LCSD-****
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FR80 OPERATOR'S REFERENCE MANUAL

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To generate this manual, log on to any 7600 account, and execute:

XPORT RD .1Ø9976:OPFILES[FR8ØMAN1* FR8ØMAN2*] / *t v*

ALLOUT NIPS GR. PS. 1 FR8ØMAN1* FR8ØMAN2* BOX mmm identification

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PREFACE

PREFACE

The FR80 Operator's Manual has been written as a reference and supplement to an FR80 training program. The manual includes descriptions of the various pieces of equipment used on the FR80; disc and utility routines; how to run production from the disc and tape Systems, from both data tapes and CHORS; troubleshooting instructions for certain pieces of equipment and for production work; explanations of the various logs and forms; and technician call-in procedures.

Technical verification was provided by: Chuck Mancuso, Joe Kuchta, and Dale McDonald. Any questions or comments concerning this manual should be directed to the authors, the FR80/CHORS coordinators, or an I/O supervisor.

NOTE:	Updates to this document are indicated by a narrow vertical line ▒ on the right side of the page. In addition, a listing of modifications can be found at the end of text.
	Operator entered instructions to the system are followed with the use of rt, which indicates the use of the return key.

INTRODUCTION

INTRODUCTION

The FR80 system converts magnetically recorded, computer-derived information into alphanumerical text or graphically displayed copy. The system takes information from magnetic disc and/or tape, and translates it into images on a high-precision cathode-ray tube. A camera photographs the face of the tube, and the resultant film output is processed in Computations photographic processing lab.

There are currently four FR80s. They are all basically identical, but may have been modified in some way to meet special processing needs. All four FR80s can process data from magnetic tape. FR80s 1-3 can process data from "CHORS". CHORS means Computer Hardcopy Output Recording System. In very simple terms, CHORS is an intermediate system through which output files from worker computers are directed to disc pack storage and then processed by the appropriate output processing device.

Each FR80 has its own reload tape, as there are certain differences that must be taken into account when manipulating the memory of each FR80.

There are two processing systems. Under normal circumstances, the FR80s are run from an internal disc system. There is a back-up system on magnetic tape.

Production work on the FR80s fall into one of three categories: FCB, Load and Go, and Data Only. Each is explained in the "Run Procedures" section of this manual.

Those characteristics that are unique to each FR80 are covered on the next page. While the information given is part of general operating procedures, these procedures can change for periods of time. To keep informed on a day-to-day basis, always check the FR80 Status Board for any changes.

FR80s 1 and 2

These FR80s are essentially the same. They are both used to run 105mm 48X microfiche film. Two types of output files are processed on these machines interchangeably – 105mm and FCB.

FR80 3

This FR80 is used to process 105mm film (FCB and 105mm queue types). It is unique because:

1) Instead of one disc, it has two; it needs separate reload procedures.
2) The tape drive it uses is different than those attached to other FR80s.
3) Error recovery procedures are somewhat different.
4) The teletype operates at a faster rate than those for the other FR80s.

Appropriate operator responses to these differences will be covered later in this manual.

FR80 4

FR80–4 is used to process all output types other than Load and Go 105mm. Our current output types, other than 105mm, include FCB; 35mm, which can be made into film strips or slides; P16mm (sprocketed movie film); 16mm (unsprocketed movie film); 24X (an enlarged image on 105mm type film); HCY (Hardcopy – a type of paper film that produces a high quality 8.5 x 11.0 inch paper output); and HFB (done on the Hardcopy camera using film that produces 8.5 x 11.0 inch viewgraphs). We have color capability for 35mm and P16mm, but color work is generally directed to a different output processing device (DICOMED).

FR80–4 is not connected to CHORS, so all work processed on FR80–4 is done from magnetic tapes. Depending on what type of work is being done, the Camera Select Switch (unique to FR80–4) may have to be reset and the intensity may have to be changed. The photo techs are the only ones who should make any changes, but the operator may want to verify that the changes have been made. The Daily Log for FR80–4 is the only place where backlog information needs to be recorded.

FR80 HARDWARE

BRIEF DESCRIPTION OF THE FR80 SYSTEM

The FR80 system is designed and manufactured by Information International, Inc. The Laboratory's FR80s have the capability of running from both disc and tape systems. The disc system is the primary system used; the tape system is used for backup purposes only. While reading magnetic tapes or disc packs, the system processes the information and records characters and vectors on a high-precision cathode-ray tube. A special camera system photographs the face of the tube. The resulting film must be processed in another off-line unit. The FR80 is organized into four functional sections:

1. Input section
2. Processor
3. Data translator
4. Recording unit

Input Section

The standard FR80 system configuration consists of seven-track magnetic tape drives (currently), a master tape controller and teletype. The master tape controller can be expanded to handle up to four magnetic tape drives and to provide switch selection of the desired drive. The input section controls the flow of data to the processor at a normal transfer rate of 30,000 18-bit words per second. The teletype units serve as a 30-character per second auxiliary communications link with the processor unit.

Processor

The basic binary processor utilizes an 18-bit word and a 16K core memory. Serving as the central control unit of the system, the processor combines operating data and plotting instructions for routing to the data translator. Under program controls, the processor instructs the data translator to generate the required alphanumerics, vectors, and formats for special forms.

Data Translator

The Data Translator takes information received from the processor (data and instructions for handling the data), and converts it to electrical signals.

Recording Unit

Electrical signals are converted into a recorded film image in the recording unit. The image is focused by the optical system and recorded by the microfilm camera. The operator can watch what is being put on film by looking at the TV-like display monitor.

FR80 Console

There are three sections to the FR80 console: instruction, address and data. These sections all consist of 18-bit words.

Instruction Section

I/O Transfer Instruction Definitions

1. The group of lights numbered from 00 to 17 is the current instruction being executed.

2. The first six bits (lights 00 to 05) of the instruction register show the type of instruction being executed. An IOT is a common instruction.

3. The next six bits (lights 06 to 11) show which hardware device is being referenced.

4. The last six bits (lights 12 to 17) show the command telling the hardware device bits (06 to 11) what to do.

I/O Transfer Instruction Operation

If the system halts, the I/O transfer instruction will indicate the error condition.

1. The following pairs of numbers will appear in the six bits (06 to 11), possibly identifying the hardware device that is causing the error condition.

    03 = teletype read
    04 = teletype print
    37 = register control (which is the first six bits)
    47 = character generator
    57 = disc
    60 = skip
    63 = camera
    73 = magnetic tape drive
    77 = internal (extend mode, reset, clocks, etc.)

2. 740040 in instruction register lights, indicates a halt instruction.

Instruction Group Switches and Indicators

1. Single Time – Two-position toggle switch used to increment a program through the individual states of the major state. Used in conjunction with Continue switch.

2. Single Step – Two-position toggle switch used to increment a program through the major states of the instruction. Used in conjunction with Continue switch.

3. Single Inst (Single Instruction) – Two-position toggle switch used to increment a program through its execution, a single instruction at a time. Used in conjunction with Continue switch.

4. Clock Mode – Stops internal clock and will halt machine. If switch is up, depress switch and press Continue switch to resume machine function. Used for maintenance purposes only! If, after PM, the FR80 slows to a halt or just stops, make sure this switch has been put down.

5. Extend Mode – Allows machine to start anywhere in memory. When on, depressing START causes the system to start in Extend mode.

6. Bank Mode – Allows machine to run in lower 8K of memory only.

7. Lamp Test – Tests instruction group indicator lamps only.

8. Ind Inh (Indicator Inhibitor) – Stops the data lamps.

9. Adr Stop (Address Stop) – Three-position toggle switch: Down position is normal and does not affect machine. When in middle position and Data select switch is in MEM, the program halts at the location keyed into the address registers on a read or write condition. Upper position will halt machine only if program tries to write into memory. This will force machine into key state requiring an operator response. (Data switch in MEM will slow the machine's performance by approximately 20%, because it has to read memory twice.)

NOTE: For normal machine operation, all switches must remain in the down or "off" position with the exception of BANK and EXTEND mode; they are kept "up".

Continued on next page ——→

Instruction Group Switches and Indicators (Continued).

10. Repeat Fast, Repeat Slow – Used in conjunction with Examine, Deposit, and Continue. Will complete operator's keyed–in request at either a 60–cycle rate (slow) or at full machine rate (fast).
Usage of these switches (indicator lights) can result in destruction of memory.

LAMP INDICATORS

11. PI (Program Interrupt) – Interrupts signals; used for debug and programming purposes. Not connected at this time.

12. Run – Will be on when machine is processing.

13. Disc Run -- Shows when disc is being accessed. If Disc Run light is on, and RUN light is off, disc is stopped. Both lights must be on to run from disc.

14. Clock – Indicates real–time clock is functioning.

15. Link – Not applicable to operators.

16. Fetch, Defer, XCT, Break – Major steps of an instruction. If the machine halts and any of these lights remain on (other than the Fetch light) the machine has a malfunction. What you do to correct the malfunction will depend on the situation (camera out of film, blown fuse, etc.)

17. Index, Extend – Memory–addressing indicators.

Address Section

1. Prg, Key, Reg lights – Set internally in machine by the executing program. Any key operation sets Key register.

2. Address Lights (00 to 17) – Indicates where in memory the program is actually executing.

   Location 1 to 39 – Dedicated locations; for example: 6, 7 – time counters; 32, 33 – magnetic tape increment.

   Location 40 and above: 40 – first empty location; 100 – starting location for diagnostics.

3. Start – When depressed, machine will start running program at location that has been set in on the address section of console; normally switch 12.

4. Reset – Clears all halts, and resets all counters to zero. When simultaneously used in conjunction with Stop switch, it will set machine up for hardware read in.

5. Stop – Terminates program execution after current instruction has been processed.

6. Continue – Three-position toggle switch locks in the up position. It stays momentarily in the down position. It will pick up program where Stop switch halted it. Also used in conjunction with Single-Time, Single-Step, and Single-Instruction switches.

7. Examine/Examine Next – When placed in up position, it will display any location keyed into the address section, and display that location in the data lights. When put in down position repeatedly, after first going to up position once, it will display each address of memory in increments of one word, starting with the location keyed into address register by operator. Information found at the examined addresses will be displayed in the data lights. This switch can be used while machine is running program. It will not erase memory.

8. Deposit/Deposit Next – When placed in up position, it will place into memory the information keyed in with the data switches, at the location keyed into the address registers. When deposit switch is placed in the down position repeatedly, after first going to the up position once, it will place whatever is keyed into data register into the memory location specified by the address registers, incrementing the location by one. This switch can be used while machine is running program. It will erase memory – USE WITH CAUTION!

Data Section

1. Prg, Key, Reg lights – Set internally by machine. Any key operation sets Key register

2. MEM through Y lights – Selection of data select indicator lights is achieved through rotation of the Data Select switch. These positions are used for debugging and programming purposes – not applicable to operators. Data select AC light should be on under normal operating conditions.

3. Data lights (00 to 17) – The lights numbered 00 to 17 on the data section of console show the information found at the location indicated by the address indicator lights. They also provide a means to deposit into the accumulator or memory by setting the toggle switches below the data indicator lights, and using the Deposit switch.

4. Read–in – Initiates the hardware read–in process.

5. Read–in–Mode – When in MT mode, machine will load from magnetic tape when Read–in switch is depressed. When in PT mode, machine will load from paper tape at teletype when Read–in switch is depressed. When in Disc mode, the machine will load from disc when Read–in switch is depressed.

6. Data Select – Seventeen–position rotating switch for indicators MEM through Y. Do not leave in MEM, because it can slow down machine by 20%. Normal setting is in AC.

7. Power – Controls power to entire system. TURN OFF ONLY IN EMERGENCY SITUATIONS! Emergency situations include power outages, fire, earthquake, water, and injury. It will take several seconds to power down. When turned back on, the machine requires two hours to stabilize.

8. Tape Drive Select – The Tape Drive Select switches are thumb wheels lined up horizontally near the tape drives. The farthest left switch is for tape drive A, the next for tape drive B, etc. The farthest right switch is reserved for the CHORS system. When dialed:

   1 = drive is in read/write mode
   2 = drive is in standby
   3 = drive is for programs tape
   4 = drive is in load mode

Standard Settings

The standard settings for the FR80 console are as follows:

1. Bank and Extend Modes - up.
2. Fetch Light -- on (always)
3. Address Location 40 (key 12) - up.
4. Data Address 1000 (key 8) - up (resets time).
5. Read-in-Mode -- Disc.
6. Data Select - AC.
7. Power - on.

Trouble Shooting

If console goes dead and Debug will not appear:

1. Press Stop, Reset, and Read-in switches several times.
2. If Debug does not appear, set the address location to 037777 and press Stop, Reset and Start.
3. If machine will not respond after several attempts, clear memory then go to step 1. If this fails, call your supervisor for help.

To clear MEMORY:

1. All data keys set to 0.
2. Push "fast repeat" switch up.
3. Push Stop-Reset.
4. Push "deposit" key up.
5. Push "deposit next" key down until all address register lights are blinking.
6. Push "fast repeat" key down. Put data key 8 up.

TELETYPES

TELETYPES

Each FR80 has its own Texas Instruments Silent 700 terminal. The terminal serves as a 30-character per second auxiliary communications link with the Processor Unit. To use a terminal, the two cables at the back of the terminal must be securely plugged in. Also, the following switches must be in the positions indicated:

UPPERCASE – depressed to left
HALF DUP – depressed to right
ONLINE – depressed to left
LOW SPEED – depressed to left

In addition to the regular typewriter-style keyboard, the terminals also use the following special function keys:

/(slash) – Completes word when enough characters are typed to make it unique.

CTRL – Used together with another key.

CTRL-A – Finishes the current fiche and stops. Works only for FCB.

CTRL-D – Calls up DEBUG.

CTRL-I – Used to interrupt any program instantly. Whatever has been interrupted must be restarted from the beginning.

ESC – Used together with other keys.

DEL – Used to "delete" a typed line. There is no key for deleting a single character.

PAPER ADV – Used to advance the paper through the teletype.

RETURN – Sends command to machine.

SHIFT – Used to access the character shown on the upper half of the alphanumeric keys.

SHIFT ? – Lists the parameters for the currently running job. (Use these keys when the system is in Monitor Mode.)

Teletype Paper Change

1. Use unclassified (borderless) teletype paper.
   (Thermographic or Thermal printing paper with small core.)

2. Lift lid.

3. Remove old paper roll.

4. Insert new paper roll so that paper comes from underneath paper guide roller.

5. Press "Paper Advance" key until the paper reaches the exit point at the top of the teletype.

6. Close lid.

Troubleshooting the Teletype

If you have trouble with a teletype:

1. Make sure the power cable is securely attached.

2. Make sure the switches are all set correctly.

3. Make sure you are using the correct paper.

4. The teletypes for FR80s 1, 2, and 4 are interchangeable.
   If you have a problem with one of these, you could move a teletype from an idle FR80 to replace the malfunctioning one.
   The teletype for FR80 3 is <u>not</u> interchangeable with the others.

If a teletype malfunctions after you've checked all of the above <u>and</u> you can't swap teletypes, call an FR80/CHORS technician.

TAPE DRIVES

TAPE DRIVES

Introduction

The FR80s each have one or more 7-track tape drives attached to them. There are two types of Kennedy drives.

Kennedy 9100 Tape Drive

Cleaning

For these tape drives, use alcohol to clean the Read/Write head. The rest of the drive must be cleaned by a technician. Clean the Read/Write head for each new tape.

Loading

1. Place tape on upper hub, flush against flange with Write-Enable groove facing towards drive.
2. Press center hub down to secure reel onto hub.
3. Thread tape, following diagram in drive.
4. Wind tape around take-up reel clockwise for five or six wraps.
5. Press LOAD switch. Tape will advance to load point.
6. Press ONLINE switch.

Unloading

1. Press ONLINE switch to take unit off-line.
2. Press REWIND switch. If reel is at load point, the tape will unwind. If not, press REWIND again.
3. Lift center hub and remove reel.

