

MCA
DISCO VISION[®]

MCA VIDEO DISC PLAYER
MODEL PR-7820

OPERATOR'S MANUAL



PLAYER DESCRIPTION

GENERAL

Welcome to the world of MCA DiscoVision. The videodisc and the videodisc player are the successful culmination of concerted efforts by scientists around the world. With the use of lasers, microprocessor and the latest electronic semiconductor devices, these players can re-create a studio-quality television picture from the videodisc.

The videodisc, identical in size to a standard 12-inch phonograph record, carries up to 30 minutes of programming per side in standard format, and up to one hour per side in the extended play format. (See page 10)

The design of the player enables it to search out any desired frame in less than five seconds, play in slow motion or freeze frame. These features, coupled with the advantages of operation under the control of a computer program entered either manually, by the user, or automatically, from a videodisc, makes the unit an ideal medium for education, product demonstration and other applications heretofore existing only in the imagination.

Although it is technologically sophisticated, the videodisc player is very easy to operate. Please read this manual before putting the player into service.

THEORY OF OPERATION

Information on the videodisc is carried by a series of microscopic pits which are laid down in a spiral track on a light reflective surface. Playback of this information is achieved by

directing a tightly focused light from a low-powered laser onto the disc and picking up the reflected signal with a photo-sensitive diode. The "laser stylus" thus never physically contacts the disc and so the disc never wears out. In addition, the laser is focused on the reflective layer at the center of the disc and dust or fingerprints on the surface are out of focus for the beam and thus do not interfere with playback.

The signal picked up by the photo diode is processed to develop an NTSC compatible T.V. signal which can drive either a T.V. monitor or a standard T.V. set. In addition, signals are also derived to drive servo-mechanisms which control focus of the laser beam, tracking, motor speed and time base correction of the video signal. Control of the player is exercised by a microprocessor, which permits the wide variety of control features of the player to be achieved.

OPERATIONAL FEATURES

The videodisc player incorporates the following operational features:

FRAME DISPLAY — Each frame is uniquely identified by a frame number. If desired, these numbers can be displayed on the T.V. screen along with the video program.

FREEZE-FRAME — This operation will cause the program to stop at the frame displayed at the instant the button is pushed and will continue to display that frame until another mode is selected.

SCAN (Forward or Reverse) — This mode permits you to rapidly move through the program material — either forward or reverse — to find a particular desired segment.

SLOW MOTION (Forward or Reverse) — The speed of this function is controlled by a separate control located on the front of the player. The slow motion speed can be controlled from normal speed (30 T.V. frames per second) all the way down to a virtual stop.

STEP-BY-STEP MOTION (Forward or Reverse) — Functioning only in the Freeze-Frame mode, this function permits you to move backward or forward (one frame) each time the button is pushed. This mode is used for viewing a series of still frames.

SEARCH — This control is used to obtain rapid access to a desired specific frame number. The frame number is entered into a register by the use of a numerical key pad on the Remote Control, and then the SEARCH button is pressed.

AUTO STOP — This mode is a programmed STOP which requires entry of a desired frame number from the Remote Control number key pad. While the program is playing, the desired frame number is entered into the register and

the AUTOSTOP button is pressed. When the player arrives at the desired frame number, it will stop and go into the Freeze Frame mode.

DUAL AUDIO — The videodisc carries two separate audio channels which can be used for stereo sound or dual language programming. The player permits the selection of either one or both of these channels.

USER PROGRAMMING CAPABILITY — It is possible for the user to enter a multiple step program into the player by using the remote control key pad. This program would make use of the previously described features in a desired sequence keyed to individual frame numbers. Instructions for writing, entering and running such a program are to be found in the Appendix to this manual.

PRE-PROGRAMMED CAPABILITY — The player has the capability of reading, storing and running programs which may be included on certain videodiscs. If you play such a Self-Programmed disc, the player will automatically read and execute the program without any special action required of the operator.

DIRECT COMPUTER INTERFACE — The machine provides a special connector which permits access to the internal microcomputer from an external computer. If you need more information of this feature please contact MCA DiscoVision.

EXTERNAL SYNCHRONIZATION — If it is desired that the machine work into a video network, it can be externally synchronized to studio Composite Sync and Color Subcarrier through convenient terminals.

