

CYBERNET
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CONTROL DATA
CORPORATION

EXPORT / IMPORT 200

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Terminal
User
Guide

CDC® MARC-II Remote Terminal
To CDC 6600 Computer
Software Communications System

FOREWORD

MARC (**M**ultiple **A**ccess **R**emote **C**omputing) designates Control Data's family of remote terminals used with CYBERNET Service — CDC's nationwide communications network. These terminals include MARC-I through the MARC-V Systems, each of which can communicate with a Control Data 3300 or 6600 CYBERNET Center, or even with each other.

This manual provides user information on the operation of MARC-II Terminals under the EXPORT/IMPORT 200 System. EXPORT/IMPORT 200 is a program that allows MARC-II Terminals to communicate exclusively with Control Data 6600 CYBERNET Centers.

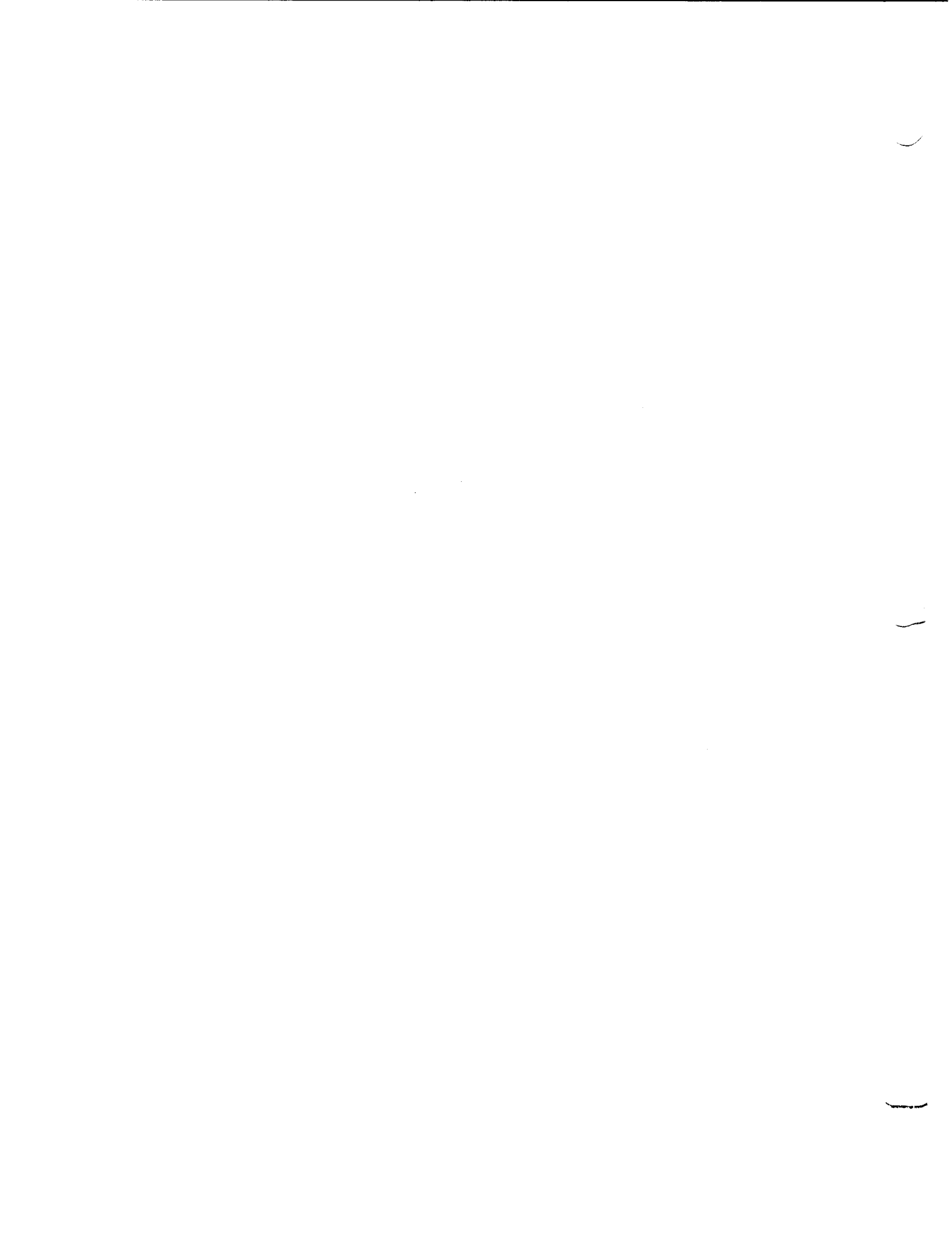


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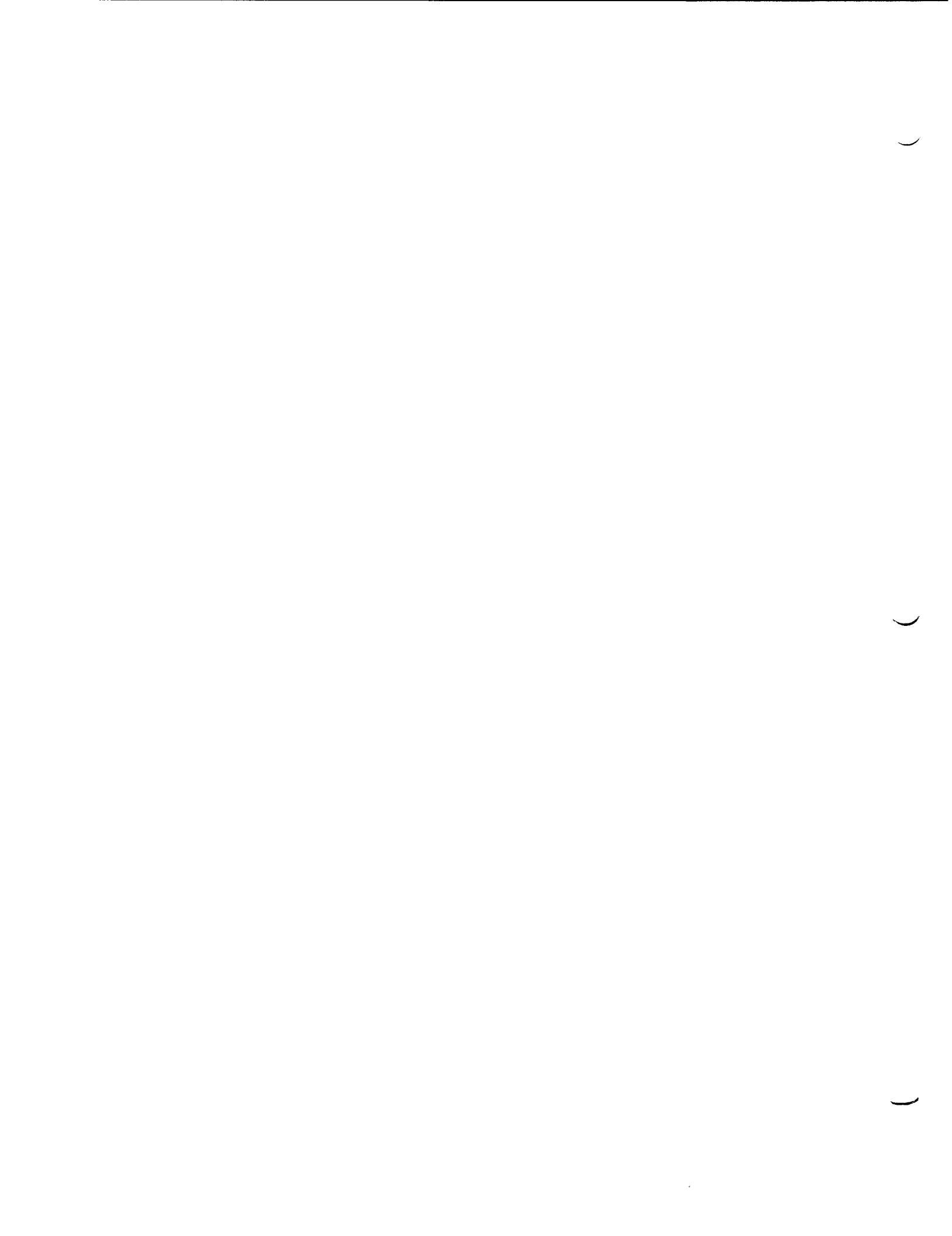
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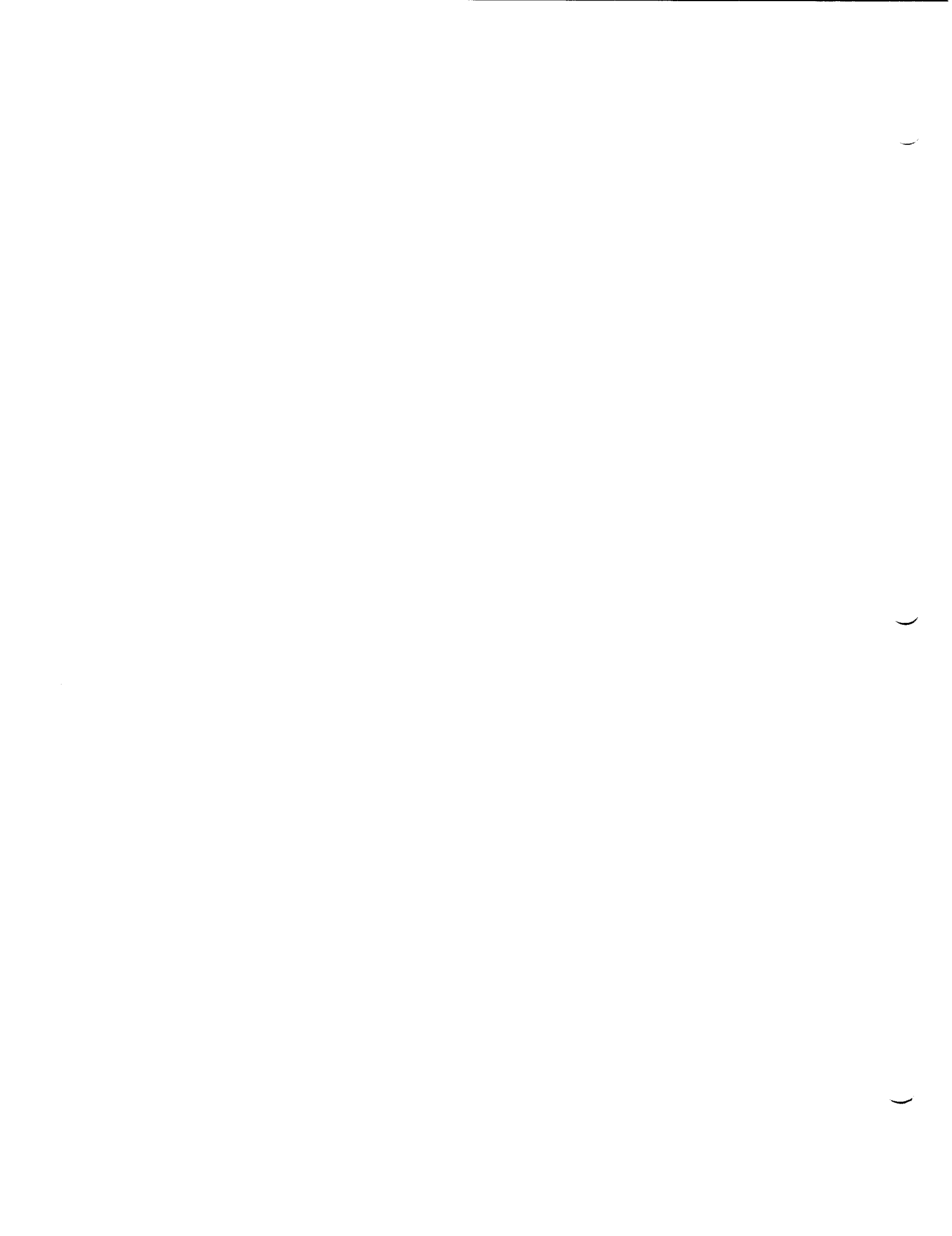
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EXECUTIVE SUMMARY

THE MARC-II Remote Terminal offers the user immediate access to the most powerful problem-solving tools available today — without heavy investment in equipment and facilities.

Managers, scientists, engineers, programmers, and virtually anyone having data processing requirements can benefit from MARC-II Systems being linked to Control Data's nationwide network of 6600 CYBERNET Centers through the EXPORT/IMPORT 200 System. This network, called CYBERNET Service, brings the user — directly where results are needed — such services as: (1) the computational power and speed of the CDC family of computers, (2) ready-to-use applications, and (3) highly-trained personnel services.