Kennedy Tape Drive With Tension Arms

Cleaning

1. Clean the Read/Write head for each new tape. Move the grey cover by pressing it open from the top clockwise.

2. Clean the entire unit once per shift. Use alcohol and wipe the head, the white rollers at the top and bottom, the black and silver rollers above and below the Read/Write head, and the black rubber wheel.

Loading

1. Place tape on upper hub, flush against flange with write-enabling groove facing towards drive.

2. Press center hub down to secure reel onto hub.

3. Thread tape, following diagram in drive.

4. Wind tape around take-up reel clockwise for five or six wraps.

5. Press Load switch. Tape will advance to load point.

6. Press Online switch.

7. Set toggle switch to "TAPE" when ready to process tape.

8. Set Unit Select switch to "1" when ready to process tape.

Unloading

1. Press Online switch to take unit offline.

2. Press Rewind switch. If reel is at load point, the tape will unwind. If not, press Rewind again.

3. Lift center hub and remove reel.

CAMERAS

CAMERAS

Introduction

There are ten cameras available to plot FR80 types: five 105mm 48X cameras for 105mm and CB output types, one 105mm 24X camera for 24X output types, one camera for Color 35mm and Color P16mm output types, one 35mm camera for DD80 and 35mm with an adapter for P16mm output types, one 16mm camera for 16mm output types, and one hardcopy camera.

Description – 105mm Camera

The 24X and 48X 105mm cameras are the same, except that the 24X produces larger page images than the 48X. 105mm production plots two microfiche per foot of film. These cameras are box shaped with two box shaped magazines for film supply and take-up. When running FCB output on FR80-4, the Camera Select switch is set to "1". No 105mm Load and Go output is currently being run on FR80-3 or 4.

Procedures for 105mm Film and Camera

The following should be done after a cut, before starting the run.

1. Film cuts on 105mm film size will occur approximately every 3 hours of actual plotting time, or when deemed necessary by the operator, not to exceed approximately 245 feet of film.

2. Check magazine latches (facing to the right), and insure that all doors are closed on the camera and magazine.

3. Check to insure that the vacuum hose is connected.

4. Check to insure that both power plugs at the back of the camera switch box are plugged in.

5. Check to insure that the switch on the right side of the camera is up.

6. Clear the camera once to insure that the proper amount of film is being advanced.

7. For FR80-4, check to insure the intensity setting is correct.

8. Run an FCB test tape before each cut, regardless of the system you are using (tape vs disc).

Gauge Monitoring – 105mm Camera

Make sure the supply spindle rotates, in order to insure that the film is advancing through the camera and is actually being exhausted.

Description – 16mm Camera

16mm films take the thin 1000–foot plastic supply cassette and the take– up magazine with the small flange. The 16mm camera has the small film aperture device WITHOUT sprockets. 16mm plots 24 frames per foot of film. Be sure the correct camera is installed (16mm vs P16mm). When using FR80–4, the Camera Select switch is on 1.

Be aware that once Go/rt is typed to start processing, a 16mm job may clear the camera four or more times, because of parameters set by the user. **NOTE:** Clear will not type out on the teletype.

Procedures for 16mm Film and Camera

The following should be done after a cut, before starting a run.

1. Check to insure that the power cord is plugged in.
2. Check to insure that the door on the face of the camera is tightly closed.
3. Clear the camera four times, to insure that the proper amount of film advances through the camera.
4. Check to insure the intensity setting is correct.
5. If you are running 16mm "Data Only" tapes, put one clear between each tape.
6. Run the 16mm test tape before each cut, regardless of the system you are using (tape vs disc).
7. Make sure the Camera Select Switch is set on "1".
8. Make sure the black rubber belt is attached to the take–up magazine.

Gauge Monitoring – 16mm Camera

1. Make sure the supply spindle rotates, in order to insure that the film is advancing through the camera and is actually being exhausted.
2. Make sure the film footage indicator on the supply magazine does not decrease by more than 400 feet. If you don't, the take–up magazine may jam.

Description – Hardcopy (HCY and HFB) Camera

The Hardcopy camera is large and black and takes up most of the area allowed for camera installation. It is a box-like camera. HCY and HFB use the same camera. Different film is inserted for each. HCY and HFB plot one frame per foot of film. Hardcopy film can only be run on FR80-4, because only FR80-4 has a Camera Select Switch, which is set on "3" to run HCY and HFB.

Procedures for HCY/HFB Film and Camera

The following should be done after a cut, before starting a run.

1. Film cuts on HCY and HFB film size will occur approximately every two hours of actual plotting time.

2. Check to insure the camera select switch is on "3".

3. Check to insure that the green READY LIGHT and the yellow "ON" light are on.

4. Check to insure the intensity setting is correct.

5. Check to insure that the emulsion switch is set to "EMULSION OUT".

6. Check to insure the vacuum hose is attached to the camera.

7. The photo technician should clear the camera once using the CLEAR button on the camera.
   NOTE: Do not use the "CLEAR" command when running HCY/HFB.

8. Run the "FHCY#" Test Tape before the plotting of HCY/HFB, regardless of the system you are using (tape vs disc).

Gauge Monitoring – HCY/HFB Camera

1. Make sure take-up magazine and supply spindles rotate.

2. Make sure the film footage indicator moves (located on the supply canister), to insure that the film is actually being exhausted.

Description – 35mm and P16mm Camera

35mm and P16mm film are processed using the same camera. The film aperture areas are removable. The supply and take-up magazines are circular.

35mm plots 16 frames per foot of film. It uses the wide supply and take-up magazines with the large flanges. Magnetic tapes or queues may be labeled "35", "DD80", or "X35". Be sure the correct camera is installed (35mm vs P16mm).

P16mm plots 40 frames per foot of film. It uses the thin supply magazine and take-up magazine with the large flange. The P16mm camera uses the small film aperture device with sprockets. Be sure the correct camera is installed (P16 vs 35mm or 16mm).

Be aware that once Go/rt is typed to start processing, a P16 job may clear the camera four or more times, because of parameters set by the user. **NOTE:** "CLEAR" will not type out on the teletype.

Procedures for 35mm and P16mm Film and Camera

The following should be done after a cut, before starting the run.

1. Film cuts will occur every three hours, not to exceed 400 feet.
2. Make sure the black rubber belt is attached to the take-up magazine.
3. Check to insure that the power cord and 10-ft indicator are plugged in.
4. Check to insure that the door on the face of the camera is closed tightly.
5. Clear 35mm twice. Clear P16mm four times. These clears insure that the proper amount of film advances through the camera.
6. Check to insure the intensity setting is correct.
7. Run a test tape before each cut, regardless of the system you are using (tape vs disc). For 35mm, use the 35mm test tape. For P16mm, use the 16mm test tape (there is no P16 test tape).
8. For FR80-4, the Camera Select Switch should be set to "1".

Gauge Monitoring

1. Make sure that the supply spindle rotates, in order to insure that the film is advancing through the camera and is actually being exhausted.
2. Make sure the film footage indicator on the supply magazine does not decrease by more than 400 feet. If you don't, the take-up magazine may jam.

Description – Color 35mm and Color P16mm Camera

C35 and CP16mm film are processed using the same camera. The film aperture assemblies are removable. The supply and take-up magazines are circular. When using FR80-4, the Camera Select switch is on "1".

C35mm plots 16 frames per foot of film. It uses the wide supply and take-up magazines.

CP16mm plots 40 frames per foot of film. It uses the thin supply magazine and take-up magazines. Be sure you have the color camera installed, with the correct film size.

Procedures for Color 35mm and Color P16mm Film and Camera

The following should be done after a cut, before starting the run.

1. Film cuts will occur every three hours, not to exceed 400 feet.
2. Check to insure that the black rubber belt is attached to the take-up magazine.
3. Check to insure that the power cord, color filter plugs, and 10-ft indicator cables are all plugged in.
4. Check to insure that the door on the face of the camera is closed tightly.
5. Clear C35mm twice. Clear CP16mm four times. These clears insure that the proper amount of film advances through the camera.
6. Run a color test before and after each run, regardless of the system you are using (tape vs disc).

Gauge Monitoring – Color 35mm and Color P16mm

1. Make sure that the supply spindle rotates, in order to insure that the film is advancing through the camera and is actually being exhausted.
2. Make sure the film footage indicator on the supply magazine does not decrease by more than 400 feet. If you don't, the take-up magazine may jam.

CHORS

CHORS

Introduction

As mentioned earlier, the CHORS system provides direct access for output files from the mainframe computers to CHORS disk packs for processing. For processing purposes, the FR80 recognizes CHORS as (in effect) another tape drive.

The ADM31 is the communications link with the CHORS system. To get the jobs from the disk packs to the FR80s, you have to enter a command at the ADM31. It accepts commands from the operator and displays messages from CHORS. All operator control of the CHORS FR80 files is accomplished through the ADM31.

Once files are written on the CHORS disk packs, the FR80 operator looks at the ADM31 display to see what files have to be processed by the FR80s. Under normal conditions, the only queue types that are written to CHORS for FR80 are FCB and 105. Other types can be written to CHORS but it's not advisable, as the FR80 that processes other queue types isn't attached to CHORS. FR80 files are written to packs labeled on the ADM31 as "FR" (Pard or lower security classification) or "CL" (above-Pard classification). To access the jobs on the "CL" pack, a command has to be given at the ADM31 to "classify" the FR80 you'll be processing on. You have to "declassify" the FR80 to go back to regular FR jobs.

Once the command is typed at the ADM31 to start processing, you have to go to the FR80 teletypes to complete the steps necessary to start processing. The FR80 teletypes handle all communications with the FR80 system. This means that all errors that appear on the FR80 teletypes are handled identically for CHORS or tapes.

Commands at the ADM31 for FR80

The following ADM31 commands are ones you will have to use on a regular basis in order to process FR80 files from CHORS.

ABORT – AB N

Where N is the number of the FR80 (1, 2, or 3). The abort command stops the FR80 immediately! When given during the processing of a job, one abort will stop the job and hold it for reprocessing on the same FR80. Two aborts will return the job to the queue to be processed later; i.e., the next time the queue is assigned. Be sure to check the FR80 teletype, as an END JOB or film advancement will possibly be necessary.

The ABORT command will NOT change the assigned Classification (be it classified or unclassified)

Classification

CL N

Where N is the number of the FR80 (1, 2, or 3), on which above PARD jobs are to be processed. This command must be entered prior to running any above–PARD jobs. The classified jobs are assigned to the FR80 using the normal CHORS command (see FRJOBS section below).

The CL command can only be changed by using the UNCL (unclassified) command, or by deadstarting CHORS.

UNCL N

Where N is the number of the FR80 (1, 2, or 3), on which PARD or below–PARD jobs are to be processed.

FRJOBS – F N queue

Where F is FRJOBS, N is the number of the FR80 (1, 2, or 3), and queue is the file type, such as: 105 or FCB.

This command assigns a particular queue to a specific FR80. This command will run only those jobs from the specified queue, and only under the classification mode assigned to the FR80.

LIST DRIVE PACK – LI D P

This command will produce a printer file (list) of all the jobs on drive# (D) for pack# (P). When the ADM31 displays the message that the list is ready, tell the printer operator the pack and job number so you can get a printed copy of the list. Lists serve several purposes:

1) When a pack is completed or goes to the overflow shelf, a list must go with the pack and another goes to Forrest Allen (Box E30).

2) When processing files, a list of the pack may be helpful in following your progress.

3) A list may be helpful in getting information for updating the I/O Status Display.

LOG DRIVE PACK QUEUE – LO D P Q J

This command will display all of the jobs on drive# (D) for pack# (P) for queue type (Q) starting at job (J). If you omit J, the log will start at job 0 on the ADM31. To view more of the contents of the pack for that queue type, hit the return key. This will move the top entries off the screen and show additional entries at the bottom. If you have to look at a lot of jobs, you can use the entire screen by typing CTRL–S rt, then continue to hit the return key until you find the information you're looking for, or you reach "end of list". Typing CTRL–S rt will restore the normal top display. Use LOG to:

1) Get information for updating the I/O Status Display.

2) Check the progress for a particular job.

3) Get a count of the number of files left to process for a particular queue type.

4) Check the track size of a job.

MARK PACK QUEUE CLASSIFICATION JOB JOB JOB... - M P Q S J J

This command will mark, on pack# (P), queue type (Q), classification (S), job# (J) as being completed. You can mark a number of jobs at the same time, as long as the numbers are in order from the lowest number to the highest number. Use this command when you have trouble with a job and decide the job can't be plotted or when you are told to mark a job(s). By marking the job, CHORS believes the job has been completed so that you can go on to the next job in the queue.

STOPFR80 - STO

This command will stop the FR80 specified by #, after the job in progress completes. Use this command to stop an FR80 to:

1) Prepare for a film cut.
2) Process a different queue type.
3) etc.

A complete list of CHORS ADM commands is available in the CHORS manual.

FR80 Messages from CHORS (ADM31 Messages)

ADM31 messages from CHORS are CHORS system messages to the operator. The messages included here do not require operator intervention, as they do not indicate an error. Error messages from CHORS are included in the Error Handling section of this manual.

CLASSIFIED MODE

The above message is the response from CHORS when the CL (classified) command is issued.

FR80 N STOPPED AT PACK BOUNDARY

The above message indicates that the job queue assigned to that particular FR80 on that specific pack was completed. NOTE: In the message listed above, N = FR80 number. This message does NOT imply that there are no more jobs for that queue to process. It is meant to indicate that there are NO MORE JOBS for that QUEUE on the PACK you have been processing from. Also remember that there may be more jobs of a different queue on the pack.

FR80 N STOPPED BY OPERATOR

The above message is the reply from the STOP/FR80 command. It will be displayed on ADM31 upon completion of the job which was in progress when the STOP command was issued. Note: In the above example, N = FR80 number

FR80 N END OF Q S QUEUE

N = FR80 number
Q = Queue name
S = Classification

The above message indicates that there are no more jobs in the assigned queue, or the plot command has completed.

FR# - QUEUE CLASSIFICATION PACK# JOB# PLOTTED

The above message appears on the ADM31 when the current job is finished plotting.

FR# - QUEUE CLASSIFICATION PACK# JOB# STARTED

The above message is the response from CHORS when the FRJOBS command is issued. It also indicates that the first job not plotted in the assigned queue is ready to be read from disc, and be plotted.

JOB PLOT STARTED

The above message is the response from CHORS when the PLOT command is issued.

UNCLASSIFIED MODE

The above message is the response from CHORS when the UNCL (unclassified) command is issued.

WILL DO

The above message is the response from CHORS when the STOPFR80 command is issued.

STANDARD OPERATING PROCEDURES

STANDARD OPERATING PROCEDURES

Introduction

This section covers the logs and forms used in the FR80, and the procedures for updating the I/O Status Display, for calling in a technician, and for shift turn over.

FR80 Daily Log

1. DATE – Enter date in form of MM/DD/YY to MM/DD/YY.

2. FR80# – Enter machine number.

3. OPERATORS – Sign in the appropriate shift box. Use your first initial and last name.

4. BACKLOG – The log for FR80–4 is used to record the backlog for all FR80s. Enter beginning–of–shift backlog quantity for each type of tape in the appropriate shift column. For CHORS, indicate the number of files if there is only one pack. If multiple packs, put the number of packs in this box (e.g., 3 pks or 78).

5. TOTAL NO. OF HOURS – Enter end–of–shift tallies of machine times for each column indicated – IDLE, EM, PM, SYS, and UP.

6. TIME – Time is 24 hour clock time. A time is entered whenever the machine status changes, the film is cut, a camera is changed, or when any statement is entered under COMMENTS. A new log is started at 08:00 each day.

7. STATUS – Check one of the following whenever a time and comment are entered.

   UP – When machine is processing.
   EM (emergency maintenance) – When machine is stopped because of hardware problems and an engineer is called to resume processing.
   PM (preventive maintenance) -- When machine is taken out of service so hardware checks can be run.
   SYS (System) – When machine is out of service (software trouble or development).
   IDLE – When machine is available for processing, but there is no work to be run or CHORS is down for a long period of time.