REJECT — This function cancels any of the operating modes, returning the disc to the load position and stopping motor rotation.

REMOTE CONTROL UNIT

A useful feature of the player is the Remote Control Unit, shown in Figure 1. This unit duplicates the front panel controls and, in addition, incorporates a numerical key pad for the entry of numerical data into the microprocessor and additional keys used for the programming function.

You will notice that many of the keys have dual labels. One label duplicates a front panel function, and the other describes a function used in the programming mode. For details of the programming function, refer to the DiscoVision Programming Manual. When operating in the normal mode, disregard the programming function labels.

The Remote Control Unit communicates with the player either over an infra-red beam or through a remote control cable. The wireless mode is generally the most convenient to use but the cable should be used when more than one player is in use in the same room. Most effective wireless operation is obtained when the top end of the unit is pointed towards the player. Successful reception of the remote command is indicated by the flashing of the red lamp on the Remote Indicator (located next to the Slow Motion Speed Control).

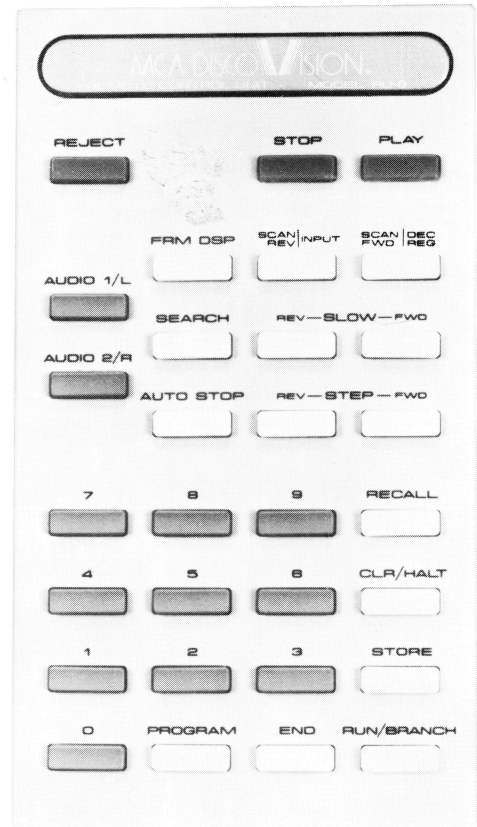


FIGURE 1 REMOTE CONTROL UNIT

“On-deck” operation of the Remote Control Unit is achieved by placing the unit on the player top as shown in Figure 2. The unit cable may be used by plugging one end into the remote unit adjacent to the infra red bulbs and the other into the marked jack in the front of the player.

