconds a run input is sent in both modes and the show begins.

2.) MANUAL CLOCK START MODE - this feature is similar to the autostart alarm. When the clock autostart function is disabled by installing jumper J3 on the CPU board it becomes a simple schedule reminder. In this mode the Ultimation tells the projectionist that the show is scheduled to start and a manual run input is required. When the manual clock start time matches the real time clock value the Ultimation 2000 sounds the local alarm for 3 seconds and the remote alarm for 2 seconds.

The local display will indicate FEATURE 1 (2, 3, etc.) READY TO RUN and wait for a manual run input. The remote station will have its stop light illuminated and the green run light will be blinking.

If the unit does not receive a local or remote run input within 30 minutes it assumes that the show was canceled. It then automatically returns to the manual clock mode. It post the next scheduled clock start time. The show can still be started by going to the manual start mode pressing the run button.

When in the autostart mode, the run light at the remote station will blink 2 times per second (twice as fast as when in manual start mode).

3.) REMOTE START INPUT - provisions have been made to allow a remote start input. Changes in the synchronous operation have allowed the use of the SYNC IN (TB6-11) terminal as a remote start input.

4.) SUPERVISORY ACCESS PASSWORD - Due to the sensitive nature of information contained in the supervisory setup data a 5 digit access code has been added. This code allows access to the data by authorized personnel only. The access code is the first five digits of pi (31415).

To enter the supervisory mode turn the key to program. The screen will ask for a password. Enter 31415 and the unit will

automatically enter the supervisory mode at the last value entered. If you enter an incorrect password sequence, simply press clear and re-enter the value.

The addition of the password does not keep your non-authorized personnel from viewing the supervisory values. When the key is in the run mode, the supervisory key can be pressed. The screen will display the supervisory values. The only difference is that the values can not be changed in this mode.

4.) TIMED AND CLOCK AUTOSTART REMOTE DISABLE - The Ultimation 2000 has been enhanced to allow your projectionist to remotely disable the autostart modes. This feature allows the show to be delayed due to long lines or other problems without having to run up to the projection booth.

The procedure requires the projectionist to press the stop button at the remote station. The Ultimation 2000 automatically enters the manual start mode. The stop light on the remote station illuminates and the run light blinks. The local display indicates FEATURE 1 (2, 3, etc.) READY TO RUN. To start the show simply press the local or remote run button.

This feature also has been designed to allow the projectionist to bypass a scheduled clock autostart time. If, for instance, you wish to cancel a scheduled show and the unit is in clock autostart, all your projectionist has to do is push the local or remote stop button. The unit goes into manual start mode. If, however, a run input is not initiated in 30 minutes, the Ultimation 2000 assumes that the show was canceled. It goes back to the clock autostart mode and awaits the next scheduled clock autostart value.

6.) SYNCHRONOUS OPERATION - The synchronous system has been altered in the Ultimation 2000 making it friendlier, simpler and more versatile.

Function 16 in the supervisory was originally a programmed sync delay time between to machines. It was simple but limited the sync operation in terms of multiple sync operation and random order of interlocked houses. The latest software version changes the sync operation all together.

The new synchronous system has no supervisory function and requires only four wires between machines. It also allows multiplexing and customization with very minor modifications or additions.

The new system requires that four wires be connected between all machines on the sync chain. These four wires are ground, sync enable, resume and failsafe stop.

IMPORTANT NOTE: THE GROUND WIRE IS VERY CRITICAL AND MUST BE THE SAME GROUND FOR ALL MACHINES TO AVOID

ERRATIC BEHAVIOR.

Operation of the synchronous mode requires the addition of a fifth cue (sync cue) to the film. The fifth cue acts as the run input on each of the machines.

To run in sync the following conditions must be met:

1. A fifth cue (sync cue) must be added to the film. This is the first cue that is seen by each machine. It acts as a run input for each machine.

2. One machine is selected as the master machine.

3. The master machine is the only machine in the sync chain to have the blue sync button depressed

4. The master machine is the last machine to see the film.

5. All machines on the sync chain must have the same feature values programmed for the selected feature.

6. All slave machines must be in the manual start mode.

7. The master, and only the master, may be set up in the clock or timed autostart mode.

8. The show can be started at the master machine only.

To begin a movie, insure that the sync cue is positioned above the cue detector on the first slave machine. Press the run button on the master machine. All projectors will start simultaneously. As the sync cue passes through cue detectors the show start sequence will initiate.

At the end of the show each machine will shut down as the tail of the film runs out and the failsafe arms fall. On endless loop systems all projectors will continue to run until the master machine sees the end cue. At that time it sends out a failsafe stop signal stopping all projectors on the chain.

The cue learn mode is still usable in the sync mode. Simply place all machines in the cue learn mode for the first presentation.

IMPORTANT NOTE: REMEMBER THAT THE CUE LEARN MODE REQUIRES THAT THE FILM BE THREADED AT THE APPROXIMATE SAME PLACE FOR EACH SHOW. LARGE VARIATIONS EXCEEDING 10 FEET IN LENGTH MAY RESULT IN INCORRECT OPERATION WHICH MAY BE NOTICEABLE TO YOUR CUSTOMERS.

7.) CHANGEOVER OPERATION - the Ultimation 2000 has been modified to allow customization of your film format changeovers. Function 16 (formerly sync time delay) has been redefined as the LENS C/O ZIPPER and can be used to close the changeover at film format

changes. The result being a black screen with no sound.

The feature allows you to program the amount of time your changeover remains closed. The input ranges from 1 to 9 seconds. To determine the desired value simply time your lens change device cycle and add 1 second.

During the lens change the sound in the auditorium is also discontinued. This is done by selecting the tape format on your sound processor. Because the non-sync source is not active, the result is no output to the amplifiers and speakers. If your sound system uses a continuous non-sync source feed the output through the non-sync relay (maintained) in the automation before sending it to your amplifiers.

8.) CHANGEOVER PULSE - function 17 is the supervisory item used to dictate the length of the pulse sent to the changeover coil. In previous versions the software allowed a range from 1 to 9 seconds. This field has been narrowed to protect the changeover coils and now stands at 0.1 to 1.0 seconds.

9.) SHUT DOWN DELAY - function 23 is a new feature added to the software. The shut down delay allows you to program the desired time you want the projector to run after seeing the end cue. The function allows you to customize the time dependent on where your film transport system is located.

The software still recognizes the dropping of the failsafe arms as a normal and legitimate end of show even if the timer has not expired.

10.) NON-SYNC CONTACTS - function 22 is another new feature which allows you to select either pulsed or maintained contact closure on the two non-sync relays. This allows you to adapt to the wide variety of products available today.

11.) CURTAIN CLOSE TIME - function 40 is used to drive functions 41 through 43. It simply requires the amount of time it takes the curtain to open (or close).

12.) CURTAIN CALL - function 41 is a new feature which further enhances the dramatic effect offered by curtains in todays fines theatres. The two legal states are YES and NO. If yes is selected the curtain call function will cause the curtain to close on the end of the last trailer and reopen at the beginning of the feature presentation.

The function is driven off of the learned cue times and requires no additional cues. For this reason the curtain call function is not active during the cue learn mode. Once times are learned and the cue learn mode is deactivated the computer will generate the curtain call function.

13.) AUXILIARY PROJECTOR DELAY - function 42 was designed to

(LAST PAGE IN MANUAL)