Continued on next page ——→

8. FILM CUT – Check the box when you first notify the photo technician to cut the film. The time taken for a film cut is included with idle time when the film cut occurs next to an idle period. If the film cut occurs between "UP" periods, the film cut time is included as "UP time".

9. CAMERA (Change) – Check when a different camera is mounted.

10. FILM TYPE – Enter type of film running; 105, P16, 16, 035, HCY, etc.

11. COMMENTS – Make a log entry at shift change, including any information from the previous shift (equipment down, CE not available until a certain time, etc.). Enter a comment whenever you start plotting a different film or queue type. Note film cut requests that are not fulfilled. For "SYS" entries involving software development, or "PM" entries, write the name of the person taking the machine. For "SYS" entries involving software trouble, and for "EM" entries, include what the problem is, and the name of the person you've notified. If the engineer is not on site or is not immediately available, make a separate entry showing when the engineer arrives. Include the number of the MTR you've written. When the machine is returned to service, include the name of the person returning the machine, what was done to correct the problem, and whether replots are being done.

The following diagram is an approximation of the FR80 Daily Log used in the FR80 machine area. Due to space limitations, the spacing in the diagram below is not to scale.

FR80 DAILY LOG

PAGE___OF___

DATE_____ TO_____

FR80

#_____

OPERATORS

DAY_____

SWING_____

OWL_____

BACKLOG			
TYPE	DAY	SWING	OWL
CB			
105			
24X			
16			
P 16			
35			
C-35			
C-P16			
HCY			
CHORS			

	IDLE	EM	PM	SYS	UP
DAY					
SWING					
OWL					
TOTAL					

TIME	UP	EM	PM	SYS	IDLE	FIRE	CAM	FILM TYPE

COMMENTS

FR80 Production Log

1. TYPE – Film type is entered here (FCB, 105, 35mm, etc.)

2. TAPE No. OR CHORS – Enter number of Production tape, name of Data Only tape, or CHORS. For CHORS, a separate entry is made for each FR80 running from CHORS. A new entry is made when you begin processing from a different pack, or after a film cut.

3. MACH – Enter which machine the tape comes from (R, MFE, etc.) or "–" for CHORS.

4. DATE PLOTTED – Enter date the tape or CHORS is started processing.

5. TIME PLOTTED – Enter the time the tape or CHORS is started processing.

6. PACK No. – If you're running from CHORS, enter the pack number you're running from for this particular FR80.

7. STARTING JOB No. – If you're running from CHORS, enter the starting job number for this particular FR80.

8. ENDING JOB No. – If you're running from CHORS, enter the last job you plot for this particular FR80.

9. REPLOTS – If work has to be re–done, check this box. For CHORS, indicate all pack and job numbers to be re–done in the "COMMENTS" section of this log.

10. CLASSIFIED – If the work is above–PARD, check this box.

11. COMMENTS – Anything that needs to be noted that is not covered by the rest of the log should be included here, such as CHORS replot information.

12. FR80 – Enter the number of the FR80 that the tape or CHORS is plotted on.

13. OPER – Enter operator initials.

NOTE: All 105 and FCB tapes should be placed in the tape rack that is located below the tape drive of FR80 #1 once they have been logged in the appropriate log. All other tapes should be placed in the tape rack located at FR80 #4 once they have been appropriately logged in.

FR80 PRODUCTION LOG

TYPE:

TAPE NO. or CHORS	M A C H	DATE PLOTTED	TIME PLOTTED	PACK NO.	STARTING JOB NO.	ENDING JOB NO.	REPLOTS	CLASSIFIED	COMMENTS

NOTE: Due to space limitations, the two right-most columns of the above FR80 PRODUCTION LOG example had to be omitted. They are for "FR80" designator, and "OPER.' initials.

Discrepancy Slip

Any time that you have trouble running a job or are unable to complete it, you must fill out a discrepancy slip. The white top copy goes to the user via his box number and the yellow second copy goes to User Services, Box E30.

```
 .----------------------------------------------------------------------.
 |                          DISCREPANCY SLIP                            |
 |      DESCRIPTION                                                     |
 |                                                                      |
 | BOX NUMBER:____________/JOB TITLE:______________________            |
 |                                              COMMENT                 |
 | QUEUE:____________________                                           |
 |                                                                      |
 | PACK/JOB:_______/_________                                           |
 |                                                                      |
 | DATE:_____________________                                           |
 |                                                                      |
 | TIME:_____________________                                           |
 |                                                                      |
 | CLASSIFICATION:___________                                           |
 |                                                                      |
 | MACHINE:__________________                                           |
 |                                                                      |
 | OPERATORS INITIALS:______                                            |
 .----------------------------------------------------------------------.
```

BOX:
Box number of the output being processed.

JOB TITLE:
The job title that is beside (or after the box number)

QUEUE:
The type of output; FCB, HSP, 105, HCY, P16, etc.

PACK/JOB:
The pack and job number in error. (If it's tape, line out "PACK" and put tape number and machine letter.)

DATE:
The date from the CHORS pack list. Beside it, in parentheses, write in the clock time and date the error occurred.

TIME:
The time from the CHORS pack list.

CLASSIFICATION:
The classification taken from CHORS list.

MACHINE:
The machine from the SEND column from CHORS list. Beside it, include the number of the FR80 that was used.

OPERATORS INITIALS:
The initials of the operator writing the discrepancy slip.

COMMENT:
What caused the job to be incomplete (DLM, disk parity error, etc.)

Machine Trouble Report (MTR)

This form is used to report equipment malfunctions. None of the FR80 equipment should have trouble maintenance performed on it without an MTR being submitted by the operator. When a piece of equipment malfunctions, note the problem in the FR80 Daily Log and include the number of the MTR. For an example illustration of an MTR, see the next page.

The form is in triplicate, sequentially numbered, and requires the following information to be filled in by the operator.

1. MACHINE -- Enter FR80 machine number.

2. TROUBLE: NEW or RECURRING – Review FR80 Daily Log to ascertain whether the problem is a recurring problem.

3. OPERATOR – Enter first initial and last name.

4. TROUBLE SYMPTOMS – Provide a thorough description.

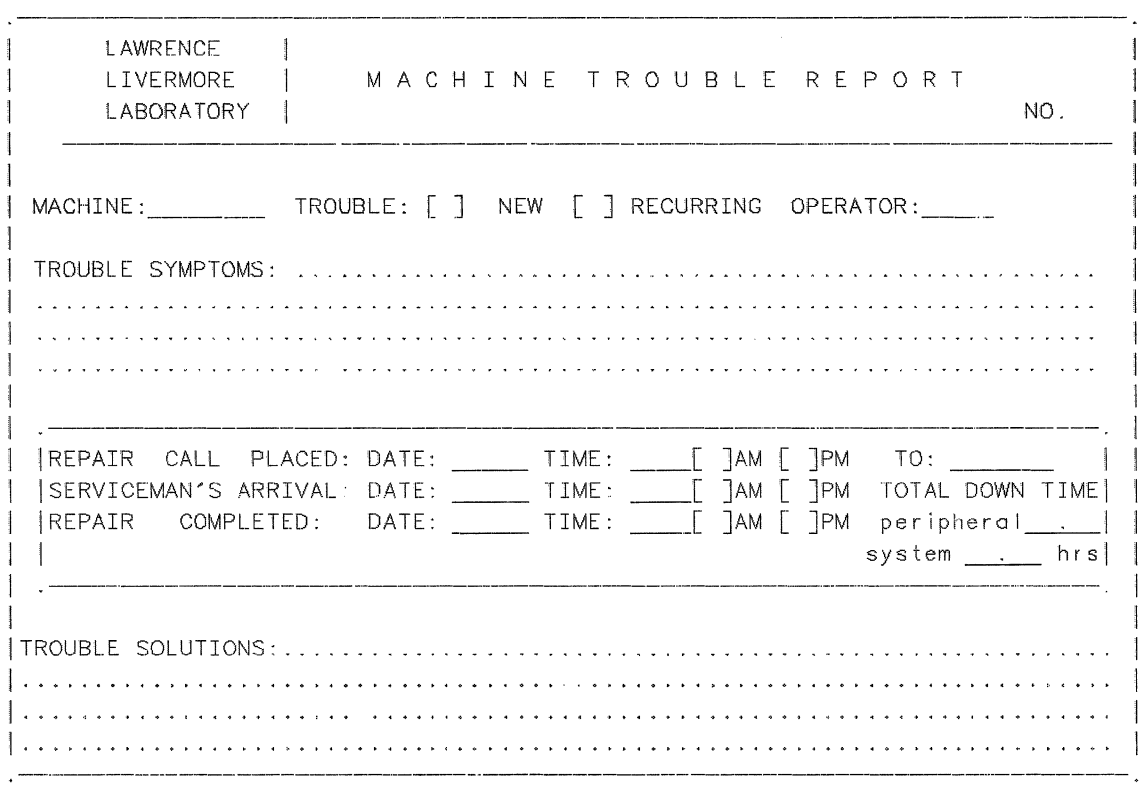
5. REPAIR CALL PLACED:
   DATE and TIME – Self explanatory.
   TO – Enter name of service person.

If a call is not made (i.e. production can continue without the malfunctioning equipment), cross out the word "REPAIR" and write in "no", then write the date and time. If "NO CALL PLACED", there will be no entry for "TO ..".

Once you've completed these steps, remove the white top copy and put it in Bob Anderson's mail box. Attach the rest of the form to the malfunctioning piece of equipment.

When the service person arrives, write the date and time of arrival on the form on the equipment. Also make note of his arrival in the FR80 Daily Log.

When the machine is fixed, make sure the service person completes his portion of the form. Put the completed form in Bob Anderson's box. Record in the FR80 Daily Log that the equipment is back in service and what was done to repair the equipment.



Example of an MTR

Technician Call-In Procedure

1. Notify supervisor or lead operator before calling customer engineer.

2. Call number of first engineer on the list posted inside the FR80 room.

3. If home phone is answered by anyone, relay message concerning problem. The engineer is now considered as having been notified. Make an entry into the FR80 Daily Log concerning who was notified, when called, and message given by answering party (i.e., when engineer will be in, confirmation that the message will be passed on to engineer, etc.).

4. If no one answers home phone, dial 123. Wait for dial tone, then dial 132. This number will activate the engineer's pager. Keep the phone line open for approximately 30 seconds to insure pager has been activated. The FR80 operator won't hear a beep, even though the pager has been activated.

5. The engineer will respond to pager by calling in on extension 2-4290. KEEP THIS LINE AVAILABLE!

6. If the engineer doesn't respond within 15-25 minutes, again call his home phone. If no answer, retry the pager again.

7. Repeat #6 for two hours or until the engineer has been notified. If unable to contact him after trying for two hours, phone next engineer on list.

8. When the technician arrives, you must stay in the area with him when he is working on equipment. Necessary absences should be kept as short as possible. This is extremely important because if something happens and the technician gets an electrical shock, you will be responsible for helping him and for calling the Emergency number (2-7333). If the technician objects to calling the emergency number, leave the room and make the call anyway. THIS IS LAB POLICY!

Shift Change Procedures

Beginning of Shift

When you are assigned to the FR80, there are things to be done when you are taking over from the previous shift. The order listed below is not necessarily the order in which you must do these tasks, as long as you complete them all.

1) Accept verbal information provided by previous shift.

2) Fill out each of the machine Daily Logs, according to the procedure described in this manual.

3) Check the FR80 Status Board for any new information.

4) Acquaint yourself with the ADM31 display and the status of CHORS.

5) Read back through the Daily Logs and note any information recorded that may not have been passed on verbally.

6) If your shift policy assigns the FR80 operator this duty, get backlog information and update the I/O Status Display on the TMDS.

End of Shift

These are tasks that must be done to insure a graceful shift change.

1) Have your information together on any problem or status changes that occurred during your shift. Report this to your supervisor or lead operator, as well as to the operator who relieves you.

2) For each machine, tally the total number of hours on the Daily Logs.

3) Make sure your Daily Log and Production Log entries are all current and accurate.

4) Leave your work area clean. This includes making supplies available when they are low (like teletype paper and blank logs), getting rid of garbage, and making sure processed or bad tapes are returned to the vault by the support operator.

5) If you have to turn replots over to the next shift:
   a) Locate and log the pack and job numbers to be replotted, in the FR80 Production Log. Don't leave this duty for the next operator!
   b) Notify the next operator that you have made the replot entries.
   c) Note in the FR80 Daily Log that replots are being done and why. This covers you if there's a question on the next shift.

6) Be considerate of other operators.

Updating the I/O Status Display

The purpose of updating the I/O Status Display is to update the user community on the status of the FCB, 105mm, AN, GR files, and system or camera problems. This is done normally on the teletype in the FR80 that is beneath the TMDS. The I/O Status Display should be updated according to the policies of your shift, using a utility routine called "BACKLOG".

Before you update the I/O Status Display, run the LOG routine on the ADM for each file type (105, FCB, GR, and AN), or get a listing for each pack. You will need the time and date for each type for the next job to be processed.

1) Go to the teletype beneath the TMDS. Make sure the teletype is powered on and online, and that the TMDS is on.

2) If the TMDS is not displaying the I/O Status Display, type:
   V 1637 *

3) Log into the CRAY-C (preferably) or CRAY-D. Type:

   C *userno* 999998 A 102SOP
   OR (999954) **OR** (B,C,D,E) 102SOP
   OR (999990) " "

   where C = the CRAY machine letter.
   userno = your six digit user number
   999998 = one of the three production accounts;
   use whichever of the three is available
   A = one of the six suffixes;
   use whichever of the six is available
   102SOP = A standard you must use

If you get "on TTY xxx", use a different production account and retype your log-on line. If you get anything but "nil" when you log in, choose another suffix by typing CTRL-E L, where "L" is the new suffix letter.

Continued on next page ——→

4) Start the routine BACKLOG. Type:
BACKLOG / *t v*

The program will prompt:
FR80-105 :

At this point, enter the following information:
DATE1 TIME1 TIME2 DATE2

where: *DATE1* (format = mm/dd/yy)
The date of the next job to be processed by CHORS for this queue type

TIME1 (format = hh:mm)
The time of the next job to be processed by CHORS for this queue type

TIME2 (format = hh:mm)
The time the output will be made available to the user

DATE2 (format = mm/dd/yy)
The date the output will be made available to the user

Initially, the only information that needs to be typed is *DATE1* and *TIME1*. The other two will be filled in by the program with the current machine date and time. Allowing the program to fill in the DATE2 and TIME2 is fine for the printers when there is no backlog. When there is a backlog on the printers, you must enter an estimate. When you estimate the DATE2 and TIME2 for FR80, remember that the film won't be available until the film is cut and processed. To estimate when the FR80 output you're processing now will be ready, take the time of the next cut and add an hour and 30 minutes.

So, if you're processing a job with a time of 13:30 and your next cut is at 14:45, add an hour and 30 minutes to 14:45. The job should be available at 16:15.

Continued on next page ——→

5) After you've completed the line for FR80-105, the other prompts will be:

```
FR80-FCB      :
NIPS HSP      :
NIPS GRAPHICS:
MESG-1:
MESG-2:
```

"MESG-2:" is not actually available. It's just there. For "MESG-1:" enter a message of 80 characters or less, indicating CHORS or specific I/O equipment status.

If you're in doubt about the format of any of these messages, type "HELP" to get assistance.

There are several options available to the user to make updating easier. To skip over any line that doesn't need a change, hit the return key when the prompt appears and the line will remain unchanged. To change a portion of a line, type an "x" where you would normally retype the data.

Example:

```
FR80-105      : x 12:30 x x
--- OR ---
FR80-FCB      : 12/13/80 x
```

NOTE: In the two above examples, the "12:30" and the "12/13/80" represent changes. The "x"s represent information that did not get changed.

RUN PROCEDURES

RUN PROCEDURES

Introduction

This section covers what DEBUG is; what FCB, Load and Go and Data Only are; and how to run FCB, Load and Go, Data Only, and test tapes.

