# Film-Tech

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# INSTRUCTION MANUAL

# CPA-10

**Theatre Automation Computer System**


**STRONG INTERNATIONAL, Inc.**
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402/453-4444 FAX 402/453-7238

OPERATION AND INSTALLATION MANUAL
STRONG CPA-10 AUTOMATION SYSTEM
04/89

!!WARNING!!

!!WARNING!! A SECURE ELECTRICAL EARTH GROUND FOR THE CPA-10 AUTOMATION SYSTEM AND THE REMAINING SYSTEM COMPONENTS, SUCH AS THE XENON LAMPHOUSE/CONSOLE SYSTEM, IS ABSOLUTELY IMPERATIVE FOR PROPER SYSTEM OPERATION. FAILURE OF THESE SYSTEMS TO BE PROPERLY GROUNDED MAY RESULT IN DAMAGE TO THE CPA-10.

EVIDENCE OF IMPROPER GROUNDING MAY VOID WARRANTY

SYSTEM SPECIFICATIONS:

PROJECTION BOOTH FUNCTIONS:
Projector/Lamp ON/OFF; Exciter ON/OFF; Changeover OPEN/CLOSE; Non-Sync ON/OFF; Film Sound MONO, SVA (Stereo), SPECIAL 1, SPECIAL 2, SPECIAL 3, Lens Turret Automation with Masking selection; Auxiliary Projector ON/OFF.

AUDITORIUM FUNCTIONS:
Curtain with Curtain Call; Four discrete Dimming circuits, including House Lights with Half-Level, Stage, Cove and Tivoli Light Circuits; Top and Side Masking control.

OTHER FEATURES:
Remote Stations: Four Configurations of Remote Status Stations with Alarm, with or without Start/Stop capability.
Interlocked Operation: Eight Interlock Loops available, fully programmable, with maximum of 16 systems per loop.
Clock and Timer: Allows programmed automatic show starts, 10 per day, seven schedules per week, of any program combination. Timer allows time-delayed start.
Programming Access: Via two numeric Passwords, Upper (full access) and Lower (limited access).
Memory: Battery Back-Up retains full program memory with Power OFF.
Programs: Capable of nine (9) separate programs, with maximum of ten (10) cues and/or seventy (70) steps per program.
Special Projection: Capable of programmed change of projection speed for 30 Frames-per-Second operation, or other special requirements.

THIS MANUAL APPLIES TO STRONG SOFTWARE VERSION #1.001,#1.002, and #1.004.

INSTALLERS: READ AND UNDERSTAND ALL SECTIONS OF THIS MANUAL BEFORE PROCEEDING WITH INSTALLATION AND/OR OPERATION OF THIS AUTOMATION SYSTEM.

OPERATION AND INSTALLATION MANUAL
STRONG CPA-10 AUTOMATION SYSTEM

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* Also Refer to CR REMOTE Manual

## SOFTWARE CHANGE NOTICE

DATE: 10/07/93
PROJECT: STRONG CPA-10
VERSION: 2.000
CHECKSUM: 3292

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1. Added "PROJECTOR MOTOR/LAMP ON" instruction. This instruction turns on the motor/lamp but does not initiate show *start logic*. A "WAIT FOR CUE" instruction (and a cue) is required to initiate show *start logic*.

2. Added "PROJECTOR MOTOR/LAMP OFF" instruction. This instruction causes the projector motor/lamp to turn off using the normal timer K and Q delays. The changeover is closed. Exciter is turned off.

3. Added "INTERMISSION WAIT dd:dd" instruction. This instruction automatically switches to nonsync sound and initializes projector motor shutdown using the normal K and Q delays. The changeover is closed. Exciter is turned off. Shutdown is maintained until the intermission delay timer expires or a resume is received. This instruction requires a "WAIT FOR CUE" instruction (and a cue) to initiate the show *start logic*.

4. Both "-- WAIT-- dd:dd" and "INTERMISSION WAIT dd:dd" now wait indefinitely for time setpoint=99:99! The maximum time entry was increased from 59:59 to 99:99 to support this for these two instructions (only). They both also watch for the resume key or the remote resume (remote start input) to terminate the wait.

   Both instructions will also terminate due to either the cue key or the cue input - and as before, the next "WAIT FOR CUE" program instruction is also executed by this same cue!

5. REMOTE RUN input now also serves as REMOTE RESUME during the program. Note also when system is "stopped" due to a stop or fault input during a WAIT or INTERMISSION WAIT and the system is "READY TO RESUME", the first resume *restarts* wait timers and the second resume *terminates* the wait timers. (SYNC RESUME is held internally for 3 seconds, so there must be >3 seconds between resume events.)

6. Added "NONSYNC" sound format to "format" instruction. Note that switching to nonsync is now allowed during the show. Also switching to other sound formats is also possible when the motor/lamp is off. (The exciter is a function of both the motor and the sound format.)

7. House lights, stage lights, and curtain outputs are pulsed when the new (house lights, stage lights, or curtain) instruction is executed even when the commands are the same. (i.e. house lights up followed by house lights up causes two pulses.)

8. Exciter is now turned off for sound format–nonsync and for intermission.

9. Run switch LED now blinks for intermission as well as for the special "hold" feature during timed start, as before.

10. Remote output "intermission" for configurations "C" and "D" is on during intermission delay.

11. CUE LEARN is now disabled during intermission wait shutdown and motor/lamp off times. It is enabled at the time the following "show start" cue is received. This results in the "cue learn times" showing two times captured at the same time. The second one is never used. (Time is ignored while the show off.)

12. Shut down delay is now correctly defaulted to zero rather than the cue factor default.

## USING THE NEW INSTRUCTIONS

| | |
|---|---|
| PROJECTOR MOTOR/LAMP ON | INSTRUCTION #28 |
| PROJECTOR MOTOR/LAMP OFF | INSTRUCTION #29 |
| INTERMISSION WAIT MM:SS | INSTRUCTION #30 |
| Added NONSYNC to FORMAT instruction | INSTRUCTION #17 |

Using the new instructions PROJECTOR MOTOR/LAMP OFF and PROJECTOR MOTOR/LAMP ON we will write a program that will keep the projector motor *off* until a cue from the slide projector turns it *on*.

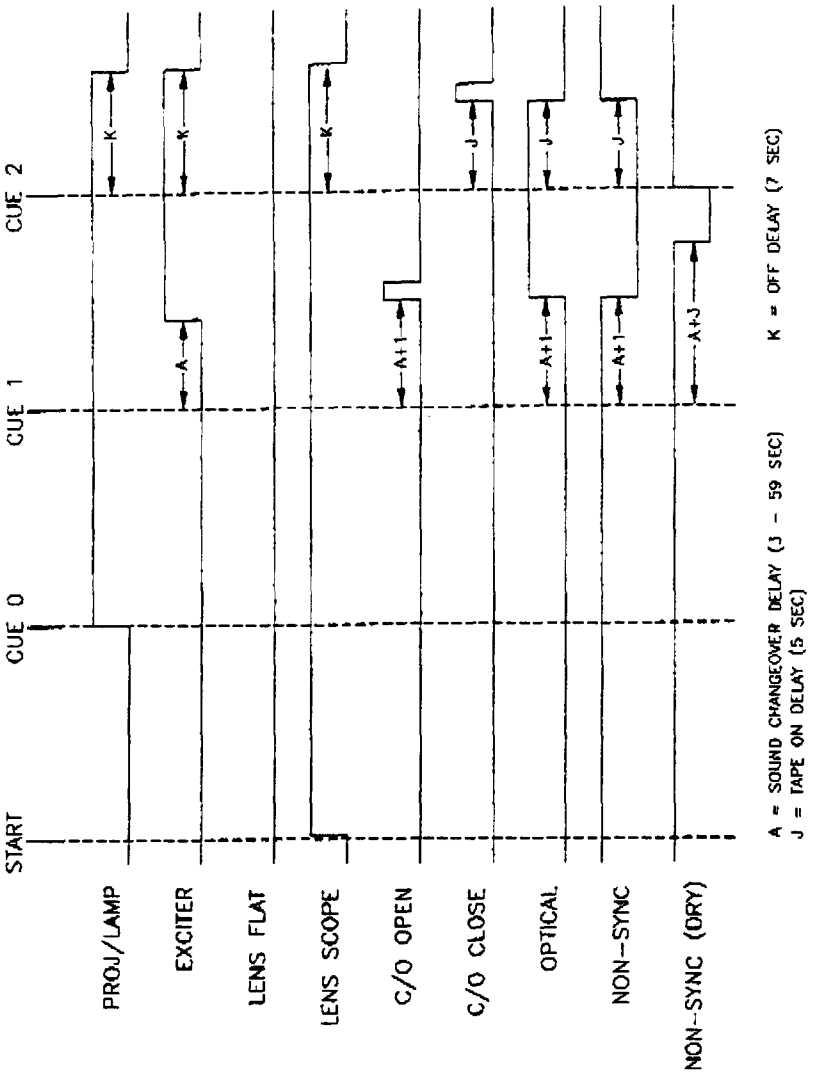
| | ----PROGRAM---- | | ----COMMENTS---- |
|---|---|---|---|
| 01 | FORMAT 1: NONSYNC SCOPE 24 | | |
| 02 | PROJECTOR MOTOR/LAMP OFF | | Keep projector motor off |
| 03 | AUX PROJECTOR ON | 0:00 | |
| 04 | HOUSE LIGHTS HALF 1 | 0:00 | |
| 05 | CURTAIN OPEN | 0:00 | |
| 06 | ---WAIT CUE 0--- | | Wait for cue from slide projector |
| 07 | PROJECTOR MOTOR/LAMP ON | | Turn projector motor on |
| 08 | ---WAIT CUE 1--- | | Show start cue from film |
| 09 | FORMAT 2: OPTICAL SCOPE 24 | | |
| 10 | AUX PROJECTOR OFF | 0:05 | |
| 11 | HOUSE LIGHTS DIM | 0:00 | |
| 12 | ---WAIT CUE 2--- | | End of show cue |

When the program is started instructions 01 through 05 are executed and the program waits for a cue from an external device (slide projector). The PROJECTOR MOTOR/LAMP OFF instruction must be before the first WAIT CUE to keep the projector motor *off* at start. At cue 1 instructions 07 is executed. A film cue (cue 2) is needed to initiate the *start logic* (exciter on, changeover open, etc.) and execute instructions 09, 10 and 11. Instruction 12 is the *end of show* cue. See timing diagram.

By setting instruction 06 to WAIT CUE 0 the program will *also* work in synchronous mode.

**Note:** Cue Learn mode

In the previous example only cue 3 is learned. All other cues will show 0:00 time. Cue 1 is not learned because the projector motor was off and cue 2 is not learned because it's the *show start* cue (similar to cue 0 used for sync start).


START
CUE 0
CUE 1
CUE 2
PROJ/LAMP
EXCITER
LENS FLAT
LENS SCOPE
C/O OPEN
C/O CLOSE
OPTICAL
NON-SYNC
NON-SYNC (DRY)
K
A
A+1
J
A+J
A = SOUND CHANGEOVER DELAY (J - 59 SEC)
J = TAPE ON DELAY (5 SEC)
K = OFF DELAY (7 SEC)

Using the INTERMISSION WAIT instruction we will write a program that will perform an intermission that will be capable of being restarted automatically or by a remote input.

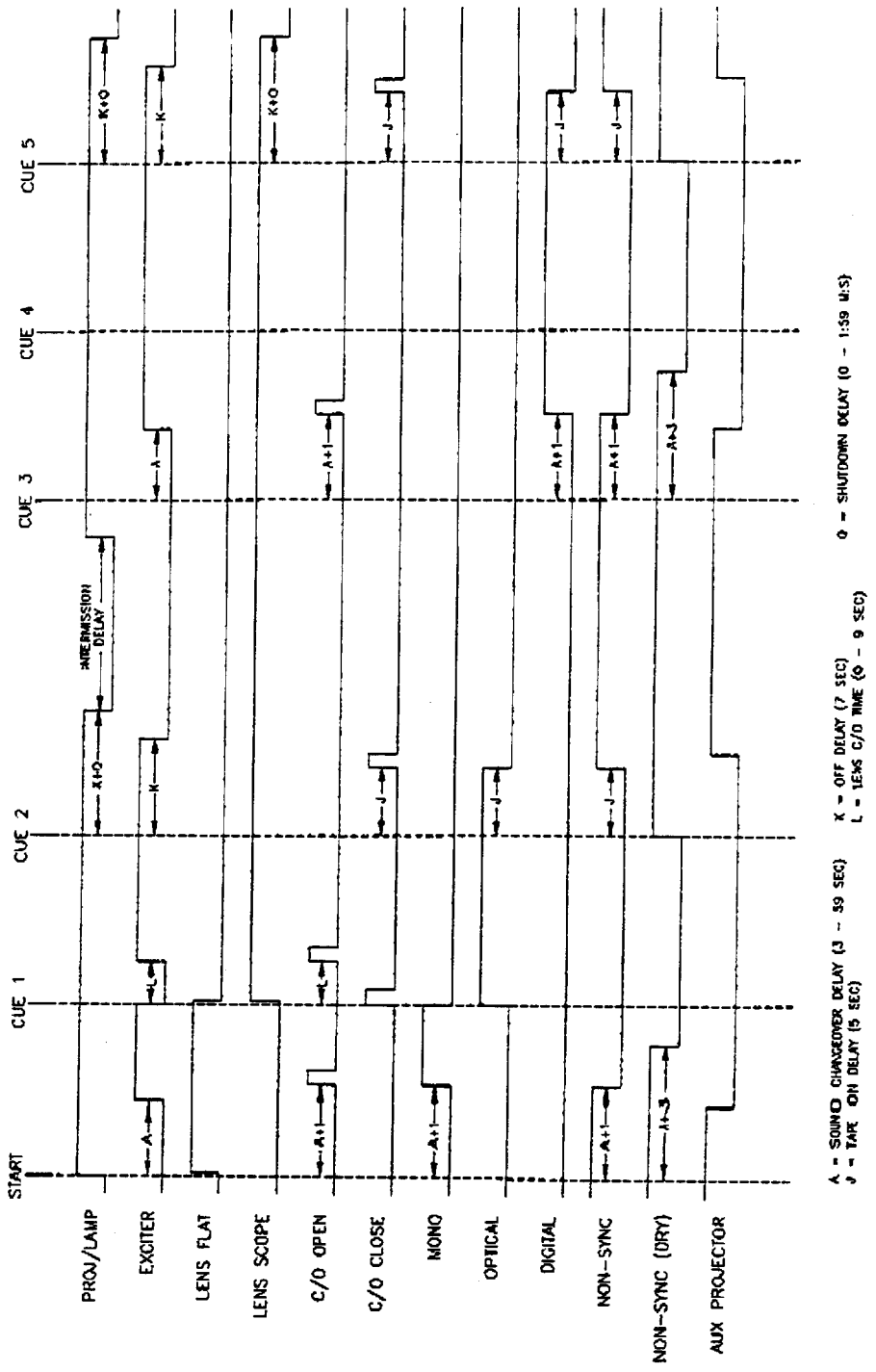
| | ---PROGRAM--- | | ---COMMENTS--- |
|---|---|---|---|
| 01 | ---WAIT CUE 0--- | | Show start cue on film (sync) |
| 02 | FORMAT 1: MONO FLAT | 24 | Trailer |
| 03 | HOUSE LIGHTS HALF 1 | 0:00 | |
| 04 | CURTAIN OPEN | 0:00 | |
| 05 | AUX PROJECTOR OFF | 0:05 | |
| 06 | ---WAIT CUE 1--- | | |
| 07 | FORMAT 2: OPTICAL SCOPE | 24 | Show |
| 08 | SHUTDOWN DELAY | 0:10 | |
| 09 | ---WAIT CUE 2--- | | |
| 10 | AUX PROJECTOR ON | 0:06 | Intermission with slide show |
| 11 | HOUSE LIGHTS BRIGHT | 0:00 | |
| 12 | INTERMISSION WAIT | 10:00 | |
| 13 | ---WAIT CUE 3--- | | Show start cue from film |
| 14 | AUX PROJECTOR OFF | 0:05 | Show |
| 15 | FORMAT 3: DIGITAL SCOPE | 24 | |
| 16 | HOUSE LIGHTS DIM | 0:00 | |
| 17 | ---WAIT CUE 4--- | | |
| 18 | HOUSE LIGHTS HALF 1 | 0:00 | Credits |
| 19 | SHUTDOWN DELAY | 20:00 | |
| 20 | ---WAIT CUE 5--- | | |
| 21 | HOUSE LIGHTS BRIGHT | 0:00 | Shutdown with delay |
| 22 | AUX PROJECTOR ON | 0:06 | |

This program will start as a normal show. At cue 2 the INTERMISSION WAIT instruction will perform a normal shutdown using the J , K and Q delay times. When the intermission delay timer expires the projector motor will start. A film cue (cue 3) is needed to initiate the *start logic* (exciter on, changeover open, etc.) and execute instructions 14, 15 and 16 . The rest of program will continue and shutdown as normal. See the following timing diagram.