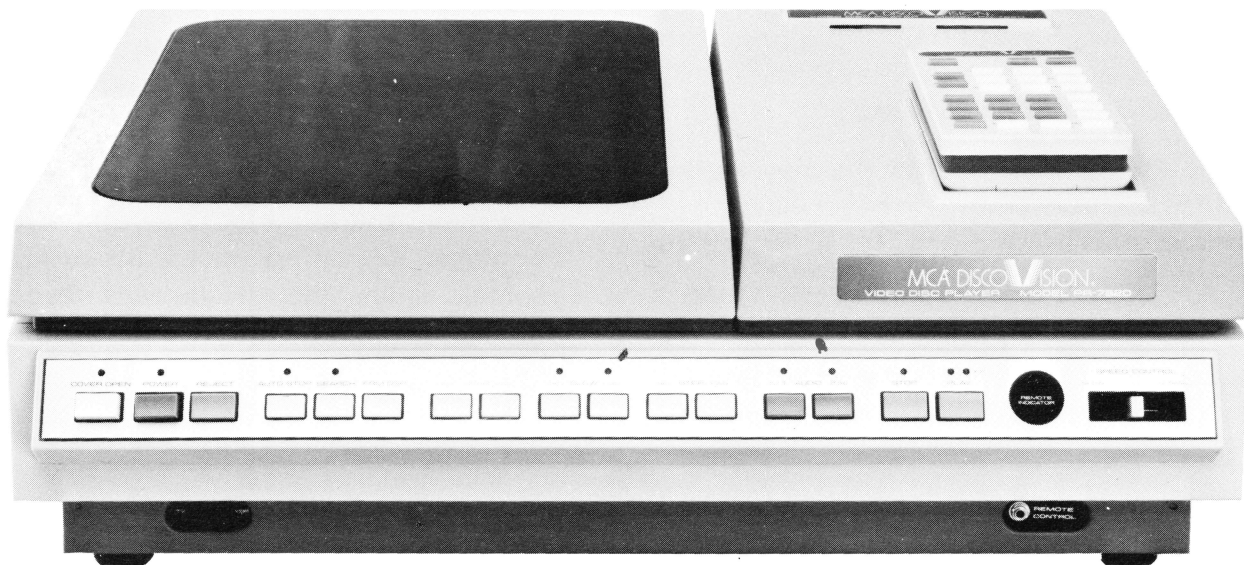


FIGURE 2 FRONT VIEW OF THE VIDEODISC PLAYER

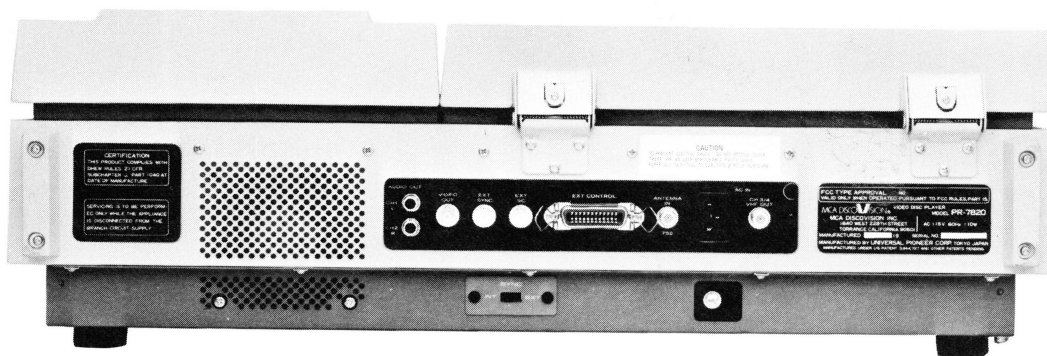


FIGURE 3 REAR VIEW OF THE VIDEODISC PLAYER

PLAYER PREPARATION

UNPACKING THE VIDEODISC PLAYER

The packaging system of the Videodisc Player has been carefully designed to protect it from the hazards of shipping. However, to make sure that the unit has not suffered from unusual abuse, carefully inspect it as you unpack it. If you see any damage to the player, file a claim with the shipper and notify the designated repair facility.

Our warranty is void if the unit is shipped by common carrier in other than the factory designed shipping carton. Therefore, to obtain the best warranty service save all the shipping materials.

PRECAUTIONS

When removing the player from the shipping carton *do not lift it by the hinged cover*. Make sure that you grasp it firmly at the base with fingers extended under the player. It is easier if two people lift the player out.

Before attempting to operate the player, after bringing it in from storage in either elevated or sub-freezing environments, let it first attain room temperature.

Keep hands, hair and clothing away from the rotating spindle. Although the spindle motor cannot be powered when the cover is open, it

normally spins at 1800 r.p.m. and will take several seconds to slow down after the cover is raised.

Program is read from the disc by means of a laser optical system. Access and adjustments to this system should only be by authorized service technicians.

CAUTION — Use of controls or adjustments or performance of procedures other than those specified here-in may result in hazardous radiation exposure.

To protect the delicate carriage mechanism from the effects of shipment, the player is equipped with a carriage hold-down screw. This captive screw is located in an access hole on the left side of the player and must be released before attempting to use the player. To release the screw, insert a standard screwdriver into the access hole, engage the screw and turn counter-clockwise until the carriage is released and no further resistance is felt (approximately six complete turns.).

Conversely, when shipping the player, reverse the process; insert the screwdriver, engage the screw and turn clockwise until the screw tightens. It may be necessary to hold the spindle against the left side of its traverse slot to engage the carriage hold-down screw.

CONNECTIONS

STANDARD T.V. SET SYSTEM

Figure 4 shows how to connect the player for use with a standard T.V. set.