Debug

Debug is the highest memory address in a machine. It is the basic control program for file management. Debug is used to load program files from the disc and to start programs in execution. It can also be used to modify programs or to write files onto the disc.

You can return to Debug from any system by simultaneously holding down the control key (CTRL) and the letter "D" at the FR80 console teletype. This makes it possible to access the disc and load the program you want to run from.

When running from the FCB program it is not necessary to type CTRL-D (Debug) for each successive series of FCB files (CHORS or tapes). Just enter the date, at the start of a run, and label each time you begin processing from a new pack or when processing output tapes.

When running from the Load and Go program, it is necessary to type CTRL-D (Debug) for each successive series of files (CHORS to tapes) and when ever you have to restore after an FR80 has: 1) been aborted by the operator, or 2) stopped or been aborted by the CHORS system (usually due to an error condition).

There are other steps that need to be taken when an FR80 has been aborted or halted for an error condition. Refer to "FR80: Program Errors, System Responses, and Trouble Situations" for the handling of these situations.

If CTRL-D (Debug) is not typed after any of the above mentioned conditions, and the operator inadvertently types the command "GO/rt", the parameters and I.D. (Box #) that was held in memory will be set and plotted on the next fiche being run. This causes one user to receive incorrect output (fiche), and another user to receive no output at all. This also causes unnecessary problems for systems personnel, who will be looking for a problem generated by a user or the system, when it was simply that the operator did not type CTRL-D, but GO/rt instead. This is a very serious error and should never be done.

NOTE: At times, depending on where the system has stopped in memory, Debug cannot be reached by typing CTRL-D. Then you should press STOP and RESET simultaneously and then the READ-IN key at the FR80 console.

FCB Introduction

The CB (compressed block) program is located in the MON directory. The data is plotted on 105mm size film. FCB microfiche contain alpha-numerics which are formatted into text or reports requested by the user. The CB program does not load parameters or search for program load instructions. It is simply a transfer of data from memory to the microfiche. This process is the opposite of the handling of Load and Go program files which searches for the program load instruction and sets parameters.

Loading FCB from Disc System

1) Type: CTRL-D (debug)

2) Teletype response: *DEBUG
   If it doesn't respond, simultaneously press STOP and RESET, then press READ-IN on the console.

3) To load the CB program, type: CB esc J.
   If the teletype beeps, retype CB esc J. If the teletype beeps again, type: MON;CB esc J.

4) Teletype responds: *MONITOR. At this point, go to FCB Run Procedures.

Loading FCB from Tape System

1) Mount the System Reload Tape for the FR80 you are using. Dial "READ IN MODE" to MT. Dial the tape drive select switch to 3 and all others to 2. Put data switch 17 and address switch 12 up.

2) Simultaneously press STOP and RESET, then press READ-IN on the console. "HANG A TAPE" will appear on the display screen. Dial the System Reload tape drive to 1.

3) Teletype responds: 7-track 800 bpi
   Jan 6 1981 FR#3 System Reload Tape

4) Type: LMON;CBrt. The tape will load the CB program automatically.

5) Teletype responds: *MONITOR. At this point, go to FCB Run Procedures.

FCB Run Procedures (CHORS or tape)

1) Date the film at each film cut and when reloading the program (for troubleshooting purposes). This is done by typing: da/mm/dd/yy hhrt, where da/ is date, mm/ is month, dd/ is day, yy is year (followed by two spaces), hh is hour, and rt is the return key.

2) Teletype responds: *OK

3) If you are processing a tape, go to step 4. If you are processing CHORS files, go to the ADM31 and type: F # FCB, where # is the number of the FR80 you will be processing on.

4) Enter a label. The label can't exceed six characters in length. For CHORS, type: LA/*FPPJJ*, where LA/ is label, *F* is the number of the FR80 (1,2,3, or 4), *PP* is the CHORS pack number, and *JJ* is the starting job number The pack number or the job number can be three characters, as long as the entire label doesn't exceed six characters. The FR80 will cut off any characters beyond the first six. You get the pack and job numbers from the ADM31 when you start CHORS.

   For tape, type: LA/*TFWXXX*, where La/ is the label,
   T indicates processing is from a tape,
   F is the number of the FR80 (1,2,3, or 4),
   W is the worker computer letter (R,S,U, or M[MFE]), and
   XXX is the tape number.

5) Teletype responds: *OK

6) For FR80s 1, 2, and 4, dial the tape drive Select Switch you'll be processing from to 1, all others to 2. The CHORS tape drive Select Switch is always the farthest right-hand tape drive Select Switch.

   For FR80 3, tapes are processed by dialing the tape drive Select Switch to 1, and the toggle switch beside the tape drive Select Switch to "TAPES". CHORS is processed by setting the tape drive Select Switch to 2, and the toggle switch to "CHORS".

7) At the FR80 teletype, type: GO/rt.

8) The teletype will respond with each job's box number and security level number as it starts plotting. At the end of each tape or series of CHORS files, a total frame and page count will be given. Refer to the example that follows.

Continued on next page ——→

```
LABEL/354000*OK
DATE/02/24/83  07*OK
GO/

1:41.5" FRAME 0
BOX A50 2
BOX A50 2
BOX A80 2
BOX A85 2
BOX A85 2
BOX C48 2
BOX A43 2
BOX A80 2
BOX G27 2
BOX B61 2
BOX B61 2
BOX A60 2
BOX A10 2

57'37.9" FRAME 36 PAGE 8197
*END OF FILE
```

9) For each additional tape or series of CHORS files, enter only the label and then type: GO/rt. It isn't necessary to go into debug.

FCB Test Procedures

Run a test just before every film cut. The FCB test is used both for FCB work and 105 Load and Go work. If you were previously running 105mm at the time of the cut, you must load in the FCB program to run the test.

1) Enter the date.

2) Label the test as follows: LA/*FR#N U*, where LA/ is the label, *FR#* is constant, *N* is FR80 number followed by one space, and *U* is the tape drive letter.

3) Dial the tape drive the test is on to 1, all others to 2.

4) Type: GO/rt.

If a "tape error" is encountered while running an FCB test tape, run a different test tape(s) on the same tape drive until one test completes without any tape errors. Run the original test tape on a different FR80 using the "no film" option. If it runs okay on a different FR80, write an MTR on the tape drive that caused the tape errors, and make appropriate log entries. If it fails on a different FR80, attach the teletype listing of the tape that has the error to the test tape(s), and leave for the Day Shift FR80/CHORS coordinator, EE technician, or the senior technologist.

LOAD and GO Programs

The Load and Go program will 1) search for the desired program load instructions asked for by the load and Go output job, 2) automatically set any desired parameter changes made by the user, and 3) plot the job. This process will continue for all user jobs on the output tape or queue until all data is plotted and the end of the tape or queue is reached, or the FR80 is stopped. Load and Go file types include 35mm, P16mm, 16mm, HCY, HFB, 105mm, 24X, Color 35, and Color P16.

Loading Load and Go From Disc System

1) Type: CTRL-D (debug)

2) Teletype Responds: *DEBUG. If it doesn't respond, simultaneously press STOP and RESET, then press READ-IN on the console.

3) Type: SYS esc J. If the teletype beeps, retype SYS esc J. If the teletype beeps again, type: MON;SYS esc J.

4) Teletype responds: *MONITOR
At this point, go to the Load and Go Run Procedures.

Loading Load and Go from Tape System

1) Dial READ-IN mode to "MT".

2) Mount the Load and Go Programs tape and dial this tape drive to 3. This tape will be left mounted and dialed to 3 as long as you are running Load and Go from the tape system.

3) On the console simultaneously press STOP and RESET, then READ-IN.

4) Teletype responds: *MONITOR
At this point, go to the Load and Go Run Procedures.

NOTE: The tape system is significantly slower for Load and Go file types because each time a new job comes up, the programs tape must be rewound by the system and then searched forward for the correct program, where as disc has more direct access.

Load and Go Run Procedures (CHORS or tape)

1) For processing tapes: mount the production tape and dial the tape drive select switch to 1. Unless you are using the programs tape, which is dialed to 3, all other tape drives should be dialed to 2.

   For processing CHORS: go to the ADM31 and type: F # QQQ, where # is the FR80 you will be processing on, and QQQ will be the Load and Go queue type you will be processing. This will normally be 105. Next, go to the FR80 you will be processing on and dial the farthest right-hand tape drive select switch to 1 This will access CHORS. Unless you are using the programs tape, which is dialed to 3, all other tape drives should be dialed to 2.

2) At the FR80 teletype, type: GO/rt.

3) The teletype will respond with the character "L" plus some number 1, 2, 3, 5, 6, or 7, generally followed by one or more "*OK" comments. Next, it will list the box and level number. At the end of each tape or series of CHORS files, a total frame and page count will be given. Refer to the following example. Refer to "Load and Go Program Description" for more explanation.

```
*MONITOR
GO/
L1*OK
*OK
*OK
*OK
*OK
*OK
*OK

BOX A18  LEVEL 2

48.8" FRAME 0   PAGE 24
L1*OK
*OK
*OK
*OK
*OK
*OK
*OK

BOX B49 LEVEL 2

42.8" FRAME 0  PAGE 94
TOTAL FRAMES=2   TOTAL PICTURES=120
*END OF FILE
```

Continued on next page ——→

4) For each additional tape or series of CHORS files, repeat the procedure starting with "Loading Load and Go from Disc System" or "Load and Go from Tape System", depending on which system you are using.

Frequently you will receive tapes from the National Magnetic Fusion Energy Computer Center (NMFECC). These tapes should be logged in at the appropriate production log(s); 105, FCB, or FR80 #4 log (for all types other than 105 & FCB), and placed in the appropriate tape racks. These tapes will also be accompanied by an RJET listing. After the tape has been processed, the teletype listing is stapled to the RJET listing to be collected by the photo technician when the film cut is made.

Run procedures for these tapes are the same as any other Load and Go or FCB type. Once the tape has been processed it should be placed on the tape cart that is located next to the ADM-31. The support operator will take the tape to the Tape Vault.

Parameter Changes

Parameters can be changed by the operator when requested by a user. This request should be via a Work Order Sheet, on which the changes desired will be written.

To make the change(s):

1) Type: CTRL-D (*Debug)

2) Type: SYS esc J

3) System response: *MONITOR

4) Put data switch 5 in the UP position.

5) Type: G/rt (The system will load the program and parameter requested by the user. The user's Box # and I.D. will be typed out.)

6) System response: *MONITOR *REV* 4.0805

7) Type in the parameter change requested by the user.

   Example: If the work order sheet requested rotation to be changed to "1", type: RO/(machine will finish word) 1rt.
   Once the change has been accepted, the system will type back "* OK."

8) Type: G/rt
   Once the job has completed, the system will load in the next job's program and parameter changes, and then type out "*MONITOR".

9) Rewind and unload the tape.

10) Put switch 5 DOWN.

11) Type: CTRL-D
    SYS esc J
    and continue normal processing.

Load and Go Program Description

Below is a job from a Load and Go run:

```
.-------------------------------.
|  *DEBUG                       |  L1 = 105mm program
|  *MONITOR                     |  L2 = 105mm program
|  GO/                          |  L3 = 105mm program
|  L1*OK                        |  L4 = not used
|  *OK                          |  L5 = 35mm and P16mm program
|  *OK                          |  L6 = 35mm and P16mm program
|  *OK                          |  L7 = 16mm program
|  *OK                          |  H5 = Hardcopy program (HCY and HFB)
|                               |  C5 = Color program
|  BOX  T59   LEVEL 1           |
|                               |
|  34.0"  FRAME 0 PAGE 33       |
.-------------------------------.
```

"*OK" indicates that a parameter change requested by the user is valid and accepted by the system. Some other comments may be listed among the *OK parameter changes. Unless stated otherwise, do nothing about these comments, as they do not require operator intervention.

*VOID

The parameter change requested is invalid, therefore it was ignored by the system.

FORMAT ERROR

The parameters entered after the slash by the user are not appropriate for the command.

TOO BIG

The parameter change entered by the user requires an image size larger than the aperture of the camera.

TITLE ERROR

The format of the titling information is illegal. This error may stop the FR80. If it does stop the FR80, refer to "Error Handling Procedures" for instructions.

UNKNOWN CONTROL

The FR80 interprets this to mean "one space before printing". This error may stop the FR80, or a list of unknown control messages may be printed out. If one of these problems arises, refer to "Error Handling Procedures" for instructions.

Load and Go Test Procedures for Color

The Color Tests are only available from the disc system. They cannot be run if the disc is down. The programs are not available on System tape. Run a Color Test at the beginning and end of a Color run. To run a Color test:

1) Mount the Color Test tape.

2) Type: CTRL-D (debug).

3) Teletype responds: *DEBUG
   If it doesn't respond, simultaneously press STOP and RESET, then press READ-IN on console.

4) For C16, type: 16COLOR esc J
   For C35, type: 35COLOR esc J

5) Teletype responds: *MONITOR

6) Type: GO/rt

7) At the end of the test, clear the camera the appropriate number of times.

NOTE: Both Color Tests (C35 and C16) reside on the same test tape.

Load and Go Test Procedures for Black and White

All black and white Load and Go tests are only available from tapes. To run a black and white Load and Go test, choose and mount the appropriate test tape (each is labeled as to type), and use the Load and Go run procedures to run the tape. At the end of the test, clear the camera the appropriate number of times.

Data Only Tapes

Data Only tapes are submitted by users with special information on them to be plotted. There are NO parameters or program loads on the tapes; these are ALL supplied by the user on a special FR80 Work Order Sheet, and entered into the machine by the FR80 operator.

Verification of Work Order Sheet

1. If the Work Order Sheet is not correctly, or completely filled out, attach a note to the Work Order Sheet, and, together with the tape, send all the material back to the tape librarian.

2. Titling information may be supplied by the user on the Work Order Sheet.

3. Make sure that the tape name on the reel matches the tape name listed on the Work Order Sheet.

4. Check classification level of the tape to insure proper handling procedures.

5. After the tape has been processed, the second copy of the Work Order Sheet will be put in the appropriate folder with the teletype listing, and the original copy of the Work Order Sheet will go to the photo lab with the exposed film.

NOTE: Occasionally you may receive tapes with work order sheets attached that don't require the usage of the data only system tape. These tapes are plotted in the same manner as any production tape that you would normally plot using the program(s) that reside on the disc system.

FR80 Work Order Sheet

These Work Order Sheets are used to make special requests to the FR80 operator to plot tapes not written by the User-1 program. The tapes submitted for plotting in this manner will be entered into normal production channels at the tape vault librarian's deck. The tape librarian will make blank FR80 Work Order Sheets available to the user (requester), but will not fill them out. The user MUST fill out the form completely and in duplicate. The tape librarian will fill out the required Materials Accountability Form, and deliver the tape(s) and FR80 Work Order Sheet to the support operator, who, in turn, will deliver them to the FR80 facility.

After the tapes have been plotted, the original Work Order Sheet is collected by the photo technician when picking up the exposed film for developing. The support operator then returns the tape to the Tape Librarian. The original Work Order Sheet and the output are sent to the user's output box. A copy of the Work Order and teletype listing will be kept at the FR80 facility.

FR80 is no longer able to provide titling on output, because the FR80 systems have been standardized to run from disc. If titling is needed, it must be provided by the user.

Refer to the next page for an explanation of what information goes on a Work Order sheet.

There are four sections to the FR80 Work Order Sheet:

(1) User information (2) Camera (3) System to Use (4) Parameter Changes

User Information

(1) User name and phone extension – self explanatory.
(2) Tape name(s) – enter names of all tapes to be plotted.
(3) Series – Encircle "series" if tapes need to be run in sequential order.
(4) Box number – Enter user's printout distribution slot number.
(5) Date submitted – self explanatory.
(6) Classification – Encircle the appropriate security classification.

Camera

Film Type: 105 mm – check applicable description.