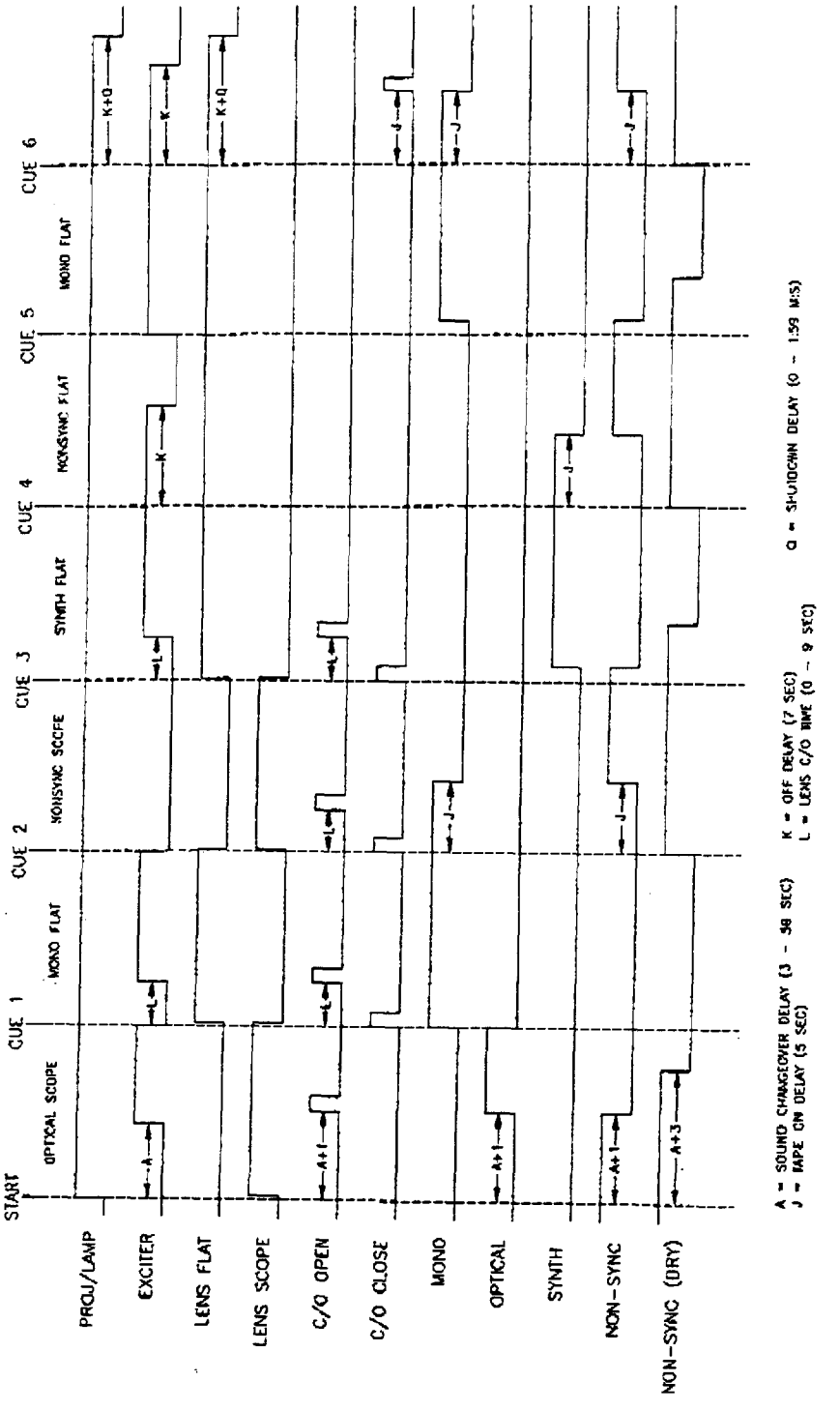
Cue 2 and cue 3 will show identical times. See item number 13.

You may override the intermission wait time with the REMOTE START/RESUME input or local RESUME key.

This "intermission" program could also be written using the PROJECTOR MOTOR/LAMP OFF, PROJECTOR MOTOR/LAMP ON, WAIT and NONSYNC FORMAT instructions. Also, the two programs described could be combined into one program that used all four *new* instructions.


START
CUE 1
CUE 2
CUE 3
CUE 4
CUE 5
PROJ/LAMP
EXCITER
LENS FLAT
LENS SCOPE
C/O OPEN
C/O CLOSE
MONO
OPTICAL
DIGITAL
NON-SYNC
NON-SYNC (DRY)
AUX PROJECTOR
INTERMISSION DELAY
A = SOUND CHANGEOVER DELAY (3 - 59 SEC)
J = TAPE ON DELAY (5 SEC)
K = OFF DELAY (7 SEC)
L = LENS C/O TIME (0 - 9 SEC)
O = SHUTDOWN DELAY (0 - 1:59 M:S)

Using the NONSYNC format instruction we will demonstrate the relationship to the lens, exciter, changeover and other film sound formats with the following timing diagram:



USERS OF THE CPA-10 ARE ENCOURAGED TO STUDY ALL SECTIONS OF THIS OPERATORS MANUAL TO BECOME FAMILAR WITH THE SYSTEM AND ITS CAPABILITIES

## 1.0 PRODUCT OVERVIEW

Strong's Computerized Projection Automation is designed to be the most versatile, capable and reliable system ever designed for Motion Picture Theaters. Computerized operation allows options including nine separate programs, each capable of ten separately cued sequences of all available functions. An internal clock can provide programmed start times, and a "Cue Learn" feature automatically initiates the next sequence in the event of a missed film cue.

The CPA-10 allows two levels of programming: a basic level for programming of normal operations and schedules, and a more extensive level for use by Supervisory personnel. Programming of either level is easily accomplished once familiar with the system.

The CPA-10 controls all booth and auditorium functions, including House Lights with half-level, Stage Lights, Curtain (with Curtain Call feature), five Sound formats, Lens/Masking control, Special Projector operation, and Intermission functions such as a Slide Projector. Interlocked operation is easily accomplished for up to 16 units. The control panel includes a full set of manual controls.

Users of the CPA-10 are encouraged to study all sections of this Operator's Manual to become familiar with the system and its capabilities.

## 1.1 CPA-10 CONTROL PANEL

The CPA-10 has manual controls for most functions, including Masking, Curtain, House and Stage Lights, Projector and Lamp, Changeover, etc. These are rocker type switches and their general functions should be obvious to the operator. These controls are located on the left side of the panel.

The Automation controls are located to the right of the manual controls. To the far right are POWER, SYNC, STOP and RUN controls. The programming Key-pad and Display Screen make up the remainder of the panel. All programming will be done using the Keypad. The POWER switch provides 110VAC to the CPA-10 for operation. SYNC tells the CPA-10 that it is interlocked with other selected systems in its assigned Sync Loop. The RUN switch initiates the automated presentation, while the STOP switch halts the film presentation.

The Keypad consists of numeric, program, and function keys. The Display Screen shows the current status of the system in the RUN mode or the instruction being edited in the SET-UP mode. The Display Screen can be electronically "tilted" to provide the best viewing angle.

The SET-UP key is used for gaining access to program and supervisory functions. Access to the SET-UP mode is limited to two PASSWORDs: the low level password allows programming of the film formats, clock start times, interlocked operation, while a high level password allows extensive programming of the systems functions. The SET-UP mode is used with PROGRAM to change or modify the presentation, or with SUPERVISORY to change or modify the basic configuration of the system. A Flow Chart (Section 6.1)

shows method of access and data entry. INSERT, DELETE, ENTER, CLEAR, CHANGE, COPY, and the SCROLL keys are used during the editing of a program. CUE LEARN turns on the LEARN function, while CUE INPUT manually inserts a film cue in the program. TIMER and CLOCK functions automatically start the selected PROGRAM. If a program is halted due to a film break, an alarm will sound at remote stations; it may be cancelled with ALARM CANCEL and the program re-started with RESUME.

## 2.0 TERMS AND DEFINITIONS

A PRESENTATION is the entire sequence of automated events controlled by the CPA-10 Automation, including a series of Intermission functions. A PRESENTATION might include automatic timed starts of several programs on a daily schedule (using CLOCK function).

A PROGRAM is a particular series of events and functions that will take place during a Presentation. Each PROGRAM can contain up to 70 Instructions, or Program Steps, which are performed sequentially. The CPA-10 has the capability of storing nine different Programs, and of running these programs in any scheduled sequence according to the internal clock/calendar.

An INSTRUCTION is a particular function that will be executed during a Program Step. It may have a timed relationship to the step; that is, House Lights may be programmed to raise thirty seconds after the Step is encountered in the Program List. Each of these functions is identified by a particular Instruction Number.

PASSWORDs allow access to two levels of the CPA-10. PASSWORD 2 is for Supervisory personnel and allows access to all levels of the system, including full PROGRAM listing. PASSWORD 1 allows access to basic programming functions that would be required for normal booth operation.

FORMAT is the determination of the parameters of the film format, including: type of sound (SVA, SR, MONO, SPECIAL 1, SPECIAL 2); projection lens (Flat or Scope); and a "SPECIAL" switch that may be used for selection of a higher rate of film projection. Each Program (1-9) is capable of ten Formats and cues. FORMATs are initiated by the RUN switch (show start, FORMAT 1), and by subsequent film cues.

The CUE LEARN function allows the automation to "remember" what should happen in a program, and will initiate those functions in a program if those cues are missing and the system is in the "Learned" mode.

SET-UP allows programming of different functions. Supervisory and extensive PROGRAM SET-UPs are available only to PASSWORD 2. PASSWORD 1 has access only to PROGRAM FORMATS, CLOCK SET-UP, INTERLOCK SET-UP, and CUE LEARN functions.

SUPERVISORY is a set of system functions including relay contact configuration, power up states, maintenance schedules, interlock configurations, along with other system parameters most of which will be set up at system installation and not changed unless there is a hardware change.

most SUPERVISORY specifications can only be changed using PASSWORD 2.

## 3.0 NORMAL OPERATION

Normal operation assumes completion of the basic programming of the CPA-10 to perform normal functions. This initial programming should be accomplished as the equipment is installed according to the requirements of the theater by the installing engineers, and can be changed only by Supervisory personnel using PASSWORD 2.

PASSWORD 1 ( set by the Supervisor) allows a lower level of programming for normal operation. Generally, the daily program operation will require only modification of show times or film FORMAT changes that occur with normal changes of feature films. This level of programming is accessed by both PASSWORDS 1 and 2.

It is important to note that the CPA-10 functions in a manner similar to current automation technology in that a prescribed sequences of events are performed at a given input, such as pushing the RUN button or sensing of a foil film cue. However, the CPA-10 can perform many more functions in a wide variety of ways, all of which are fully programmable.

### 3.1 POWER UP SCREEN

The CPA-10 will display a status screen for 2 seconds upon power up. This screen indicates the software version number (i.e. VERSION 1.001). and the checksum number (i.e. CHECKSUM 45277). The checksum number is a diagnostic tool which indicates the result of the EPROM checksum calculation. This number should be recorded and posted for future reference. The number will be the same on all CPA-10s using the same software version. If the number changes, erratic behavior will result. Contact factory for assistance.

## 4.0 SET-UP OF SUPERVISORY FUNCTIONS.

Supervisory is a set of system functions including relay contact configuration, power up states, maintenance schedules, interlock configurations, status indicators, along with other system parameters most of which will be set up when the system is first installed and subsequently changed only when technological developments or basic presentation changes are required. On the following pages is a complete listing of SUPERVISORY FUNCTIONS followed by detailed descriptions of each function.

Programming functions of the SUPERVISORY are broken down into two specific levels. Each requires a password for entry (low level and high level password) which prevents unauthorized access. Low level programming functions cover areas normally performed by the projectionist and relate to changes which are specific to an individual presentation. Low level password has access to the following: film formats, clock start times, interlock set up, cue learn functions, and time of day. High level password allows access to all SUPERVISORY functions.

## 4.1 ENTERING THE SET-UP SUPERVISORY MODE

| KEYSTROKE | DISPLAY SCREEN | COMMENT |
|---|---|---|
| SET-UP | SELECT FUNCTION TO SET-UP | |
| SUPERVISORY | ENTER PASSWORD | |

At this point, password 2 or the high level password is required.

| KEYSTROKE | DISPLAY SCREEN | COMMENT |
|---|---|---|
| PASSWORD 2 | SET-UP SUPERVISORY | 1 SEC. DELAY |
| | SELECT FUNCTION **1** | |

NOTE: Bold print denotes a flashing display.

Legal entries for this screen are the numbers 1 through 32. Entry of any legal number followed by the ENTER key will display the corresponding function. SUPERVISORY functions can also be scrolled through by use of the scroll keys. Each time the scroll keys are depressed the next SUPERVISORY function will be displayed on the display. The flashing cursor indicates the field which is to be edited. Data must be valid to exit SUPERVISORY screens (exit always saves data.) Table 1.1 on the following page list the 32 supervisory functions

TABLE 4.0 SUPERVISORY FUNCTIONS

| FUNCTION | DISPLAY | | LEGAL VALUES |
|---|---|---|---|
| 1 | SYNC LOOP | X | (0 DISABLES 1 TO 8 ACTIVE) |
| 2 | SYNC OVER | .... .... .... .... | (CANNOT EDIT STATUS ONLY) |
| 3 | SYNC ID | XX | (0 DISABLES 1 TO 16 ACTIVE) |
| 4 | NETWORK ID | XX | (NOT CURRENTLY AVAILABLE) |
| 5 | SET DAY OF WEEK | MONDAY | (MONDAY TO SUNDAY) |
| 6 | SET TIME OF DAY | 12:00 AM | (1:00 TO 12:59 AM OR PM) |
| 7 | SOUND C/O DELAY | XX SEC | (3 TO 59 SECS.) |
| 8 | LENS C/O TIME | X SEC | (0 DISABLES 1 TO 9 SECS.) |
| 9 | CHANGEOVER PULSE | X SEC | (.1 TO 1.0 SEC.) |
| 10 | FAILSAFE BOBBLE DELAY | XX SEC | (1 TO 10 SECS.) |
| 11 | CUE FACTOR DEFAULT | .XXX SEC | (.001 TO .999) |
| 12 | CUE LEARN | AUTO | (AUTO/MANUAL) |
| 13 | TIMED START | YES | (YES/NO) |
| 14 | CLOCK START | YES | (YES/NO) |
| 15 | REMOTE CONFIGURATION | X | (A/B/C/D) |
| 16 | PASSWORD 1 | XX | (1 TO 99 LOW LEVEL) |
| 17 | CURTAIN CONTACTS | PULSED | (PULSED/MAINTAINED) |
| 18 | LIGHTS CONTACT | PULSED | (PULSED/MAINTAINED) |
| 19 | LENS/MASK CONTACTS | PULSED | (PULSED/MAINTAINED) |
| 20 | SOUND CONTACTS | PULSED | (PULSED/MAINTAINED) |
| 21 | NON-SYNC DRY CONTACTS | PULSED | (PULSED/MAINTAINED) |
| 22 | CHANGEOVER CONTACTS | PULSED | (PULSED/MAINTAINED) |
| 23 | POWER UP HOUSE LIGHTS | BRIGHT | (BRIGHT/DIM/NONE) |
| 24 | POWER UP STAGE LIGHTS | BRIGHT | (BRIGHT/DIM/NONE) |
| 25 | POWER UP CURTAINS | OPEN | (OPEN/CLOSE/NONE) |
| 26 | POWER UP AUX PROJECTOR | ON | (ON/OFF) |
| 27 | FAULT TO CURTAIN | NONE | (OPEN/CLOSE/NONE) |
| 28 | FAULT TO AUX PROJECTOR | NONE | (ON/OFF/NONE) |
| 29 | RUN HOURS | XXXXX | (STATUS ONLY) |
| 30 | SCHEDULE A | XXXX HRS XXXX ELAPSED | (EDIT SET POINT 1234 CLEAR) |
| 31 | SCHEDULE B | XXXX HRS XXXX ELAPSED | (EDIT SET POINT 1234 CLEAR) |
| 32 | SCHEDULE C | XXXX HRS XXXX ELAPSED | (EDIT SET POINT 1234 CLEAR) |
| 33 | SCHEDULE D | XXXX HRS XXXX ELAPSED | (EDIT SET POINT 1234 CLEAR) |

## 4.2 SUPERVISORY FUNCTION DEFINITIONS.

FUNCTION 1

01 SYNC LOOP X

Function 1 is one of the three supervisory functions assigned to synchronous operation. The CPA-10 offers the flexibility to have up to 8 different sync loops active in a multiplex at any one time.
Function 1 (using password 1 or 2) assigns a particular machine or house to one of 8 sync loops.
Legal values are 1 through 8., 0 disables the system from interlocked operation. Enter data with the number keys.

FUNCTION 2

02 SYNC OVER 5585 8868 6665 1115

Function 2 is a sync status screen. Utilizing the synchronous communication line the CPA-10 displays the status of all houses in a multiplex from one location. Up to 16 houses may be displayed. Password 1 or 2 allows access to this function.

In our example the CPA-10 designated as house 1 is assigned to sync loop 5 along with house 2,4,12 and 16. Likewise house 3,5,6 and 8 are assigned to sync loop 8. It only display the information as it existed when you entered the supervisory mode. Any changes you make on a particular machine will not be updated until you exit the supervisory mode. Verification of changes requires that the set-up supervisory mode be exited and then re-entered so that the screen is updated.

FUNCTION 3

03 SYNC ID XX

Function 3 is used to define each CPA-10 in a multiplex environment. Each house or auditorium must have a unique identification number for the synchronous mode to operate properly. Legal entries are 1 through 16. (0 disables.) Enter data with the number keys. This function may be viewed and edited with passwords 1 or 2.

FUNCTION 4

04 NETWORK ID XX

Function 4 is similar to function 3 in that it is an identification for the CPA-10. This function is currently not used but it is included to facilitate the use of a centralized LAN (local area network) at a later date.

FUNCTION 5

05 SET DAY OF WEEK MONDAY

Function 5 allows you to set the internal clock (battery-backed). Valid entries are the days of the week. To change the day simply push the appropriate key labeled Monday through Sunday.

FUNCTION 6

06 SET TIME OF DAY 12:00 AM

Function 6 allows you to set the clock. Enter the appropriate time values using the numbered keys. Toggle the AM and PM with change key.