1. Attach one end of the R.F. cable to the terminal labeled VHF OUT. Make sure that the center wire of the cable enters the hole in the player connector and tighten the knurled outer barrel of the cable connector.
2. Attach the other end of the cable to the 75 ohm cable input of the T.V. set. If the set does not provide this input, you will need to attach a 75 ohm to 300 ohm adapter to the cable and attach the leads of the adapter to the VHF antenna screws of the T.V. set.
3. Set your T.V. set to either channel 3 or 4 — whichever is *not* used in your area. Set the player to the same channel using the channel switch located on the left hand side of the player.
4. Connect your T.V. antenna to the terminal labeled ANTENNA IN on the player. If your antenna lead-in is not a 75 ohm coaxial cable you will need a 300 ohm to 75 ohm adapter.
5. A switch on the lower left of the front of the player permits you to switch your T.V. to either the antenna (TV) or the output of the player (VDP).

6. Since the player provides two channels of high fidelity sound, you may wish to use a separate audio system. If so, use a pair of standard audio cables to connect the AUDIO 1 and AUDIO 2 player outputs to the auxilliary inputs of a stereo amplifier or receiver.
7. Plug the AC line cord from the player into a 115 VAC 60 HZ outlet.

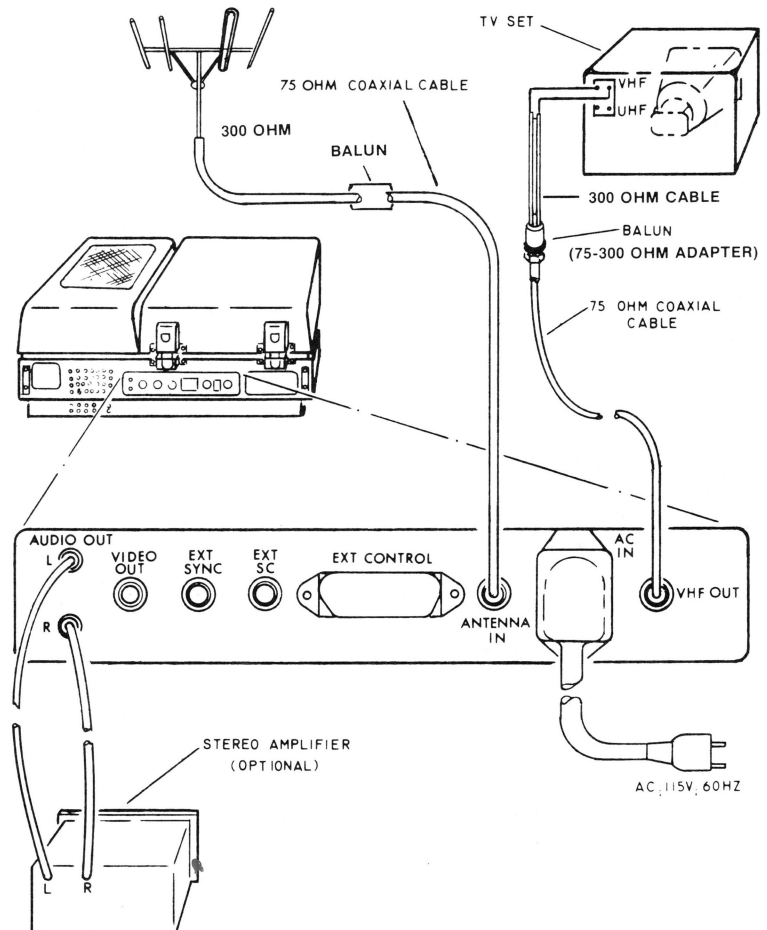


FIGURE 4 STANDARD T.V. SET SYSTEM

STUDIO MONITOR SYSTEM

Figure 5 shows how to connect the player in a typical studio system using monitors.

1. Use a coaxial cable to connect the player terminal marked VIDEO OUT to the terminating video input terminal of a standard NTSC monitor.
2. Connect an audio cable from the AUDIO 1 terminal of the player to the audio input of the monitor. If a separate stereo audio system is available, connect both AUDIO 1 and AUDIO 2 to auxilliary inputs of the system.
3. If house sync is to be used, connect Composite Sync to the EXT SYNC terminal of the player, and Color Subcarrier to the EXT SC terminal. Place the SYNC switch in the EXT position.