System to Use

Check one:
LOAD and GO – Output produced by Frog and Fichout routines. _____
RAD (HSP RETRIEVE) _____
CB (COMPRESSED BLOCK) _____
DATA ONLY _____
NAME OF SPECIAL PROGRAM TO USE;MUST BE SUPPLIED BY USER: _____

Parameter Changes To Be Made To A Program

(User would enter command and changes)

Date Plotted

Self Explanatory – operator entry.

Comment(s) If Trouble

Operator indicates any problems running the job.

On the following page is a sample of an FR80 Worker Order Sheet.

The diagram below is of the FR80 Work Order Sheet. Due to space limitations, this illustration is not to true scale, nor are things exactly as you will find them on the "real thing". However, this picture will give you an idea what it looks like.

FR80 WORK ORDER SHEET

Please fill out this form correctly. If not completed correctly, the operator is not obliged to plot your work. Titling information is to be put on film by the user.

USER NAME ———————————————— EXT. ————————
TAPE NAMES(S) ———————————————————————— SERIES
BOX NUMBER ———————————————— DATE SUBMITTED ————
CLASSIFICATION (CIRCLE ONE): UNCL PARD OUO CRD SRD
CAMERA (CHECK IF APPROPRIATE):

105MM ————————
35MM ————————— XEROX ————————
COLOR ————————
P16MM ———————— (PERFORATED 16MM FOR MOVIES)
HCY ———————— ROLL ———— CARTRIDGE ————

SYSTEM TO USE (CHECK ONE):

LOAD-AND-GO (FROG, FICHOUT) ————————
RAD (HSP RETRIEVE) ————————
CB (HSP RETRIEVE) ————————
DATA ONLY ———————— NAME OF SPECIAL PROGRAM TO USE
MUST BE SUPPLIED BY USER ————

PARAMETER CHANGES TO BE MADE TO A PROGRAM

COMMAND	CHANGE	DATE PLOTTED
1.	/	
2.	/	COMMENT(S) IF TROUBLE
3.	/	
4.	/	
5.	/	
6.	/	

PLEASE SUBMIT THIS FORM IN DUPLICATE.
LL4930

Run Procedures for Data Only Tapes

Loading the Program

1. Dial Read-in mode to MT
   (programs on disc are unreliable - don't use them)

2. Make sure that the correct camera is mounted for the program requested.

3. Dial the Data Only Programs tape drive to 3, and simultaneously press Stop and Reset, then Read-in on console.

4. To load a special program, type: LOAD/***rt (where *** = program name).
   Teletype responds: *MONITOR

5. Parameter changes, when specified, ***must*** be entered by the operator. This is done by typing the first three (3) letters of the command followed by a slash (/), followed by the change ***exactly*** as specified. Press the return key.
   If "list" is found in the "Data Only" space of the Work Order Sheet, simultaneously press Shift and "?" keys to produce a listing of parameters. This should be sent up to the tape librarian with the user's copy (original) of the Work Order Sheet.

6. After the program parameter changes have been entered, clear the camera as follows:

35mm and C35mm -- 1 clear	105mm – Ø clears
P16, CP16, and 16mm – 2 clears	HCY – Ø clears

7. Tape(s) MUST BE RUN IN SEQUENTIAL ORDER! Do NOT change any parameters until finished with series.

8. Mount and dial user's tape drive to 1, all others to 2 (except for the programs tape drive, which remains 3.)
   At this point, you can unload the program tape.

9. Type: GO/rt for the FIRST tape in a series. Type: CONTINUE/rt each additional tape. For a single tape, type: GO/rt.

10. Type: END JOB/rt at the end of the series of tapes for the 105mm camera. If there are other jobs for the film type being run, go back to step #4. If there are no more jobs for the film type being run, clear the camera as specified in step #6.
    NOTE: For an example of how to do steps 3–10, see the next page.

11. The user's tape is to be sent to the tape vault after processing.

TAPE PROGRAMS AVAILABLE
RAD
CB
Fiche 7-track print
B Fiche 7-track print
16 7-track print
B 16 7-track print
Bill Cook 16 print
Open order (DPS)
TID correlation index
509/report
PER-10 (16)
F PER-10 (Fiche)
ME index 16 (DPS)
Title B Fiche displayer
FR80 displayer

*MONITOR	At the console do a RESET/STOP
LOAD/FICHE 7-TRACK PRINT	then press READ IN in MT mode.
*MONITOR	Type: LOAD/FICrt
TAPE TYPE - 2,5 OR 8/5*OK	Now looking on the Work Order Sheet
FIXED BLOCKING/700*OK	we set the parameters as the user
LINE SIZE/140*OK	has instructed us (EXACTLY).
GO/	GO/rt
14:24'34.8" FRAME 0	
11'3.7" FRAME 5 PAGE 1473	At the end of the 1 OF 2 ZZ255,
*END OF FILE	type: REWIND/rt to rewind the
	tape that is dialed to 1. Then
REWIND/*OK	switch that unit to 2 and dial the
CONTINUE/	2 of 2 ZZ255 to 1 and type:
	CONTINUE/rt.
21'48.3" FRAME 5 PAGE 1473	
29'32.5" FRAME 9 PAGE 2521	At the end of the second tape,
*END OF FILE	type: REWIND/rt to rewind the
	tape. Type: END JOB/rt to
	complete the fiche and clear the
REWIND/*OK	buffer. (THIS IS ONLY DONE WHEN
END JOB/*OK	PLOTTING 105MM FILM SIZE DATA ONLY
	TAPES.)

Example of Data Only 105mm output tape.

Berkeley Hardcopy/HFB Tapes (Disc System only)

On occasion, you may receive HCY/HFB tapes from the Berkeley Lab that need to be plotted. Along with the tape will be a worker order giving instructions in regard to parameter changes and other user requests. To plot these tapes, follow the instructions below.

1. Type: CTRL-D
2. Teletype responds: *DEBUG
3. If it does not respond, simultaneously press Stop and Reset, then press Read-in.
4. Type: HARD esc J
5. Teletype responds: *MONITOR
6. If "list" is found in the Data Only space on the Work Order Sheet, simultaneously press the Shift and ? key to produce a listing of parameters available under the program HARD.
7. Parameter changes, when specified, MUST be entered by the operator: type the first three letters of the command followed by a slash (/), then type the change EXACTLY as specified, then press the Return Key.
8. Dial User Output Tape to 1, all others to 2.
9. Type: GO/rt.
10. If tapes are a series, run in sequential order. Do not change parameters or read the program in from disc until the series is finished.
11. After the last tape has been plotted, notify the photo technician that you are ready for a film cut. Don't clear the camera. The photo technician will do this.

    NOTE: If at any time the green READY light goes out or the camera stops plotting, first check the footage gauge – the camera may be out of film. If this is the case, press STOP then START to revive the teletypes. Call a photo technician to reload the camera with film. If the camera is not out of film, before taking any other steps call a photo technician.

12. Replot the last tape, or, if it is an extremely long tape, rewind it sufficiently to allow for processing exposure.

TROUBLESHOOTING

EXPLANATION OF ERROR RECOVERY COMMANDS

The following commands are used via the teletype to recover from most software errors that cause the system to halt.

AD Overlay

The AD overlay, if properly used, can be a valuable tool in CHORS problem solving. Of special interest to the FR80 operator is Option 2. NOTE: Option 2 will set missing TCUPGO.

Option 2 – Set TCUPGO

If the FR80 should stop in mid-job, and all lights are in a fixed position, check to see if the FR80 has stopped TCUPGO. This can be verified by checking the FR80 T-CUP, which is located to the left of the MODCOMP CPU. Set TCUP number switch to the FR80 number in question, and check the following:

Forward Tape Control lights: 10011 (on, off, off, on, on)

TCUPGO light	0	(off)
NoNextBuf light	0	(off)
Out of Data light	0	(off)

If all the above light configurations are met, then call in the AD Overlay at the ADM31, and follow the ADM31 instructions. The AD Overlay is called in by typing on the ADM31 the following instructions:

(CTRL-E)ADrt — When AD options are listed on the ADM31, type: 2, then follow the above instructions.

Upon completion of use, remember to type END to terminate the AD Overlay, and release the overlay area for general use.

ADVANCE / (n)

Command is ADV/Nrt. Machine will finish word. Camera will advance the film "n" frames. "N" = number of frames to advance the film. If the "N" option is omitted, then N = 1.

BACK/rt

Command is BA/rt. Machine will finish word. This command backspaces the data tape to the start of the current file. This command works on all Load and Go file types. **NOTE:** BACK/40(rt) – Command is BA/40(rt). Machine will finish word. Type the number 40, then hit the return key. This command will backspace the data tape 40 records. This command should only be used when these three conditions are all present: 1) when running HCY, HFB, 16mm, P16mm, or Color, 2) when the camera has run out of film, and 3) if the file has been plotting one hour or more.

CLEAR/rt

Command is CL/rt. Machine will finish word. Camera will advance film into the take-up magazine. (Check the camera set-up procedures in regard to film type being used for the correct number of clears required to advance the exposed film.) **NOTE:** The 105mm cameras need a 105 program loaded (L1, L2, L3, or CB esc J) in order to clear or advance correctly. If after typing CL/rt or ADV/rt the teletype responds immediately with "O.K.", the camera didn't clear (advance) correctly. Load a 105 program and retype the command.

CONTINUE/rt

Command is CON/rt. The machine will finish word. The command CONTINUE will restart the program at the location where it was last interrupted.

DATA SWITCH 5

Data switch 5 (10000) in the UP position will cause the system to pause between jobs. It is used in conjunction with the SKIP command on Load and Go program tapes. This switch is used when only certain jobs have been requested from a Load and Go tape. Type: CTRL-D (debug), then SYS esc J. Use the SKIP/-n command (where "-n" is job number 1 for this example) to find the job on the data tape. Type: GO/rt. Put switch 5 in the UP position. The job will run to completion, then the system will pause. If the next job you wish is 7, put data switch 5 DOWN, and use the SKIP command (SKIP/-5) to locate job #7 on the data tape. Once the job has been located the system will pause again. Type: CONT/rt to plot job #7. Put data switch 5 UP. Once it has completed, the system will pause again. Rewind the tape (REW/rt), return data switch 5 to the DOWN position and continue normal processing.

NOTE: Data switch 5 must be also used with the "MAKE FILM" command. Refer to the "MAKE FILM" command for explanation and usage.

END JOB/rt

NOTE: This command works only for 105 cameras. The command is EN/rt. The teletype will finish the word. When the return key is pressed, the machine should finish titling the fiche, clear the memory buffer, and advance the film. The teletype will respond with "O.K." when "END JOB" has completed. ANY time you have trouble with a 105--type job (105mm, FCB, or 24X), and the job stops abnormally, do an END JOB. When you type END JOB, there are some conditions you need to be aware of. (1) If you get an immediate "O.K." when you type END JOB, the job may really be ended normally. It might not. Check the track count for the job on the ADM31. If the Log Routine and the track count are very nearly the same (within 6 to 8 tracks) for that job, consider it done and mark it, if it isn't marked already by the system. If the track count isn't right, retry the job. (2) If you get an "END*UNKNOWN", the system can't accept the END JOB, so you will have to use the FR80 command "ADVANCE/3" to move the job out of the way. (3) If END JOB works, you should see the console lights blinking and the titling being completed on the FR80 display monitor.

FIND/rt

The FIND command is used with the LABEL command. All tapes must have a label entered prior to using the FIND command. The FIND command only works with FCB jobs on tapes.

FIND/N,*rt – This command will start from job N (where N = the number of the job from which you wish to start plotting) and plot all jobs until the end of the tape is reached.

FIND/*,Nrt – This command will start from the beginning of the tape and plot all jobs up to, and including job N (where N = the number of the last job to be plotted from that tape) and will then terminate.

FIND/Nrt – Plots job N only.

FIND/M N O P Q rt – This command will plot up to five selected jobs. Job M is to be lowest numbered job, and each subsequent job is to be a higher number. Job Q is the highest numbered job. This command will plot a maximum of five jobs and will then terminate.

When the FIND command has located and plotted all jobs, the machine types: time, total frame, and total page counts; the tape will then rewind automatically.

An important point about the FIND command is that it does not look at the jobs based on a pre-assigned number. What it does is to count each job that comes up, starting with #1, regardless of where you are in the tape. This means if you have trouble with a job in the middle of a tape, you can end that job, then type FIND/1,*rt. FIND will look for the next job, then plot to the end of the tape.

FOCUS/rt

Command is FOC/rt. This command causes the focusing image to appear on the monitor screen and the light source. (When running under the CB program this command will not work unless the program is reloaded.) To terminate the focus image, hit the "Return Key" or type CTRL-1.

GO/rt

Command is G/rt. Teletype will finish word. Advances the film one frame and starts the program.

MAKE FILM/N(rt)

Command is MA/Nrt. Machine will finish word. Type the number "zero" for "view only mode" and hit the return key. The view-only-mode suppresses the film advance, eliminates some typeouts, and blanks the light source so that no film will be exposed. When using the MAKE FILM command, data switch 5 must also be used. If it is not, the system will ignore the command, and the job will be plotted on film. The correct usage of this command for Load and Go is:

1) Type: CTRL-D (*Debug)

2) SYS esc J

3) System responds: *MONITOR

4) Put data switch 5 in UP position.

5) G/rt (At this point the system will load the program and parameters requested by the user. The user's Box number and I.D. will be typed out on the teletype also.)

6) System responds: *MONITOR *REV* 4.0805

7) Put data switch 5 down.

8) Type: MA/Ørt

9) Type: G/rt

10) System response: *NO FILM?

11) Hit the Return Key.

Continued on next page ------>

The correct usage of this command for FCB is:

If the CB program is loaded, start with Step 5.

If the CB program is *not* loaded:

1) Type: CTRL-D (*Debug)

2) CB esc J

3) System response: *MONITOR

4) Type: DA/rt

5) Type: LA/rt

6) Type: MA/Ørt

7) Type: G/rt

8) System response: *NO FILM?

9) Hit Return Key

Once you have completed the job, you must do one of two things:

1) Type: MA/1rt

(OR)

2) Type: CTRL-D SYS esc J **(OR)** CB esc J

to return to the MAKE FILM mode and resume normal processing.

NOTE: After using the "Make Film" command in order to start normal processing (plotting on film), you must change the film mode to "1" (make film) or reload the Load and Go or CB program.

PLOT

The "PLOT" command replots FR80 jobs which have already been marked as plotted, or specified jobs that have not been plotted. PLOT is limited to a maximum of 32 jobs. If more than 32 jobs are assigned, only the first 32 jobs will be replotted. Jobs may be assigned individually or in sequence, but the last job number in a sequence must be equal to or greater than the first job number in the sequence. Command string is:
PL *N PP QQQ C JOB(JOBS-JOBS)*, where:

PL = Plot

N = FR80 number (1,2, or 3)

PP = Pack number jobs are located on

QQQ = 105 or FCB (queue type)

C = Class ("CL" for classified, "UNCL" for unclassified)

JOB = Job number

(OR)

JOBS-JOBS = A series of jobs

.REPORT TAPE ERRORS/

Command is .REP/. The machine will finish word. The number zero is then entered by the operator and the return key is then pressed. Then type CONTINUE/rt. This command will cause the system not to report any tape errors when they occur. Using this command sometimes results in stacking (data being written on top of data). If this stacking should occur, hit STOP, then START switch on the console to recover the teletype, and type END/rt to complete fiche titling. Go to the next job to be plotted by using the FIND/1,* command. **NOTE:** .REPORT TAPE ERRORS/Ort only works under the CB program.

REWIND/rt

Command is REW/rt. The machine will finish word. This command will rewind the tape on drive selected to 1, to load point. You can also include a unit number, to rewind drives not dialed to 1. That would be: REWIND/Nrt, where "N" = the drive number.