FUNCTION 7

07 SOUND C/O DELAY XX SEC

Function 7 controls the delay time between the show start input and the sound changeover from the non-sync music source to the film sound source. For example, with the SOUND C/O DELAY set for 5 seconds, 5 seconds after the show starts the changeover will open and 5 seconds after the last cue (end of show cue) is encountered the changeover will close. The legal range is 3 to 59 seconds. Enter data with the number keys.

FUNCTION 8

08 LENS C/O TIME X SEC

Function 8 represents the time required for the lens changer to change positions from flat to scope and vise-versa. The time is used to control lens changeover functions in the changeover auto mode (see SET-UP PROGRAM MODE). In the changeover auto mode, when the computer is controlling the opening and closing of the changeover based on format commands, the changeover is closed while the lens changer is in motion so that audience sees a professional presentation. Upon expiration of the timer the changeover is reopened. legal value range is 1 to 9 seconds. 0 disables the function. Data entry is made with the number keys.

FUNCTION 9

09 CHANGEOVER PULSE X SEC

Function 9 controls the length or duration of the pulse sent to the changeover device. The legal values are from .1 to 1.0 seconds. It is strongly recommended that the CHANGEOVER PULSE be set to the minimum value that allows the changeover to complete its full stroke. Enter data with the number keys.

FUNCTION 10

10 FAILSAFE BOBBLE DELAY XX SEC

Function 10 is designed to prevent premature shutdown caused by platter or other types of rewind and film transport equipment during startup or any other portion of the presentation. Anytime the failsafe arms fall during a presentation the FAILSAFE BOBBLE delay timer is actuated, if the failsafe arms return to the up position before the timer expires the presentation is not shut down. If, however, at the end of the set time the failsafe arms have not returned to the up position the presentation is stopped. Legal entries are 1 to 10 seconds. Enter data with the number keys.

FUNCTION 11

11 CUE FACTOR DEFAULT .XXX

Function 11 is used in conjunction with the CPA-10 Cue Learn system. This system learns the cue locations the first time a presentation is shown and places a "window" based on the size of the CUE FACTOR. In the event of a missed cue, the CPA-10 maintains the proper timing of events by artificially implanting the cue at the end of the window (see CUE LEARN MODE section A.2). The valid range is .000 to .999. Enter data with the number keys.

FUNCTION 12

12 CUE LEARN XXX

Function 12 allows the CUE LEARN MODE to be manually or automatically terminated at the end of the first presentation. In the MANUAL mode the operator is required to manually deactivate the CUE LEARN mode by pressing the CUE LEARN key after the first presentation is completed. In the AUTO mode the CPA-10 assumes that all cues were in their proper location and the presentation went as planned. At the end of the first presentation the CPA-10 will automatically deactivate the CUE LEARN mode. Legal entries are AUTO and MANUAL. Toggle data with the CHANGE key.

FUNCTION 13

13 TIMED START XXX

Function 13 controls the operators access to the timed autostart function. This function either enables or disables the TIMER function. Legal states are YES/NO. Enter data with the CHANGE key. See section 8.0 for more information.

FUNCTION 14

14 CLOCK START XXX

Function 14 controls the operation access to the CLOCK autostart. Function in the same manner as the timed start function above. Legal states are YES/NO. Enter data with the CHANGE key. See section 7.0 for more information.

FUNCTION 15

15 REMOTE CONFIGURATIONS X

Function 15 is designed to provide multiple REMOTE STATION CONFIGURATION. The CPA-10 currently offers 4 variations utilizing up to five outputs each. The current list of remote station outputs for VERSIONS 1.001, 1.002 and 1.004 are define as follows.

ALARM: On when a fault stops the projector during the movie. Off between shows and there is no faults.

READY: On when failsafe arms are up. Off when failsafe arms are down.

READY (version 1.002): On when motor is running between show start and sensing of end cue. Blinking when "READY TO RUN" during intermission.

LOAD: On when the failsafe arms are down. Off when the failsafe arms are up.

LOAD 1 (version 1.004): Same as load.

LOAD 2 (version 1.004): Blinking when failsafe arms are down. On when failsafe arms are up and motor is off.

SHOW RUNNING: On between show input and the sensing of the end cue. Off if stopped or if a fault exists.

PROJECTOR RUNNING: On when the projector motor is running. Off when the projector motor is stopped.

INTERMISSION: On between the end of show cue and the run or start input. Off between the run or start input and the end of show cue.

TRAILER: Not intermission and when house lights are half 1.

FEATURE: Not intermission and when house lights are dim.

CREDITS: Not intermission and when house lights are half 2.

The four (4) remote configurations are referred to as A, B, C and D. They each utilize a different combination of the remote station outputs which are terminated at connector P13 pins 1 through 5.

| CONFIG. | PINOUT | V1.001 | V1.002 | V1.004 |
|---|---|---|---|---|
| A | P13-1 | ALARM | ALARM | ALARM |
| | P13-2 | READY | READY | READY |
| | P13-3 | LOAD | LOAD | LOAD 1 |
| B | P13-1 | ALARM | ALARM | ALARM |
| | P13-2 | LOAD | LOAD | LOAD 2 |
| | P13-3 | SHOW RUNNING | SHOW RUNNING | SHOW RUNNING |
| C | P13-1 | ALARM | ALARM | ALARM |
| | P13-2 | LOAD | LOAD | LOAD 1 |
| | P13-3 | PROJ. RUNNING | INTERMISSION | INTERMISSION |
| D | P13-1 | ALARM | ALARM | ALARM |
| | P13-2 | TRAILER | TRAILER | TRAILER |
| | P13-3 | FEATURE | FEATURE | FEATURE |
| | P13-4 | CREDIT | CREDIT | CREDIT |
| | P13-5 | INTERMISSION | INTERMISSION | INTERMISSION |

Legal entries are A, B, C and D. Enter data with the change key.

## FUNCTION 16

16 PASSWORD #1 XX

Function 16 defines the low level or projectionists' password. The low level password allows access to the synchronous set up and time functions of the supervisory mode, the clock set-up mode, the program set-up mode (format commands only) and the cue learn set-up mode. It allows the projectionists to perform all functions required in his job while maintaining protection for the high level information. Legal entries are 01 to 99. Enter data with the number keys.

FUNCTION 17

17 CURTAIN CONTACTS PULSED

Function 17 allows the relay contact closure to be field configurable. Legal entries are PULSED and MAINTAINED. Data is toggled with the change key.

FUNCTION 18

18 LIGHT CONTACTS PULSED

Function 18 allows the relay contact closure to be field configurable. Legal entries are PULSED and MAINTAINED. Data is toggled with the change key.

FUNCTION 19

19 LENS/MASK CONTACTS PULSED

Function 19 allows the relay contact closure to be field configurable. Legal entries are PULSED and MAINTAINED. Data is toggled with the change key.

FUNCTION 20

20 SOUND CONTACTS PULSED

Function 20 allows the relay contact closure to be field configurable. Legal entries are PULSED and MAINTAINED. data is toggled with the change key.

FUNCTION 21

21 NON-SYNC DRY CONTACTS PULSED

Function 21 allows the relay contact closure to be field configurable. legal entries are PULSED and MAINTAINED. Data is toggled with the change key.

FUNCTION 22

22 CHANGEOVER CONTACTS PULSED

Function 22 allows the relay contact closure to be field configurable. Legal entries are PULSED and MAINTAINED. Data is toggled with the change key.

FUNCTION 23

23 POWER UP HOUSE LIGHTS BRIGHT

Function 23 controls the power up state of the house lights. Any time the computer resets due to cycling of power it will revert to this state. Legal entries are BRIGHT, DIM, HALF 1, HALF 2 and NONE. The NONE state tells the computer to do nothing but maintain the status quo. Enter data with the change key.

FUNCTION 24

24 POWER UP STAGE LIGHTS BRIGHT

Function 24 controls the power up state of the stage lights. Any time the computer resets due to cycling of power it will revert to this state. Legal entries are BRIGHT, DIM and NONE. The NONE state tells the CPA-10 to do nothing except maintain the status quo. Data entry is performed with the change key.

FUNCTION 25

25 POWER UP CURTAIN OPEN

Function 25 controls the power up state of the curtain. Anytime the computer resets sue to the cycling of power it will revert to this state. Legal states are OPEN, CLOSE, and NONE. The NONE state instructs the CPA-10 to maintain the status quo. Data entry is performed by using the change key.

FUNCTION 26

26 POWER UP AUX PROJECTOR ON

Function 26 controls the power up state of the auxiliary projector. Any time the CPA-10 resets due to cycling of power it will revert to this state. Legal entries are ON, OFF, and NONE. The NONE state tells the CPA-10 to do nothing except maintain the status quo. Data entry is made with the change key.

FUNCTION 27

27 FAULT TO CURTAIN NONE

Function 27 controls the fault state of the program. In the event of a fault which shuts the presentation down (i.e. xenon failure, exciter failure, failsafe, etc.) the CPA-10 reverts to this function to determine what it should do with the curtain output. Legal states are OPEN, CLOSE, and NONE. Data entry is preformed with the change key.

FUNCTION 28

28 FAULT TO AUX PROJECTOR NONE

Function 28 controls the fault state of the program. In the event of a fault which shuts the show down (i.e. xenon failure, exciter failure, failsafe, etc.) the computer reverts to this function to determine what it should do with the auxiliary projector output. Legal entries are ON, OFF, none. Data entry is performed with the change key.

FUNCTION 29

29 RUN HOURS XXXXX

Function 29 is an internal clock which tracks the total number of hours the CPA-10 as been running in the filed. It represents the summation of the total run hours as calculated from the time the run input is sensed until the end cue is detected. The timer may be cleared by utilizing a special access code. Consult the factory for details.

FUNCTION 30

30 SCHEDULE A XXXX HRS XXXX ELAPSED

Function 30 allows the setting of a timer in hours which will notify the operator each time an even multiple of the number is passed in terms of cumulative run hours. This timer is commonly used to drive periodic maintenance or keep track of specific equipment life such as the xenon bulb. Legal values range from 1 to 9999 hours. Data entry is made with the number keys.

In certain applications the elapsed timer must be cleared such as when a xenon bulb is replaced. The elapsed timer may be cleared by entering 1234 clear. The LCD display will show nothing until the entire sequence is completed. At that time the display will show elapsed hours as 0.

FUNCTION 31

31 SCHEDULE B XXXX HRS XXXX ELAPSED

See FUNCTION 30 for details

FUNCTION 32

32 SCHEDULE C XXXX HRS XXXX ELAPSED

See FUNCTION 30 for details

FUNCTION 33

33 SCHEDULE D XXXX HRS XXXX ELAPSED

See FUNCTION 30 for details

## 5.0 SET-UP PROGRAMS

In the SET-UP PROGRAM MODE the operator can design and program up to nine (9) individual programs which control the presentation. Each program may contain up to 70 lines of instruction. In this section the procedures, rules and regulations covering the program functions are covered. The CPA-10 offers complete flexibility in customizing a presentation. The following table, Table 5.0 contains the 27 program instructions currently offered in the unit.

TABLE 5.0 PROGRAM INSTRUCTIONS

| | INSTRUCTION | | RANGE |
|---|---|---|---|
| 01 | HOUSE LIGHTS BRIGHT | MM:SS | 00:00 TO 59:59 MINUTES/SECONDS |
| 02 | HOUSE LIGHTS DIM | MM:SS | 00:00 TO 59:59 MINUTES/SECONDS |
| 03 | HOUSE LIGHTS HALF 1 | MM:SS | 00:00 TO 59:59 MINUTES/SECONDS |
| 04 | HOUSE LIGHTS HALF 2 | MM:SS | 00:00 TO 59:59 MINUTES/SECONDS |
| 05 | HOUSE LIGHTS NONE | MM:SS | 00:00 TO 59:59 MINUTES/SECONDS |
| 06 | STAGE LIGHTS BRIGHT | MM:SS | 00:00 TO 59:59 MINUTES/SECONDS |
| 07 | STAGE LIGHTS DIM | MM:SS | 00:00 TO 59:59 MINUTES/SECONDS |
| 08 | STAGE LIGHTS NONE | MM:SS | 00:00 TO 59:59 MINUTES/SECONDS |
| 09 | CURTAIN OPEN | MM:SS | 00:00 TO 59:59 MINUTES/SECONDS |
| 10 | CURTAIN CLOSE | MM:SS | 00:00 TO 59:59 MINUTES/SECONDS |
| 11 | CURTAIN NONE | MM:SS | 00:00 TO 59:59 MINUTES/SECONDS |
| 12 | CURTAIN CALL | MM:SS | 00:00 TO 59:59 MINUTES SECONDS |
| 13 | CURTAIN CLOSE EARLY | MM:SS | 00:00 TO 59:59 MINUTES/SECONDS |
| 14 | AUX PROJECTOR ON | MM:SS | 00:00 TO 59:59 MINUTES/SECONDS |
| 15 | AUX PROJECTOR OFF | MM:SS | 00:00 TO 59:59 MINUTES/SECONDS |
| 16 | CUE FACTOR | .XXX | .001 TO .999 |
| 17 | FORMAT SOUND;LENS;FILM SPEED | | MONO FLAT 24<br>SVA SCOPE SPECIAL<br>SPECIAL 1<br>SPECIAL 2<br>SPECIAL 3 |
| 18 | WAIT CUE | XX | 0 TO 10 |
| 19 | SHUT DOWN DELAY | MM:SS | 00:00 TO 59:59 MINUTES/SECONDS |
| 20 | WAIT | MM:SS | 00:00 TO 59:59 MINUTES/SECONDS |
| 21 | CHANGEOVER OPEN | MM:SS | 00:00 TO 59:59 MINUTES/SECONDS |
| 22 | CHANGEOVER CLOSE | MM:SS | 00:00 TO 59:59 MINUTES/SECONDS |

| | | | |
|---|---|---|---|
| 23 | CHANGEOVER NONE | MM:SS | 00:00 TO 59:59 MINUTES/SECONDS |
| 24 | CHANGEOVER AUTO | MM:SS | 00:00 TO 59:59 MINUTES/SECONDS |
| 25 | EXCITER ON | MM:SS | 00:00 TO 59:59 MINUTES/SECONDS |
| 26 | EXCITER OFF | MM:SS | 00:00 TO 59:59 MINUTES/SECONDS |
| 27 | EXCITER AUTO | MM:SS | 00:00 TO 59:59 MINUTES/SECONDS |

## 5.1 PROGRAM INSTRUCTION DEFINITIONS

Review these descriptions before proceeding. Rules concerning their application and limitations are noted.

HOUSE LIGHTS

| INSTRUCTION NUMBER | INSTRUCTION | RANGE |
|---|---|---|
| 01 | HOUSE LIGHTS BRIGHT | 00:00 TO 59:59 M/S |
| 02 | HOUSE LIGHTS DIM | 00:00 TO 59:59 M/S |
| 03 | HOUSE LIGHTS HALF 1 | 00:00 TO 59:59 M/S |
| 04 | HOUSE LIGHTS HALF 2 | 00:00 TO 59:59 M/S |
| 05 | HOUSE LIGHTS NONE | 00:00 TO 59:59 M/S |

This set of instructions each operate in the same manner to intelligently control the four House Light outputs. A single timer is used to implement these five instructions. Execution of the instruction simply sets and enables the timer. Executing one of these instructions again (before the timer times out) simply overrides the previous instruction. The time is specified in minutes and seconds. Control immediately interprets the next instruction in the list. Later when the timer times out (independently counts down to zero) the four outputs are set to the desired state:

| | OUTPUT | | | |
|---|---|---|---|---|
| | BRIGHT | DIM | HALF 1 | HALF 2 |
| BRIGHT | ON | OFF | OFF | OFF |
| DIM | OFF | ON | OFF | OFF |
| HALF 1 | OFF | OFF | ON | OFF |
| HALF 2 | OFF | OFF | OFF | ON |
| NONE | OFF | OFF | OFF | OFF |

When the outputs are configured for PULSED, only a transition to the on state will cause the to occur.

| INSTRUCTION NUMBER | INSTRUCTION | RANGE |
|---|---|---|
| 06 | STAGE LIGHTS BRIGHT | 00:00 TO 59:59 M/S |
| 07 | STAGE LIGHTS DIM | 00:00 TO 59:59 M/S |
| 08 | STAGE LIGHTS NONE | 00:00 TO 59:59 M/S |

This set of instructions each operate in the same manner to control the 2 Stage light outputs. A single timer is used to implement these three instructions. Execution of the instruction simply sets and enables the timer. Executing one of these instruction again (before the timer times out) simply overrides the previous instruction. The time is specified in minutes and seconds. Control immediately interprets the next instruction in the list. When the timer times out the two outputs are set to the desired state.

| | OUTPUT | |
|---|---|---|
| | BRIGHT | DIM |
| BRIGHT | ON | OFF |
| DIM | OFF | ON |
| NONE | OFF | OFF |

When the outputs are configured for pulsed, only a transition to the on state will cause the pulse to occur.

| INSTRUCTION NUMBER | INSTRUCTION | RANGE |
|---|---|---|
| 09 | CURTAIN OPEN | 00:00 TO 59:59 M/S |
| 10 | CURTAIN CLOSE | 00:00 TO 59:59 M/S |
| 11 | CURTAIN NONE | 00:00 TO 59:59 M/S |

This set of instructions each operate in the same manner to intelligently control the 2 curtain outputs. A single timer is used to implement these 3 instructions. Execution of the instructions simply sets and enables the timer. executing one of these instructions again (before the timer times out) simply overrides the previous instruction. The time is specified in minutes and seconds. Control immediately interprets the next instruction on the list. Later, when the timer times out the two outputs are set to the desired states:

| | OUTPUT | |
|---|---|---|
| OPEN | ON | OFF |
| CLOSE | OFF | ON |
| NONE | OFF | OFF |

When the outputs are configured for pulsed, only a transition to the on state will cause the pulse to occur.