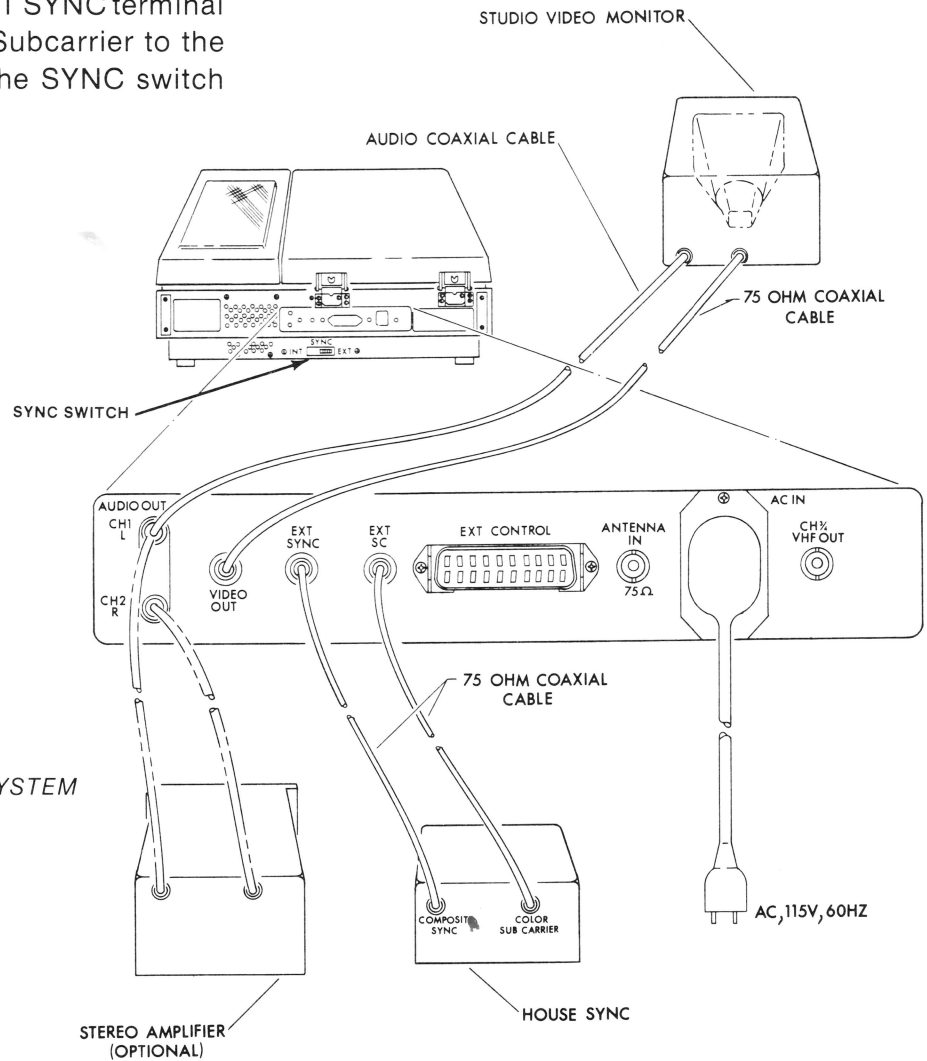


FIGURE 5 STUDIO MONITOR SYSTEM

PLAYER OPERATION

STARTING THE PLAYER

Power the machine by pushing the POWER button. As the laser takes a short time to come up to full operating power, allow a warm-up time of three or four minutes before playing a disc.

LOADING THE PLAYER

Release the cover latch by pushing the white COVER OPEN button.

Industrial videodiscs are labelled with the label on the same side as the program it describes. Therefore place the disc on the player label up. However, entertainment discs are made with the label on the opposite side to the program it describes. Consequently, when playing an entertainment disc, make sure that the label describing the side you want to play is on the lower side of the disc.

Remove the disc from its protective cover, holding it either with one hand between the third finger in the center hole and the thumb

on the outside edge, or with both hands using fingertip pressure on the edge of the disc. (See Figure 6) Place it over the spindle, and secure it with the Disc Clamp.