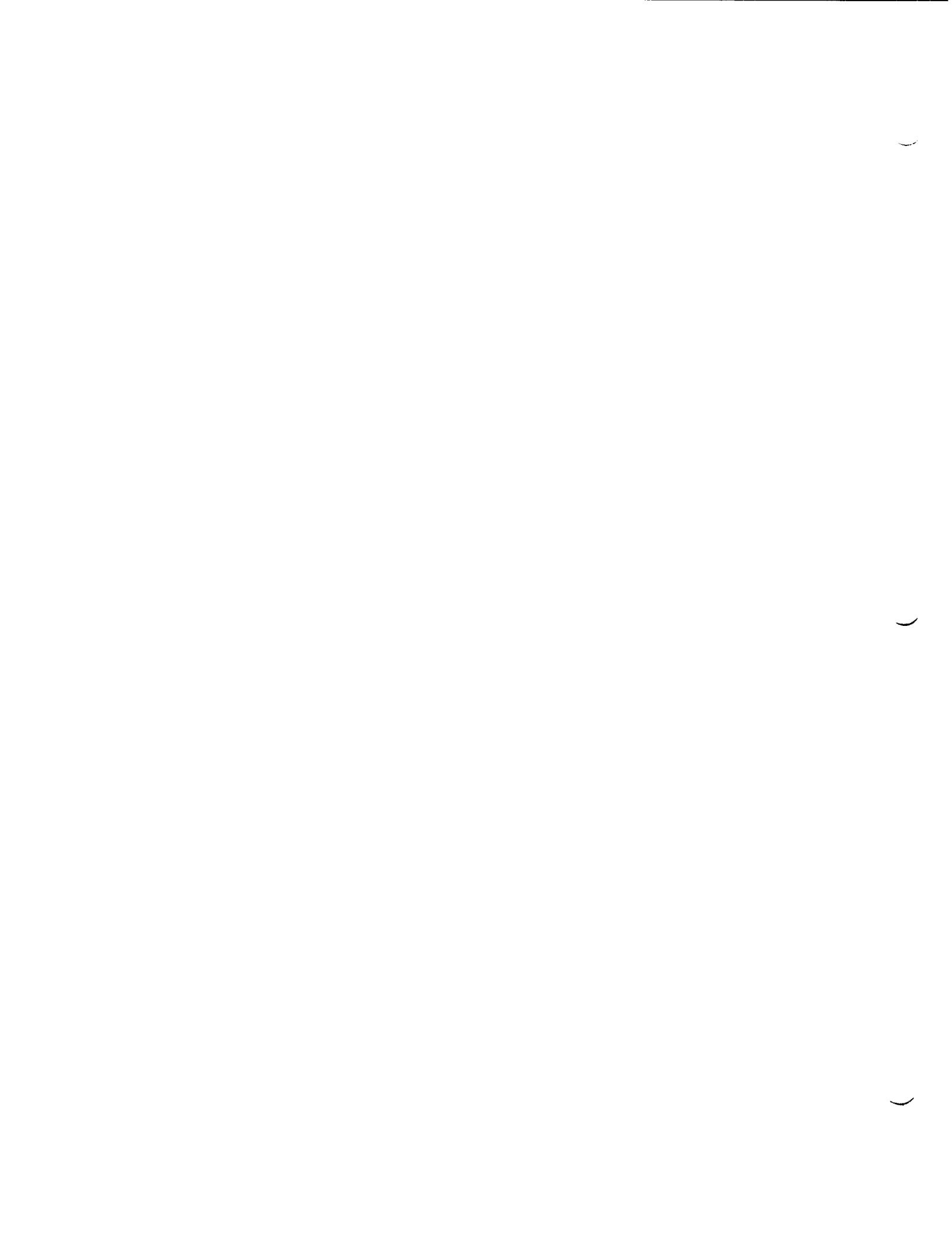
The MARC-II was developed primarily to provide a more economical way to solve problems with a computer. The terminal itself consists of an easy-to-operate typewriter keyboard, a Cathode Ray Tube (CRT) display screen, card reader, and line printer. This equipment provides fast data processing service at a reasonable cost. Direct costs are further reduced since MARC-II Systems do not require special site preparation, such as air conditioning, computer flooring, or wiring; computer operators and maintenance personnel are also not required.

The EXPORT/IMPORT 200 System facilitates easy operation of MARC-II Systems. Users may submit their jobs to 6600 CYBERNET Centers in batch mode, and then

control their overall flow (both central site processing and those peripheral read and write activities performed at the terminal) through a defined set of commands. Output may be returned to the originating terminal or transferred to any other MARC-II Terminal in the CYBERNET System, including the central site.

The greatest benefit of the MARC-II Terminal is the time reduction between submitting jobs and obtaining results. Managers and engineers can get results where and when they are needed. Decisions can be made, reports generated, and projects completed in a fraction of the time previously required. The ability of a development programmer to obtain results of a computer run in only a few minutes enables him to maintain a cohesive train of thought — thus compressing the development cycle manyfold. Often, the immediate availability of a powerful computer resource offers new approaches to solving problems by using techniques which would otherwise be impossible.

The advanced concepts embodied in the MARC-II Terminal and CYBERNET Service virtually obsolete older, less efficient means of data processing. CYBERNET computers can process jobs literally for pennies and return the results to the user in minutes. By applying the capabilities of MARC-II Systems under EXPORT/IMPORT 200, the user knows that his data processing problems are being solved by the most advanced technology currently available.



CHAPTER ONE

INTRODUCTION

DEVELOPMENT OF THE REMOTE JOB ENTRY CONCEPT

The Early Stages of Computer Usage

Early computer users were small in number and operated computers themselves. Consequently, they were unconcerned with scheduling problems or efficient utilization of the computer. And, if the first programmers could not gain immediate access to the computer, they simply waited in line.

During this period, each computer was equipped with an operator's console. This console provided the user with a way of monitoring the activity inside the computer. By manipulating particular buttons and switches, he could cause certain actions to be taken by the computer. This "hands-on" mode of operation gave the user a sense of intimate communication and interaction with his computer.

Because of the small number of users, a simple waiting line worked well for the older, relatively small systems of this era. However, the popularity of computer usage was growing and, as more people required the services of a computer, more time was spent waiting in line by more users. In addition, the larger computers being developed were not efficiently utilized under this system. During one user's turn of ten minutes, eight or nine minutes might typically have been spent in extra work like preparing for the job, correcting small errors, and obtaining and relinquishing access to the computer. Also, larger computers meant rising operating costs.

Operators Specialize in Computer Operation

To improve the efficiency of both the individual user and the physical computer system, computer operators were hired to specialize and improve the actual operation of the machine. Under this system, the user merely submitted his job to the operator and waited for the results.

In essence, an operator acted as the user's proxy at the computer. The user's job usually took the form of a deck of punched cards. The operator kept jobs originating from many users in order, and submitted them to the computer. In addition, the operator performed several

tasks to improve the efficiency of the computer. For instance, while one job was being processed, another could be **set-up** (made ready) by the operator. This overlap of activities assured that the idle time of the computer was minimized. This tended to increase the **through-put** — which is a measure of the number of jobs performed over a specified period of time, and is a relative measure of system efficiency.

However, the employment of operators had its bad effects. It made the individual users **remote** from the computer since they no longer had access to "hands-on" operation. Therefore, users tended to lose their sense of intimate communication and interaction with their computers.

For instance, a sophisticated programmer could deduce much information about the progress of his job just by watching periodic messages typed at the console. Or, by depressing a switch he could elicit some status-of-the-job information from the computer or modify the way in which the processing proceeded. Since the utilization of computer operators meant that the user was generally no longer present when a job was processed, he could not meaningfully apply these facilities.

Moreover, since a user was no longer able to preside over the processing of his job, he had to give the operator written **run instructions**. If a job was composed of many intricate steps, potentially expensive errors resulting from incomplete or misunderstood instructions was a continuing problem.

Many jobs which were processed in this kind of environment were not properly handled because of insufficient instructions to the computer operator.

Batch Operating Systems

To elicit even more efficiency from computer installations, software techniques and procedures for operating computers were developed. These were the first **operating systems**, which automatically took over many routine operator tasks and minimized the chance for error.

In practice, the user's jobs were collected and submitted to the **system** (composed of the computer and its oper-

ating system) as a **batch** of jobs. Consequently, the colloquial name **batch system** was originated.

The standardization of job-handling techniques not only provided quicker through-put but, in a limited sense, facilitated more communication between all three parties (user, operator, computer).

- The computer operator still collected all the existing jobs together and arranged them in a sequence. The order was based on priorities and/or a first-come, first-served principle. All these jobs constituted a **batch**. In a well designed batch operating system, the entire batch would be processed without the computer ever stopping or "idling". Since jobs were processed one at a time, this kind of operating system is most properly called a **serial batch system**.
- In the absence of an operating system, the operator was responsible for watching the clock. An operating system could automatically take care of this same kind of monitoring.
- Normal run instructions were handled by instructions on punched cards that controlled the system. The batch operating system interpreted these cards and typed messages to the operator when his action was required. In general, written operating instructions were used only in exceptional cases.
- The user could usually communicate some job information to the system, such as the maximum number of minutes some step of a job was allowed. Any activity beyond this time implied an error.
- The batch operating system could also communicate with the user by outputting error messages and status information.

However, since the user was not present when messages were issued, he was in no position to act upon the information; consequently, he still had not regained his former degree of intimate communication.

The Advent of the Multi-Access System

With the popularity of data processing beginning to boom, it was apparent that more efficient techniques of accessing computers than serial batch systems would have to be devised. Therefore, the concept of **multi-access** was born. A number of factors both pushed and pulled this concept into being.

On one hand, advances in computer design and technology "pushed" by allowing computers to do more sophisticated things like dividing memory into insulated segments and switching control between many programs which could all reside in the computer's memory. This was part of the **multi-programming** concept.

In a multi-programmed operating system there could be two or more apparently simultaneous users of a computer. If one user had to wait even a tenth of a second — for some event to occur, then another user's job could be activated during this interval. The multi-programmed operating system was responsible for performing the necessary switching from user to user. A multi-programmed operating system was a first step toward multi-access, but intimate communication was still lacking.

To the user, a multi-programmed operating system appeared identical to the more conventional serial batch operating system. One user was not "aware" of other concurrent users of the system. Many of the components of the operating system itself could even be treated as just another user, further contributing to overall efficiency. For instance, if the multi-programmed operating system had its own accounting routine, this routine could be called in to update itself when there was available time.

Multi-programmed operating systems were generally batch-oriented systems, but batches were not necessarily processed sequentially. Multi-programmed operating systems functioned so that there were two or more jobs in the **input queue** (also called the "job stream"); several of these were selected for processing. Sophisticated techniques determined the best time to switch from one program to another. One common time for this switching was when some program requested an action which implied communication with the outside world. Since the computer was so much faster than the people and devices with which it communicated, a significant amount of time was spent waiting for input and output activity to be completed. When a user requested some input/output action, the program was delayed, waiting for the action to be completed. Rather than waiting idly, the computer (through the operating system) caused another user to be activated for a small increment of time.

Some jobs waited in the input queue because other jobs were using facilities which the waiting job also required. However, it was more common that several users would reside concurrently in the computer; each being processed in small increments of time because they required fewer resources than were present in the entire system.

On the other hand, multi-access was "pulled" into being by the needs of users. The growing volume of users alone demanded that they be able to share computers interactively; returning to a state of "hands-on" control. And along with the growing popularity of computers, their cost was continuing to expand — this also had to be shared.

Under multi-access, each user of a central system had his own **peripheral equipment station** (card reader, printer, and necessary controllers). Through this equipment, he submitted his jobs in batch form to the central computer. The central computer took all jobs from all users and placed them into an input queue. When possible, jobs were taken from the input queue and processed either one at a time or under the computer's multi-programmed operating system.

By allowing more than one user to have access to the computer simultaneously, the cost to each user was minimized. Each user only paid for those resources actually utilized. The total power of the computer was more evenly distributed over many simultaneous users.

Multi-access also returned a degree of intimate communication with the computer to the user. He usually operated his peripheral equipment himself, and (depending on the degree of sophistication involved in programming the multi-access operating system), could at least interrogate the system about the status of his job and take appropriate action.

Remote Job Entry Systems

The advent of multi-access led directly to the development of **remote job entry**. As stated previously, in order to get into a multi-access system a user had to have his own station of peripheral equipment (or access to one), and the technology involved in interfacing peripheral equipment with central processing units was improving. Technical improvements were also being made in telecommunications equipment and methodology. Subsequently these peripheral stations were combined with data sets (telephone lines) to create **remote terminal devices** that would allow distant users to access the central computer; hence, remote job entry systems came into being.

Like multi-access systems, a remote job entry system can operate in one of two basic ways:

- **Uninterrupted.** In this kind of system, a job enters the computer (after being selected from the input job queue) and retains control of the computer whenever the computer is not servicing real-time communication needs.
- **Interrupted.** With this kind of system, several jobs are multi-programmed whenever the computer is not servicing the real-time communication needs.

Therefore, remote job entry systems function much like multi-access systems except that data is transmitted back and forth between remote terminal and central computer via telephone lines.

EXPORT/IMPORT 200 As a Remote Job Entry System

How does the EXPORT/IMPORT 200 System and its connection with CYBERNET Service fit into this picture of developing computer usage techniques? EXPORT/IMPORT 200 is a remote job entry system that allows MARC-II Terminal users to submit batched jobs (programs and data) to centrally located CONTROL DATA® 6600 Computers. There, they are processed under CDC SCOPE, a multi-programmed operating system. Additionally, users may "talk" to SCOPE, giving it special instructions for running their jobs. Combined together, this system of terminals and central 6600 computers forms the nationwide CYBERNET Service.

EXPORT/IMPORT 200 CONFIGURATION

The MARC-II Terminal system is composed of three primary pieces of equipment which operate in the following manner under EXPORT/IMPORT 200:

- A card reader reads each job (at the effective speed of 140 cards per minute) and sends it to SCOPE.
- A printer receives and prints output from SCOPE at the effective speed of 180 lines per minute.
- A combination display screen/keyboard is employed by the user to talk to SCOPE and the central site computer operator. The user types his commands and messages to SCOPE and the central site operator on the keyboard; in turn, any messages from these sources are displayed for the user on the terminal screen.