| INSTRUCTION NUMBER | INSTRUCTION | RANGE |
|---|---|---|
| 12 | CURTAIN CALL | 00:00 TO 59:59 M/S |

This is special instruction that is active only when running in the LEARNED MODE. Based on the learned time of the next film cue, the instruction calculates the time before that cue and executes a curtain close output. Upon reading that cue the curtain will reopen. For example, with the CURTAIN CALL set for a time of 10 seconds the curtain will start to close 10 seconds before the next cue is read. When the cue is read the curtains will begin to open. This instruction can be used to close the curtain at the end of a trailer and then reopen the curtain at the beginning of the main feature. Time is specified in minutes and seconds and should be set 2 to 5 seconds longer than the time required for the curtain to fully close. Control immediately interprets the next instruction on the list.

| INSTRUCTION NUMBER | INSTRUCTION | RANGE |
|---|---|---|
| 13 | CURTAIN CLOSE EARLY | 00:00 TO 59:59 M/S |

This specialized function instruction is only active in the LEARNED mode. The curtain will close prior to the last cue. The amount of time set controls how early the curtain closes. This could be used to synchronize the curtain closing with the changeover to prevent the audience from seeing a white screen at the end of the presentation.

| INSTRUCTION NUMBER | INSTRUCTION | RANGE |
|---|---|---|
| 14 | AUX PROJECTOR ON | 00:00 TO 59:59 M/S |
| 15 | AUX PROJECTOR OFF | 00:00 TO 59:59 M/S |

This set of instructions operate to control the AUXILIARY PROJECTOR outputs. A single timer controls these instructions. Executing one of these instructions sets and enables the timer. Executing one of again (before the timer times out) overrides the previous instruction. Time is specified in minutes and seconds. Data entry is made with the number keys.

| INSTRUCTION NUMBER | INSTRUCTION | RANGE |
|---|---|---|
| 16 | CUE FACTOR | .000 TO .999 |

This instruction overrides the CUE FACTOR DEFAULT (supervisory function) for the remainder of the program and adjusts the cue window accordingly. Control immediately interprets the next instruction on the list. Data entry is made with the number keys.

| INSTRUCTION NUMBER | INSTRUCTION | RANGE |
|---|---|---|
| 17 | FORMAT X : SOUND:LENS:SPEED | |

This instruction allows the film format parameters to be selected. The changeover occurs as defined in supervisory function. System immediately interprets next instruction on the list. Sound selections includes: MONO, SVA (STEREO), SPECIAL 1, SPECIAL 2, AND SPECIAL 3. SPECIAL 1, 2, and 3 can be used for any desired function i.e. a mute, synthesized stereo, magnetic, special types of noise reduction.

| INSTRUCTION NUMBER | INSTRUCTION | RANGE |
|---|---|---|
| 18 | WAIT CUE X | 1 TO 10 |

This instruction causes the program to wait for one of the following: In the CUE LEARN ACTIVE MODE:

Film cue (foil)
CUE INPUT (keypad)
Failsafe when last cue is expected by program

In the CUE LEARN NOT ACTIVE (LEARNED MODE)

Film cue within learned cue window
CUE INPUT (keypad)
Failsafe within last cue window

Control immediately executes next instruction on the list. Data entry is made with the number keys.

| INSTRUCTION NUMBER | INSTRUCTION | RANGE |
|---|---|---|
| 19 | SHUT DOWN DELAY | 00:00 TO 59:59 M/S |

This instruction performs a shut down of the projector/lamp in the time specified after the last cue. This instruction MUST be placed before the last WAIT CUE instruction in the program. Time is specified in minutes and seconds. If the time is set for 0:00 shut down will occur immediately upon changeover close at show end. To delay shut down, the timer must be set longer than the changeover delay time in supervisory. This can be used to allow film to clear projector before shut down.

| INSTRUCTION NUMBER | INSTRUCTION | RANGE |
|---|---|---|
| 20 | WAIT | 00:00 TO 59:59 M/S |

This instruction causes a delay for the specified time in minutes and seconds. When the WAIT instruction is read the timer is set. No other instructions in the program are executed until the timer times out. Generally this instruction will be used for intermission features. When

used during a presentation a manual cue input or a film cue will override this instruction and control will immediately execute the next instruction on the list. If used during an intermission, a start input will abort the WAIT instruction.

| INSTRUCTION NUMBER | INSTRUCTION | RANGE |
|---|---|---|
| 21 | CHANGEOVER OPEN | 00:00 TO 59:59 M/S |
| 22 | CHANGEOVER CLOSE | 00:00 TO 59:59 M/S |
| 23 | CHANGEOVER NONE | 00:00 TO 59:59 M/S |
| 24 | CHANGEOVER AUTO | 00:00 TO 59:59 M/S |

This set of instructions allows more control of the SOUND CHANGEOVER outputs. Time is specified in minutes and seconds. The CHANGEOVER NONE instruction simply overrides the CHANGEOVER AUTO function allowing you to open and close the changeover using instructions 21 and 22. The CHANGEOVER NONE will not be active until the timer expires (if a time is specified). When using instructions 21 and 22 before the first cue, the CHANGEOVER OPEN delay time must be set at a value less than that of the of the SOUND C/O delay that is set in supervisory. After the first cue the CHANGEOVER CLOSE time must be set to 0. The CHANGEOVER OPEN time can be set to the amount of time you would like the changeover closed. At the last cue (end of show cue ) the changeover will close in the predetermined amount of time regardless of the mode it is in. CHANGEOVER AUTO always puts the changeover outputs back into the auto mode in the time specified. Data entry is made with the number keys.

| INSTRUCTION NUMBER | INSTRUCTION | RANGE |
|---|---|---|
| 25 | EXCITER ON | 00:00 TO 59:59 M/S |
| 26 | EXCITER OFF | 00:00 TO 59:59 M/S |
| 27 | EXCITER AUTO | 00:00 TO 59:59 M/S |

This set of instructions allows more control over the exciter outputs. Time is specified in minutes and seconds. The EXCITER ON and EXCITER OFF instructions simply turn on or off the exciter lamp in a program. The EXCITER AUTO returns the control of the exciter back to the auto mode. Control immediately interprets the next instruction on the list.

## 5.2 BASIC PROGRAM OPERATION

A PROGRAM is a series of events that the system will perform in the order in which those instructions are encountered in a PROGRAM list. Many instructions have timers that determine when the actual event will take place in relation to when the instructions is encountered. For example, a HOUSE LIGHTS DIM--0:30 instruction is encountered; the system understands this instruction in the list and proceeds to the next instruction on the list, then 30 seconds later the house lights will dim.

Important PROGRAM INSTRUCTIONS are: FORMAT, WAIT CUE, AND WAIT

FORMAT: Format configuration will be displayed when the system is running a film presentation, show the type of sound, lens, and projector speed used. to 10 different FORMAT instructions can be used during a program.

WAIT CUE: The run input can be thought of as a first cue that starts the program. All instructions are executed until the first WAIT CUE is encountered. The cue may be from the cue detector assembly or from the CUE INPUT key on the control panel. The system will then perform the next set of instructions on the list. When the last WAIT CUE instruction in the program list is encountered, the system will perform the End of Show functions (changeover close, sound to non-sync, etc.). A maximum of ten cues may be encountered in a Program.

WAIT: Halts the execution of any program instructions for a prescribed period of time in minutes and seconds. WAIT may be used in a Program during a film portion of the program, as well as after the film to initiate programmed intermission functions. After the programmed time has expired, the system performs the next instruction on the list. WAIT may be terminated at any time by pressing the RUN or CUE INPUT.

## 5.3 SAMPLE PROGRAM VIEWING AND EDITING

Each CPA-10 is shipped from the factory with a SAMPLE PROGRAM stored in program locations 1 through 9 (using the COPY function). The SAMPLE PROGRAM resides in program location 10 and cannot be edited.

Refer to the SAMPLE PROGRAM (Appendix B ). Program listing for both passwords are shown; the visible information can be edited as required. This program uses four cue and includes four film formats, house half light level, curtain call and slide projection during the programmed intermission. The program can be viewed and edited as follows with PASSWORD 1:

| KEYSTROKE | DISPLAY SCREEN | | | COMMENT |
|---|---|---|---|---|
| [SET-UP] | SELECT FUNCTION TO SET-UP | | | |
| [PROGRAM] | ENTER PASSWORD | | | |
| [PASSWORD 1] | SET-UP PROGRAMS | | | 1 SEC. DELAY |
| | 1- 1 FORMAT 1: MONO | FLAT | 24 | VIEW |
| [SCROLL DOWN] | 1- 7 FORMAT 2: MONO | FLAT | 24 | VIEW |
| [SCROLL RIGHT] | 1- 7 FORMAT 2: **MONO** | FLAT | 24 | EDIT |
| [CHANGE] | 1- 7 FORMAT 2: **SPECIAL1** | FLAT | 24 | EDIT |
| [SCROLL RIGHT] | 1- 7 FORMAT 2: SR | **FLAT** | 24 | EDIT |
| [CHANGE] | 1- 7 FORMAT 2: SR | **SCOPE** | 24 | EDIT |
| [PROGRAM] | MANUAL START MODE | | | 1 SEC. DELAY |
| | PROGRAM 1 READY TO RUN | | | |

Note that BOLD print denotes a flashing display. The above steps have gained access to two of the four FORMAT specifications of PROGRAM 1, steps 1 and 7, using PASSWORD 1. The editing steps above changed the format of the second trailer from MONO to SPECIAL 1 and the lens from FLAT to SCOPE; the other parameter of the format (speed) remains unchanged.

Depending on the theater requirement, this program might be used for many film presentations with a few modifications. For instance, FORMAT 1 is for trailers; FORMAT 2 is for a short feature; FORMAT 3 is for the main feature. Note that film formats can be specified and changed as required. This same program can run a flat feature one day and a scope feature the next if the appropriate format specification is given.

PASSWORD 2 would have allowed access and the ability to edit the entire program in a similar manner. SCROLL UP/DOWN moves through the program steps, while SCROLL LEFT/RIGHT allows the fields of the instruction being viewed to be edited. INSERT and DELETE allow the insertion and removal of entire steps from a program (see next section). Note that programs in progress may be viewed but not edited, including programs in a WAIT state during intermission functions. In order to edit a program in a WAIT condition during an intermission, press the CUE INPUT key once ending the program. You will then be able to edit the program.

## 5.4 BUILDING PROGRAMS

The process of building a program requires access to the SET-UP PROGRAMS MODE. Begin by entering the SET-UP PROGRAMS MODE with the following keystrokes:

| KEYSTROKE | DISPLAY SCREEN | COMMENT |
|---|---|---|
| SET-UP | SELECT FUNCTION TO SET-UP | |
| PROGRAM | ENTER PASSWORD | |
| PASSWORD 2 | SET-UP PROGRAMS | 1 SEC. DELAY |
| | 1-1 FORMAT 1: MONO FLAT 24 | |

The CPA-10 screen then displays a line of program code. The first time this mode is accessed after each power up condition the first step of program 1 (i.e. 1-1) is always displayed. If re-entering the mode the screen will display the step at which the program was exited previously.

The SET-UP PROGRAM MODE screen displays the program number (1 through 9), the program step number (1 through 70) and the instruction currently programmed in that position. If nothing is programmed in that position "STEP NOT PROGRAMMED" is shown.

In the SET-UP PROGRAM MODE granted access by PASSWORD 2 there are two sub-modes. They are the INSERT and EDIT MODE. The INSERT MODE is used to build programs or add instructions to existing programs. The EDIT MODE is used to modify the variable area fields in the instructions already programmed such as changing a delay time or other user definable item.

Movement in both modes is made by using the "RIGHT", "LEFT", "UP" and "DOWN" SCROLL KEYS.

Before beginning to build a program it is important to delete any program instructions currently stored in memory. This is accomplished by using the DELETE key. Beginning with program 1 line 1, press the DELETE key. Each time the DELETE key is pressed a line of instruction is deleted. Repeat this process until all 70 steps in program 1 are showing "STEP NOT PROGRAMMED". To verify scroll through the steps with the SCROLL UP/DOWN keys.

## 5.5 INSERT MODE

The INSERT MODE is only accessed with PASSWORD 2. The INSERT MODE is toggled on and off using the INSERT key. Begin by pressing the INSERT key:

| KEYSTROKE | DISPLAY SCREEN | COMMENT |
|---|---|---|
| INSERT | 1- 1 _____ | |

The screen has a flashing cursor the entire width of the display indicating that the INSERT MODE is active.

At this point the program is entered line by line into the computer. It is recommended that the program be written out on a piece of paper prior to entry. Data entry error and illogical sequencing will be minimized.

There are two ways to enter the desired program step into the sequence. The first method is to use the SCROLL UP and DOWN keys to move through the entire list of instructions. When the desired instruction appears on the display, press the ENTER key. The step is entered and the flashing cursor moves to the field to be edited. Modify the field as required.

| KEYSTROKE | DISPLAY SCREEN | COMMENT |
|---|---|---|
| INSERT | 1- 1 _____ | EDIT #1 |
| SCROLL DOWN | HOUSE LIGHTS BRIGHT 1 | |
| SCROLL DOWN | HOUSE LIGHT DIM 2 | SELECT |
| ENTER | 1- 1 HOUSE LIGHTS DIM 0:00 | EDIT TIME |
| SCROLL DOWN | 1- 2 _____ | EDIT #2, SAVE #1 |
| SCROLL DOWN | STAGE LIGHTS DIM 7 | SELECT |
| ENTER | 1- 2 STAGE LIGHTS DIM 0:00 | EDIT TIME |

Scroll through the program instruction list entering and editing program instructions to build the desired program.

The second method of building programs is much quicker and simpler. It utilizes the program instruction numbers (1 through 27) as shown in Table 4.1. Instead of scrolling through the program instruction list, simply enter the two digit number representing the desired program instruction. The CPA-10 automatically enters the correct instruction in the sequence and displays it on the screen.

| KEYSTROKE | DISPLAY SCREEN | COMMENTS |
|---|---|---|
| [INSERT] | 1- 3 _____ | EDIT #3 |
| [1][2] | 1- 3 CURTAIN CALL 0:00 | EDIT TIME |
| [1][5] | 1- 3 CURTAIN CALL 0:15 | |

Continue building programs in the same manner by using the SCROLL UP/DOWN keys.

When the data entry is complete verify the information by scrolling through the program and checking against the written copy.

The SAMPLE PROGRAM stored within the CPA-10 can be used for a reference or a starting point for developing custom programs. Appendix B illustrates the sample program and shows how it would look if viewed all at once. There are points concerning the interactive programming of the CPA-10 which should be carefully noted. They will aid in the understanding of the unit and minimize the potential for later mistakes. Use the program in Appendix B as a reference.

First, the WAIT CUE command and the WAIT command serve as sequencers for the program. During the show the computer executes all program lines between the WAIT CUE X instructions each time it sees a cue. Likewise, during an intermission the computer uses the WAIT instruction in much the same way.

Second, the computer looks at all instructions between WAIT CUE X and WAIT instructions in a sequential fashion (but control interprets these instructions at such high speed that instructions between WAIT CUES can be thought of as being executed simultaneously). When competitive instructions (i.e. STAGE LIGHTS DIM and STAGE LIGHTS BRIGHT) are both listed in a program between WAIT CUE X or WAIT instructions, only the latter program line (instruction carrying the largest program number) will be exercised.

Third, all timers effectively start at the WAIT CUE X and WAIT instructions after which they appear. If there are two program lines following a WAIT CUE 1 instruction, for instance, with the first having a timer reading of 3:30 and the second having a timer reading of 5:30, there will be a two minute delay between the occurrence of the two events. The first will begin at 3 minutes and 30 seconds after the first cue and the second will begin at 5 minutes and 30 seconds after the first cue.

Fourth, movement between the variable area fields shown in the display is accomplished with the "RIGHT" and "LEFT" SCROLL keys. The display is a wrap-around design and allows you to move from the far right of the display to the far left with a single "RIGHT" SCROLL keystroke. The same applies to the other direction.

Fifth, the blinking cursor will not move when an illegal value has been entered. Refer to TERMS AND DEFINITIONS for a definition of legal entries.