ENGAGING THE DISC CLAMP

To engage the Disc Clamp, simultaneously press the two projecting ears at the very top of the clamp until both audibly click and remain in retracted position. This will allow the clamp to snap downward and expand the drive/retainer ring, securing the disc to the spindle. Lower the cover, making sure that the latch engages.

REMOVING THE DISC

The disc clamp is released by grasping the outer diameter of the spool with the index and second finger and pulling it up while pressing the center shaft down until an audible click is heard. The disc may then be removed from the player by grasping the edges and carefully lifting it from the spindle.



FIGURE 6 LOADING THE PLAYER



FIGURE 7 PRESS PROJECTING EARS



FIGURE 8 PRESS CENTER SHAFT DOWN

PLAYING THE DISC

The player can be controlled with either the controls located on its front, or with the Remote Control Unit. The remote control duplicates the operational controls of the player and in addition adds a number key pad for frame address and further controls for the programming functions which are discussed in the DiscoVision Programming Manual.

With the disc in the stationary position the only functional control is the Play control. Press the PLAY button. The disc will start to rotate and the carriage will move it under the laser stylus platform until it reaches the inside edge of the recorded material, which is the start of the program. The laser stylus will focus and find frame number 1, at which time the picture will appear on the television screen. Frame 1 will be stationary for several seconds and then play will commence at regular speed.

The operational controls will now function as follows:

STOP — Stops the program, resulting in a Freeze Frame.

AUDIO (1 & 2) — The video program is accompanied by two audio tracks which may, depending on the disc, be used for a stereo soundtrack, bilingual voice tracks or carry identical information. Pushing the audio buttons permits the selection of either one or both of these tracks. If only one track is selected, as would be the case for a bilingual program, it will be routed to both audio outputs.

FRAME DISPLAY — Pushing this button displays the number which identifies each frame of the program. Pushing the button a second time will cancel the display.

SCAN (Forward or Reverse) — This mode functions only when your finger is on the button and permits you to rapidly move through the program material — either forward or reverse — to find a particular desired segment. The Scan mode functions at two different speeds. If SCAN is pushed while the player is in either the Play or Slow Motion modes, Fast Scan will be engaged, capable of traversing the whole disc in 5 seconds. If the player is in the Stop mode when SCAN is pushed, Slow Scan will result which requires 2 minutes to traverse the disc.

STEP (Forward or Reverse) — Functioning only in the Freeze-Frame Mode, pushing one of these buttons moves you one frame each time the button is pushed. This mode is useful for viewing a series of still frames.

SLOW (Forward or Reverse) — The Slow Motion Mode is variable from normal speed (30 T.V. frames per second) to stop, by adjustment of the SPEED CONTROL, located at the extreme right front of the player.

SEARCH — This control is used to obtain rapid access to a desired frame number. The frame number is entered into a register with the numerical key pad on the Remote Control and then the SEARCH button is pressed. The T.V. screen will go blank while the search is in progress and, at its conclusion, the desired frame will be displayed — in Freeze-Frame Mode. It will be necessary to push the PLAY button to restart the program. If no frame number is entered before the search button is pressed, the player will search back to frame 0 and stop.

AUTO STOP — This mode is a programmed STOP and also requires entry of a desired frame number from the Remote Control number key pad. While the program is playing, the desired frame number is entered

into the register and the AUTO STOP button is pressed. When the player arrives at the indicated frame number, it will stop and go into the Freeze-Frame mode.

REJECT — Pressing this button will interrupt player operation, cancel any of the operating modes, returning the disc to the load position and stopping motor rotation. The disc can then be unloaded by pushing the COVER OPEN button to release the cover, disengaging the Disc Clamp as described earlier, and transferring the video disc back to its protective container, being careful to keep fingers off the playing surface of the disc.

FRAME NUMBER STORAGE REGISTER

An easy-to-use and most useful feature of the player is its ability to store and recall frame numbers. This feature can be used for finding and playing specific segments of a video disc without the need to remember the frame numbers.

To enter a number into a register, it is first necessary to call up the register by entering its identifying number (from 0 to 512) with the numerical key pad of the Remote Control Unit, followed by pushing the RECALL button. This action displays the register number and its current contents on the T.V. screen. Now enter the desired frame number with the number key pad and push STORE. The frame number is now stored in the register and the next register in sequence is automatically recalled. The next desired frame number is then entered into this new register with the number key pad and stored by pushing STORE. Similarly, a whole series of such frame numbers can be stored in sequence.