TELECOMMUNICATIONS

EXPORT/IMPORT 200 utilizes telephone lines to carry information between terminals and central site CYBERNET Centers. Therefore, when a user wants to communicate with a 6600 via EXPORT/IMPORT 200, he first has to call the central site computer on a telephone which is connected to his MARC-II Terminal. EXPORT/IMPORT 200 actually resides within the central site 6600. It communicates with different terminals over telephone lines, sending and receiving messages, and requesting SCOPE to process the jobs sent over these same lines.

USER BENEFITS

Fast Turnaround

The enormous computer power and through-put capability of the CONTROL DATA 6600 Computer Systems ensure all users of fast and reliable turnaround of data processing tasks. Jobs may be redirected among CYBERNET Centers to satisfy particular applications requirements and provide the best possible response time for the user.

Speed

Because of character compression and buffered input/output, the MARC-II System is the fastest and most versatile remote terminal in its price class. Information is transmitted between the terminal and a Data Center at speeds of up to 300 characters per second. Typical computer output has many repetitive blanks and zeros. However, the MARC-II Terminal reduces costly transmission time by compressing the blanks and zeros through special hardware techniques. Up to 31 blanks or 15 zeros can be compressed into two characters. The printer then decompresses the blanks and zeros and prints a full line.

Additional efficiency is gained through a 1000-character buffer for each peripheral device at the terminal. This feature allows card reader input to the central site at the same time that output is being received on the remote printer.

Convenience

After submitting his program by the card reader, the terminal user can control program through-put by entering the appropriate commands via the keyboard/display screen. The user has the option of printing output data on his own MARC-II printer, at the central site, or sending it to any other MARC-II Terminal in the CYBERNET network. Cards can also be read and listed directly at the terminal without contacting the central site.

Economy

The cost of utilizing a MARC-II Terminal under EXPORT/IMPORT 200 is minimal. The user need only to connect his system to a voice-grade communications

line, enabling EXPORT/IMPORT 200 to transmit data between his terminal and the central site.

Minimum Environmental Requirements. Compact design, minimum environmental requirements, and dial-up voice-grade line enable the MARC-II Terminal to be installed where it is needed. The MARC-II system runs on less than 20 amps of regular 110-volt/60-cycle house current and operates within a wide range of temperature and humidity conditions. It can be located and operated in almost any place that can be serviced by a telephone.

Low Operating and Maintenance Costs. Dial-up voice-grade lines, low maintenance costs, and low monthly rental combine to make the MARC-II Terminal an economical tool for remote terminal users. In addition, expensive central computer installation, maintenance, operating, and programming costs are avoided.

CYBERNET Service Access

EXPORT/IMPORT 200 offers MARC-II users instant access to the broad spectrum of data processing capabilities and services provided through CYBERNET Service.

Computing Power. The computational power and speed of the CONTROL DATA 6600 Computer and advanced peripheral equipment are available on-line to E/I 200 users.

Applications. A wide variety of applications programs and systems are offered to satisfy most scientific or business data processing requirements.

Personnel. Trained and experienced personnel including computer systems specialists and applications analysts are available to provide the best possible counsel and assistance in all phases of data processing.

CHAPTER TWO

TERMINAL APPLICATIONS

The MARC-II Remote Terminal, communicating with 6600 CYBERNET Centers under EXPORT/IMPORT 200, offers two options for processing data: (1) remote job entry, and (2) local processing. Descriptions of the two options are provided below.

REMOTE JOB ENTRY

Jobs submitted via the MARC-II Terminal to a 6600 CYBERNET Center for batch processing are controlled by the CDC SCOPE Operating System at the central site. Interface between SCOPE and the terminal is provided by the EXPORT/IMPORT (E/I) 200 Communications System.

EXPORT/IMPORT 200 CAPABILITIES

E/I 200 enables the MARC-II user to:

- Submit jobs to SCOPE from the remote card reader
- Receive output files on the remote printer
- Enter commands from the remote keyboard to control job processing
- Request status information about jobs submitted from the terminal. Status indicates whether a job is in the input or output queue, or in execution.
- Stop activity of either card reader or line printer
- Restart card reader or line printer activity
- Abort job currently being printed or read
- Drop specified job from input queue or from execution
- Drop specified job from output queue
- Repeat printing of all or part of a job
- Divert output from terminal to other locations
- Send message from remote terminal to central facility

A TYPICAL OPERATION SEQUENCE

A typical sequence of operations to submit a job from a MARC-II to a 6600 CYBERNET Center might be:

- The remote operation prepares the job and establishes Dataphone* communications with the 6600 CYBERNET Center.
- EXPORT/IMPORT 200 reads the job from the remote card reader into the stack of several jobs to be processed by SCOPE.
- SCOPE processes the job and places its output into the output queue.
- E/I 200 then transmits the output files to the line printer at the appropriate remote terminal.

EXAMPLE — MRI/STARDYNE PROCESSING WITH A MARC-II TERMINAL

Consider the following example of MARC-II remote job entry, using a CYBERNET Service applications program called MRI/STARDYNE. The MRI/STARDYNE System is a series of compatible digital computer programs designed to analyze linear elastic structural models. The System encompasses the full range of static, stability, and dynamic analysis and is ideally suited for computing those characteristics of the following typical systems:

- Offshore platforms. Dynamic response to winds, wave forces, ice floes, and onboard equipment vibration.
- Rapid transit systems. Estimates of passenger comfort levels and equipment life. Dynamic response to gusts and track irregularities. Pantograph dynamics.
- Aircraft. Structural behavior under maneuver, gust and landing conditions. Calculation of bending modes for inclusion in auto pilot analysis.
- Space vehicles. Quasi-static loads corresponding to lift-off and staging transients, aerodynamic forces, and ignition transients. Launch probability, and response to orbital disturbances. Thermal deformations.
- Buildings. Static response to wind and gravity load. Dynamic response to earthquake and blast.

*Trademark of the Bell Telephone System

- Transmission towers/antennas. Static deformations due to winds, gravity loads, and thermal gradients. Dynamic response to gust, earthquake, and equipment vibration.
- Bridges. Static loads and stress caused by wind and gravity forces. Dynamic response to gust and vortex shedding.
- Ships. Flexible body response to wave forces. Static strength analysis.

Preparing the Input

A typical STARDYNE run from a MARC-II Terminal begins with the preparation of three kinds of input: SCOPE Operating System control cards, STARDYNE instructions (which control the STARDYNE program) and the static and dynamic data (which describe the problem that STARDYNE will solve) are key-punched on 80-column cards from the user's coding forms. If the user wishes to edit the input before submitting the job, he may list the deck using the off-line card-to-print operation of the MARC-II Terminal.

Submitting the Job

The user or operator loads the job deck (i.e., SCOPE and program control cards, plus input data) in the remote card reader and establishes communications with the 6600 site. EXPORT/IMPORT 200 then reads the job from the card reader and stores it on the disk file in the stack of jobs to be processed under SCOPE.

Job Processing

The SCOPE Operating System reads the STARDYNE

System and the user's job deck into the 6600's central memory, where STARDYNE processing is performed. After a solution is obtained and the processing is completed, output requested by the user is stored on the disk file in the output queue.

Disposition of the Output

The output produced by STARDYNE generally consists of an execution listing of STARDYNE statements and various analysis reports of the solutions performed. These may include time histories of forces, stresses, and displacements in the structure. The user can specify that the output be printed at his terminal, at a different terminal, or retained at the central site for future disposition.

LOCAL PROCESSING

In addition to the operations described above, the MARC-II Terminal provides the capability for two local processing operations — card-to-print and display screen-to-print.

In the first operation, cards may be listed off-line on the remote printer. This operation may also be performed while data is being transmitted between the terminal and the central site.

In the second operation, data entered from the keyboard may be transferred from the display screen to the printer by merely pressing a special key on the keyboard. This capability provides hard copies of messages and displays.

CHAPTER THREE

HARDWARE DESCRIPTION

The MARC-II Terminal operating under EXPORT/IMPORT 200 offers the remote terminal user a variety of input and output features. The basic display equipment consists of a 217-12 Equipment Controller and Keyboard/Display Station. Other units include the 222-12 Line Printer (180 line/minute — effective speed) and the 224-12 Card Reader (140 cards/minute — effective speed)

The equipment is designed to communicate with the central site via modems conforming to RS-232B EIA

Standard. These devices provide phone-line type data links with the central site. All communications between the terminal and the central site are processed and routed by the Equipment Controller.

Appendix A summarizes the features of each of the units described above.

Figure 3-1 depicts the MARC-II/6600 Configuration.

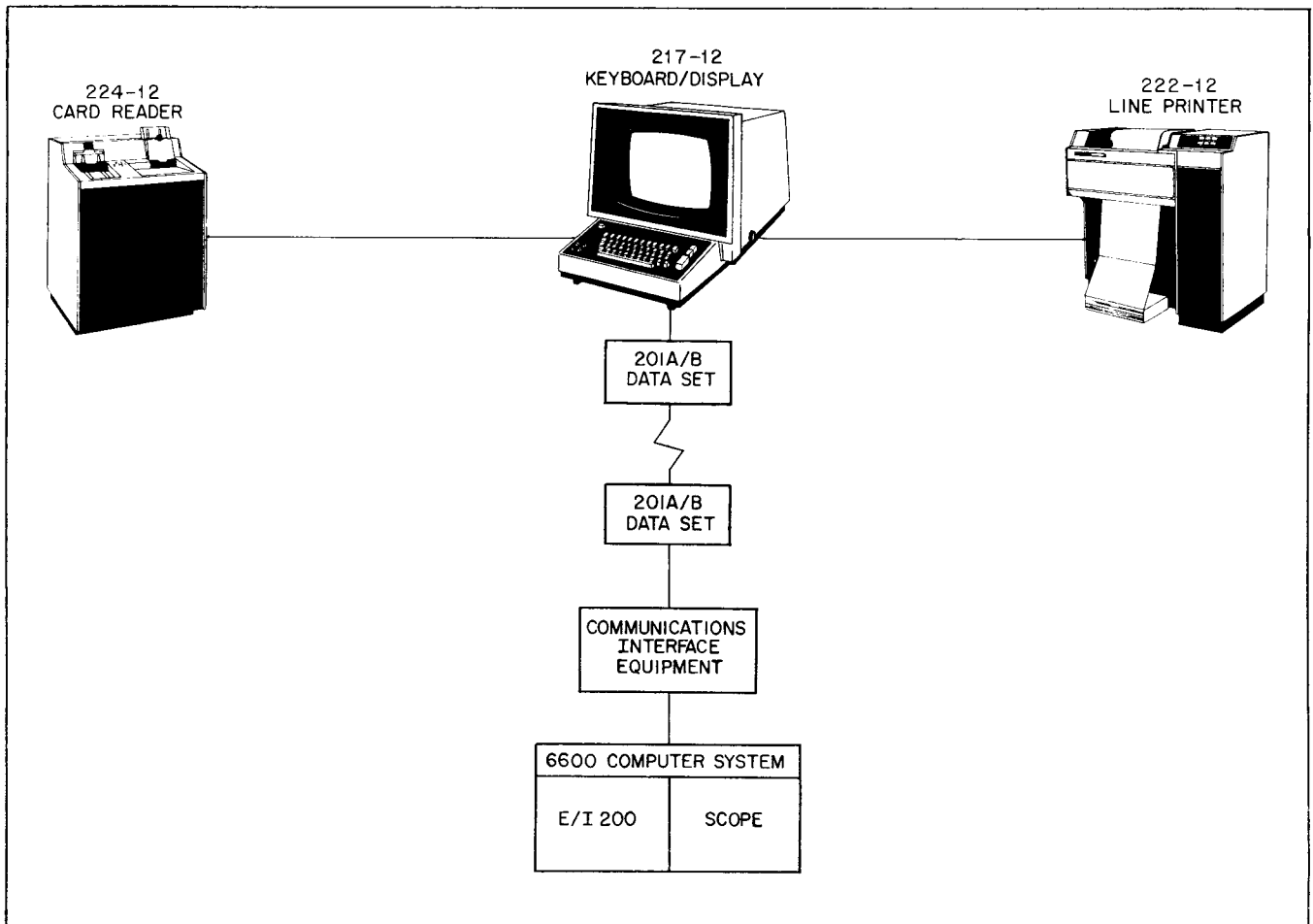


Figure 3-1. MARC-II/6600 Configuration



CHAPTER FOUR

HOW TO USE EXPORT/IMPORT 200: A TUTORIAL

INITIATION

Preparing the Equipment

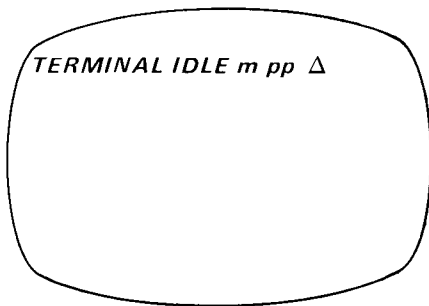
For instructions on proper switch settings and power application, refer to the hardware section, Chapter VI — Hardware Operation, in the latter part of this manual.

Establishing Data Communications with the Central Site

To connect the MARC-II Terminal to the central site:

- Remove the handset from its cradle and press the TALK button.
- Dial the appropriate central site telephone number.
- If a busy signal occurs, try again after a few minutes.
- If an operator answers, inform him of your intentions, press the DATA button and hang up.
- If the central site answers automatically, a steady tone followed by beeps will be heard. Press the DATA button and hang-up.

If the EXPORT/IMPORT 200 System is part of the operating central site software (running at a control point) the following message will appear on the display screen and the EXPORT/IMPORT 200 System may be called into use for your terminal.



This message indicates your terminal is on-line to the central site but not yet active.

m = multiplexor number

pp = port number on the multiplexor

If the EXPORT/IMPORT 200 System is not currently operational at the central site software, no message will appear on the terminal display screen. Thus, you will have to wait until the System is brought-up at the central site before you can establish connection.