EXAMPLE PROGRAM

| KEYSTROKE | DISPLAY SCREEN | COMMENT |
|---|---|---|
| [SET-UP] | SELECT FUNCTION TO SET-UP | START SET-UP |
| [PROGRAM] | ENTER PASSWORD | SELECT PROGRAM |
| [PASSWORD 2] | SET-UP PROGRAMS | 1 SEC. DELAY |
| | 1- 1 STEP NOT PROGRAMMED | EMPTY PROG. STEP |
| [INSERT] | 1- 1 _____ | EDIT STEP #1 |
| [1][7] | 1- 1 FORMAT 1: MONO FLAT 24 | INSTRUCTION #17 |
| [SCROLL DOWN] | 1- 2 _____ | EDIT #2, SAVE #1 |
| [0][3] | 1- 2 HOUSE LIGHTS HALF 1 0:00 | INSTRUCTION #03 |
| [SCROLL DOWN] | 1- 3 _____ | EDIT #3, SAVE #2 |
| [0][7] | 1- 3 STAGE LIGHTS DIM 0:00 | INSTRUCTION #07 |
| [SCROLL DOWN] | 1- 4 _____ | EDIT #4, SAVE #3 |
| [0][9] | 1- 4 CURTAIN OPEN 0:00 | INSTRUCTION #09 |
| [1][0] | 1- 4 CURTAIN OPEN 0:10 | SET TIME STEP #4 |
| [SCROLL DOWN] | 1- 5 _____ | EDIT #5, SAVE #4 |
| [1][8] | 1- 5 --- WAIT CUE 1 --- | INSTRUCTION #18 |
| [SCROLL DOWN] | 1- 6 _____ | EDIT #6, SAVE #5 |
| [1][7] | 1- 6 FORMAT 1: MONO FLAT 24 | INSTRUCTION #17 |
| [2][ENTER] | 1- 6 FORMAT 2: MONO FLAT 24 | SELECT FORMAT #2 |
| [CHANGE][CHANGE] | 1- 6 FORMAT 2: SVA FLAT 24 | EDIT SOUND |
| [ENTER] | 1- 6 FORMAT 2: SVA FLAT 24 | SELECT SVA |
| [CHANGE][ENTER] | 1- 6 FORMAT 2: SVA SCOPE 24 | SELECT SCOPE |
| [CHANGE] | 1- 6 FORMAT 2: SVA SCOPE SP | SELECT HIGH SPEED |
| [SCROLL DOWN] | 1- 7 _____ | EDIT #7, SAVE #6 |
| [0][2][2][0] | 1- 7 HOUSE LIGHTS DIM 0:20 | INSTRUCTION #02 SET TIME STEP #7 |
| [SCROLL DOWN] | 1- 8 _____ | EDIT #8, SAVE #7 |
| [1][8][2] | 1- 8 --- WAIT CUE 2 --- | INSTRUCTION #18, PROGRAM CUE #2 |
| [SCROLL DOWN] | 1- 9 _____ | EDIT #9, SAVE #8 |
| [0][4] | 1- 9 HOUSE LIGHTS HALF 2 0:00 | INSTRUCTION #04 |
| [SCROLL DOWN] | 1-10 _____ | EDIT #10, SAVE #9 |
| [1][3][2][0] | 1-10 CURTAIN CLOSE EARLY 0:20 | INSTRUCTION #13, SET TIME STEP #10 |
| [SCROLL DOWN] | 1-11 _____ | EDIT #11, SAVE #10 |
| [1][9][2][0] | 1-11 SHUT DOWN DELAY 0:20 | INSTRUCTION #19, SET TIME |
| [SCROLL DOWN] | 1-12 _____ | EDIT #12, SAVE #11 |
| [1][8][3] | 1-12 --- WAIT CUE 3 --- | INSTRUCTION #18, PROGRAM CUE #3 |

| | | |
|---|---|---|
| [SCROLL DOWN] | 1-13 _____ | EDIT #3, SAVE #12 |
| [0][1] | 1-13 HOUSE LIGHTS BRIGHT 0:00 | INSTRUCTION #01 |
| [SCROLL DOWN] | 1-14 _____ | EDIT #14, SAVE #13 |
| [0][6] | 1-14 STAGE LIGHTS BRIGHT 0:00 | INSTRUCTION #06 |
| [SCROLL DOWN] | 1-15 _____ | EDIT #15, SAVE #14 |
| [PROGRAM] | MANUAL START MODE | 1 SEC. DELAY |
| | PROGRAM 1 READY TO RUN | LEAVE SET-UP MODE |

This Program includes a film Format change from a standard Flat Mono trailer to a Scope feature running at high speed with SVA (stereo) sound. House light half-levels are used. A total of three cues are used with two film Formats. When the program encounters the last WAIT CUE instruction, the system initiates sound and picture changeover (closed) per the predetermined time (5 seconds---not programmable)

The CURTAIN CLOSE EARLY instruction is an "anticipatory" instruction that functions only in the "Learned" mode. In this program the curtain would begin to close 20 seconds before the 3rd cue "should" be encountered. The CURTAIN CALL instruction also functions in this manner. For more information on the "Learned" mode of operation, see Section A.0 .

Several Sample programs, each with varying capabilities, are listed in in Appendix C.

PROGRAMMING HINT: USE COPY MODE TO COPY ENTIRE PROGRAMS, THEN EDIT AS REQUIRED TO BUILD DESIRED PROGRAM. (SEE SECTION 9.2)

## 5.6 EDITING SAMPLE PROGRAM

Suppose you want to INSERT a CURTAIN CALL in this program. Enter the program with password 2 as above and SCROLL to step #5.

| KEYSTROKE | DISPLAY SCREEN | COMMENT |
|---|---|---|
| | 1- 5 --- WAIT CUE 1 --- | INSTRUCTION #18 |
| [INSERT][1][2] | 1- 5 CURTAIN CALL 0:00 | INSERT #12 |
| [2][0] | 1- 5 CURTAIN CALL 0:20 | SET TIME |
| [INSERT][SCROLL DN] | 1- 6 --- WAIT CUE 1 --- | |
| [PROGRAM] | MANUAL START MODE | EXIT SET-UP |

Notice that the CURTAIN CALL instruction is now step #5 and the WAIT CUE 1 instruction was pushed down to step #6 and all subsequent steps numbers are increased by 1.

You can re-enter a program in the same manner to DELETE, INSERT and modify steps, or simply to scroll through the program to verify actions. Again, note that programs "in progress" cannot be edited.

PROGRAMMING NOTES:

Remember "anticipatory" instructions (CURTAIN CALL and CURTAIN CLOSE EARLY) must be encountered before the WAIT CUE instruction and are only active in the "Learned" mode.

Use the CUE LEARN mode on the first showing of a feature. If film cues are absent, insert cues manually as required using CUE INPUT.

To DELETE an entire program: COPY an "empty" program into the program you want to delete; or enter step #1 of the program and repeatedly press DELETE to clear all program steps. Be sure all steps are cleared.

The last WAIT CUE instruction will initiate the show close functions.

When data entry is complete verify the information by scrolling through the program and checking it against the written copy. Verify the actual operation of the program by running a "dummy" show. remember to experiment with fault and power loss conditions.

## 6.0 MANUAL START MODE

The MANUAL START mode requires the operator to manually press the RUN input switch on the front panel to start a show. MANUAL START mode can be activated at any time by pressing the PROGRAM key.

| KEYSTROKE | DISPLAY SCREEN | COMMENT |
|---|---|---|
| [PROGRAM] | MANUAL START MODE | 1 SEC. DELAY |
| | PROGRAM 1 READY TO RUN L | |

The READY TO RUN message only appears if the failsafe arms are up and all other fault conditions (see FAULT MESSAGES SECTION D.0) have been cleared. Any one of the 9 programs can be run simply by pressing one of the number keys (1 through 9). The CUE LEARN function can be toggled on and off by pressing the CUE LEARN key.

## 7.0 CLOCK START FUNCTION

The CLOCK autostart function allows automatic programmed start times on a daily basis. Each day's schedule can be different if required and can consist of any combination of available Programs. Up to ten Programs can be scheduled per day. The CLOCK function must be enabled in the SUPERVISORY (PASSWORD 2). Schedules can be set with PASSWORDS 1 and 2; and the CLOCK function can be activated by any operator.

Enter the SET-UP CLOCK START MODE as follows:

| KEYSTROKE | DISPLAY SCREEN | COMMENT |
|---|---|---|
| [SET-UP] | SELECT FUNCTION TO SET-UP | |
| [CLOCK] | ENTER PASSWORD | PASSWORD 1 OR 2 |
| [PASSWORD] | DAY ? | PROMPT/DAY |
| [FRIDAY] | FRIDAY 1 11:00 AM PROGRAM 1 | EDIT SHOW #1 TIME |
| [1][0][0][CHANGE] | FRIDAY 1 1:00 PM PROGRAM 1 | CHANGE TIME |
| [ENTER] | FRIDAY 1 1:00 PM PROGRAM 1 | EDIT PROGRAM # |
| [2] | FRIDAY 1 1:00 PM PROGRAM 2 | CHANGE PROGRAM # |
| [SCROLL DOWN] | FRIDAY 2 1:30 PM PROGRAM 2 | SAVE #1, EDIT #2 |

Continue to SCROLL DOWN through the daily shows to set show times. The above steps changed a program start time to 1:00 pm of Program #2. Note the CHANGE key is the AM/PM switch. To exit the SET-UP CLOCK MODE press the PROGRAM key; all data entered for show times to this point will be saved.

PROGRAMMING HINT: USE COPY COMMAND TO COPY PROGRAM SCHEDULES FROM ONE DAY TO ANOTHER. (SEE SECTION 9.1)

## 7.1 OPERATION OF THE CLOCK START FUNCTION

The CLOCK START function is activated (if enabled in SUPERVISORY) by pressing the CLOCK key. The display will show the day, upcoming show number, the start time and Program which will be run. Shows will be started at the time displayed. Disable CLOCK operation by pressing the PROGRAM key to return to MANUAL mode.

| KEYSTROKE | DISPLAY SCREEN | COMMENT |
|---|---|---|
| [CLOCK] | CLOCK START MODE | 1 SEC. DELAY |
| | FRIDAY 1 1:00 PM PROGRAM 1 L | ACTIVE |

The CUE LEARN may also be used in the CLOCK START MODE. Just as in the manual start mode, press the CUE LEARN key. When an "L" appears in the far right field, CUE LEARN mode is active.

## 8.0 TIMER START FUNCTION

The TIMER function allows automatic Program start after a specified time in hours and minutes. The TIMER function must be enabled in the SUPERVISORY (PASSWORD 2). When enabled, any operator can program a timed start as follows:

| KEYSTROKE | DISPLAY SCREEN | COMMENT |
|---|---|---|
| [TIMER] | TIME START MODE | 1 SEC. DELAY |
| | TIME TO START 0:00 PROGRAM 1 | EDIT MODE |
| [1][5] | TIME TO START 0:15 PROGRAM 1 | ENTER TIME |
| [ENTER] | TIME TO START 0:15 PROGRAM 1 | EDIT |
| [4] | TIME TO START 0:15 PROGRAM 4 | ENTER PROGRAM |
| [ENTER] | TIME TO START 0:15 PROGRAM 4 L | START TIMER |

The flashing colon (:) in the display indicates the TIMER function is activated and Program 4 will start in 15 minutes. The display will show time remaining before start. The TIME mode may be cancelled by pressing the PROGRAM key to return to MANUAL mode. The timer may be reset at any time before time out by pressing the CLEAR key and re-entering the desired time. Maximum delay time is 99 hours 59 minutes.

The CUE LEARN mode may also be active in the TIME START mode by pressing the CUE LEARN key. When an "L" appears in the far right field, CUE LEARN mode is active.

## 9.0 THE COPY FUNCTION

The COPY function can be used to copy CLOCK start times or PROGRAMS from one location to another. For instance, if start times are the same for monday as for the rest of the week, times for monday can be programmed and then copied to other days with the same schedule. Similar schedules can be copied and then edited. The same holds true for building Programs. For instance, make Program #4 a copy of Program #2 and edit as required. Using the COPY function dramatically reduces the amount of data entry normally required in building programs.

### 9.1 COPY START TIMES

The first field is the day to copy, the second is the destination day of the copy. Enter the day to copy and press the SCROLL RIGHT key; enter the destination day, and press ENTER. The screen will display "COPY COMPLETE" and then prompt for additional COPY CLOCK action. Escape the COPY mode by pressing the PROGRAM key.

| KEYSTROKE | DISPLAY SCREEN | COMMENTS |
|---|---|---|
| [COPY] | SELECT FUNCTION TO COPY | |
| [CLOCK] | ENTER PASSWORD | PASSWORD 1/2 |
| [PASSWORD 1] | COPY START TIMES | 1 SEC. DELAY |
| | COPY __DAY?__ TO DAY? | EDIT DAY |
| [MONDAY] | COPY MONDAY__ TO DAY? | ENTER DAY TO COPY |
| [SCROLL RIGHT] | COPY MONDAY TO __DAY?__ | EDIT DAY |
| [TUESDAY] | COPY MONDAY TO TUESDAY | ENTER DESTIN. DAY |
| [ENTER] | COPY COMPLETE | 1 SEC. |
| | COPY __DAY?__ TO DAY? | EDIT DAY |
| [PROGRAM] | MANUAL START MODE | 1 SEC. DELAY |
| | PROGRAM 1 READY TO RUN | |

### 9.2 COPY PROGRAMS

To copy programs requires PASSWORD 2. The first field is the program to copy, the second is the destination program location of the copy. Enter the program to copy and press the SCROLL RIGHT key; enter the destination program location, and press ENTER. The screen will display "COPY COMPLETE" and then prompt for additional program copies. Escape the COPY mode by pressing the PROGRAM key.

| KEYSTROKE | DISPLAY SCREEN | COMMENT |
|---|---|---|
| [COPY] | SELECT FUNCTION TO COPY | |
| [PROGRAM] | ENTER PASSWORD | |
| [PASSWORD 2] | COPY PROGRAMS | 1 SEC. DELAY |
| | COPY PROGRAM __0__ TO PROGRAM 0 | EDIT |
| [2] | COPY PROGRAM __2__ TO PROGRAM 0 | ENTER # TO COPY |
| [SCROLL RIGHT] | COPY PROGRAM 2 TO PROGRAM __0__ | EDIT |
| [4] | COPY PROGRAM 2 TO PROGRAM __4__ | ENTER DESTIN. # |
| [ENTER] | COPY COMPLETE | 1 SEC. |

```
                    COPY PROGRAM  0  TO PROGRAM  0        EDIT
[PROGRAM]               MANUAL START MODE                 1 SEC. DELAY
                    PROGRAM 1 READY TO RUN
```

The CPA-10 has a standard program (see Appendix B) permanently stored in memory. It is Program #10. Program #10 may be copied to any of the other program locations but it cannot be viewed or edited in that location. Its purpose is to provide a starting point for beginning users.

## A.0 CUE LEARN FUNCTION

The WAIT CUE instruction waits for a cue input before executing subsequent instructions in the program. Cues can be input manually using the CUE INPUT key, or foil cues on the film can be sensed by the cue detector of the failsafe assembly.

The CUE LEARN function should be used on the first run of the program and after any change is made to the film itself (adding, deleting or moving cues). Using the internal clock, the CPA-10 will "learn" when the cues of a particular film should occur. After learning cue locations all subsequent presentations will be run in the "LEARNED" mode. The CPA-10 will expect to to encounter these cues at particular times. If film cues are not encountered within a specified "window", the system will automatically insert a cue allowing the program to carry out the next set of instructions. If any of the film cues are missed during a presentation an error message will be displayed at the end the show indicating which cues were missed. The size of the "window" is defined by the CUE FACTOR DEFAULT function in the SUPERVISORY. The CUE FACTOR DEFAULT can be overidden by using the CUE FACTOR instruction in the Program allowing you to vary the width of the "window" throughout the Program. Note that the CUE INPUT key on the control panel is active in "LEARN" or "LEARNED" mode.

The CUE LEARN function in the SUPERVISORY can be set to AUTO or MANUAL. In the AUTO mode the CUE LEARN is automatically disabled after the first run of the program, after which all subsequent runs will be in the "LEARNED" mode. In the MANUAL mode CUE LEARN must be disabled manually by pressing the CUE LEARN key. The CUE LEARN mode is active when an "L" appear in the far right field.

## A.1 SET-UP CUE LEARN TIMES

CUE LEARN times can be manually entered, if desired, eliminating the necessity of learning the cue times each time a film is moved from one house to another. Access is granted with PASSWORD 1 or 2. CUE LEARN times can be viewed and edited as follows:

| KEYSTROKE | DISPLAY SCREEN | COMMENTS |
|---|---|---|
| [SET-UP] | SELECT FUNCTION TO SET-UP | |
| [CUE LEARN] | ENTER PASSWORD | PASSWORD 1/2 |
| [PASSWORD 1] | SET-UP CUE LEARN TIMES | 1 SEC. DELAY |
| | LEARN TIMES FOR PROGRAM ? | SELECT # |
| [1] | 1- 1 LEARN TIME 5:15 | VIEW OR EDIT |
| [SCROLL DOWN] | 1- 2 LEARN TIME 98:45 | VIEW OR EDIT |
| [1][0][1][4][5] | 1- 2 LEARN TIME 101:45 | CHANGE TIME |
| [SCROLL DOWN] | 1- 3 LEARN TIME 110:09 | VIEW OR EDIT |
| [PROGRAM] | MANUAL START MODE | 1 SEC. DELAY |
| | PROGRAM 1 READY TO RUN | |

Enter the desired times using the number keys. The CUE LEARN times are all displayed in minutes and seconds with the upper legal value of 999 minutes 59 seconds (equivalent of 16 hours 39 minutes and 59 seconds). Entries may be set to zero with the CLEAR key. The CPA-10 allows up to 10 cue times to be programmed. Scroll through the 10 cue time using the SCROLL UP and DOWN keys. Clear all cue times which are not being used. Verify upon completion that all cue times are arranged in chronological ascending order.

## A.2 CUE WINDOW FACTOR

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 film cue foils. Thereafter, if cue 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. Using this system, the projectionist does not have to be concerned about any missing or errant cues, once cues have been learned in the CUE LEARN mode.