SCAN JOB, FRAME, COMMAND/(J,F,C)rt

Command is SC/rt. The machine will finish the command. This is a command for responding to 3-letter errors for Load and Go. Depending on the options used for J, F, and C the machine will scan for either the next job, frame, or command This does not work on L3 or L7 programs. The options available are:

0,0,1 = scan to next command
0,1,0 = scan to next frame
1,0,0 = scan to next job

Start with SC/rt and NO OPTIONS. If you get an immediate repeat of the error, or one like it, try typing SCAN at least two more times before stopping the job. Whenever you use the SCAN command, observe the screen. If you notice any sudden variation of the picture on the screen (such as lines or flickering stars or a long bright line) when you hit the return key, stop the job by hitting STOP then START on the console. Type FOCUS/rt Hit the return key on the console to stop the focus pattern. Do an END JOB/ for 105, or an ADVANCE/3 for other Load and Go types. For 105, try the job on another FR80 unless the track count is within 6 to 8 tracks of being complete. Do not focus the last attempt you make to run the job. In any case, you should write a Discrepancy Slip for the job.

SKIP/rt (or) SKIP/-N(rt)

Command is SK/rt or SK/-Nrt. Machine will finish word. The command SK/rt will skip to the next job. The command SK/-Nrt, where "-N" is the number of jobs you will skip, will skip the number of jobs that you have entered. These commands work only with Load and Go program data tapes.

FR80: Program Errors, System Responses, and Trouble Situations

NOTE: In all cases where it states to hit STOP then START on the console, for FR80 #3 you must hit STOP then RESET,START.

CON

Undefined control character. Type: SC/rt to scan to the next command in the users program. Follow SCAN Command Procedures.

DEFINE PERMANENT PICTURE N?

The permanent picture definition "N" was encountered. This response is to insure that you wish to define or redefine the picture. Hit the space bar to continue processing. This action lets the system know that you do not wish to define or redefine the permanent picture.

DELETE PERMANENT PICTURE N?

The instruction to delete permanent picture "N" was encountered. This response is to insure that you wish to delete the picture. Hit the space bar to continue processing. This action lets the system know that you do not wish to delete the picture.

DELETE PERMANENT PICTURE DEFINITIONS

The instruction to delete permanent picture definitions was encountered. This response is to insure that you wish to delete the definitions. Hit the space bar to continue processing. This action lets the system know that you do not wish to delete the definitions.

DLM (Delimiter Invalid)

Data lost in transfer. Type: SC/rt to scan to the next command in the users program. Follow SCAN Command Procedures.

FR80 DROPS INTO MONITOR
FR80 DROPS INTO DEBUG

The system has received an instruction from the users program that it does not understand, which causes one of the above mentioned conditions to occur. Hit STOP then START at the FR80 console to revive teletype. Type: END/rt to complete the titling of the fiche. If this occurs while running from CHORS, you must also abort the job at the ADM31 and mark the job as plotted before continuing to process more files. Be sure to fill out a discrepancy slip.

FIRST RECORD MISSING FS CHARACTER (file separator character missing)

This is an FCB error only. Make sure the tape is at load point or beginning of file. If it was not, rewind the tape and put it on-line, or abort a CHORS file at the ADM31 and restart it. Hit STOP then START, re-enter the tape label and type GO/rt. If the tape is at load point or beginning of file, depress STOP, then START. Use the FIND command to continue plotting from tape. If running from CHORS, mark the job printed and continue plotting. In both cases, if the Box# is obtainable, fill out a discrepancy slip. Use Mag Tape Displayer to verify the correct header (if any) on the job

ILLEGAL COMMAND

A command not known to the system has been encountered. For 105, type END JOB/rt, then GO/rt. For all other Load and Go, just type GO/rt.

LONG RECORD

A record was encountered which does not fit into the allocated buffer space. Type CON/rt.

* N UNKNOWN CONTROL

A carriage control character (N) unknown to the program was encountered. Type CON/rt.

NO FILM?

This response is from the MAKE FILM command, after the command GO or CONTINUE has been entered. If you don't wish to make film, hit the return key. Anything else will void the entire command.

NO FILM LEFT

There is no film left in the camera. GO and CONTINUE will be void until the camera is reloaded. For 105 cameras, put the switch on the right of the camera down. Unplug the bottom supply cord by turning it counter-clockwise to shut the camera off. Call a photo technician to reload the camera with film. Back up three to five jobs, depending on the size of the jobs on CHORS or tape, using the appropriate command (FIND, SKIP, BACK, PLOT) and replot the jobs. For all other cameras, call a photo technician to reload the camera with film. Using the appropriate command (SKIP or BACK), replot the job(s) that the camera ran out of film on. **NOTE:** Refer to the "BACK" command when replotting jobs that have run for a long period of time.

NON PERMANENT PICTURE N NEEDED

The non permanent picture N, which was not defined, was called for. Type CON/rt, and the program will continue recording without the picture.

TAPE ERROR

Either the parity and/or density of the magnetic tape do not agree with the tape characteristics you have instructed the program to accept, or the tape has physical damage or unreadable data on it. Type CON/rt to continue processing at the location where the interrupt occurred.

10 FT. LEFT

There is only ten feet of film left in the supply magazine. CON/rt will allow the program to continue without further notification until there is NO FILM LEFT.

THREE LETTER ERRORS

Below is a listing of some common and not so common three letter errors that can be generated by the FR80 Data Format Displayer program. To continue processing after an error, use the "SCAN" command to continue processing.

DLM = Invalid checkpoint delimiter
CON = Unknown control character
PAG = Invalid page number
UNA = Unassigned device
TPW = No tape writing in system
EOF = Read past end of file on disk
CVR = Character not in convert table
CNV = Bad convert statement
TMF = Too many fonts
UNC = Unknown command
NAM = Invalid name command
DIO = No disk I/O in system
DKR = Disk read error
DKN = Disk name missing
DKW = Disk write error
FNM = Font not found
IOX = I/O device exchanged
BDF = Bad font format

TITLE ERROR

The format of the titling information is illegal. A title error that causes the FR80 to halt is in most cases related to the CHORS system and the worker computer in the mainframe area. The jobs are usually no more than one track in size. Notify your supervisor when this problem occurs. Using the "MARK" command, mark the job(s) as printed and continue processing. Remember to fill out a discrepancy slip for the job(s).

TMN (Too Many Names – available space exceeded)

This is an error from the FR80 Data Format Displayer program. To continue processing after this error has occurred, type SCAN/rt. Follow the SCAN Command Procedures.

TELETYPE PAPER ADVANCES (after typing GO)

This situation occurs when the wrong program or no program has been loaded. Press RESET–STOP then READ–IN, and load the appropriate program (SYS esc J or CB esc J) and/or using mag tape displayer, check to make sure the file has the correct header.

UNC

Unknown command. Type SC/rt to scan to the next command in the users program. Follow the SCAN Command Procedures.

UNKNOWN

A command, program name, or form name unknown to the program has been encountered. If this response is encountered before the actual plotting of the job has begun, abort and restart CHORS or rewind the tape to load point. Reload the system with SYS esc J from Debug, and type GO/rt. If this response is encountered after plotting has begun (from CHORS), check the track count on the ADM31 against the track count on the pack listing. If the track count on the ADM31 is within six tracks of the track count on the pack listing, at the FR80 type EN/rt. At the ADM31, abort the FR80, mark the job, fill out a discrepancy slip, and continue running. **NOTE:** In most cases the job has completed and ended normally. Therefore an immediate response from EN/rt is not unusual, nor is no writing on the monitor scope. Be sure the job is not rerunning!

UNKNOWN CONTROL

An Unknown Control is interpreted as a "space one before printing". This response may or may not stop the job from plotting. If the job does stop plotting, press STOP then START keys on the console to interrupt the program and revive the teletype. Type END JOB/rt if running 105, or ADVANCE/3rt for other Load and Go. Reload the system using SYS esc J. If running from tape, use the "SKIP" command to start plotting the next job. If running from CHORS, abort the job at the ADM31. Press STOP then START keys on the console to interrupt the program and revive the teletype. Type END JOB/rt. At the ADM31, using the "MARK" command, mark the job as printed. Reload the system using SYS esc J. Restart the FR80 unit using the appropriate CHORS commands.

CHORS Error Messages From ADM31

ADM31 messages from CHORS are CHORS system messages to the operator and will in most situations require some sort of intervention and/or response from the operator(s).

ERROR – NO PACK AVAILABLE FOR NEW JOBS

No standby packs are available. Make a standby pack available as soon as possible. No CHORS response is necessary. Notify the mainframe operator to hold files on disc until a standby can be made available. A prompt response will aid in eliminating a tape backlog situation, by informing the mainframe personnel that the I/O group realizes the problem does exist, is under control, and will be corrected.

FR80 SPECIFIED IS IN USE

The files have been assigned to an FR80 that is already plotting, or a deadstart is in progress. Reassign the files to another FR80, or wait until the deadstart completes.

FR# – ABORTED AT TTT (CL) PK# JOB#, ON OPERATOR CMND

This message appears on the ADM31 when the operator executes the ABORT command, where FR# = the aborted FR80, TTT = file type, (CL) = file classification. After aborting an FR80, use the appropriate steps to revive the teletype and use the END JOB command to finish the titling of the fiche (only if you had been plotting on the FR80).

FR# – ABORTED AT TTT (CL) PK# JOB#, DISK ERROR
FR# – ABORTED AT TTT (CL) PK# JOB#, MEMORY T.O.
FR# – ABORTED AT TTT (CL) PK# JOB#, OUT OF DATA ON LG JOB

This message indicates that the current job has aborted due to one of the above listed errors, where FR# = the erroring FR80, TTT = file type (FCB or 105), (CL) = file classification. After any of these, check the track count for the job. If the job is at least 80% complete, abort the job at the ADM31, mark it and use the appropriate steps to revive the FR80 teletype. Use the "END JOB" command to finish the titling of the fiche. Fill out a discrepancy slip for the job. If the job is less than 80% complete, abort the job at the ADM31 and revive the FR80 teletype. Use the "FOCUS" command to put a focus spot on the bad fiche. Use the "END JOB" command to finish the titling of the fiche. Mark the job as plotted, and use the "PLOT" command to replot the job. **NOTE:** If this error repeats, do not "FOCUS" the job. Use the "END JOB" command to complete the titling of the fiche. Abort the job at the ADM31 and continue plotting, starting with the next job.

ILLEGAL FR80 NUMBER – USE 1–3

The above message is the error reply from the ABORT, FRJOBS, or REPLOT command. The operator response to the above message is to re–enter the command using the correct FR80 number; 1, 2, or 3.

ILLEGAL QUEUE SPECIFIED

The above message is the error reply from FRJOBS or PLOT commands. The operator response should be to re–enter the command using the correct job queue(s).

IN USE

The error reply from PLOT or REPRINT when the command(s) are already in use on the FR80 or NIPS that you are trying to assign the command to. It is also a response to the EXAMINE command when trying to examine a drive that the system has already recognized. Verify what equipment you are working with and either wait for the previous work to complete or correct what you're doing.

OV NOT RELEASED

The error reply from the overlay routine where the overlay is being used by someone else or has not been terminated from previous use. Check to make sure the overlay is not being used. If it is, you must wait until it has been freed. If it is not being used, go to the ADM31 and type CTRL–E KOV to kill the overlay.

Troubleshooting Tape Drives

The following are procedures for handling problems with the various FR80 tape drives.

Loss of Vacuum

When a tape drive loses vacuum – press STOP then START keys on the console to revive teletypes. Then...

For FCB:
1. Type CTRL-D (Debug)
2. Type CB esc J
3. Type FOCUS/rt
4. Hit the RETURN key
5. Type END JOB/rt
6. Type ADVANCE/3rt

For 105:
1. Type FOCUS/rt
2. Hit the RETURN key
3. Type END JOB/rt

For all other Load and Go:
1. Type FOCUS/rt
2. Type ADVANCE/rt

Once you've completed the appropriate steps above:

1. Press STOP/RESET button on tape drive
2. Press LOAD FWD (Fwd Load)
3. Press STOP/RESET
4. Press REWIND/UNLOAD
5. When the tape reaches load point, unload the tape and move it to another drive/FR80.
6. For FCB, use the FIND routine to go to the job that was plotting when the tape drive lost vacuum. Attempt to finish the tape.
   For Load and Go, use the SKIP routine to go to the job that was plotting when the tape drive lost vacuum. Attempt to finish the tape.

Continued on next page ---------->

If, after moving the tape to another drive, the tape causes the second drive to lose vacuum, do not focus the job that was being plotted. Just do an END JOB or an ADVANCE, depending on the film type, and write out a discrepancy slip. Try to plot any remaining jobs on the tape.

If the problem is persistent with a particular drive, write an MTR and avoid using that drive until it has been repaired.

Tape Runs Away

In this situation, during processing of a tape, the tape suddenly starts advancing very quickly, but the monitor is blank and no processing is being done. The cause of this is that the last job on the tape does not have an end-of-file mark. The FR80 advances the tape, looking for more data, or an end-of-file mark. To respond to this situation:

1) Press the ON-LINE button.

2) For FR80s 1, 2, and 4, press STOP then START on the console.
   For FR80 3, press RESET then START on the console.
   This revives the teletype.

3) For FCB and 105, type END JOB/rt
   For all other Load and Go, type ADVANCE/rt

4) Rewind and unload the tape.

5) Fill out a discrepancy slip for the job.

Tape Runs Off The END-OF-TAPE

This situation is caused by the End-Of-Tape (EOT) marker being gone, by the amount of tape after the EOT marker being too short, or by the FR80 not sensing the EOT marker.

1) For FR80s 1, 2, and 4, press STOP then START on the console.
   For FR80 3, press RESET then START on the console.
   This revives the teletype.

2) For FCB and 105, type END JOB/rt.
   For all other Load and Go, type ADVANCE/rt.

3) Rethread the tape, reversing the order you used to load the tape.
   Put several extra wraps of tape on the reel. Press the REWIND
   switch and unload the tape.

4) Fill out a discrepancy slip for the job.

POWER OUTAGE PROCEDURES

POWER OUTAGE PROCEDURES

In the event of a power outage (where the emergency lights come on) or when the power to a particular device flickers off and on several times, the following action should be taken by I/O operators and Photo Technicians in order to protect equipment.

Power Out

I/O Operators:

1. Turn off power switches located on the front panels of the FR80s and FR80 tape drives (don't touch anything behind the FR80s).

2. Call Hal Nida (Extension 2-3701, & Home: (209) 578-1379

3. Make appropriate log entries.

Photo Technicians:

1. Disconnect cables to the cameras.

If Power Is Still Off After One Hour

Call the appropriate shift supervisor.

Ed Long	(Swing)	Home: 415-449-0284
Don Birts	(Photo Lab)	Home: 707-422-6663

When Power Is Restored

I/O Operators:

1. Reset circuit breakers on front panel of ModComp if they were tripped by the power outage. Don't touch anything behind the ModComp or VGSC.

2. Notify a CDC CE or an EE technician if any 844 disk fails to come on-line. Don't touch circuit breakers at rear of the drives.

3. Deadstart the ModComp.

4. Check the DICOMED equipment every half hour for the first couple of hours (fire watch).

5. Restore power to the IBM/1800 (follow the writeup at the 1800 machine). After power has been restored, check equipment at half hour intervals (fire watch).

Photo Technicians:

1. Before restoring power to the FR80s, call the on-call EE technician and tell him that you are ready to restore power.

2. Reconnect cables to the cameras.

3. Allow sufficient time for the FR80s to stabilize (EE technicians will determine when FR80s have stabilized).

4. Check vacuum circuit breakers to the FR80s and compressor (one is located on the West wall in Room B-129, the other is located on the North wall of storage room B-146).

When a power outage occurs, action must be taken promptly. Familiarize yourself with this procedure, and ask your supervisor to point out any switches or circuit breakers referred to in this procedure that need to be identified.

Loss of Power on FR80 #3 Disc

FR80 #3 has a unique hardware configuration because it has two discs. One is "fixed" (not normally removed) and the other is "removable". The other FR80s have one disc each and are not removable. They're also not easily restarted if they idle down. A technician must be called in. For FR80 #3 however, it's possible for the operator to cycle the disc back up after a power loss (the ready light will be off). Follow these steps:

1. Power the FR80 back on.

2. Remove the clear plastic cover from the buttons under the tape drive. These are the buttons for the disc drive.

3. Press the RUN/STOP button.

4. Wait for the SAFE light to come on.

5. When the SAFE light comes on, press the RUN/STOP button again.

6. Wait for the RUN light to come on. If the light comes on, the disc drive should be okay. If this light doesn't come on, notify your supervisor or EE technician. If on a weekend, notify EE technician following Call-In Procedures found in this manual.