Checking Connection Condition

From this point on, the Equipment Controller Operator Panel may be consulted to determine the condition of the terminal connection. The following three conditions may exist:

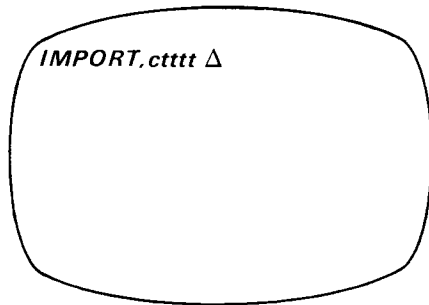
- A steady blinking of the MAN REL light indicates your terminal is normally connected to the central site, and is being regularly polled for activity.
- A solid lighting of the MAN REL button indicates your terminal is normally connected to the central site, but some factor (such as heavy disk usage at the central site) is preventing normal polling of the terminal.
- No lighting of the entire switch (ON LINE/MAN REL) indicates your terminal is disconnected from the central site.

Command Format

A command name may be entered in full, or it may be abbreviated to the first character. Other abbreviations are not accepted. A command is terminated by a Δ (SEND key character) or a period followed by Δ. When a command includes parameters, it must be followed by a single space or comma and the parameters separated by commas or single spaces. Only information sent to the central site via MESSAGE commands can contain embedded blanks.

Calling EXPORT/IMPORT 200 Into Operation

EXPORT/IMPORT 200 may now be called into operation for your terminal by depressing CLEAR, typing IMPORT, *ctttt* (the identification code assigned to your terminal) and depressing the SEND key. The above information will appear as follows on the display screen:

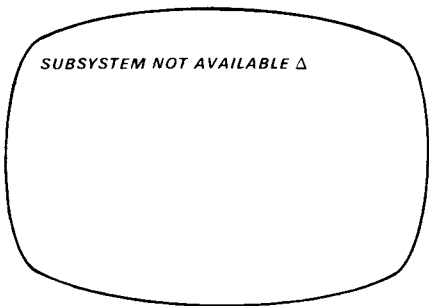


where:

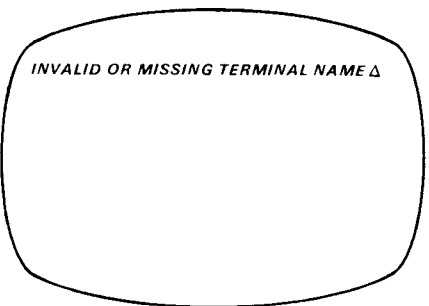
c = check digit

tttt = terminal identification code

[Pressing the SEND key causes a delta symbol (Δ) to appear on the display screen, and transmits the information preceding it in the display.] If you should misspell the word, IMPORT, the following message appears on the screen:

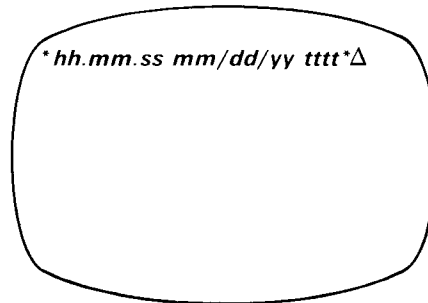


If there is an error in the terminal identification code, the following diagnostic is returned:



To correct either of the above situations, push the CLEAR key and retype IMPORT, *ctttt*Δ.

EXPORT/IMPORT 200 responds by clearing the display and writing out the time of day, date, and your four-character terminal identification, for example:



The time is shown in hours (*hh*), minutes (*mm*), and seconds (*ss*). The date is represented by months (*mm*), days (*dd*), and year (*yy*). *tttt* is your terminal identification code. This message will appear whenever the terminal is on-line to EXPORT/IMPORT 200, but idle.

From now on, you will be communicating with SCOPE, the central site operating system, via EXPORT/IMPORT 200. Jobs may be sent to SCOPE for processing, and commands may be given to EXPORT/IMPORT 200 concerning the handling of these jobs.

SUBMISSION OF JOBS

Loading the Card Reader

- Before loading, fan the cards from both ends to break any bond between them. Then, align the cards by joggling before inserting them into the input hopper.
- Load cards into the input hopper, face down with the 9 edge toward the rear. A maximum of 1200 cards can be loaded initially. Cards may be inserted in the hopper during machine operation, but the card weight should not be removed when the card supply is less than 100 cards.
- Place the AUTO/MAN switch in the AUTO mode by depressing if necessary. (If AUTO switch not already lit.)
- Depress the ERROR/FEED switch to ready the first card for reading.
- Depress the READY/CHECK switch to reset the logic and illuminate the READY indicator.

Initiating Card Reader Input

The card-reading operation is initiated by depressing either the LOAD button or the LIST button on the Equipment Controller Operator Panel.

- **LOAD Operation.** Pushing the LOAD button causes cards to be read and the data transferred into the card reader's memory buffer until it is filled (12 card images). The LIST operation is explained later in this chapter.

TRANSMISSION OF JOBS TO THE CENTRAL SITE

After jobs are stored in the card reader's memory buffer, they must be transmitted to SCOPE by the following procedure.

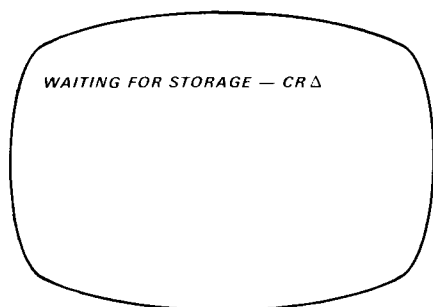
- Depress the CLEAR Key.
- Type READ or R (the first letter of a command may be used in place of the full command) on the display's keyboard.
- Depress the SEND Key.

Subsequent card reading of any jobs in the hopper is controlled by the central site.

All MARC-II Terminal operations under EXPORT/IMPORT 200 (job and command submission, and output return) are performed in "block mode". Block mode means the line indicator (█) is blocked and permanently set in the upper left-hand corner of the display screen. When the SEND key is pressed, the data to be transmitted always starts at the upper left-hand corner and ends at the Δ. Message transmission from the central site will generally clear the screen and begin in the upper left corner.

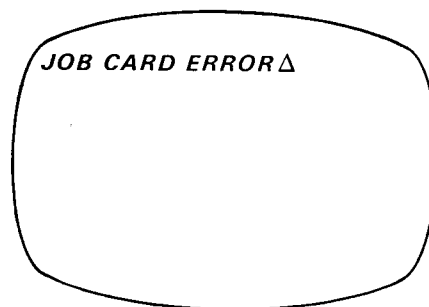
On the display screen, the entry marker indicates the position at which data will next appear. The marker is an underline which begins at this position and terminates at the point where the line will end when filled with data. As data is displayed and fills the line toward the right of the screen, the entry marker becomes correspondingly shorter. When the end of the line is reached, the entry marker moves to the beginning of the next line, running under the entire space reserved for this line.

After the READ Δ command is sent, the following message may be flashed upon the user's screen.



This is a message from the central site indicating that there is momentarily no space in the central site's memory to receive job input. However, this message should disappear quickly and the transmission process continue.

The SCOPE \$ control cards (i.e. control instructions that guide the SCOPE Operating System) at the beginning of each job are read and checked for validity. If they are not valid, the following message is displayed:



In this event, replace the erroneous job cards with correct ones, and reload the entire deck. With some MARC-II Terminals, the card reader buffer may still contain the card data previously read. Make certain this buffer is cleared by pressing the MAN REL button.

However, before the deck can be resubmitted, the current read operation has to be terminated. This can be done through the following procedure.

ENDING A READ OPERATION IN PROGRESS

When errors such as JOB CARD ERROR occur, the current card read operation has to be terminated. (The operation may also be terminated at other times, however.)

When data is being either read or printed, the keyboard is locked so that the data cannot be overwritten. Thus, to enter the END, CR instruction or any other instruction or command, you will have to interrupt.

Interrupt Procedure

- Press the INT key which stops the peripheral equipment (either reader or printer — in this case, the reader).
- When the display buffer is free, the line indicator(█) positions itself at the top of the screen and all activity stops.
- The keyboard unlocks.
- Press the CLEAR key.
- Enter the command.
- Depress the SEND key.

End Card Reader Operation Instruction

To end card reader operation, enter the following command:

END,CR Δ
(or)
E,CR Δ

To re-initiate reading, reload the cards and use the READ command just as if the job were being initiated for the first time.

With some MARC-II Terminals, some card data may be left in the reader buffer. Before proceeding, the MAN REL switch should be pressed to clear this buffer.

Resuming Transmission to the Central Site

If the first cards are valid job cards, reading continues until the hopper is empty. If the last card is an end-of-information card, reading is terminated and the job is placed into the SCOPE input queue. (The SCOPE input queue is the group of jobs waiting at the central site to be processed. The SCOPE output queue is the group of jobs already processed at the central site and waiting to be output.) If the last card read is not an end-of-information card, the central site expects more card data and sends this message to your display screen:

READER NOT READY Δ

■ To continue reading, place more cards in the hopper, push the READY button on the card reader, push the LOAD button, and type:

GO Δ
(or)
READ Δ

(The GO Δ or G Δ command may be used to resume any interrupted peripheral operation after sending a command or message.)

Several jobs may be stacked in the hopper to be read continuously with no operator intervention. The reading operation terminates only when the last card in the stack is an end-of-information card.

Possible Error Messages

If the card reader detects that illegal characters have been read, this message is displayed:

CARD READ ERROR Δ

This means there is an erroneous card among the last 24 cards which were read. The incorrect card should be corrected and the entire deck reloaded.

The same "interrupt E,CR, and READ" procedure as outlined for JOB CARD ERROR should be followed to re-submit the corrected deck.

The following message could also be received:

INPUT FILE ERROR Δ

This is a message from the central site indicating an uncorrectable parity error in the input file of the job being read. Card reading stops. In this case, the deck should be reloaded and the same procedure as above followed.

LIST Operation

To list card data on the terminal's printer without communicating with the central site, load and ready the reader as previously outlined, and press the LIST (instead of LOAD) key. Pushing the LIST button causes cards to be read in batches of 12 cards each and listed on the line printer. This operation should be performed when the terminal is incapable of receiving output. (If not, listed data and actual output are printed intermit-

tently.) The terminal can be rendered incapable of receiving output by calling the B or H display (see **JOB PROCESSING**) and leaving it on the display screen while the LIST operation is being performed. Keyboard messages may also be composed and transmitted during the LIST operation. The operation continues until the hopper is empty or not ready.

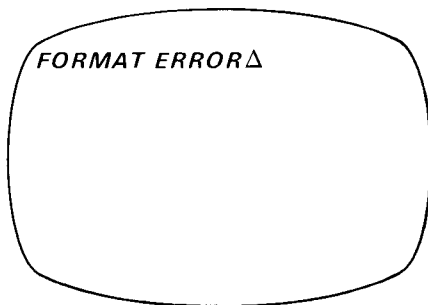
Card Unloading

All but the last 100 cards may be removed from the stacker while the unit is operating. As the cards enter the output stacker, they will be in the same order as they were when loaded. Card feeding stops automatically when the stacker is full.

The last card in the deck may be fed through by depressing the READY button, then the FEED button.

JOB PROCESSING

Jobs submitted from remote terminals are processed by SCOPE identically to those submitted at the central site except for the processing of output files. At any time during processing, commands or messages may be sent to the central site. This may be for the purpose of obtaining information about your job, or to give special instructions for its handling. If any command (including those entered during input and output phases) is invalid (e.g., entered in an improper format), the following message is displayed:



To correct the situation, the command may be re-entered properly, or another command may be selected.

If hard copies of any messages sent or received (or of the following displays) are desired, the AUX SEND key must be pressed while the information is still on the display screen. Pushing the AUX SEND key causes any information appearing on the display screen to be automatically printed by the line printer.

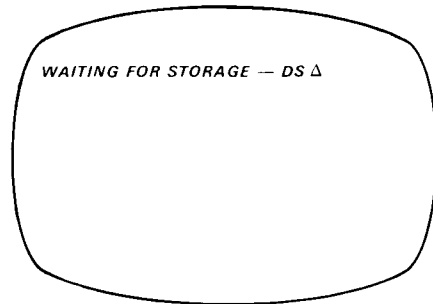
DISPLAYS

After you submit your job, you may want to follow its status at the central site. This information can be ob-

tained through two user-callable displays. They are: (1) the H display which gives a list of jobs currently in the SCOPE input, output and dependency queues, and (2) the B display which indicates what jobs are in execution.

If your card deck is small, the card read operation will probably have finished by the time you want to call the displays. If this is so, the usual "date, time, terminal identification" display appears on your screen. You will only have to type the letter of the appropriate display and depress the SEND key. If a read or write operation is still in progress, you will have to follow the interrupt procedure outlined in the **SUBMISSION OF JOBS** section.

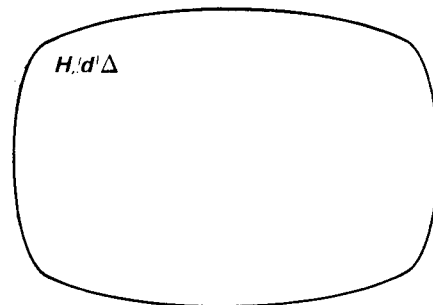
After a display request is sent, the following message may be flashed upon the screen:



This is a message from the central site indicating that there is temporarily no space in the central site's memory available to receive display messages. However, this message should disappear quickly and the requested display appear. If not, type GO Δ to abort the display request.