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)

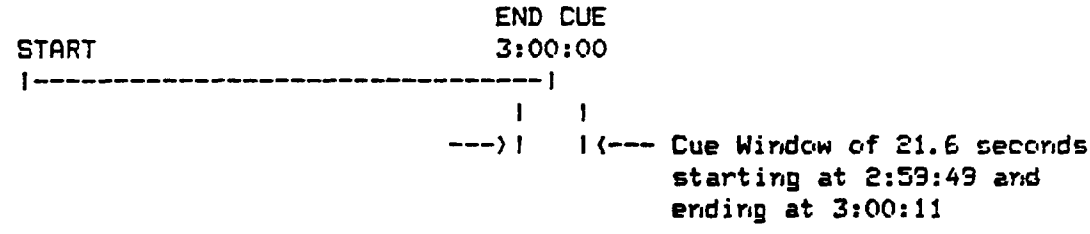
EXAMPLE: CWF value = 0.002, expected movie length = 3 hours

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 CPA-10 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 CPA-10 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 CPA-10 will only recognize cues within the four established windows. If none are sensed it automatically inserts one at the end of a window which maintains your professional presentation. If cues are sensed outside 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 CPA-10. Simply keep the unit in the CUE LEARN MODE for several days. After each presentation of the same show, record the 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 fluctuation 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 [(2:21:45 + 2:15:00) divided by 2].

The result is as follows:

Average fluctuation = (HIGH VALUE - LOW VALUE) divided 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:

Deviation = AVERAGE FLUCTUATION/AVERAGE RUN TIME
= 0:03:22/2:18:22 (convert to seconds)
= 202 seconds/8302 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 should be 0.027.

The CWF value of 0.027 is logical in light of actual conditions. 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 transport 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.

## 8.0 INTERLOCKED (SYNC) OPERATION

CPA-10 systems are capable of running a feature synchronously. In a multi-projector booth, eight combinations, or "loops", of interlocked systems are possible, with 2 to 16 systems per loop. The first three functions of the SUPERVISORY determine: the loop to which to which a particular unit belongs; loop status; and a unit identification number (usually the booth number). The first two functions can be accessed by both PASSWORDS 1 and 2 (see SUPERVISORY functions 1 - 3 section 4.2)

To operate systems in "SYNC", the following must be true:

1) A film cue (CUE 0) begins the show open sequences of each system. The cue must be placed the proper distance ahead of the beginning of the feature (as determined by the "C/O DELAY" timing) and must be "seen" by each system.
2) Each system must have the same basic PROGRAM, with the same number of "WAIT CUE" and FORMAT instructions. Assign one particular program for SYNC operation (such as Program #9). The first step of the SYNC Program must be "WAIT CUE 0". It is suggested that the desired Program be copied into the SYNC Program slot (such as #9), and then the "WAIT CUE 0" Instruction be inserted. The "WAIT CUE 0" is necessary for proper operation of the Interlocked systems.
3) Each system must have a unique SYNC ID number.

4) Systems that are to operate together must have the same SYNC LOOP number assigned.
5) Systems that are to operate in Sync must have their SYNC switch ON.
6) The "MASTER" system must be the last unit to "see" the film.
7) The "SLAVE" system(s) must be "READY TO RUN PROGRAM X" and in Manual Start mode.
8) The MASTER system MUST start the feature; the feature may be started in any of the three start modes (CLOCK, TIMER, MANUAL). Note that the software assumes the system that gives the START is the MASTER (see #5 above).
9) STOP, REMOTE STOP, and RESUME keys are all logically connected to each system. Once the Program is in process, it may be STOPped or RESUMEd from any system in the Loop.

Shutdown:
1) SLAVE systems normally wait for the MASTER to shut down at the end of the Program (no Failsafe action).
2) SLAVES in LEARN mode receiving a Failsafe indication at Show End will "drop off" the Sync Loop and individually shut down.
3) SLAVES in the LEARNED mode receiving a Failsafe indication in the LEARNED End Cue Window will drop off the Sync Loop and shut down individually.

Exceptions:
1) SLAVES will STOP (fault) if the MASTER signal is lost.
2) SLAVES that drop "off-line" (lose power, etc.) are NOT detected.

## C.0 RUNNING THE PRESENTATION

It is necessary that the operator be fully familiar with the CPA-10 and its features before running film. In particular, the LEARN feature and its use should be thoroughly understood. Initial running of each presentation, or of a film presentation that has been changed, should be conducted with the system in the LEARN mode. (See Section A.0)

## C.1 MANUAL, TIMER AND CLOCK MODES OF OPERATION

TIMER and CLOCK modes are discussed above. Press PROGRAM to be in the MANUAL mode; display is: "PROGRAM X READY TO RUN". Press desired Program number if different from the display; press the RUN switch to start the Program.

## C.2 PROGRAM STATUS DISPLAY

The display will indicate which Program is running; the cue next expected; and current Format information on Sound, Lens, and projection speed. An "L" in the last column indicates the system is in the LEARN mode, is accepting all film cues and memorizes their occurrences. If the last column does not display "L", the system is operating in the LEARNED mode and will accept only film cues within the prescribed "cue window". If a film cue is not detected within that window, the system will simulate that cue. The LED in

the RUN switch is lit during the film portion of the Program.

## C.3 PROGRAM INTERRUPTION

A film Break, other fault detection, or pressing the STOP switch will cause a shut-down of the projector and lamp, House Lights to Raise, and other functions that may be programmed in SET-UP SUPERVISORY; the RUN LED will extinguish and the STOP LED will light. Display will show the Fault message that caused the program to stop, such as "PROGRAM X FAILSAFE". When the fault is corrected, display will show: "PROGRAM X READY TO RESUME". Press RESUME on the key pad to resume the Program.

## D.0 FAULT MESSAGES

The following section contains the fault messages for the CPA-10 and the necessary action to clear them. There are two types of fault messages, major and minor. Major faults require that specific action be taken to clear the fault condition. Minor faults may be cleared by pressing the CLEAR key.

DEAD BATTERY - REPLACE (minor)
Indicates low battery condition. Replace the battery to clear the fault (see section E.6).

CHECK CUE LEARN TIMES (minor)
Reminder that cue times have been learned. Check them by viewing the SET-UP/CUE LEARN times. Clear by pressing the CLEAR key.

PROGRAM X FAILSAFE (major)
Indicated local failsafe condition. Re-thread to clear.

PROGRAM X FAULT - SYNC STOP (major)
Indicates a fault on another system when interlocked.

PROGRAM X READY TO RESUME (minor)
Indicates the program has been stopped. No other faults are present and the program can be re-started by pressing the RESUME key.

SUPERVISORY MEMORY FAULT (major)
Indicates a checksum error in the Supervisory set-up data. Edit data to correct the checksum. Clear the message by pressing the CLEAR key.

PROGRAM START TIMES MEMORY FAULT (major)
Indicates a checksum error in the Clock set-up data. Edit data to correct the checksum. Clear the message by pressing the CLEAR key.

PROGRAM FAULT AT X- 0 (major)
This fault indicates that a checksum error in the Program set-up data was found by the power up routine. Only the first error found is reported. View the program to find the error, then edit the Program to correct the checksum. Clear the message by pressing the

CLEAR key. Then cycle power to determine if any other fault exists.

MAINTENANCE SCHEDULE A/B/C/D (minor)

This fault indicates that maintenance is required for schedule A, B, C OR D. The timer may be reset in the Supervisory when maintenance has been performed. Pressing the CLEAR key when this message is displayed resets the corresponding timer (A, B, C or D) and clears the message from the display.

MISSED CUE X,X,X,X (minor)

This fault indicates that specific CUE inputs were not received and an automatic cue was issued at the end of the cue window (you were in LEARNED mode). This indicated the film cue tapes are worn or missing. Clear the message by pressing the CLEAR key.

LEARN TIME MEMORY FAULT (major)

Indicates a checksum error in the Program Learn Times was found by the power up routine. Edit the Program Learn Times data to correct the checksum. Clear the message by pressing the CLEAR key.

XENON LAMP FAILURE (major)

This fault indicates that the xenon lamp failed to light after 10 seconds. Press CLEAR to remove the message from the display. (Note, on systems without this optional hardware just satisfy the xenon input)

EXCITER LAMP FAILURE (major)

This fault indicates that the exciter lamp failed to light after 2 seconds. Press CLEAR to remove the message from the display. (Note, on systems without this optional hardware just satisfy the exciter input)

## E.0 SYSTEM INSTALLATION

!!WARNING!!

!!WARNING!! A SECURE ELECTRICAL EARTH GROUND FOR THE CPA-10 AUTOMATION SYSTEM AND THE REMAINING SYSTEM COMPONENTS, SUCH AS THE XENON LAMPHOUSE/CONSOLE SYSTEM, IS ABSOLUTELY IMPERATIVE FOR PROPER SYSTEM OPERATION. FAILURE OF THESE SYSTEMS TO BE PROPERLY GROUNDED MAY RESULT IN DAMAGE TO THE CPA-10.

EVIDENCE OF IMPROPER GROUNDING MAY VOID WARRANTY

### E.1 ELECTRICAL CONNECTION

The SINGLE MOST IMPORTANT FACTOR when installing the CPA-10 is to provide the unit with a very high quality Earth Ground, which is defined as: a separate copper grounding wire run back to the Main Power Panel's Ground bar; or, a separate microcomputer earth ground provided by a copper grounding rod buried a minimum of four (4) feet in the earth and used exclusively for microcomputers. Connection to Ground at an electrical sub-panel only and/or relying on conduit or mechanical ground is NOT sufficient for reliable operation of the CPA-10 system. Ideally, this ground will service only the CPA-10 system and run directly to the main power distribution panel of the building.

The provisions of the National Electrical Code and local building codes will govern wire size and other requirements that supersede this manual and must be followed during installation.

### E.2 WIRING TERMINATIONS

A Wiring Termination Schedule is provided in APPENDIX B for connection of the CPA-10 to related components. Many items will be pre-wired by Strong if the CPA-10 is a part of a pre-wired projection console system. Check all connections for tightness, and verify proper electrical grounding of the CPA-10, the console, and other components.

Generally good practice dictates that low voltage signal leads and high power feed wires be separated as much as possible, minimizing the chance of noise being introduced into the signal wires.

### E.3 INSTALLATION AND INITIAL OPERATION

Installation of the CPA-10 includes set-up of the basic operating parameters of the system, including initial power-up tests, SET-UP of SUPERVISORY functions, and initial programming to determine proper system operation. The WARNING noted above is the first and most important step of preparing the system for proper operation.

The installing engineer should be thoroughly familiar with this manual and the CPA-10 System before attempting any operation or programming of the system.

With the CPA-10 POWER switch OFF, apply power to the projection system and check manual operation of all external components--projector, lamphouse, curtains, dimmers, etc.

## E.4 DISPLAY ADJUSTMENT

The viewing angle of the display can be electronically adjusted by turning the adjustment potentiometer (located on the front right corner of the main circuit board, accessible through the front hinged panel). Adjust for proper viewing angle as desired.

## E.5 FUSE REPLACEMENT

The CPA-10 supplies 12VDC to external devices, such as the Failsafe Cue-Detector, Xenon Lamp monitor, Remote Status Stations, etc. A fuse (F1) located directly behind the hinged control panel prohibits external system problems from damaging the CPA-10 Power Supply. This is a 2-Amp standard fuse and should never be replaced with a fuse of higher rating. Be sure to determine the cause of fuse failure before replacing; all external systems for the CPA-10 are designed as very low current devices and current draw should never approach the fuse rating.

## E.6 BATTERY REPLACEMENT

A lithium battery (Size 1/2AA, 3.6V) maintains system memory when power is removed from the CPA-10 and has an approximate life of five years. A Minor Fault display (DEAD BATTERY - REPLACE) will indicate the need to replace it. The battery is located on the main circuit board of the unit on the right-hand side, near the power supply.

If removed with Power Off, all memory of the system will be lost and full programming of the system will be required. It is possible to replace the battery with Power ON, if care is used to NOT touch portions of the chassis and switches that are electrically "HOT". Cut the wire tie securing the battery to the circuit board and lift each lead out of the board socket with insulated pliers. BE SURE OF CORRECT BATTERY LEAD POLARITY WHEN INSTALLING the new battery. It is not necessary to secure the new battery to the circuit board.

APPENDIX A

PROGRAMMING FLOW CHART

```
PROGRAM ))))))  MANUAL START MODE

TIMER   ))))))  TIMED START MODE

COPY    ))))))  PROGRAM ))))))  COPY PROGRAM

          OR )))  CLOCK   ))))))  COPY START TIMES

CLOCK   ))))))  CLOCK START MODE

SET-UP  ))))))  PROGRAM ))))))  SET-UP PROGRAMS

          OR )))  CLOCK   ))))))  SET-UP START TIMES

          OR )))  CUE LEARN ))))  SET-UP LEARN TIMES

          OR )))  SUPERVISORY ))  SET-UP SUPERVISORY FUNCTIONS
```

APPENDIX B

CPA-10 SAMPLE PROGRAM

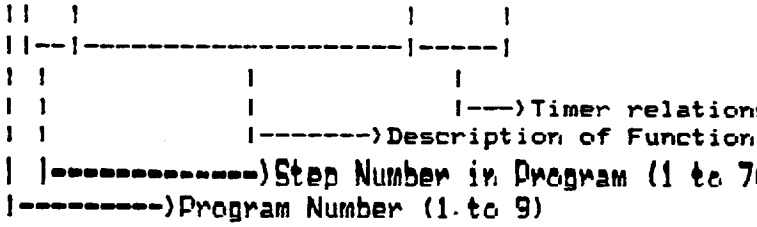
Full Listing (PASSWORD 2): Action (assumes LEARNED mode)

FEATURE:

```
1- 1 FORMAT 1: MONO    FLAT  24        Format 1 Film Spec, Show Start
1- 2 CURTAIN OPEN           0:10       Timed from START
1- 3 AUX PROJECTOR OFF      0:00       Timed from START
1- 4 STAGE LIGHTS DIM       0:30       Timed from START
1- 5 HOUSE LIGHTS HALF 1    0:40       Timed from START
1- 6 --- WAIT CUE 1 ---                Waits for Cue #1
1- 7 FORMAT 2: SPECIAL1 FLAT 24        Format 2 Film Spec
1- 8 CURTAIN CALL           0:20       Timed BEFORE Cue #2 in Learned mode
1- 9 --- WAIT CUE 2 ---                Waits for Cue #2
1-10 FORMAT 3: SVA     SCOPE 24        Format 3 Film Spec
1-11 HOUSE LIGHTS DIM       0:25       Timed from Cue #2
1-12 --- WAIT CUE 3 ---                Waits for Cue #3
1-13 HOUSE LIGHTS HALF 2    0:00       Timed from Cue #3
1-14 CURTAIN CLOSE EARLY    0:20       Timed BEFORE Cue #4 in Learned mode
1-15 SHUT DOWN DELAY        0:15       Timed from Cue #4
1-16 --- WAIT CUE 4 ---                Waits for Cue #4; Show End Cue
1-17 HOUSE LIGHTS BRIGHT    0:00       Timed from Cue #4
1-18 STAGE LIGHTS BRIGHT    0:00       Timed from Cue #4
```

INTERMISSION:

```
1-19 --- WAIT ---          10:00       Timed from Cue #4, Slide Proj On
1-20 HOUSE LIGHTS HALF 1    0:00       Timed from WAIT
1-21 STAGE LIGHTS DIM       0:00       Timed from WAIT
1-22 CURTAIN OPEN           0:00       Timed from WAIT
1-23 AUX PROJECTOR ON       0:00       Timed from WAIT
1-24 --- WAIT ---          15:00       Timed from WAIT
1-25 HOUSE LIGHTS BRIGHT    0:00       Timed from WAIT, Slide Proj Off
1-26 STAGE LIGHTS BRIGHT    0:00       Timed from WAIT
1-27 CURTAIN CLOSE          0:00       Timed from WAIT
1-28 AUX PROJECTOR OFF      0:20       Timed from WAIT
1-29     STEP NOT PROGRAMMED
1-30     STEP NOT PROGRAMMED
```



```
Short Listing (PASSWORD 1):

1- 1 FORMAT 1: MONO     FLAT  24
1- 7 FORMAT 2: SPECIAL1 FLAT 24
1-10 FORMAT 3: SVA      SCOPE SP
```

APPENDIX C

ADDITIONAL CPA-10 SAMPLE PROGRAMS

PROGRAM WITH ONE FORMAT CHANGE

| | | | | |
|---|---|---|---|---|
| 1- 1 | FORMAT 1: MONO FLAT 24 | | Format 1 Film Spec | Show Start |
| 1- 2 | HOUSE LIGHTS HALF 1 | 0:10 | Timed from START | |
| 1- 3 | STAGE LIGHTS DIM | 0:10 | Timed from START | |
| 1- 4 | CURTAIN OPEN | 0:10 | Timed from START | |
| 1- 5 | CURTAIN CALL | 0:20 | Timed BEFORE Cue #1 | |
| 1- 6 | --- WAIT CUE 1 --- | | Waits for Cue #1 | |
| 1- 7 | FORMAT 2: SVA SCOPE 24 | | Format 2 Film Spec | Scope Lens |
| 1- 8 | HOUSE LIGHTS DIM | 0:25 | Timed from Cue #2 | |
| 1- 9 | --- WAIT CUE 2 --- | | Waits for Cue #2 | |
| 1-10 | HOUSE LIGHTS HALF 2 | 0:00 | Timed from Cue #3 | |
| 1-11 | CURTAIN CLOSE EARLY | 0:20 | Timed BEFORE Cue #3 | |
| 1-12 | SHUT DOWN DELAY | 0:15 | Timed from Cue #4 | Proj Stop |
| 1-13 | --- WAIT CUE 3 --- | | Waits for Cue #3 | |
| 1-14 | HOUSE LIGHTS BRIGHT | 0:00 | Timed from Cue #4 | |
| 1-15 | STAGE LIGHTS BRIGHT | 0:00 | Timed from Cue #4 | |