NOTE: All FR80's take two hours to stabilize once powered off before you can start processing.

MAGNETIC TAPE DISPLAYER

MAGNETIC TAPE DISPLAYER

Magnetic Tape Displayer (mag tape displayer) provides a means of viewing information from magnetic tape or CHORS. Any portion of a record may be displayed on the monitor or teletype. **NOTE:** From CHORS, Mag Tape Displayer can only read forward. It cannot back up! A brief command summary is displayed on the monitor when Mag Tape Displayer is first accessed, which looks like that shown below.

L	Rewind
R	Read
.	Reread
B	Bits per inch
#	Drive number
A	Annotation & input radix
$	Display next part.
W	Word
P	Display page.
Q	Display one line
O	Octal
D	Decimal
H	Hexadecimal
F	BCD
E	EBCDIC
S	Signed
U	Unsigned
Z	Suppress Zeroes
X	Print Zeroes
=	Search for match
<	Search for Larger
>	Search for smaller
N	Search for unequal
C	Compaction
M	Monitor
T	TTY

Mag tape command summary

To access Mag Tape Displayer from disc:

1) Type: CTRL-D (Debug)

2) Type: M esc J

At this point, the Command Summary shown on the previous page will be displayed.
Go to the next page for further instructions.

To access Mag Tape Displayer from tape:

1) Set Read-In Mode to MT.

2) Set data switch 17 up (this tells the machine to start writing onto the disc at location 1).

3) Set address switch 12 up.

4) Dial System Reload Tape to 3 (use the reload tape carrying the same number as the FR80 you are using).

5) Simultaneously press STOP and RESET, then press READ-IN.

6) Dial reload tape to 1 when "hang a tape" message appears on the monitor.

7) Teletype responds:
   7 track 800 bpi
   date and title of tape

8) Type: LSYS;M and press RETURN

9) Dial the reload tape to 2 and unload it.

At this point, the Command Summary shown on the previous page will be displayed.
Go to the next page for further instructions.

Continued on next page ——→

At this point, dial the Tape Drive Select Switch to "1", that corresponds with the tape drive selected or CHORS. The tape or CHORS must be at load point or the beginning of file. Mag Tape Displayer will force a tape to load point to start with anyway. With CHORS, Mag Tape Displayer will presume you are at the beginning of the file, whether you are or not. This means that no matter whether you are looking at the first record of a file or the fifteenth, the record header will claim it's looking at the first record when you start. Be sure you are really at the beginning of a file!

For Load and Go tapes, or CHORS files, type: JOB#,RECORD#R. For example: 2,29R, where 2 = Job Number, 29 = Record Number, and R = Read. This will display the 29th record of the 2nd job on the monitor.

For FCB tapes, or CHORS files, you can only type "R". If you need to look at a job in the middle of a series of jobs, you must just keep typing "R" until you reach the record header of the job you are looking for. For instance, if you needed to look at the tenth job, you would keep typing "R" until you saw "1Ø 1R" in the record header. This isn't particularly practical for CHORS files, but it's the only way to view jobs on a tape. It's probably more efficient to call up CHORS files individually.

To look at CHORS files with the Mag Tape Displayer, use the "PLOT" command to enter the job(s) you wish to look at, at the ADM31. Once you have requested the job(s) at the ADM31, you are ready to view the job(s) at the FR80 display monitor. **NOTE:** Jobs that have not been plotted when you look at them with Mag Tape Displayer will be marked as printed if you view them to the end of the file! If what you're looking at is a good, non-plotted job, you must go back and process the job using the "PLOT" command.

Below is a sample display from Mag Tape Displayer. The first line of data from U1 to W?20 BIN 5B is the record header.

U1	7TR	2F	29R	255	W?20 BIN 5B
	0	0	461123	100	215044
	4	435407	523600	226255	125500
	8	132200	540045	766600	2500
	12	431255	125507	516751	
	16	221400	3570	735253	477711
	20	406300	436645	243600	201
	24	75447	441200	75301	73445
	28	312600	2600	161777	777777
	32	# 221*	777777		
	253	770000	3535		

In the sample display, the record header translates as follows:

U1 Indicates that this record was read from the tape on drive 1.

7TR Indicates that the drive is a 7-track unit.

2F Indicates that the record was in the second file of the tape (i.e., after one file mark). A large number in this field indicates that the actual file number on the tape is not known to the program.

29R Indicates that the record being displayed is the 29th record of the file. A large number in this field indicates that the actual record number on the tape is not known to the program.

W? Following the W, a ? indicates that an unrecoverable error was encountered reading this record.

20 Indicates that only two characters were read in the last word; the third character is to be ignored. (In reading odd length nine-track tapes, 10 indicates that only one byte in the last word is relevant.)

BIN Present only if 9BPI not in effect. Indicates that the record was read in binary (odd parity) mode. For seven-track drives, alternate attempts to re-read after an error occurs are done in BCD (even parity) mode. BCD in this field indicates that the last successful read was done in this mode.

5B Indicates 5BPI in effect. 2BPI and 8BPI are also indicated; 9BPI is indicated by absence of this field.

The left column indicates the position in the record of the first word to the right of it. Data appears to the right of this column in the mode shown in the upper left corner of the monitor screen (in this case, octal). The number following the 32 in column 1 indicates that a repeating sequence follows; 221 is the number of words in the sequence being repeated as the single word 777777.

CB Tapes and CB CHORS Files

FCB must have 070000 as the first word of the first record, followed by 000006 as the second word, followed by 740000 as the third word of the first record of each file. If these numbers are not present in the first record, the job will not run (Figure 1-1.)

```
  1

U1  7TR        1 F              1 R             1814 W 10 BIN 8B

  0  070000  000006  740000  000042  234445  201004  710320  430061
  8  230461  141004  511720  420116  236270  401002  004014  220114
 16  230460  401002  004010  000000  000301  072343  046114  227462
 24  144434  401423  347214  432440  204475  301005  246214  220122
 32  210410  611422  746214  420040  100200  401423  046214  443461
 40  156310  631002  000000  000021  006000  010141  144002  200001
 48  000004  000000  000100  000014  100174  360663  546106  632102
 56  236540  402523  106110  051104  204304  611363  106206  632461
 64  142310  622163  046714  431433  176304  671643  106506  631107
 72  066310  611422  746214  415504  204475  301005  246214  220122
 80  210410  611422  746214  415465  142304  621444  346115  631063
 88  076154  731421  546420  447530  100524  621422  012221  041061
 96  142274  621441  546514  230462  144434  611463  106306  637461
104  156350  621521  546221  615462  142304  571443  103321  041117
112  260201  251443  044024  442102  142304  571443   10331
```

Figure 1-1. Mag tape header for CB tapes.

There is no conversion chart for FCB files. Therefore you will be unable to convert any of the words for troubleshooting purposes. The only step to take is making sure that the first, second, and third words are correct; (070000, 000006, 740000). If these words are not correct you should: 1) if running from tape, use the "FIND" command and start plotting beginning with the next job, or 2) if running from CHORS, mark the job plotted using the "MARK" command, abort the job at the ADM31, and continue plotting, starting with the next job in the queue.

Load and Go Files

Below is the conversion chart for interpreting the first record of Load and Go files (Figure 1-2).

01 = A	15 = M
02 = B	16 = N
03 = C	17 = O
04 = D	52 = *
05 = E	60 = 0
06 = F	61 = 1
07 = G	62 = 2
10 = H	63 = 3
11 = I	64 = 4
12 = J	65 = 5
13 = K	66 = 6
14 = L	67 = 7

Figure 1-2. Conversion chart for first record of Load and Go

Load and Go files must have 525252 as the first word of the first record, followed by 146100, 146200, 146300, 146500, 146600, or 146700 as the second word of the first record of each file. If these numbers are not present in the first record, the job will not run as a Load and Go (Figure 1-3).

```
        T
  U1    7TR              1 F           1 R         17 W 20 BIN 8B
          0 525252 146100 000000 000000 000000 000000 000000 000000
          8 000000 000000 000000 000000 000000 000000 000000 000000
         16 000027
```

Figure 1-3. Mag Tape header for Load and Go tapes.

Use the conversion chart (Figure 1-2) to interpret this record. When interpreting the first record of Load and Go program files, the numbers are converted in pairs, where
525252 would convert to ***, 146100 - L1* 146200 - L2* 146300 - L3* etc.

Continued on next page ——→

To interpret the second record of a Load and Go programs file, use the chart on the next page. The numbers are converted in sets of three (see Figure 1-4). The first five lines (0, 8, 16, 24, 32) are the parameters requested by the user. The sixth line (40) is the beginning of the I.D. of the file, where 102=B, 117=O, 130=X, 40=space, 120=P, 64=4, 65=5, and 40=space. Hence, the I.D. that will appear on the users output will be Box P45. In this example the zeroes that preceded the numbers (000102 or 000061) have been suppressed and therefore are not present. If the zeroes were present you would still use the same method of conversion, sets of three (see Figure 1-5). Note also in Figure 1-5, as well as the zeroes not being suppressed, the word "BOX" is not present. Therefore, the only I.D. that will appear on the output is 000121=Q 000071=9 000062=2 or Q92 (see lines 24, 32).

U1 7TR	1 F	2 R	170 W	BIN 8B					
0	123	105	124	57	61	60	62	64	
8	60	215	110	111	124	57	61	54	
16	61	54	64	215	124	111	124	114	
24	57	124	62	103	63	114	70	110	
32	66	54	61	126	61	54	63	57	
---> 40	102	117	130	40	120	64	65	40	
48	102	61	61	60	113	40	40	40	
56 #	16*	40							
72	44	115	44	215	124	111	124	114	
80	57	103	62	103	64	114	70	110	
88	61	63	54	61	126	62	54	63	
96	57	61	61	72	65	71	72	61	
104	71	44	114	44	114	44	114	44	
112	114	60	65	57	61	61	57	70	
120	63	103	40	44	115	44	215	124	
128	111	124	114	57	103	62	103	63	
136	114	70	110	61	67	54	61	126	
144	62	54	63	57	116	117	56	44	
152	63	40	40	61	40	44	124	215	
160	57	102	117	130	40	120	64	65	
168	40	215							

Figure 1-4.

U1 7TR	1 F	2 R	254 W 10 BIN 8B					
0	000123	000105	000057	000060	000071	000071	000063	000063
8	000215	000122	000117	000057	000061	000215	000103	000101
16	000057	000063	000215	000101	000104	000126	000057	000065
---> 24	000215	000120	000125	000057	000064	000215	000057	000121
---> 32	000071	000062	000040	000061	000215	000123	000105	000057
40	000061	000063	000060	000060	000060	000215	000122	000117
48	000057	000061	000215	000000	000000	000000	000000	000000
56 #	197*	000000						
253	000057							

Figure 1-5.

OCTAL	TRANSLATION	OCTAL	TRANSLATION	OCTAL	TRANSLATION
040	space	100	'	140	@
041	!	101	A	141	a
042	"	102	B	142	b
043	#	103	C	143	c
044	$	104	D	144	d
045	%	105	E	145	e
046	&	106	F	146	f
047	'	107	G	147	g
050	(	110	H	150	h
051	)	111	I	151	i
052	*	112	J	152	j
053	+	113	K	153	k
054	,	114	L	154	l
055	-	115	M	155	m
056	.	116	N	156	n
057	/	117	O	157	o
060	0	120	P	160	p
061	1	121	Q	161	q
062	2	122	R	162	r
063	3	123	S	163	s
064	4	124	T	164	t
065	5	125	U	165	u
066	6	126	V	166	v
067	7	127	W	167	w
070	8	130	X	170	x
071	9	131	Y	171	y
072	:	132	Z	172	z
073	;	133	[	173	{
074	<	134		174	
075	=	135	]	175	
076	>	136		176	
077	?	137		177	

OCTAL	TRANSLATION	OCTAL	TRANSLATION
200	null	210	
201	start message	211	horizontal tab
202		212	line feed
203	end message	213	vertical tab
204	end job	214	form feed
205		215	carriage return
206		216	new page
207		217	new line

This chart is used to interpret the second record of Load and Go files.

Alternate Displays

1. TAPE AT LOAD POINT appears when L option is typed or tape is at load point. CHORS does not respond to this command as CHORS cannot back up.

2. END OF FILE N indicates that the end of file specified has been reached.

Other Options for Mag Tape Displayer

1. JOB #,/R reads to the end of file on the job number specified.

2. OR backs tape up to end of file mark previous to the file that is currently accessed. It will cancel the use of all other commands. Also, this command does not work with CHORS, as CHORS cannot back up

3. To get a copy of what is being displayed on the monitor, type T. This types on the teletype what was shown on the monitor. To return the display to the monitor, type M.

FR80 DISC PROGRAMS

FR80 DISC PROGRAMS

The disc system is used as the principal running system for production.

To find out which disc directories are available, type: CTRL-D and F esc J. The monitor will display the default directory (identified with an asterisk), type of disc, file structure ID and free blocks located on the disc. See Figure 1-1.

Disc Directory

To view the directories
type: F esc J. This shows the default directory (asterisk beside it). (See Figure 1-1.)

To see the program directories available under the default directory hit the return key. In some cases, you will see three program directories (SYS, MON, and DIA). You may also see other program directories, such as III, HCR, OLD, etc. Don't concern yourself with these other program directories. (See Figure 1-2.)

To see the programs within a program directory, type the name of the program directory, plus a semicolon (;) and rt. (See Figure 1-3.)

To see all of the programs available, type: AUDIIrt. (see Figure 1-4.)

Programs in MON Directory

The following programs are Data-Only programs. These programs are not reliable on disc.
16BP7, COOK, OPEN, TIDCOR, 509RPT, FR80, FBP7, TIBFR8, FP7, MEINDE, FPER,16P7

These programs must be loaded by the operator, and are subject to change.

The following programs are normal production programs called for by User-1 tapes:

CB, L7 (16mm programs), L5 & L6 (35mm programs), L1, L2 & L3 (105mm programs).

```
Default Directory - FR80# 1,2,4

*SYS    D1    2316 FREE BLOCKS
        SYS

Default Directory - FR80 #3

*SYS    D1    2316 FREE BLOCKS
        SYS

FIX     D1F   2365 FREE BLOCKS
        FIX
```

Figure 1-1.

The difference between FR80 #3 and the others is due to FR80 #3 having two discs - one which is removable (*SYS) and one which is not removable (FIX). The other FR80s only have discs which are not removable. Also, depending on which disc you are running from, the asterisk will indicate which disc is being used for FR80 #3.

```
Program directories under the
Default directory

SYS  (8 FILES)    02/10/83 FR#3 SYSTEM REL
MON  (48 FILES)   02/10/83 FR#3 SYSTEM REL
DIA  (7 FILES)    02/10/83 FR#3 SYSTEM REL
III  (1 FILES)    02/10/83 FR#3 SYSTEM REL

*[SYS]  SYS
```

Figure 1-2.

Figure 1-2 is taken from FR80 #3. The information will vary somewhat from FR80 to FR80.

Continued on next page ——————→

```
MON:
                    MON:
SYS      BINARY          L1       BINARY
L2       BINARY          L3       BINARY
L5       BINARY          L6       BINARY
H5       BINARY          CB       BINARY
RAD      BINARY          FR80     BINARY
TIBFR8   BINARY          16P7     BINARY
FP7      BINARY          DD80     BINARY
FDD80    BINARY          16BP7    BINARY
COOK     BINARY          OPEN     BINARY
MEINDE   BINARY          509RPT   BINARY
TIDCOR   BINARY          PER10    BINARY
FIFILM   BINARY          FILMER   BINARY
HARD     BINARY          FBP7     BINARY
FPER10   BINARY          CP16     BINARY
COLOR    BINARY          35COLO   BINARY
16COLO   BINARY          COFR80   BINARY
TEST     BINARY          FR8DSP   BINARY
OCBFR8   BINARY          FIP7     BINARY
500CAL   BINARY          FP7NF    BINARY
TIFR8    BINARY          BRAD     BINARY
A        BINARY          2A       BINARY
3A       BINARY          SYS1     BINARY
NEWH5    BINARY          OLDH5    BINARY

48 FILES, THIS DIRECTORY

*[SYS]     SYS
```

Figure 1-3

Figure 1-3 is a listing of the programs within the program directory MON.