The H Display

To obtain a list of the names of jobs in the input, output and dependency queues enter the command:



d = I for input files
 O for output files
 D for dependent files
 (jobs awaiting execution in
 dependency queues)

Only those jobs submitted from your terminal will appear on your display screen. (See Figure 4-1, The H Display.) Once a job is submitted to E/I 200, the fourth and fifth characters of job name become identical to the identification code of the terminal from which it originated. The jobs are listed in order of priority.

To determine if the job list changed since the HΔ command was last issued, transmit the command again. To resume activity, type:

```
GO Δ  
(or)  
G Δ
```

The B Display

To display names of jobs currently in execution at the central site, type:

```
B Δ
```

Information displayed is similar to that shown in the central site 6600's B display. All control points except the one running EXPORT/IMPORT 200 are shown. Each control point contains the first line of information about the job running at it. This includes job name, priority, central processor and I/O time limits, accumulated central processor time, elapsed I/O time, and field length. The control points of jobs being processed from your terminal also contain the second line of information which includes control cards and the most current day-file message. (See Figure 4-2, The B Display.)

DROPPING A JOB

If you wish to drop your job from execution for some reason, enter the command:

```
DROP, job name Δ  
(or)  
D, job name Δ
```

The above command may also be used when a job is in the input queue.

Because only the last two characters of any job name are required to identify a SCOPE job, this command may be abbreviated to:

```
DROP, jj Δ  
(or)  
D, jj Δ
```

jj are the last two characters of the job name.

You may drop only those jobs submitted from your terminal. If the job is being executed when it is dropped, the output generated to this point is printed.

When a command (such as the DROP command) references a job or file name, the following message is sent back if the proper job or file cannot be found:

```
FILE NOT FOUND Δ
```

This means that the job or file name referenced does not exist. To correct this, re-enter the command with the proper job or file name.

		Total number of input files in the SCOPE system																			
		Number of input files for this terminal																			
		1	3	5	7	9	1	3	5	7	9	1	3	5	7	9	1	3	5	7	9
INPUT	QUEUE	106									16									-	
DDDBUT1	7776										CCCCBUS5	2040									-
XYYBUIB	7776										XXXBUIZ	2000									-
FEHBUIH	7775										ZZZBUA1	1700									-
AGCBU20	7774										AAABUB2	1600									-
AOBBU15	7773										BBBBUC7	1500									-
QEDBU22	7772																				-
RMSBU10	7771																				-
EEEBUS3	4321																				-
FFFBUE6	3210																				-
GEFBUR5	2123																				-
IEFBUH1	2100																				Δ

Figure 4-1a. The H Display, Input Queue (Sample Result of H,IΔ Command)

		Number of output files for this terminal																			
		1	3	5	7	9	1	3	5	7	9	1	3	5	7	9	1	3	5	7	9
OUTPUT	QUEUE										16									-	
DDDBUT1	7776										CCCCBUS5	2001									-
XYYBUIB	7776										XXXBUIZ	2000									-
FEHBUIH	7775										ZZZBUA1	1700									-
AGCBU20	7774										AAABUB2	1600									-
AOBBU15	7773										BBBBUC7	1500									-
QEDBU22†	7772																				-
RMSBU10	7771																				-
EEEBUS3	4321																				-
FFFBUE6	3210																				-
GEFBUR5	2123																				-
IEFBUH1	2100																				Δ

†Denotes the file currently printing

Figure 4-1b. The H Display, Output Queue (Sample Result of H,OΔ Command)



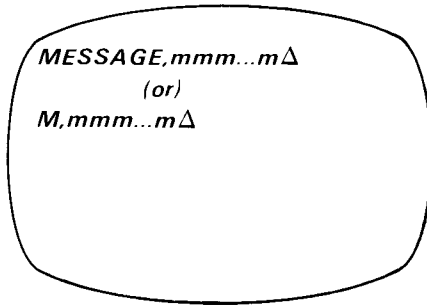
Control point	Job name	Priority	Central processor time limit	Accumulated central processor time	I/O time limit	Elapsed I/O time	Field length
1	3 5 7 9 1	3 5 7	9 1 3 5 7	9 1 3 5 7	9 1 3 5 7	9 1 3 5 7	9 1 3 5 7 9
	T . EXPORT	P 7 0 0 0	L . 7 7 7 7 0	T	I L	I 0 1 1 2 6 4	F . 1 1 4 0 0
3	HTAN02A	P 2 3 4 2	L . . . 2 0 0	T 1	I L . 7 7 7 7	I 0 . . 1 1 4	F . . . 1 0 0
4	HSZR01Q	P 3 3 0 3	L . . 2 5 0 0	T . . . 3 2 5	I L . 7 7 7 7	I 0 . . 4 1 3	F . . . 1 0 0
5	HL61013	P 3 2 5 7	L . . 1 5 0 0	T	I L . 7 7 7 7	I 0 . . . 1 7	F . . . 1 0 0
6	HLDM020	P 4 1 5 7	L 1 0	T	I L 5 0	I 0	F . 1 2 0 0 0
	X P A U S E . P U N C H E D O U T P U T W I T H T H I S J O B .						
7	HWK02N	P 3 3 1 5	L . . . 2 0 0	T 3 7	I L . 7 7 7 7	I 0 . . 1 1 6	F 1 4 5 0 0 0

Control cards and most current dayfile message

Figure 4-2. The B Display 50 x 20 Screen

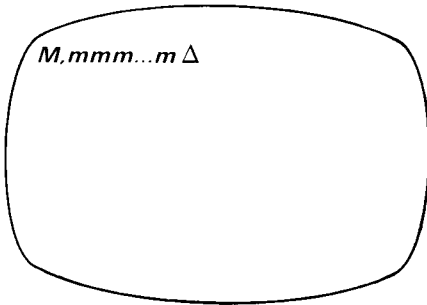
SENDING MESSAGES TO THE CENTRAL SITE

At any time during job processing messages may be sent to the central site operator. A message must be written in the following form:



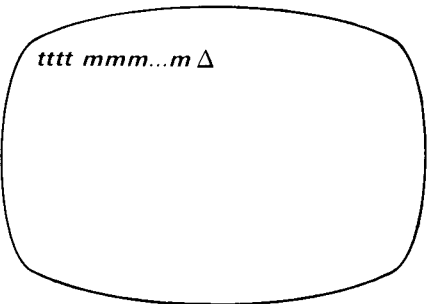
MESSAGE,mmm...mΔ
(or)
M,mmm...mΔ

If MESSAGE is spelled out, *mmm...m* is any message no longer than 22 characters including spaces; if the abbreviation M is used, *mmm...m* may be expanded to 28 characters. If a longer message is sent it will be truncated to the 22- or 28-character maximum for display. Terminal operation is suspended until the message appears at the central site. While it awaits access to the central display, the message is read and redisplayed at the remote terminal in the following short form, regardless of the form used in the command:



M,mmm...m Δ

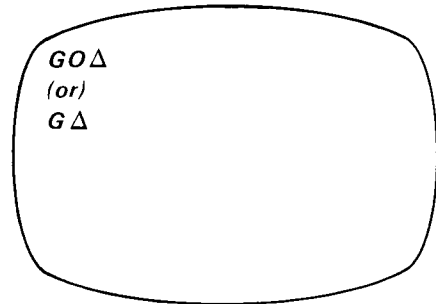
On the central site's B display the message is displayed in the message area of the control point running the EXPORT/IMPORT 200 System. It is displayed in the following form:



tttt mmm...m Δ

tttt is the code identifying the terminal which sent the message.

If a delay is caused by the presence of several messages awaiting display at the central site, the display request can be withdrawn by typing:

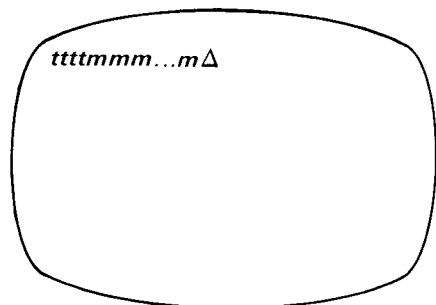


GOΔ
(or)
G Δ

The terminal resumes normal operations.

RECEIVING MESSAGES FROM THE CENTRAL SITE

The central site operator may, in turn, answer your messages or send his own messages to your terminal. A message from the central site is displayed as such on the terminal's display screen. Messages themselves may be as long as 28 characters.



ttttmmm...mΔ

tttt identifies the terminal receiving the message.

CENTRAL SITE OPERATOR DROP OF EXPORT/IMPORT 200 SYSTEM

Normally, if no terminals are active, the central site operator will drop the EXPORT/IMPORT 200 System from its control point. This leaves the 6600 control point available for the processing of jobs.

If this happens, the following message appears on the display screen and all terminals are disconnected from the central site.

OPERATOR DROP Δ

If, for some reason, this command is issued while terminals are being serviced, the files of jobs being read and transmitted to the central site are rewound and unloaded. Such jobs must be resubmitted when communication is resumed. Files of jobs being printed are rewound and saved in the SCOPE output queue for transmission at a later date.

RETURN OF OUTPUT

Each job submitted to SCOPE for processing is assigned a disposition code field by the System. This field indicates what is to be done with the job after processing. If SCOPE detects a set remote bit (the remote bit is set to one) in a job's disposition code field, it does not process the job's output files after processing of the job itself. Instead, these print files are picked up by E/I 200 which automatically sends them to the correct terminal (usually the one they came from, unless otherwise specified) for output.

All other types of files are cleared from the remote disposition facility by EXPORT/IMPORT so that they will be picked up by the central site software. As an example, punched output is punched automatically at the central site.

When no jobs are ready for printing and no other peripheral activity is taking place, the time, date, and terminal identification are again displayed on your terminal's screen.

PRINTING JOBS AT THE CENTRAL SITE AND AT OTHER TERMINALS

Central Site Printing

A job entered at your terminal can be printed at the central site with the command:

OUTPUT,job name Δ
(or)
O,job name Δ

This request may be abbreviated to:

OUTPUT,jj Δ
(or)
O,jj Δ

jj are the last two characters of the job name.

The last two characters in the name of every job in the system are unique and are thus sufficient to identify the job.

Printing at Another Terminal

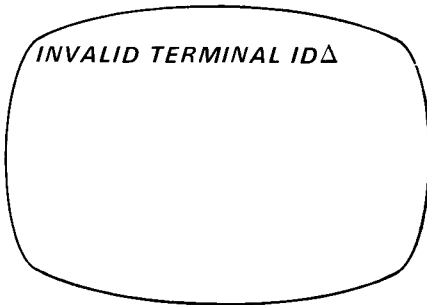
A job entered at your terminal can be printed at another terminal location with the command:

OUTPUT,job name,tttt Δ
(or)
O,job name,tttt Δ

tttt is the identification code of the other terminal. The job may be identified by the last two characters in its name alone:

OUTPUT,jj,tttt Δ
(or)
O,jj,tttt Δ

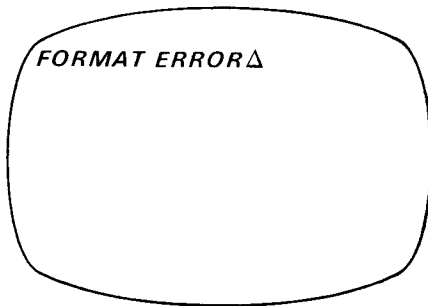
If the *tttt* parameter is omitted, the job is printed at the central site. If an illegal or incorrect terminal identification is entered, the following message is received from the central site:



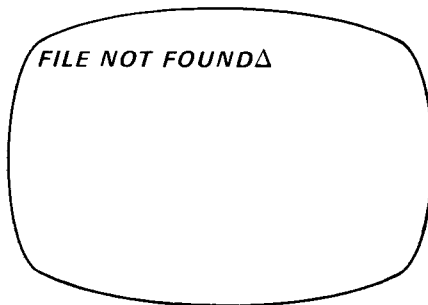
In this case, the output command should be entered again with the proper terminal identification.

Transfer of Printing Tasks — General

You may only transfer printing for jobs submitted at your terminal. Additionally, only jobs already in the SCOPE input or output queue can be transferred. Any printing in progress at the receiving terminal ceases and the print file is transmitted to the terminal designated by the OUTPUT command or to the central site. If an invalid request is sent, the following message appears:



If the specified job name is not associated with this terminal, or does not exist, or if the job is at a control point, the following message is displayed:



Preparing the Printer for Operation

When job output is ready, it is printed automatically. The only necessary activity is the preparation of the printer for operation.

To ready the printer, the POWER ON and START buttons must be depressed. For instructions on forms loading, print head and character phasing control, and ribbon change refer to Chapter VI — Hardware Operation, in the latter part of this manual. If you wish to use the PAGE EJECT button (to advance the paper roll to the top of the next form), the STOP button must first be pressed. Paper advancement during actual printing is controlled by a carriage control tape in conjunction with any special print instructions in your program.

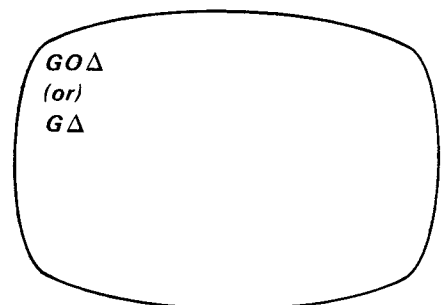
Automatic Printing Process

When an output file is available for a terminal, the central site transmits a blank line with a space suppress to the printer to determine if it is ready. If the printer is not ready, a message is displayed.



This message is also displayed if the printer leaves the ready state while printing a job — perhaps because it runs out of paper.