PROGRAM WITH TWO FORMAT CHANGES, INTERMISSION, NO CURTAIN CONTROL

| | | | |
|---|---|---|---|
| 1- 1 | FORMAT 1: MONO FLAT 24 | | Format 1 Film Spec, Show Start |
| 1- 2 | AUX PROJECTOR OFF | 0:00 | Timed from START |
| 1- 3 | STAGE LIGHTS DIM | 0:30 | Timed from START |
| 1- 4 | HOUSE LIGHTS HALF 1 | 0:40 | Timed from START |
| 1- 5 | --- WAIT CUE 1 --- | | Waits for Cue #1 |
| 1- 6 | FORMAT 2:SPECIAL1 FLAT 24 | | Format 2 Film Spec |
| 1- 7 | --- WAIT CUE 2 --- | | Waits for Cue #2 |
| 1- 8 | FORMAT 3: SVA SCOPE 24 | | Format 3 Film Spec |
| 1- 9 | HOUSE LIGHTS DIM | 0:25 | Timed from Cue #2 |
| 1-10 | --- WAIT CUE 3 --- | | Waits for Cue #3 |
| 1-11 | HOUSE LIGHTS HALF 2 | 0:00 | Timed from Cue #3 |
| 1-12 | SHUT DOWN DELAY | 0:15 | Timed from Cue #4 |
| 1-13 | --- WAIT CUE 4 --- | | Waits for Cue #4; Show End Cue |
| 1-14 | HOUSE LIGHTS BRIGHT | 0:00 | Timed from Cue #4 |
| 1-15 | STAGE LIGHTS BRIGHT | 0:00 | Timed from Cue #4 |

INTERMISSION:

| | | | |
|---|---|---|---|
| 1-16 | --- WAIT --- | 10:00 | Timed from Cue #4, Slide Proj On |
| 1-17 | HOUSE LIGHTS HALF 1 | 0:00 | Timed from WAIT |
| 1-28 | STAGE LIGHTS DIM | 0:00 | Timed from WAIT |
| 1-19 | AUX PROJECTOR ON | 0:00 | Timed from WAIT |
| 1-20 | --- WAIT --- | 15:00 | Timed from WAIT |

| | | |
|---|---|---|
| 1-21 HOUSE LIGHTS BRIGHT | 0:00 | Timed from WAIT, Slide Proj Off |
| 1-22 STAGE LIGHTS BRIGHT | 0:00 | Timed from WAIT |
| 1-23 AUX PROJECTOR OFF | 0:20 | Timed from WAIT |
| 1-24 STEP NOT PROGRAMMED | | |

APPENDIX D

WIRING TERMINATION SCHEDULE

| FUNCTION | TERMINAL BOARD BS 1- |
|---|---|
| PROJECTOR COMMON | 1 |
| PROJECTOR SWITCHED | 2 |
| LAMP COMMON | 3 |
| LAMP SWITCHED | 4 |
| EXCITER COMMON | 5 |
| EXCITER SWITCHED | 6 |
| CHANGEOVER COMMON | 7 |
| CHANGEOVER OPEN | 8 |
| CHANGEOVER CLOSE | 9 |
| N/C | 10 |
| NON-SYNC COMMON | 11 |
| NON-SYNC OFF | 12 |
| NON-SYNC ON | 13 |
| AUX PROJ COMMON | 14 |
| AUX PROJ SWITCHED | 15 |
| N/C | 16 |
| ENVIRONMENT COMMON | 17 |
| ENVIRONMENT SWITCHED | 18 |
| AUX #1 COMMON | 19 |
| AUX #1 NORMALLY OPEN | 20 |
| AUX #1 NORMALLY CLOSED | 21 |
| AUX NON-SYNC COMMON | 22 |
| AUX NON-SYNC OFF | 23 |
| AUX NON-SYNC ON | 24 |

| FUNCTION | TERMINAL BOARD BS 3- |
|---|---|
| HOUSE LIGHTS COMMON | 1 |
| HOUSE LIGHTS BRIGHT | 2 |
| HOUSE LIGHTS DIM | 3 |
| HOUSE LIGHTS HALF 1 | 4 |
| HOUSE LIGHTS HALF 2 | 5 |
| STAGE LIGHTS COMMON | 6 |
| STAGE LIGHTS BRIGHT | 7 |
| STAGE LIGHTS DIM | 8 |
| TIVOLI LIGHTS COMMON | 9 |
| TIVOLI LIGHTS BRIGHT | 10 |
| TIVOLI LIGHTS DIM | 11 |
| COVE LIGHTS COMMON | 12 |
| COVE LIGHTS BRIGHT | 13 |
| COVE LIGHTS DIM | 14 |
| REMOTE POWER | 15 |
| REMOTE RETURN | 16 |
| REMOTE OUTPUT | 17 |
| REMOTE OUTPUT | 18 |
| REMOTE ALARM | 19 |
| REMOTE ALARM CANCEL | 20 |
| REMOTE OUTPUT | 21 |
| REMOTE OUTPUT | 22 |
| REMOTE START INPUT | 23 |
| REMOTE STOP INPUT | 24 |

| | BS 2- |
|---|---|
| CURTAIN COMMON | 1 |
| CURTAIN OPEN | 2 |
| CURTAIN CLOSE | 3 |
| CURTAIN STOP | 4 |
| TOP MASK COMMON | 5 |
| TOP MASK FLAT | 6 |
| TOP MASK SCOPE | 7 |
| TOP MASK SPECIAL | 8 |
| TOP MASK STOP | 9 |
| SIDE MASK COMMON | 10 |
| SIDE MASK FLAT | 11 |
| SIDE MASK SCOPE | 12 |
| SIDE MASK SPECIAL | 13 |
| SIDE MASK STOP | 14 |
| LENS COMMON | 15 |

| | BS 4- |
|---|---|
| NON-SYNC COMMON | 1 |
| MONO FEED | 2 |
| SPECIAL 1 FEED | 3 |
| OPTICAL SVA FEED | 4 |
| SPECIAL 2 FEED | 5 |
| SPECIAL 3 FEE | 6 |
| NON-SYNC FEED | 7 |
| MONO SWITCHED | 8 |
| SPECIAL 1 SWITCHED | 9 |
| SVA SWITCHED | 10 |
| SPECIAL 2 SWITCHED | 11 |
| SPECIAL 3 SWITCHED | 12 |
| N/C | 13 |
| GROUND | 14 |
| DATA (NEG) | 15 |

| | | | |
|---|---|---|---|
| LENS FLAT | 16 | DATA (POS) | 16 |
| LENS SCOPE | 17 | N/C | 17 |
| SPEED SELECT COMMON | 18 | | |
| SPEED SELECT SWITCHED | 19 | | |
| EXCITER "ON" SIGNAL | 20 | | |
| XENON "ON" SIGNAL | 21 | | |
| FAILSAFE INPUT | 22 | | |
| CUE INPUT | 23 | | |
| INPUT RETURN | 24 | | |

APPENDIX E

RELAY SCHEDULE

| RELAY | FUNCTIONS |
|---|---|
| K1 | NON-SYNC, AUX NON-SYNC |
| K2 | EXCITER, AUX 1 |
| K3 | C/O CLOSE |
| K4 | SOUND MONO |
| K5 | SOUND SPECIAL 1 |
| K6 | LENS/MASKING SCOPE |
| K7 | SOUND SPECIAL 2 |
| K8 | SOUND NON-SYNC |
| K9 | LENS/MASKING FLAT |
| K10 | C/O OPEN |
| K11 | SOUND SVA |
| K12 | SOUND SPECIAL 3 |
| K13 | PROJECTOR SPEED SELECT |
| K14 | AUXILIARY PROJECTOR |
| K15 | PROJECTOR, XENON, ENVIRONMENT |
| K16 | CURTAIN OPEN |
| K17 | HOUSE HALF 1 |
| K18 | HOUSE, TIVOLI BRIGHT |
| K19 | HOUSE, TIVOLI DIM |
| K20 | CURTAIN CLOSE |
| K21 | HOUSE HALF 2 |
| K22 | STAGE, COVE DIM |
| K23 | STAGE, COVE BRIGHT |

APPENDIX F

INPUT/OUTPUT DEVICE FUNCTIONS

| I/O# | DEVICE | FUNCTION/OUTPUT |
|---|---|---|
| OUT01 | U2/U9 | K15 |
| OUT02 | U2/U9 | K2 |
| OUT03 | U3/U9 | K10 |
| OUT04 | U3/U9 | K3 |
| OUT05 | U5/U9 | K9 |
| OUT06 | U5/U9 | K6 |
| OUT07 | U3/U9 | K16 |
| OUT08 | U3/U9 | K20 |
| OUT09 | U5/U10 | K13 |
| OUT10 | U2/U10 | K14 |
| OUT11 | U3/U10 | K4 |
| OUT12 | U4/U10 | K5 |
| OUT13 | U4/U10 | K11 |
| OUT14 | U4/U10 | K7 |
| OUT15 | U4/U10 | K12 |
| OUT16 | U4/U10 | K8 |

| I/O# | DEVICE | FUNCTION/OUTPUT |
|---|---|---|
| OUT17 | U2/U11 | K1 |
| OUT18 | U5/U11 | K18 |
| OUT19 | U5/U11 | K19 |
| OUT20 | U4/U11 | K17 |
| OUT21 | U4/U11 | K21 |
| OUT22 | U5/U11 | K23 |
| OUT23 | U5/U11 | K22 |
| OUT24 | U1/U8 | Q2/L7/P13-2 |
| OUT25 | U1/U8 | Q1/L8/P13-3 |
| OUT26 | U1/U8 | Q4/L12/P13-5 |
| OUT27 | U1/U8 | Q5/L9/P13-4 |
| OUT28 | U1/U8 | Q3/L6/P13-1 |
| /START | U2/U8 | STARTLED/P8-12 |
| /STOP | U2/U8 | STOPLED/P8-10 |
| /SYNC | U2/U8 | SYNCLED/P8-11 |

| I/O# | DEVICE | FUNCTION/INPUT |
|---|---|---|
| IN00 | U16 | P8-7/SYNC |
| IN01 | U16 | P8-9/STOP |
| IN02 | U16 | P8-8/START |
| IN03 | U16/U25 | L13/P13-9/ALM CANCEL |
| IN04 | U16/U19 | L10/P13-7/RMT STOP |
| IN05 | U16/U18 | L11/P13-6/RMT START |
| IN06 | U16/U6 | L3/P2-14/EXCITER F/S<br>L5/P2-6/INPUT RETURN |
| IN07 | U16/U15 | L1/P2-22/XENON F/S |
| IN08 | | |
| IN09 | | |

| I/O# | DEVICE | FUNCTION/INPUT |
|---|---|---|
| IN10 | U20/U7 | L2/P2-18/CUE |
| IN11 | U20/U14 | L4/P2-10/FAILSAFE |
| IN12 | U20 | W1-1/2/3 |
| IN13 | U20 | W1-4/5/6 |
| IN14 | U20 | W1-7/8/9 |
| IN15 | U20 | W1-10/11/12 |
| IN16 | U20 | W1-13/14/15 |
| IN17 | U20 | W1-16/17/18 |
| IN18 | | |
| IN19 | | |

APPENDIX G

INTERFACE CABLE AND PLUG CONNECTIONS

| TERM BRD | CONNECTIONS INTERNAL | EXTERNAL | FUNCTION/CONNECTION | |
|---|---|---|---|---|
| BS1-1 | P5-15 | P4-7 | K15-8 | PROJECTOR COMMON |
| 2 | P5-14 | P4-10 | K15-5 | PROJECTOR SWITCHED |
| 3 | P5-10 | P4-11 | K15-9 | LAMP COMMON |
| 4 | P5-13 | P4-12 | K15-6 | LAMP SWITCHED |
| 5 | P5-4 | P4-6 | K2-6 | EXCITER COMMON |
| 6 | P5-2 | P4-2 | K2-9 | EXCITER SWITCHED |
| 7 | P5-3 | P4-1 | K10-12/K3-5 | CHANGEOVER COMMON |
| 8 | P5-1 | P4-3 | K10-8 | CHANGEOVER OPEN |
| 9 | P5-7 | P4-9 | K3-9 | CHANGEOVER CLOSE |
| 10 | | | | N/C |
| 11 | | P3-2 | K1-9 | NON-SYNC COMMON |
| 12 | | P3-3 | K1-3 | NON-SYNC OFF (NC) |
| 13 | | P3-1 | K1-6 | NON-SYNC ON (NO) |
| 14 | | P3-5 | K14-6 | AUX PROJECTOR COMMON |
| 15 | | P3-4 | K14-9 | AUX PROJECTOR SWITCHED |
| 16 | | | | N/C |
| 17 | P5-9 | P2-1 | K15-4 | ENVIRONMENT COMMON |
| 18 | P5-12 | P2-9 | K15-7 | ENVIRONMENT SWITCHED |
| 19 | | P2-2 | K2-7 | AUX #1 COMMON |
| 20 | | P2-3 | K2-4 | AUX #1 NOR OPEN |
| 21 | | P2-5 | K2-1 | AUX #1 NOR CLOSED |
| 22 | | P2-12 | K1-7 | AUX NON-SYNC COMMON |
| 23 | | P2-4 | K1-1 | AUX NON-SYNC OFF (NC) |
| 24 | | P2-8 | K1-4 | AUX NON-SYNC ON (NO) |
| BS2-1 | P7-18 | P2-16 | K16-5/K20-8 | CURTAIN COMMON |
| 2 | P7-19 | P2-15 | K16-9 | CURTAIN OPEN |
| 3 | P7-17 | P2-19 | K20-12 | CURTAIN CLOSE |
| 4 | P7-14 | P2-24 | STOP SW8 | CURTAIN STOP |
| 5 | P7-4 | P2-25 | K6-6/K9-10 | TOP MASK COMMON |
| 6 | P7-3 | P2-29 | K9-6 | TOP MASK FLAT |
| 7 | P7-8 | P2-36 | K6-10 | TOP MASK SCOPE |
| 8 | P7-7 | P2-13 | SPEC SW7 | TOP MASK SPECIAL |
| 9 | P7-9 | P2-35 | STOP SW5 | TOP MASK STOP |
| 10 | P7-11 | P2-31 | K6-12/K9-12 | SIDE MASK COMMON |
| 11 | P7-2 | P2-33 | K9-8 | SIDE MASK FLAT |
| 12 | P7-13 | P2-27 | K6-8 | SIDE MASK SCOPE |
| 13 | P7-12 | P2-28 | SPEC SW7 | SIDE MASK SPECIAL |
| 14 | P7-10 | P2-32 | STOP SW6 | SIDE MASK STOP |
| 15 | P7-5 | P2-21 | K6-5/K9-9 | LENS TURRET COMMON |
| 16 | P7-6 | P2-17 | K9-5 | LENS TURRET FLAT |
| 17 | P7-1 | P2-34 | K6-9 | LENS TURRET SCOPE |

| | | | | |
|---|---|---|---|---|
| 18 | P7-16 | P2-20 | K13-5 | SPEED SELECT COMMON |
| 19 | P7-15 | P2-23 | K13-9 | SPEED SELECT SWITCHED |
| 20 | | P2-14 | EXCITER F/S | EXCITER FAILSAFE |
| 21 | | P2-22 | XENON F/S | XENON FAILSAFE |
| 22 | | P2-10 | F/S INPUT | FAILSAFE INPUT |
| 23 | | P2-18 | CUE INPUT | CUE INPUT |
| 24 | | P2-6 | INPUT RETURN | INPUT RETURN |

| TERM | CONNECTIONS | | | |
|---|---|---|---|---|
| BRD | INTERNAL | EXTERNAL | FUNCTION/CONNECTION | |
| BS3-1 | P6-4 | P9-13 | K19-8/18-12/21-12/17-12 | HOUSE LIGHTS COMMON |
| 2 | P6-3 | P9-5 | K18-8 | HOUSE LIGHTS BRIGHT |
| 3 | P6-6 | P9-3 | K19-12 | HOUSE LIGHTS DIM |
| 4 | P6-1 | P9-7 | K17-8 | HOUSE LIGHTS HALF 1 |
| 5 | P6-2 | P9-10 | K21-8 | HOUSE LIGHTS HALF 2 |
| 6 | P6-11 | P9-4 | K22-5/K23-9 | STAGE LIGHTS COMMON |
| 7 | P6-10 | P9-6 | K23-5 | STAGE LIGHTS BRIGHT |
| 8 | P6-8 | P9-9 | K22-9 | STAGE LIGHTS DIM |
| 9 | P6-5 | P9-2 | K22-12/K18-11 | TIVOLI LIGHTS COMMON |
| 10 | P6-9 | P9-14 | K18-7 | TIVOLI LIGHTS BRIGHT |
| 11 | P6-12 | P9-8 | K19-9 | TIVOLI LIGHTS DIM |
| 12 | P6-7 | P9-1 | K19-5/K23-6 | COVE LIGHTS COMMON |
| 13 | P6-13 | P9-15 | K23-10 | COVE LIGHTS BRIGHT |
| 14 | P6-14 | P9-12 | K22-8 | COVE LIGHTS DIM |
| 15 | | P13-10 | | REMOTE POWER |
| 16 | | P13-8 | | REMOTE RETURN |
| 17 | | P13-3 | | REMOTE OUTPUT 1 |
| 18 | | P13-2 | | REMOTE OUTPUT 2 |
| 19 | | P13-1 | | REMOTE ALARM |
| 20 | | P13-9 | | REMOTE ALARM CANCEL |
| 21 | | P13-4 | | REMOTE OUTPUT 3 |
| 22 | | P13-5 | | REMOTE OUTPUT 4 |
| 23 | | P13-6 | | REMOTE START INPUT |
| 24 | | P13-7 | | REMOTE STOP INPUT |
| BS4-1 | | P1-9 | K8-8 | NON-SYNC COMMON |
| 2 | | P1-5 | K4-8 | MONO COMMON |
| 3 | | P1-3 | K5-8 | SOECIAL 1 COMMON |
| 4 | | P1-1 | K11-8 | SVA COMMON |
| 5 | | P1-7 | K7-8 | SPECIAL 2 COMMON |
| 6 | | P1-11 | K12-8 | SPECIAL 3 COMMON |
| 7 | | P1-6 | K8-12 | NON-SYNC SWITCHED |
| 8 | | P1-8 | K4-12 | MONO SWITCHED |
| 9 | | P1-2 | K5-12 | SPECIAL 1 SWITCHED |
| 10 | | P1-4 | K11-12 | SVA SWITCHED |
| 11 | | P1-10 | K7-12 | SPECIAL 2 SWITCHED |
| 12 | | P1-12 | K12-12 | SPECIAL 3 SWITCHED |
| 13 | | | | N/C |
| 14 | | P14-1 | | GROUND |
| 15 | | P14-2 | | DATA (NEG) |
| 16 | | P14-3 | | DATA (POS) |