Continued on next page ——→

```
AUDIT

                SYS:
R       BINARY          F       BINARY
D       BINARY          S       BINARY
A       BINARY          E       BINARY
M       BINARY          COPY    BINARY

 8 FILES, THIS DIRECTORY

                MON:
SYS     BINARY          L1      BINARY
L2      BINARY          L3      BINARY
L5      BINARY          L6      BINARY
H5      BINARY          CB      BINARY
RAD     BINARY          FR80    BINARY
TIBFR8  BINARY          16P7    BINARY
FP7     BINARY          DD80    BINARY
FDD80   BINARY          16BP7   BINARY
COOK    BINARY          OPEN    BINARY
MEINDE  BINARY          509RPT  BINARY
TIDCOR  BINARY          PER10   BINARY
FIFILM  BINARY          FILMER  BINARY
HARD    BINARY          FBP7    BINARY
FPER10  BINARY          CP16    BINARY
COLOR   BINARY          35COLO  BINARY
16COLO  BINARY          COFR80  BINARY
TEST    BINARY          FR8DSP  BINARY
OCBFR8  BINARY          FIP7    BINARY
500CAL  BINARY          FP7NF   BINARY
TIFR8   BINARY          BRAD    BINARY
A       BINARY          2A      BINARY
3A      BINARY          SYS1    BINARY
NEWH5   BINARY          OLDH5   BINARY

48 FILES, THIS DIRECTORY

                DIA:
ENTEST  BINARY          VG      BINARY
CPU1    BINARY          EXCHBD  BINARY
EXMADR  BINARY          CB      BINARY
COFR80  BINARY

 7 FILES, THIS DIRECTORY
```

Figure 1-4

Figure 1-4 is a listing of all the programs within each program directory. This listing is obtained by typing AUDITrt for each FR80. The listing may contain additional entries, depending on whether there are other program directories available, such as HCR, III, etc.

Programs in SYS Directory

Restore Tape From Disc

This is used to save all disc files by putting them on a tape, which is then used as a backup system. To save files on tape:

1. Type: CTRL-D (debug) and S esc J.

2. Teletype responds: DATE?

3. Enter title of tape, e.g., type: JAN 6 1977 FR#3 SYSTEM RELOAD TAPE
   Be sure to include date the tape is being written, machine the tape is being written on, and title of tape.

4. Teletype responds: OK.

5. Type: ALL.

6. Machine will write all files from disc onto the tape dialed to 1.
   Then machine will re-read tape completely to insure what was written on tape is what is found on the disc. This takes approximately 5 minutes.

7. Teletype responds: OK.

8. Rewind the tape manually.

An Example program is given below.

```
*DEBUG
DATE?
JAN 25 1981 FR#2 SYSTEM RELOAD TAPE
OK
ALL
OK
```

After restoring a tape from disc, get an index of the tape, as listed below.

Index of System Tapes

This routine works ONLY on system tapes.

1. Set Read-in mode switch to MT. Simultaneously press Stop and Reset, and then press Read-in on console.

2. Type: IN/rt. Teletype responds: INDEX/ .

3. Tape dialed to 3 will be listed on teletype.

Tape Copy

This routine will copy an individual file or a whole tape from one tape to another tape or from CHORS to a tape. To execute tape copy:

1. Type CTRL–D (debug) and COPY esc J.

2. Set parameter changes if any. For a normal copy, no changes are necessary.

   Standard settings are:

Density	2,2
Parity	1,1
Data conversion	No
Write or compare	0
Double file Mark	yes.
Block maximum	13032

   A complete list of tape copy parameters appear on the next page.

3. Dial the tape drive you are reading from, to 1.
   Dial the tape drive you are writing to, to 3.

4. For copying from one tape to another tape, type: GO/rt.
   For copying from CHORS to a magnetic tape, use the PLOT command at the ADM31 to get the job(s) you want put on a tape, then type: GO/rt.

Continued on next page ——→

Tape Copy Parameters

```
*MONITOR
*
*TIME=15'5.8"
*GO
*CONTINUE
*BACK
*USE=1
*REWIND
*SKIP
*TRY AGAIN=10
*LOAD=COPY
*ROTATION=0
*III DUMP COPY
*
*  PROGRAM READS FROM UNIT 1
*   AND WRITES ON UNIT 3
*
*DENSITY=2,2
*  READ,WRITE 1=566 2=800 3=9TR
*
*PARITY=1,1
*  READ,WRITE 0=EVEN 1=ODD
*
*DATA CONVERSION=NO
*  9=9 TO 7   7=7 TO 9   0=NO
*
*WRITE OR COMPARE=0
*  0=WRITE  1=COMPARE
*
*DOUBLE FILE MARK=YES
*  (COPY TO DOUBLE FILE MARK)
*    0=OFF  1=ON
*
*BLOCK MAXIMUM=13032
*
```

Memory to Disc from Tape

This routine will write onto the disc whatever is in memory.

1. Set Read-in Mode switch to MT.
2. Load program into memory from tape.
3. Make parameter changes to program.
4. Change Read-in Mode switch to Disc.
5. Type: CTRL-D (debug)
6. Type: PROGRAM-NAME esc F. This writes corrected program onto disc from memory into the same location as was the bad program.
7. Check program to be sure change was accepted.
8. Update all system tapes using Restore-Tape-from-Disc routine.

Memory to Disc from Disc

1. Load program into memory.
2. Make parameter changes to program.
3. Type: CTRL-D (debug).
4. Type: PROGRAM-NAME esc F. This writes corrected program into disc from memory into the same location as was the bad program.
5. Check program to be sure change was accepted.
6. Update all system tapes using Restore-Tape-from-Disc routine.

Programs in DIA Directory

The DIA directory consists of the diagnostics program used to debug hardware problems.

ENTEST = Engineering test. Tests the CRT and its circuits. Almost the same as the tape diagnostic test, CPU1.

CPU1 = Complete central processor unit test. Rings bell when complete. Checks halt command first (740040). To continue test, press Continue switch on console. If it stops at any point other than Instruction 740040, check diagnostic manual (which your supervisor has) to resolve the problem. This test is similar to $A on the tape diagnostic routines.

Reloading FR80# 1, 2, & 4 System from Tape

Read-In mode switch must be on MT. Data switch 17 must be up, which tells the machine to disregard the use of the Track Usage table. Address switch 12 must also be up. Dial the System Reload Tape to 3. Be absolutely certain you have these settings done correctly! You will destroy the reload tape if the settings are not correct. Simultaneously press STOP and RESET, then press READ-IN. Dial the system reload tape to 1 when "hang a tape" appears on the monitor. If, at any time during this procedure, you get an error message, your system tape has been destroyed. Do not hang a new system tape until you've checked your switch settings, or you'll destroy it also.

At this point, you must go to the next page (Commands for Wiping a Disc and Reloading the System) in order to complete the reload process.

Commands for Wiping a Disc and Reloading the System

NOTE: You have to complete the steps on the previous page before going on.

WIPErt — Initializes a file structure. All blocks except for the swapping area filled with zeros; a master directory with one entry, SYS, is created. The SYS directory has no files; a track usage table is written with all allocatable blocks indicated to be available. The following commands are required to initialize a file structure. (Note: the operator types ONLY the doubly underlined text) A line-feed will abort the wipe if entered at any time during the wipe dialog.

system response: File Structure i.d.:

operator response: SYSrt — An illegal character repeats the request for file structure i.d. This can be any three letters.

system response: File Structure Name:

operator response: SYSrt — File structure name is one to three characters for the default directory. Use SYS for default directory name.

system response: Unit(s)

operator response: D1Frt — If message "UNIT 1 NOT READY" comes up, disc is down. Call in a technician and/or run from tape system.

system response: Initiate Wipe?

operator response: rt — Inititates wipe; any character other than (rt) will abort the wipe. Rotate Data Select dial one click to the right, then one click to the left (data display will activate). Wait up to three to five minutes for Wipe to complete (lights will stop flashing).

system response: Wipe aborted — (This response will be typed if the wipe is aborted.)

operator response: ALL — (Loads complete tape. Takes 1-2 minutes)

system response: OK

operator response: Change Read-In Mode to DISC. Put switch 17 down. Press RESET/STOP and READ-IN on the console. This brings Debug up.

operator response: MON;program-name esc J — The system is now ready to run

Reloading FR80 #3 System from Tape

FR80 #3 has two disks. The top disk is called the "removable platter," the lower disk is called the "fixed platter." Each platter must be reloaded separately. The following instructions should be followed to insure proper reloading.

operator: Set Read-In mode switch to MT.
operator: Data switch 17 and Address Switch 12 in UP position.
operator: Dial tape unit to 3.
operator: Press Stop-Reset, Read-In.
operator: Dial tape unit to 1.
operator: WIPErt

From this point, the two platters are different. Depending on which platter is being reloaded, follow the instructions below. **NOTE:** Under normal circumstances, you should only need to reload the removable platter!!!

for REMOVABLE platter

```
system   : File Structure ID
operator: SYSrt
system   : File Structure Name
operator: SYSrt
system   : Unit(s)
operator: D1R
system   : Initiate wipe?
operator: rt
operator: ALLrt
system   : ok
operator: READ-IN mode to DISC
          switch 17 down
          RESET-STOP, READ-IN
          MON;program name esc J
```

for FIXED platter

```
system   : File Structure ID
operator: FIXrt
system   : File Structure Name
operator: FIXrt
system   : Unit(s)
operator: D1F
system   : Initiate wipe?
operator: rt
operator: ALLrt
system   : ok
operator: READ-IN mode to DISC
          switch 17 down
          RESET-STOP, READ-IN
          MON;program name esc J
```

Running FR80 #3 from Backup Disc

If the situation occurs that calls for a system reload, and while reloading the removable platter, you find that the reload tape is bad, what do you do? Below is a sequence of steps that will allow you to continue running production from the fixed platter until the system reload tape can be replaced.

1. Go into debug and type F esc J (audit program)
   If need be, reload the SYS directory from any system reload tape, by typing DSYSrt.
   The system will ask you if you want to replace each of the programs in the SYS directory. Just hit the ***return*** key. If any other key is hit, the system will not replace that program, but will go to the next program.

2. After the SYS directory has been replaced (indicated by 'ok' on the TTY), go into Debug and type F esc J .

3. When the monitor display is:

```
*SYS  D1R   2463   FREE   BLOCKS
      SYS
 FIX  D1F   2463   FREE   BLOCKS
      FIX
```

   type: [FIX]rt ***or*** [SYS]rt

If the asterisk is next to the SYS (e.g., *SYS D1R ...), type [FIX]rt to run from the fixed platter. If the display shows *FIX D1F ..., type [SYS]rt to run from the removable platter. In you are unable to run the disk system, then run from the tape system.

Copy Data from Disc to Disc

To copy one program, one directory or the entire disc, execute the following:

1. Go to the Debug and type F esc J

2. When the monitor display is:

```
*SYS  D1R  2463  FREE BLOCKS
      SYS
 FIX  D1F  2463  FREE BLOCKS
      FIX
```

type C [SYS]MON;CB BINARY=[SYS]MON;xyz BINARYrt
which will copy the CB program from the removable platter and write it on the same platter only with a different name (xyz).

(OR)

type C [SYS]MON;L7 BINARY=[FIX]MON;L7 BINARYrt
which will copy L7 from the removable to the fixed platter.

(OR)

type C MON;L1 BINARY=EXP;C5 BINARYrt
which will copy L1 into C5 in the EXP directory. If EXP or C5 is not there, the system will create it.

(OR)

type C [SYS]=[FIX]
which will copy all of the sys disc onto the fix disc.

NOTE: These are only examples of how the COPY routine works. However, *extreme* caution should be used when copying files, in that the operator may inadvertently over-write a good file.
An example error would be C MON;ABC BINARY=SYS;D BINARY
which would replace Debug with file ABC.

Deletion of Programs on Disc

1. Go into Debug and type F esc J

2. When the file structure appears on the monitor, type:

   D [FIX]MON;H5 BINARYrt

   (OR)

   D [FIX]SYS;R,MON;CB,DIA;rt

   This will delete SYS;R, MON; CB and the entire DIA directory on the fixed platter.

   NOTE:
   These are only examples of deleting programs. Use extreme caution when manipulating anything on the platters. Know what you are doing before attempting this.

Commands for Writing on Disc from Tape

Use the standard settings for the FR80 console. If a bell rings at anytime, check, and retype the command. To reload a program or directory, the system MUST be in debug (CTRL-D) state, Disc mode. Type: R esc J, which will load the program to restore a directory or individual program on disc. The operator can now reload the entire disc, one entire directory, or a single file of a directory by using one of the following options:

ALLrt	To copy all files from the current position of the tape to the disc.
BXXX;Filename	To copy a single file from tape to disc. B refers to the file as being binary. XXX refers to a three-lettered directory where the file resides. File-Name is file to be restored. The routine FXXX-Name BINARY (rt) also loads the binary file onto the disc by specifying binary in the command. Both commands load only the program.
DDir-Namert	DDir-Name 1 (Dir-Name2), (Dir-Name 3), (Dir-Name 4)...rt To load a single directory from tape to disc, use: DDir-Name, where Dir-Name is the directory you want to restore; this will load ONLY the directory!

INDEX

INDEX

MODIFICATION DATES AND CONTENT CHANGES

EDITION 3 OCTOBER 10, 1983
Aside from minor semantic and style differences, the major changes are:

1. I/O Transfer Instruction Operation updated.
2. FR80 Hardware (Data Section) updated.
3. Gauge Monitoring – 105mm Camera updated.
4. Procedures for 16mm Film and Camera updated.
5. Gauge Monitoring – 16mm Camera updated.
6. Procedures for HCY/HFB Film and Camera updated.
7. Description – 35mm and P16mm Camera updated.
8. Procedures for 35mm and P16mm Film and Camera updated.
9. Gauge Monitoring – 35mm and P16 Cameras updated.
10. Procedures for Color 35mm – P16mm Film and Camera updated.
11. Standard Operating Procedures updated.
12. FR80 Production Log updated.
13. Discrepancy Slip updated.
14. Technician Call-In Procedure updated.
15. Load and Go Procedures (CHORS or tape) updated.
16. Section titled Parameter Changes added to text.
17. Load and Go Test Procedures for Color updated.
18. FR80 Work Order Sheet updated.
19. Run Procedures for Data Only Tapes updated.
20. Troubleshooting (First Record Missing FS Character) updated.
21. Power Outage SOP updated.
22. Commands for Wiping a Disc and Reloading the System updated.
23. Previous revision marks deleted from text.

EDITION 2 JULY 8, 1983
Aside from minor semantic and style differences, the major changes are:

1. Index added to text.
2. Fourth and fifth level headings deleted from Table of Contents, but not from body of text.
3. Section titled "Instruction Group Switches and Indicators" updated.
4. Description of 16mm camera updated.
5. Description of 35mm/P16mm camera updated.
6. CHORS Introduction updated.
7. Section dealing with MTRs updated.
8. FCB Test Procedures updated.
9. FR80 Work Order Sheet section updated.
10. FR80 Work Order Sheet example added to text.
11. END JOB command instructions updated.
12. SCAN JOB command instructions updated.
13. CON information updated.
14. Power Outage Procedures added to text.
15. Magnetic Tape Displayer section added to text.
16. Source file modified with TID macro instructions.
17. Revision marks added as needed.

EDITION 1 MAY 27, 1983
Aside from minor semantic and style differences, the major changes are:

1. Original generation of document.

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