To correct this situation, ready the printer as explained before and type:

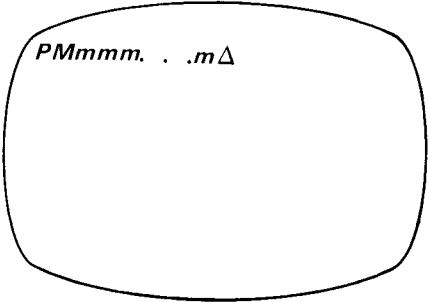


When the printer is ready, a central memory buffer is sought for the data to be printed. If no buffer is available, a message appears:



When a buffer is obtained, printing begins.

If you wish to change printing forms during the output phase of your job (i.e., from regular size paper to labels), you must include an output message in your program for this purpose. The message may be of any length, but must start with the letters PM. The rest of the message usually contains any instructions for form change you may wish. EXPORT/IMPORT 200 acknowledges this message by halting the print action and displaying the message on the display screen as follows:

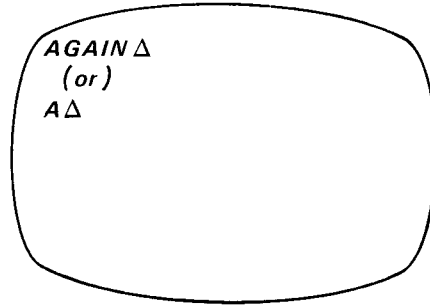


To continue processing, the paper should be refilled, the START button pressed and GOΔ or GΔ typed.

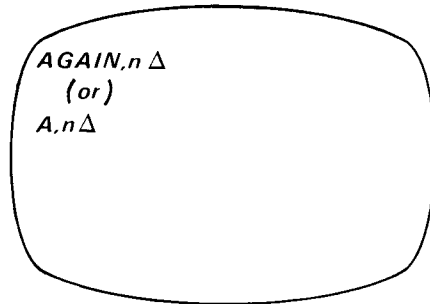
Rewinding and Reprinting Output Files

Printing of a job currently in process may be halted and resumed immediately from the beginning or some other specific point by using the AGAIN command. This command is useful if the paper jams or the printer ribbon wears out while a job is being printed. Since the AGAIN request is meaningful only while printing is in progress, the INT key on the console keyboard must be pressed to unlock the keyboard, and the CLEAR key must also be pressed before the command is issued.

To start printing again from the beginning of the job, enter the command:

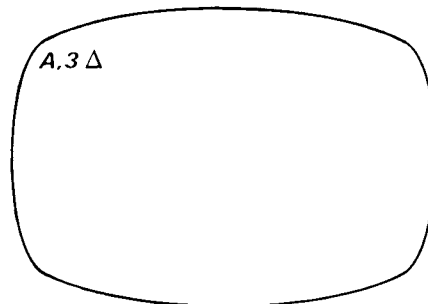


To start printing again from a point other than the beginning, enter:



n is the parameter in octal which tells the system to backspace the print file $10_8 \times n_8$ sectors and resume printing from this point. This octal parameter must not exceed 777_8 . If the beginning of the file is reached before $10_8 \times n_8$ sectors, printing is resumed from the beginning.

Example: The following command would be used to backspace the print output a few pages.



Parity Error

If a parity error occurs on the storage device at the central site which contains the output file, a message appears:

OUTPUT FILE ERROR

To continue, type:

GOΔ

The system attempts to print the output file again. If the file cannot be printed, the error message appears every time GOΔ is typed and it is necessary to reposition the file with one of the following commands:

END,LPΔ
AGAIN Δ
OUTPUT,job name Δ

Priority Command

The priority of a job currently being printed cannot be changed by this command, as it is a local file at the E/I 200 control point and is not in the SCOPE output queue. The priority of other output files can be changed with the following command:

PRIORITY,job name,pΔ
(or)
P,job name,p Δ

p is a one-to-four digit octal number not equal to zero. After the command is entered, the new priority for the output file can be seen in the H,OΔ display.

This request may be abbreviated to:

PRIORITY,jj,pΔ
(or)
P,jj,pΔ

jj are the last two characters of the job name.

To stop a currently printing job so the output file whose priority was just changed may be printed, enter the command:

OUTPUT,job name,tttt Δ

job name is the file currently printing; *tttt* is the identification code of this terminal. The currently printing job is rewound and returned to the output queue for this terminal.

Terminating Printing in Process

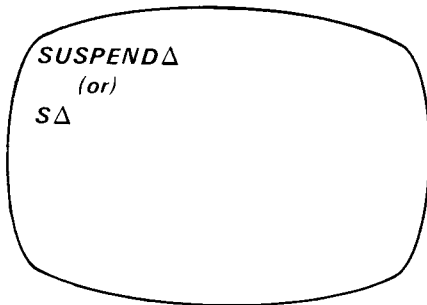
To completely terminate a job in the process of printing, press the INT and CLEAR keys, and type:

END,LPΔ
(or)
E,LPΔ

The line printer skips printing the rest of the job, prints one dayfile of it (instead of the usual three) and goes to the next print job, or it stops if none exists. The `END,LPΔ` command produces a dayfile of the job being printed.

Suspending Printing in Process

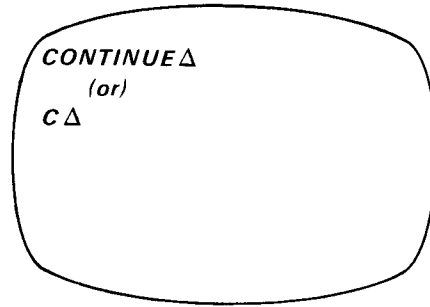
To merely suspend a printing operation currently in process, press the INT and CLEAR keys and enter:



```
SUSPENDΔ  
(or)  
SΔ
```

Printing halts immediately, but the print buffer remains as assigned. If printing is not in progress when a `SUSPENDΔ` command is sent, no new jobs are printed and no print buffers are assigned even though output becomes available.

To negate the `SUSPENDΔ` command and continue normal operation type:



```
CONTINUEΔ  
(or)  
CΔ
```

If the `SUSPEND` command has not been issued, the `CONTINUEΔ` command does not affect operation in any way.

The `SUSPEND` and `CONTINUE` instructions are helpful when it is necessary to halt print action just long enough to read a job which must get into the input queue immediately.

LOGOUT PROCEDURE

After all jobs are submitted, and all output received, you should disconnect your terminal from the central site. This leaves the line open for use by another terminal.

To break the communication, wait until all print or output activity is finished. The usual date, time, terminal identification line appears on the display screen. Then:

- Type `LOGOUT` on the keyboard/display.
- Wait for the central site to answer back with `TERMINAL IDLE`.
- Lift receiver.
- Push `TALK` button.
- Hang-up receiver.

CHAPTER FIVE

REFERENCE INFORMATION

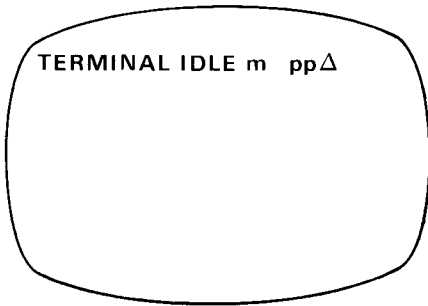
PROCEDURES

This section contains short descriptions of various procedures which the user encounters during the operation of his MARC-II Terminal under EXPORT/IMPORT 200.

Establishing Communication With The Central Site

To connect the MARC-II Terminal to the central site receiver:

- Remove the handset from its cradle and press the TALK button.
- Dial the appropriate central site telephone number.
- If a busy signal occurs, try again after a few minutes.
- If an operator answers, inform him of your intentions, press the DATA button and hang up.
- If the central site answers automatically, a steady tone followed by beeps will be heard. Press the DATA button and hang-up.
- The following message appears on the calling terminal's display screen:



- The EXPORT/IMPORT 200 System may be called into use for your terminal.

Calling EXPORT/IMPORT 200 Into Operation

EXPORT/IMPORT 200 is called into operation by the following procedure:

- Depressing the CLEAR key.
- Type IMPORT, *ctttt*.
- Depress the SEND key.
- EXPORT/IMPORT 200 responds by clearing the display screen and writing out the time, date, and a four-character terminal identification.

Card Read And Transmission Initiation

Jobs are read and transmitted in the following manner.

Card Read Operation

- Load cards into the input hopper, face down with the 9 edge toward the rear. A maximum of 1200 cards can be loaded initially. Cards may be inserted in the hopper during machine operation, but the card weight should not be removed when the card supply is less than 100 cards.
- Place the AUTO/MAN button in the AUTO mode by depressing if necessary.
- Depress the ERROR/FEED button to ready the first card for reading.
- Depress the READY/CHECK button to reset the logic and illuminate the READY indicator.
- Depress the LOAD button on the Equipment Controller Operator Panel.

Transmission Operation

- Depress the CLEAR key.
- Type READ or R.
- Depress the SEND key.
- Subsequent reading of cards in the hopper is controlled by the central site.

Interrupt Procedure

When peripheral operations are in progress (card reading, printing), the keyboard is locked. Thus, to enter an

instruction or command, you must interrupt in the following manner:

- Press the INT key. This stops the peripheral equipment.
- When the display buffer is free, the line indicator positions itself at the top of the screen and all activity stops.
- The keyboard unlocks.
- Press the CLEAR key.
- Enter the command or message.
- Depress the SEND key.

Resuming Peripheral Operations After Interrupting

To resume peripheral operations after the above interrupt procedure, follow these two steps.

- Type GO or G.
- Depress the SEND key.

Printer-Ready Initiation

When job output is ready, it is transmitted back to the terminal and printed automatically. The only necessary activity is to ready the terminal printer for operation.

To ready the printer:

- Depress the POWER ON button.
- Depress the START button.
- When output is ready, it is transmitted and printed automatically.
- Paper advancement during actual printing is controlled by the printer's carriage control tape in conjunction with any special print instructions in your program.

Logging-Out Or Entering Idle Mode

To break communication between a terminal and the central site, you must wait until all print or output activity is finished. The usual date, time, terminal identification line appears on the display screen. Then:

- Type LOGOUT on the keyboard/display.
- Wait for the central site to answer back with TERMINAL IDLE.
- Lift receiver.
- Push TALK button.
- Hang-up receiver.

Listing Cards

To merely list cards without communicating with the central site, perform the following:

- If the terminal is on-line to the central site, interrupt and call one of the displays so that the terminal is incapable of receiving output.
- If the terminal is not on-line, omit the above step.
- Load cards into the input hopper, face down with the 9 edge toward the rear. A maximum of 1200 cards can be loaded initially. Cards may be inserted in the hopper during machine operation, but the card weight should not be removed when the card supply is less than 100 cards.
- Place the AUTO/MAN button in the AUTO mode by depressing if necessary.
- Depress the ERROR/FEED button to ready the first card for reading.
- Depress the READY/CHECK button to reset the logic and illuminate the READY indicator.
- Depress the LIST button on the Equipment Controller Operation Panel.

COMMANDS

This section contains a complete list of commands available to you for controlling job throughput. Both long and short forms are included. The commands are classified by operation (input, output, etc.) and are followed by a terse description of their function. For a more complete description of each command's function and its place in the overall scheme of operation, refer to the preceding tutorial section (Chapter IV).

Also included in this section is a list of sample problems illustrating the use of each command.

NOTE: Commands, except MESSAGE, may not contain embedded blanks.

Commands

Initiation

<u>Command</u>	<u>Function</u>
IMPORT,ctttt	Connects terminal <i>tttt</i> with E/I 200, which replies with time, date, and terminal identification. <i>c</i> = check digit <i>tttt</i> = four-character identification for the terminal

Input

<u>Command</u>	<u>Function</u>
<i>END,CR</i> Δ or <i>E,CR</i> Δ	Terminates card reader operation.
<i>READ</i> Δ or <i>R</i> Δ	Begins card read operation and subsequent transmission of information to the central site.

Job Processing

<u>Command</u>	<u>Function</u>
<i>B</i> Δ	Displays all control points except those running EXPORT/IMPORT 200.
<i>DROP, job name</i> Δ or <i>D, job name</i> Δ or <i>DROP, jj</i> Δ or <i>D, jj</i> Δ	Drops job from SCOPE input queue or from execution. <i>jj</i> = last two characters of job name
<i>GO</i> Δ or <i>G</i> Δ	Resumes peripheral activities after terminal stops to send or receive message or request.
<i>H, d</i> Δ	Displays jobs in SCOPE input, output or dependency queues. Only those jobs submitted from the requesting terminal are displayed. <i>d</i> = I for input files O for output files D for dependent files
<i>MESSAGE, mmm . . . m</i> Δ or <i>M, mmm . . . m</i> Δ	Sends 22 (long form) or 28 (short form) character message to the central site operator.

Output

<u>Command</u>	<u>Function</u>
<i>AGAIN</i> Δ or <i>A</i> Δ or <i>AGAIN, n</i> Δ or <i>A, n</i> Δ	Rewinds output file currently being printed to beginning or to designated points and reprints it. <i>n</i> = backspace file 10 ₈ x n ₈ sectors.
<i>CONTINUE</i> Δ or <i>C</i> Δ	Resumes printing after SUSPEND command.
<i>END, LP</i> Δ or <i>E, LP</i> Δ	Ends line printer operation and produces one copy of dayfile of job currently being printed.
<i>OUTPUT, job name</i> Δ or <i>O, job name</i> Δ or <i>OUTPUT, jj</i> Δ or <i>O, jj</i> Δ	Prints job output at central site. <i>jj</i> = last two characters of job name
<i>OUTPUT, job name, tttt</i> Δ or <i>O, job name, tttt</i> Δ or <i>OUTPUT, jj, tttt</i> Δ or <i>O, jj, tttt</i> Δ	Prints job output at terminal <i>tttt</i> . <i>jj</i> = last two characters of job name.
<i>PRIORITY, job name, p</i> Δ or <i>P, job name, p</i> Δ or <i>PRIORITY, jj, p</i> Δ or <i>P, jj, p</i> Δ	Changes priority of named file in SCOPE output queue. <i>p</i> = 1- to 4-digit octal number; not zero. <i>jj</i> = last two characters of job name.