APPENDIX H

BASIC PLUG AND CABLE FUNCTIONS:

| | |
|---|---|
| P1 | SOUND PROCESSOR OUTPUTS |
| P2 | INPUT/OUTPUT/ENVIRONMENT |
| P3 | NON-SYNC/AUXILIARY PROJECTOR |
| P4 | PROJECTOR/LAMP/CHANGEOVER (AUTOMATION) |
| P5 | PROJECTOR/LAMP/CHANGEOVER (MANUAL) |
| P6 | LIGHT CIRCUITS (MANUAL) |
| P7 | CURTAIN/MASKING (MANUAL) |
| P8 | START/STOP/SYNC CONTROL (PANEL) |
| P9 | LIGHT CIRCUITS (AUTOMATION) |
| P10 | DISPLAY OUTPUT |
| P11 | NOT USED |
| P12 | KEYBOARD INPUT |
| P13 | REMOTE INPUT/OUTPUT |
| P14 | SYNC INPUT/OUTPUT |
| P15 | FUTURE |
| P16 | FUTURE |
| P17 | KEYBOARD INPUT |
| P18 | INPUT FROM POWER SUPPLY |

APPENDIX I

REMOTE STATIONS

SEE SECTION FUNCTION 15 FOR REMOTE FUNCTION DEFINITIONS

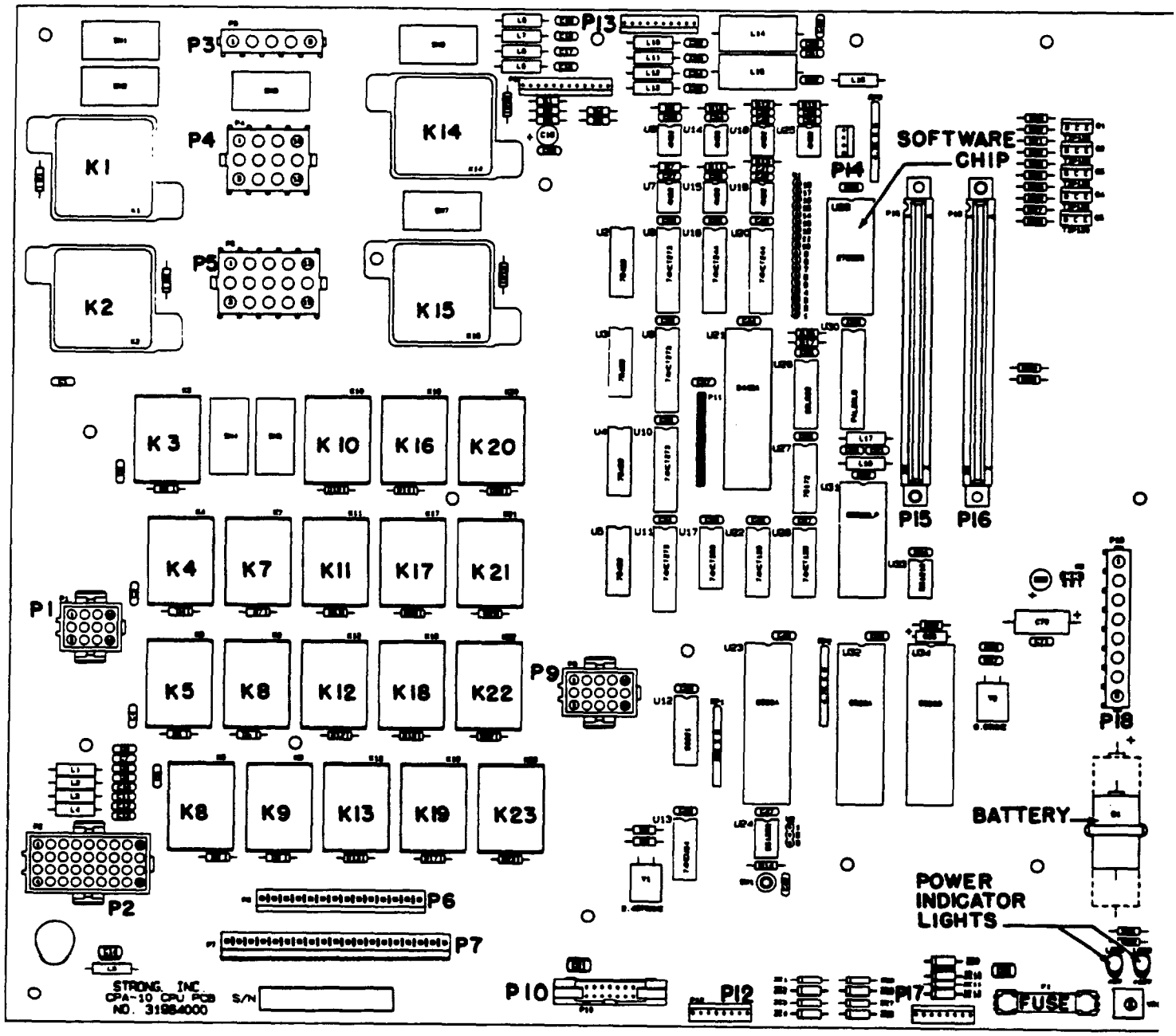
| CONFIGURATION/ FUNCTION | | CONSOLE CONNECTION | INPUT/OUTPUT | REMOTE CONNECTION |
|---|---|---|---|---|
| CONFIGURATION "A": | | | | |
| GREEN | READY | BS3-17 | OUTPUT 1 | |
| YELLOW | LOAD | 18 | OUTPUT 2 | |
| CONFIGURATION "B": | | | | |
| GREEN | SHOW RUN | BS3-17 | OUTPUT 1 | |
| YELLOW | LOAD | 18 | OUTPUT 2 | |
| CONFIGURATION "C": | | | | |
| RED | LOAD | BS3-18 | OUTPUT 2 | |
| YELLOW | INTERMISSION | 22 | OUTPUT 4 | |
| CONFIGURATION "D": | | | | |
| | TRAILER | BS3-17 | OUTPUT 1 | |
| | FEATURE | 18 | OUTPUT 2 | |
| | CREDITS | 21 | OUTPUT 3 | |
| | INTERMISSION | 22 | OUTPUT 4 | |
| FOR ALL CONFIGURATIONS: | | | | |
| | POWER (+) | BS3-15 | REMOTE POWER | |
| | POWER (-) | 16 | REMOTE RETURN | |
| RED | ALARM | 19 | REMOTE ALARM | |
| | ALARM CANCEL | 20 | REMOTE ALARM CANCEL | |
| | START | 23 | REMOTE START INPUT | |
| | STOP | 24 | REMOTE STOP INPUT | |

The remote stations used with Configurations "A", "B", and "C" have the following displays:

| | A | B | C |
|---|---|---|---|
| ALARM | RED<br>BUZZER | RED<br>BUZZER | BUZZER |
| READY | GREEN | YELLOW | |
| LOAD | YELLOW | FLASHING YELLOW | RED |
| SHOW RUNNING | | GREEN | |
| INTERMISSION | | | YELLOW |

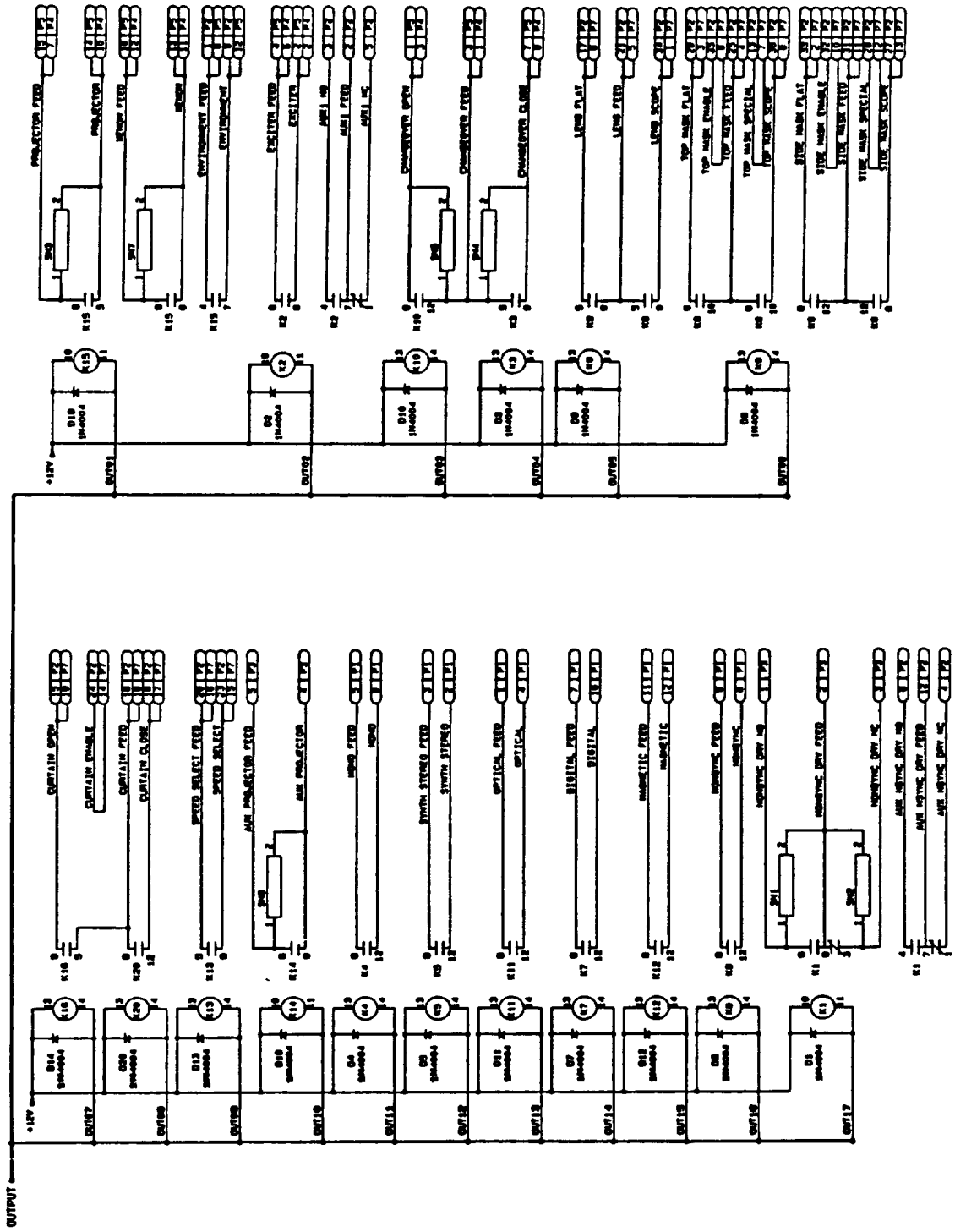
The ALARM CANCEL switch, when pressed at any remote station, cancels the ALARM output from the CPA-10 System.

The "D" Configuration is for special remote systems requiring detailed film presentation status.

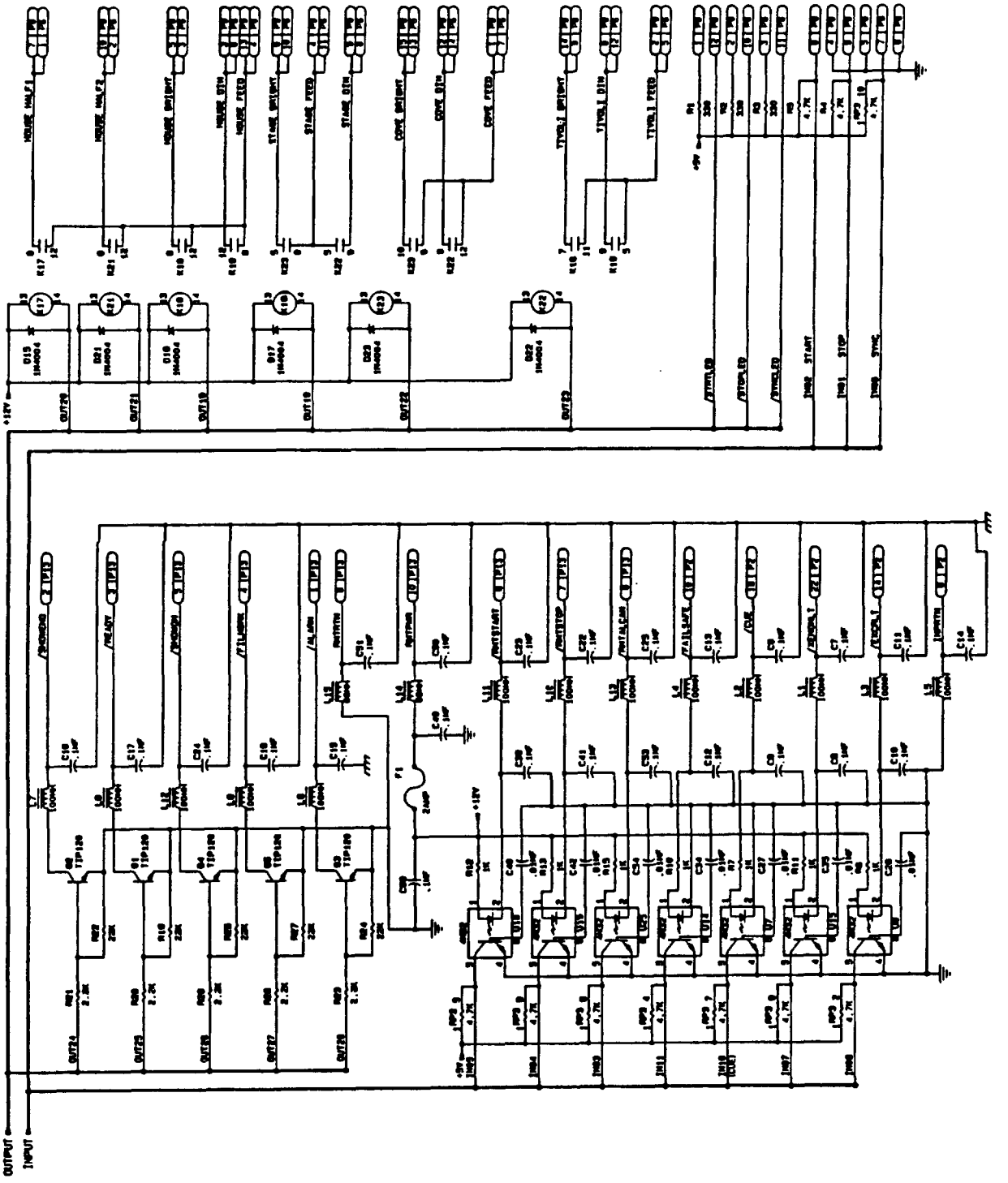



K = Relay
P = Plug or Receptacle

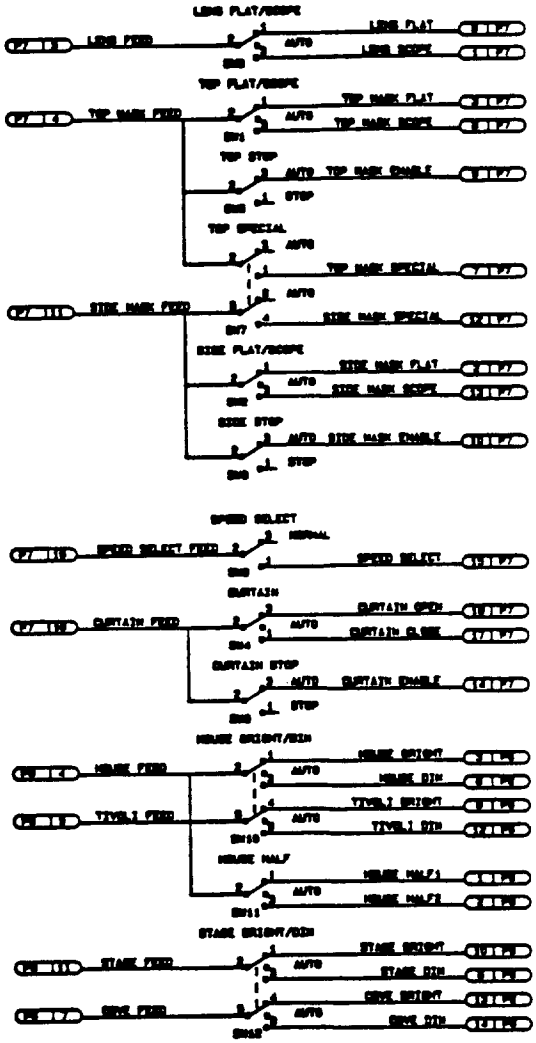
**COMPONENT LAYOUT - CPA-10 Mother Board**



CPA-10 CPU Board (1 of 



**CPA-10 CPU Board (2 of 2)**



**CPA-10 Override Switch Board**