A simple example of the use of this feature will help to clarify it: Suppose that your disc

contains presentations on different hotels in Bermuda and you want your clients to view the Holiday Inn segment which runs from Frame 1250 to Frame 1700, and the Bermudian segment, which runs from Frame 3280 to Frame 3900. You enter your frame numbers into the first four registers in the following sequence:

| | | | | |
|---|---|---|---|--------|
| | | | 0 | RECALL |
| 1 | 2 | 5 | 0 | STORE |
| 1 | 7 | 0 | 0 | STORE |
| 3 | 2 | 8 | 0 | STORE |
| 3 | 9 | 0 | 0 | STORE |

Now the frame numbers are stored in the register and will remain there until new frame numbers are written over them. To play the program push 0, RECALL to reach the first register and then SEARCH. The player will then search the disc until it finds Frame 1250 and this frame will be displayed on the T.V. screen. Now push AUTO STOP and the player will go into Play Mode until it reaches Frame 1700 and then stop. Next push SEARCH and the player will search for the frame in the next register, 3280. When this frame appears, push AUTO STOP again and the player will play up to 3900 and then stop.

You will appreciate the usefulness of this feature. If you are interested in learning more sophisticated methods of programming the machine, please refer to the DiscoVision Programming Manual.

SELF-PROGRAMMED VIDEODISCS

Some videodiscs incorporate an operational program on the disc. If such a program is encoded on the disc the player will read it and store it in memory automatically. After it has read the program it will execute it with no action required of the operator.

If you wish to play a self-programmed disc and not load the program, turn off Audio Channel 2 by pushing its control button before pushing PLAY. After the video program starts to play, you may turn Channel 2 back on again, if needed, after 5 seconds of play have occurred.

EXTENDED PLAY VIDEO DISCS

The standard video disc is recorded at a constant rotational speed of 1800 r.p.m. This permits exactly one complete T.V. picture to be recorded on each revolution of the disc. This regular spacing makes possible many of the powerful features of the player, such as Stop Motion, Slow Motion and Step-by-Step operation, and has a playing time of up to 30 minutes per side.

In programs where these features are unnecessary, such as full-length movies, it is possible to record programs in Extended-Play mode and up to one hour of program can be recorded on each side of the disc. In this mode one complete revolution of the disc contains a variable number of complete T.V. pictures and the pictures do not line up from one revolution to the next. In this case the previously mentioned features will not function.

If an Extended-Play disc is played on the player, it will be automatically recognized as such and the XP lamp on the front panel

will light indicating the nature of the disc, warning the operator that during the playing of this disc Stop Motion, Slow Motion and Step-by-Step and programming controls will not function. With Extended Play discs the frame number display will indicate elapsed time of the program rather than the frame number.

CARE AND STORAGE OF VIDEODISCS

The videodisc, like an audio disc, is made of plastic and can be cared for in a similar fashion. The disc may be dusted with a clean soft cloth and safely cleaned using a mild plastic cleaner.

While fingerprints on the disc will not affect the information stored on it, they may cut down on the amount of light reflected back from the information layer and thus detract from the quality of the picture. Consequently, handle the disc by its edges or between one edge and the large center hole to avoid touching the playing surface.

Videodiscs should lie flat in their containers rather than on edge, thus lessening the possibility of their becoming warped. If a disc becomes excessively warped, the player will not be able to track it. Always keep a disc in its container when it is not being played. Although the plastic of the disc is hard, it is still possible to pick up scuffs and scratches which could interfere with the playback process.

TROUBLE SYMPTOMS AND POSSIBLE CAUSES

The following symptoms and checks are given to help you in the event difficulties are encountered with the operation of your videodisc player:

Videodisc Does Not Rotate:

- A. Is the player plugged into the wall outlet?
- B. Is the front panel Power switch On?
- C. Is the lid completely closed? Check the Cover Open Lamp.

Videodisc Rotates, but no Picture Appears:

- A. Is the T.V. on?
- B. Is the T.V. tuned to the same channel as the player's side panel Channel Selector switch?
- C. Is the player properly connected to the T.V.? (See "Installation" section of this manual).
- D. Is the videodisc installed correctly with the label side up for industrial discs and down for entertainment discs?