Log-out

<u>Command</u>	<u>Function</u>
<i>LOGOUT</i> Δ	Places terminal in the idle mode. EXPORT/IMPORT will answer with TERMINAL IDLE message.

Sample Problems

<u>Command</u>	<u>Example</u>
<i>AGAIN</i> Δ	<p>Problem: Halt printing of a job currently in progress and resume printing from beginning.</p> <p>Example: <i>AGAIN</i> Δ</p> <p>Problem: Halt printing of a job currently in progress, backspace the print file 30g sectors, and resume printing from this point.</p> <p>Example: <i>AGAIN</i>, 3 Δ</p> <p>(The parameter n in this command backspaces the print file by 10g x ng sectors.)</p>
<i>B</i> Δ	<p>Problem: Display a list of the names of jobs in execution at the central site.</p> <p>Example: <i>B</i> Δ</p> <p>(List of job names will appear.)</p>
<i>CONTINUE</i> Δ	<p>Problem: Continue the printing of a job previously interrupted by the <i>SUSPEND</i> command.</p> <p>Example: <i>CONTINUE</i> Δ</p>
<i>DROP</i> Δ	<p>Problem: Drop job <i>JOBDD02</i> from execution.</p> <p>Example: <i>DROP</i>, <i>JOBDD02</i> Δ</p>

<u>Command</u>	<u>Example</u>
<i>END</i> Δ	<p>Problem: Terminate job being read by card reader.</p> <p>Example: <i>END</i>, <i>CR</i> Δ</p> <p>Problem: Terminate job being printed by line printer.</p> <p>Example: <i>END</i>, <i>LP</i> Δ</p>
<i>GO</i> Δ	<p>Problem: Resume printing of job in progress after printing has halted to display a list of jobs requested by the <i>H</i> command.</p> <p>Example: <i>GO</i> Δ</p>
<i>H</i> Δ	<p>Problem: Display a list of names of jobs in the input queue.</p> <p>Example: <i>H</i>, <i>I</i> Δ</p> <p>(List of job names will appear)</p>
<i>IMPORT</i> Δ	<p>Problem: Enter terminal <i>ABCTD</i> into the EXPORT/IMPORT 200 mode.</p> <p>Example: <i>IMPORT</i>, <i>ABCTD</i> Δ</p> <p>A message of the following format appears:</p> <p>* 13.22.16 08/22/68 tttt *</p>
<i>LOGOUT</i> Δ	<p>Problem: Remove terminal from EXPORT/IMPORT 200 mode and place it in IDLE mode.</p> <p>Example: <i>LOGOUT</i> Δ</p> <p>The following message appears: TERMINAL IDLE <i>m pp</i> Δ</p>
<i>MESSAGE</i> Δ	<p>Problem: Transmit the message <i>READY TO PROCEED</i> to central site.</p> <p>Example: <i>MESSAGE</i>, <i>READY TO PROCEED</i> Δ</p>
<i>OUTPUT</i> Δ	<p>Problem: Transfer printing of job <i>JOBBB06</i>, submitted at this terminal, to terminal <i>YZ</i>.</p> <p>Example: <i>OUTPUT</i>, <i>JOBBB06</i>, <i>WXYZ</i> Δ</p>

Problem: Transfer printing of job JOBBBB06 to central site;

Example: OUTPUT, JOBBBB06Δ

Example:

Press LOAD button
Press INT and CLEAR keys
Type: READΔ



PRIORITY Δ Problem: Change priority of job JOBA11 so it will be printed before a job whose priority is 6543.
Example: PRIORITY, JOBA11, 6777

SUSPEND Δ Problem: Halt printing but keep print buffer as assigned, or inhibit printing.

Example: SUSPENDΔ

READ Δ Problem: Read stack of cards in the card reader hopper.

Example: Press LOAD buttonΔ

Type: READΔ

Problem: Initiate reading of cards in card reader hopper when printing is in progress.

DIAGNOSTICS

Below is a complete list of diagnostics issued by EXPORT/IMPORT 200. The list is classified by operation (input, output, etc.). These diagnostics are displayed to you on your terminal's display screen. After correcting the situation, you must either type GOΔ or follow the outlined procedure to inform the central site that the diagnostic was received and that the operation can continue.

Initiation

Message	Meaning	Action
INVALID OR MISSING TERMINAL NAME Δ	Incorrect terminal identification was entered when calling system.	Push CLEAR key, retype IMPORT, <i>ctttt</i> Δ.
SUBSYSTEM NOT AVAILABLE Δ	Misspelled IMPORT when calling the E/I 200 system.	Push CLEAR key, retype IMPORT, <i>ctttt</i> Δ.
CARD READ ERROR Δ	Illegal characters are detected. Erroneous card is among last 24 cards read.	Correct error, interrupt, E, CR Δ, reload complete deck, and type GOΔ or READΔ.
INPUT FILE ERROR Δ	Parity error occurred at central site while system was attempting to store card data from remote terminal.	Interrupt, E, CR Δ, reload card deck, and type READΔ.
JOB CARD ERROR Δ	Job cards at beginning of deck (i.e., cards beginning with a \$ sign) are incorrect or out of sequence. Reading operation halts.	Correct deck arrangement or cards. Interrupt, E, CR Δ, reload and deck, and type READΔ or R Δ. (Normally, a new job is loaded and read while correction is made.)
READER NOT READY Δ	Card reader is out of cards. More cards are expected until end-of-information card is received or job is terminated with END card.	Reload hopper and push MAN REL and LOAD buttons.

Message	Meaning	Action
WAITING FOR STORAGE — CR Δ	No central memory buffer is available for input card data. Any printing in progress halts.	Await availability of buffer; card reading starts when a buffer is assigned.

Job Processing

FILE NOT FOUND Δ	Job name referenced does not exist. (This message may also apply to an output command.)	Re-enter command with proper job name or type GO Δ
FORMAT ERROR Δ	EXPORT/IMPORT cannot recognize command just received.	Re-enter command in required format or type GO Δ.
WAITING FOR STORAGE — DS Δ	No central memory buffer is available for H or B display.	Await availability of buffer; requested display appears when buffer is assigned. Type GO Δ to proceed without waiting for display.
tttmmm . . . m Δ	Message from central site to remote terminal. <i>ttt</i> identifies the terminal.	Type GO Δ or G Δ to continue terminal operations.
OUTPUT FILE ERROR Δ	Parity error occurred on storage device at central site which contains output file.	To continue, type: GO Δ. System attempts to print output file again; if it fails, error message is repeated. Reposition file with one of following commands: END, LOG-OUT, AGAIN, OUTPUT.
INVALID TERMINAL ID Δ	Incorrect terminal identification code was entered when diverting output to another terminal.	Press CLEAR key, re-enter command with proper terminal identification code.
PMmmm . . . m Δ	First (printer carriage-control) character of output line is P, and second is M. Line is displayed rather than printed. This message supplies you with instructions for paper form change.	Change form as specified in instruction. Type GO Δ or G Δ to continue printing.



Message	Meaning	Action
PRINTER NOT READY Δ	EXPORT/IMPORT tried to print a job, but printer was not ready. If printer enters not ready state during printing, this message may or may not be displayed, depending on hardware restrictions.	Ready printer, type GOΔ, and printing resumes automatically.
WAITING FOR STORAGE — LP Δ	No central memory buffer is available for output data.	Await availability of buffer. Printing starts when a buffer is assigned.



CHAPTER SIX

HARDWARE OPERATION

Chapters VI and VII contain information and instructions on the basic operation of the MARC-II Terminal hardware.

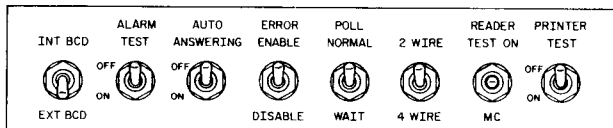
PREPARING THE EQUIPMENT

Electrical Connections

Check to ensure that all equipment is correctly plugged into the outlets.

Equipment Controller Switches

Check to ensure that the Logic Assembly Switches (located behind the lefthand panel of the Equipment Controller) are in the proper position (Figure 6-1). Normally, only the INT BCD/EXT BCD switch must be changed for data communications.* Normal switch settings are depicted below:



Turning On Power

Apply power to the equipment by depressing the POWER ON switches on each of the devices. Normally, the indicator will light when the switch is depressed. If the indicator does not light, refer to the diagnostic procedures outlined in Chapter VII. The location of these switches is shown in Figure 6-2.

The Keyboard/Display power is controlled by the ON/OFF/INTENSITY rotary control on the right-hand side of the display station. Allow for a 30-second warm-up period, then rotate the control until the marker chain is clearly visible. Operating at higher than necessary intensity may shorten the operating life of the display tube.

* EXPORT/IMPORT 200 requires EXT BCD. The function of each of these switches is described in Appendix A.

Once power is applied to the terminal hardware, various procedures for EXPORT/IMPORT 200 initiation, and submission of jobs (as outlined in the tutorial and procedures sections) may be executed.

DATA TRANSMISSION

After the operator presses the SEND key, the marker chain is repositioned at the top line. As the central site reads the message, the entry marker continually advances until the (■) symbol is read.

When the central site transmits a message, the first symbol is displayed at the current entry marker position and the entry marker continues to advance until the end of the message is encountered. The position of the entry marker is determined by the central site message. It may be reset in the upper left-hand corner or at the first position after the (Δ) symbol, depending on the type of message received.

MESSAGE EDITING

Messages being composed may be edited by repositioning the entry marker. (The Display Console Keyboard is illustrated in Figure 6-3.) The following table describes the keys and functions available for message editing:

KEYBOARD OPERATION

Special Keyboard Functions

Table 6-2 lists special function keys and describes the resulting operations.

Keyboard Lockout

The keyboard is locked-out and cannot be operated during the following circumstances:

- The SEND key has been depressed and the appropriate acknowledgement from the central site has not yet been received.
- Data is being transmitted to or from the display memory.