Poor Picture Quality or Distorted Picture:

- A. Is the videodisc installed correctly with the label up for industrial discs and down for entertainment discs?
- B. Is the player properly connected to the T.V.? (See "Installation" section of this manual).
- C. Is the T.V. tuned to the same channel number as the player's side panel Channel Selector switch?
- D. Check the fine tuning on the T.V. It may require touch-up to correctly fine tune the videodisc signal.
- E. Switch *both* the T.V. and the player to the alternate channel (3 or 4) and check for an improvement.
- F. Does the T.V. produce a good quality picture on other channels when the player is Off? If your T.V. does not produce a good picture on other channels, it will not produce a good picture from the videodisc either.

- G. Is a good picture obtained when playing other videodiscs? If so, the problem is likely a poor videodisc and not a defective player.

Picture Sticks or Suddenly Jumps Backward:

- A. This symptom is usually due to a damaged area on the videodisc. The defective area can be passed over by pressing the Search Forward button momentarily.

Freeze-Frame Flickers on the T.V. Screen:

- A. This symptom does not indicate a defective player or videodisc. Some videodisc programs normally exhibit this phenomenon if their program material was not specifically produced for videodisc use. If encountered, the flicker can be minimized by pressing the stop control button a few times to advance or reverse the program to a nearby picture that plays without flicker.

If the player fails to respond to command or continues to exhibit an unusual characteristic, push the REJECT button and after the disc has moved to the park position push the POWER button. Then start the operation sequence again by pushing POWER followed by PLAY.

Adjustment and Maintenance of the player should be handled only by Factory Authorized Technicians. As the electronics and optics require special equipment and procedures to properly service the players. When returning the play for factory service it should be re-packaged in its original carton to assure that it was not damaged during shipping.

GLOSSARY

- AUTO-STOP** — A programmed stop and freeze frame to terminate the normal TV play mode.
- BRANCH** — A program redirection command for program step execution.
- CLEAR** — A command to release programmed control of the player.
- DECREMENT REGISTER** — A program command causing the reduction by one of a number stored in a specified register.
- EXTENDED PLAY DISCS** — A disc recorded to provide up to one hour per side play time. This format eliminates stop motion, slow motion and other programming control.
- FORMAT — Extended Play** — NTSC Standard — 30 frames per second; Recorded with a variable number of frames per revolution.
- FORMAT — Standard** — NTSC Standard — 30 frames per second; Recorded with one frame per revolution.
- FRAME-NUMBER** — Sequential number assigned to each television frame.
- FRAME-NUMBER DISPLAY** — Ability of player to display frame numbers superimposed on TV picture.
- FREEZE FRAME** — Ability of player to display a single frame indefinitely.
- HALT** — A programmed player command.
- INPUT — Program** - Programming inputs to the microprocessor; either by user or from encoded disc.
- INPUT — Viewer** - Response to programmed direction via the remote unit.
- LASER** — A low powered light energy device.
- LASER STYLUS** — Optical system using a laser light beam to read information from videodisc.
- MICROPROCESSOR** — A state-of-the-art miniature computer used to control the player function.
- PAUSE** — A programmed stop for a controlled length of time.
- PRE-PROGRAMMED DISCS** — A microprocessor program encoded on the disc which is automatically executed as the disc is played.
- PROGRAM — Player Control** - A microprocessor operating program for control of the player.
- PROGRAM — Video** — A recorded video program in color or black and white with one or two channel sound.
- SCAN** — Ability to traverse across the disc at 100 times normal play speed.
- SEARCH** — Automatic rapid scan of the disc to locate a specific frame.
- SLOW MOTION** — Variable speed slow motion. Varying from normal 30 frames per second to 1 frame per minute.
- STEP MOTION** — Ability to step TV display one frame at a time.
- RECALL** — The command to call up a register from the memory of the microprocessor.
- REGISTER** — A memory location in the microprocessor.
- RUN** — A command to start execution of a microprocessor controlled program.
- USER PROGRAM** — A series of operational commands stored in the microprocessor by the operator.
- VIDEODISC** — A recorded disc, 12 inches in diameter containing 30 minutes or more of television programming.