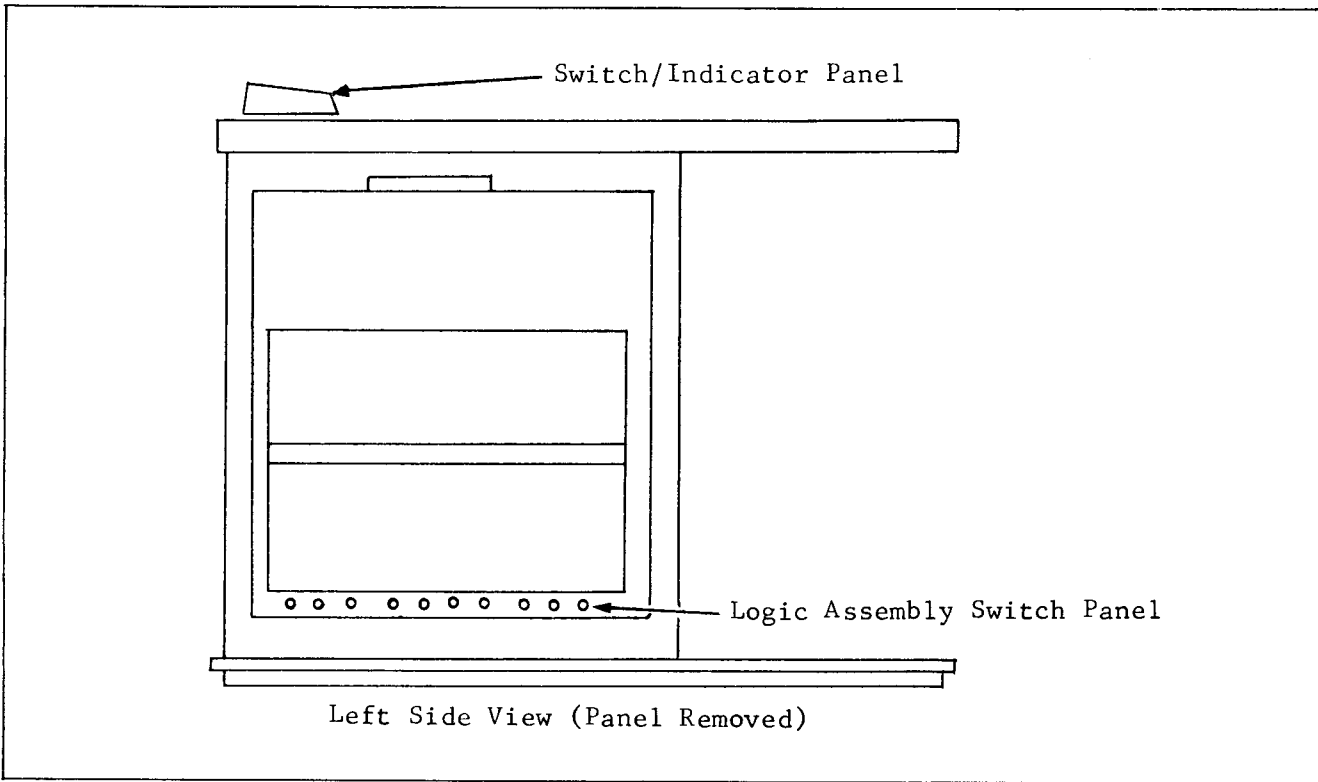


Figure 6-1. Logic Assembly Switches

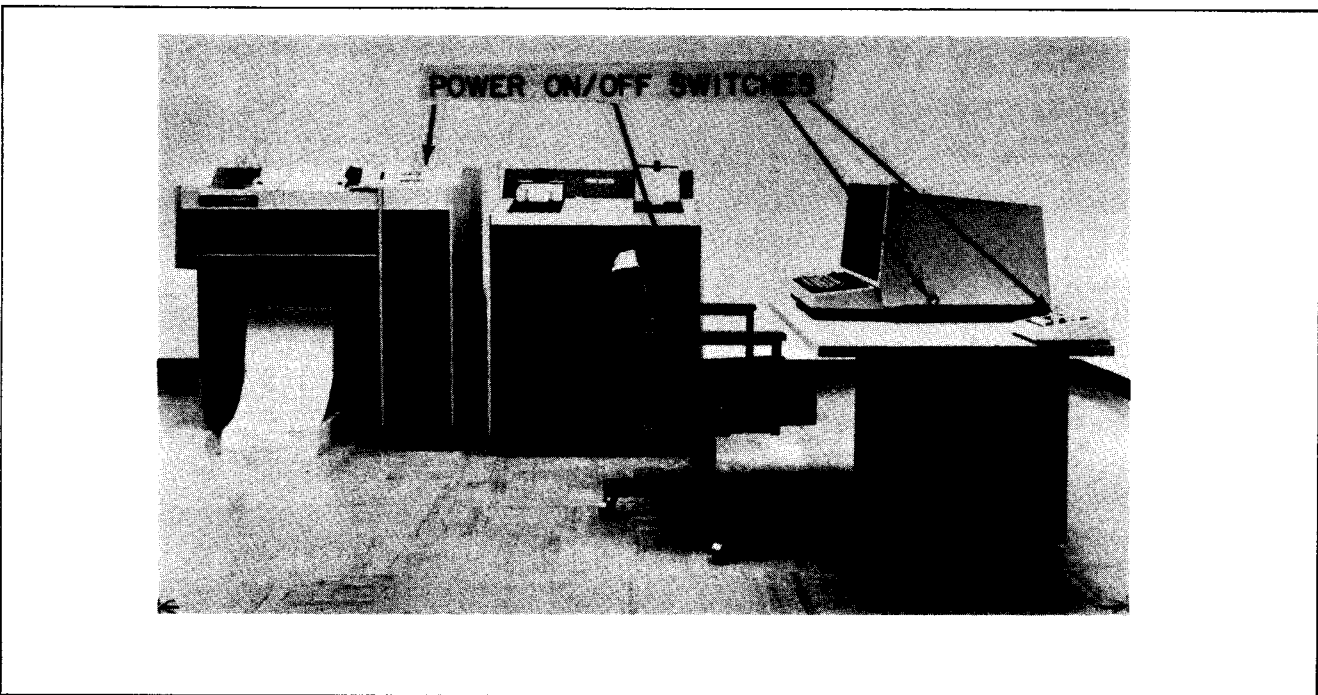


Figure 6-2. Power Switch Locations

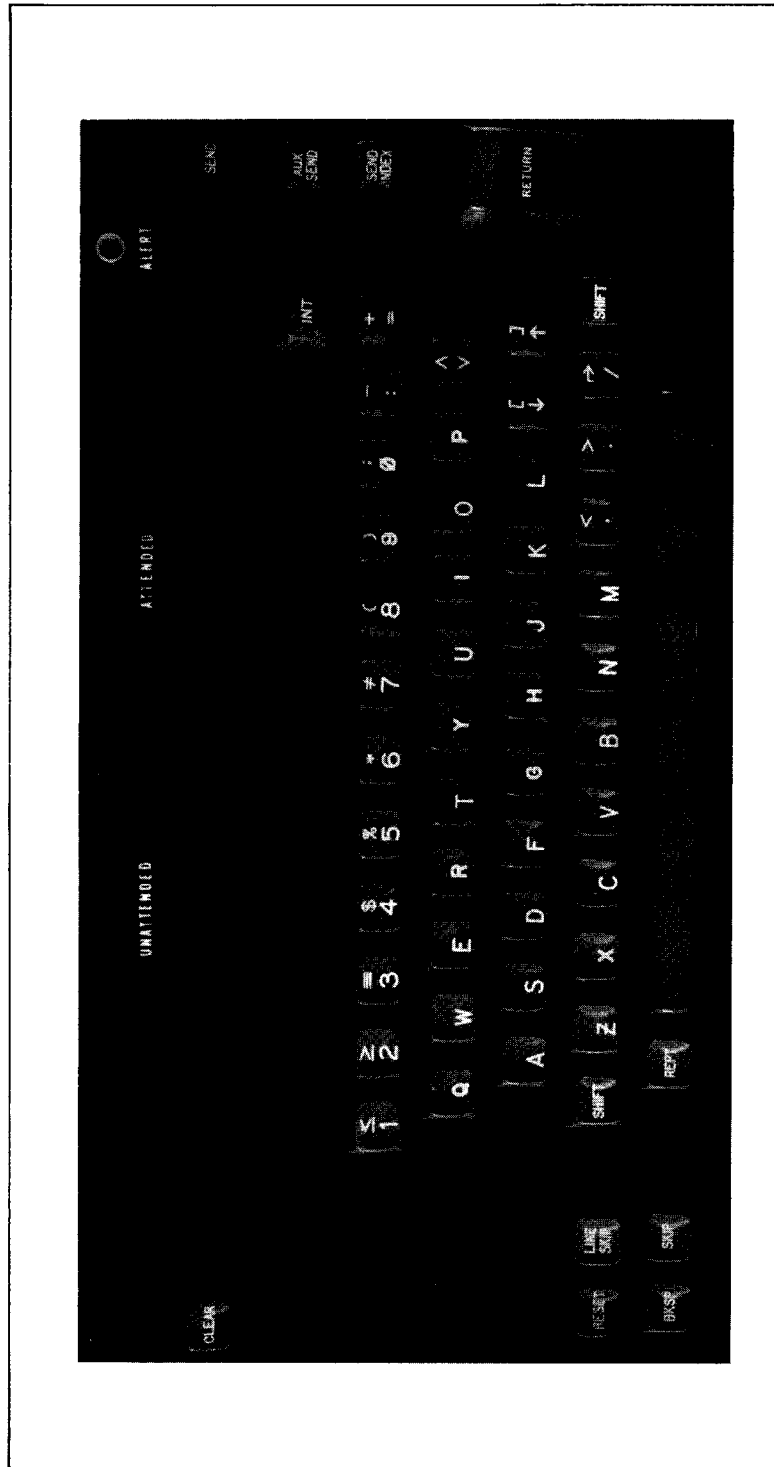


Figure 6-3. Display Console Keyboard

Table 6-1. Editing Functions

Key	Function	Key	Function
RESET	Repositions the entry marker to the upper left-hand corner. Data already on the display is not affected.		may be used with the REPT key except RESET, AUX SEND, SEND, CLEAR, and INT. All symbols repeat at 25 characters per second except LINE SKIP, SKIP, SEND INDEX and RETURN, which repeat at a slower rate.
RETURN	Repositions the entry marker at the left of the next line. All data between the carriage return symbol (-) and the end of the line is erased.	BKSP	Backspaces the entry marker one position. Data is not affected by this operation.
LINE SKIP	Repositions the entry marker at the left of the next line. No carriage return symbol is displayed; data remaining on the line is not erased.	SKIP	Advances the entry marker one position without affecting data on the display.
SHIFT	Permits upper case symbols. The SHIFT key has no effect on single-symbol keys.	SPACE	Inserts a blank at the entry marker position and erases any previous symbol. The entry marker is advanced one position.
REPT	Initiates repeat action when used in conjunction with other keys. All keys		

Table 6-2. Special Functions

SEND INDEX	Advances the line indicator (T) to the next line. The entry marker and data already present on the CRT are not affected.	ALERT	When an alert message is received from the central site and the ATTENDED/UNATTENDED switch is in the ATTENDED position, the ALERT light and audible alarm are activated. Depressing the ALERT button or the SEND key deactivates the alarm. An alert message is used when the central site wants to attract the terminal operator's attention to some special message or condition.
AUX SEND	Enters an AUX SEND symbol (') at the current entry marker position and causes all data from the upper left corner to the AUX SEND symbol to be printed on the line printer. Data is not altered and the terminal mode (line or block) has no effect on the operation.	ATTENDED/ UNATTENDED	When this switch is in the UNATTENDED position, the ALERT light and audible alarm are disabled. The terminal automatically responds to an alert message as if the operator depressed the SEND key. This allows the operation to continue even if an operator is not present.
INT	Interrupts communications with the central site to allow the operator to enter a message and/or perform some action at the terminal, such as changing the printer paper.	CLEAR	Clears all data from the CRT display and resets the marker chain to the top line.
SEND	Enters an E1 symbol (Δ) at the current entry marker position and repositions the marker chain to the line indicated by the line indicator (line mode) or the upper left corner (block mode). Data is then transmitted until the E1 symbol is read.		

- The SEND key has been depressed while the terminal is in UNATTENDED mode.

The keyboard may be unlocked by the following operator actions:

- Depressing the INT key which unlocks the keyboard as soon as the central site requests more card data or sends another message for printing.
- Depressing the MAN REL switch on the Equipment Controller. Caution should be exercised when using

this switch since data being transmitted to or from the terminal may be lost.

- Placing the terminal in ATTENDED mode if it was previously in the UNATTENDED mode.

LINE PRINTER OPERATION

The operator control panel is located in the upper right portion of the line printer cabinet. Figure 6-4 shows the control panel switches and indicators.

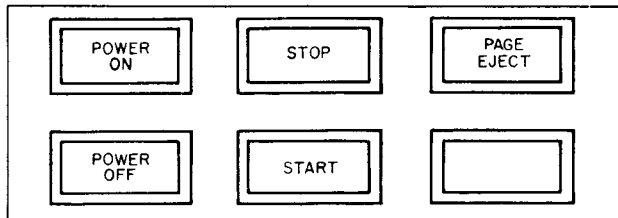


Figure 6-4. Line Printer Control Panel

Switches and Indicators

POWER ON Switch and Indicator. Pressing this momentary contact switch applies AC power to all power supplies, fans, and motors. It also applies a manual master CLEAR which clears specified logic circuits to initial state condition. When the indicator is illuminated, power is on.

POWER OFF Switch. Pressing this momentary contact switch disconnects AC power from internal power supplies, motors and fans. If POWER ON and POWER OFF switches are pressed simultaneously, power will turn off.

START Switch and Indicator. Pressing this momentary contact switch causes the printer to become Ready if all other (logic) prerequisites for a Ready condition prevail. When the indicator is illuminated, the printer is Ready. If the printer is Not Ready because it is out of paper, each operation of the START switch permits one additional line to be printed until the bottom of the form is reached.

STOP Switch and Indicator. Pressing this momentary contact switch disables the printer to Not Ready status when the end of the current print cycle is reached. The indicator is illuminated if the printer is Not Ready for any reason.

PAGE EJECT Switch. Pressing this momentary contact switch causes the paper to move to the position indicated by a punched hole in Format Tape Level 1, which indicates the top of the next form. This switch is inactive when the printer is in the Start/Ready condition.

Note: If the printer fails to become Ready when the Start switch is pressed, the operator should make certain that the print drum latch (interlock) is firmly closed, and that the format-tape brush-reader interlock is engaged before checking for other conditions which can cause a Not Ready condition.

Character Phasing Control

Vertical coverage of the printed character is adjusted by rotating the character-phasing control knob either up or down, depending on the direction of vertical adjustment desired. (See Figure 6-5a). When the knob is centered, the range of adjustment is plus or minus one-half character.

Print Head Control

Vertical Forms Positioning Controls (Figure 6-5b). To move any amount of paper upward or downward when the machine is **not** printing, pull the static control knob and rotate it in the direction of paper movement desired. To move forms within plus or minus one line of the print line while the machine is printing, rotate the dynamic control knob in the direction opposite to desired paper movement. Initially, the knob must be in center position to obtain maximum adjustment range in each direction.

Horizontal Form Positioning Control (Figure 6-5a). This control allows static or dynamic adjustment of the forms within plus or minus two columns of the desired print column. Turn the knob upward to move the print column to the left; turn it downward to move the print column to the right. Initially, the knob must be in center position to obtain the maximum adjustment range in each direction. For greater horizontal movement of the forms, release (pull up) the tractor locks and move the forms tractors in the direction desired.

Paper Tension Control (Figure 6-5b). The Paper Tension Control enables vertical paper tension adjustments, and can compensate for variations in form thickness. Turn the knob fully counter-clockwise for maximum form thickness and fully clockwise for minimum form thickness. To either decrease or increase the horizontal paper tension, release one tractor lock and move the tractor toward or away from the opposite tractor.

Format Control Tape (Figure 6-5b)

The format tape assembly is located at the left side of the printer, providing the operator with direct accessibility to install tapes. The assembly consists of a pin-feed drive roll, an adjustable idler roll, a contact roll, and brush reader assembly containing 12 control brushes for sensing holes in the tape.

Install the tape in the following manner:

- Loosen (rotate counter-clockwise) the idler roll.
- Unlatch the brush reader assembly and move it away from the contact roll.
- Place format tape on the drive roll; thread the tape between the contact roll and brushes, and over the idler roll.

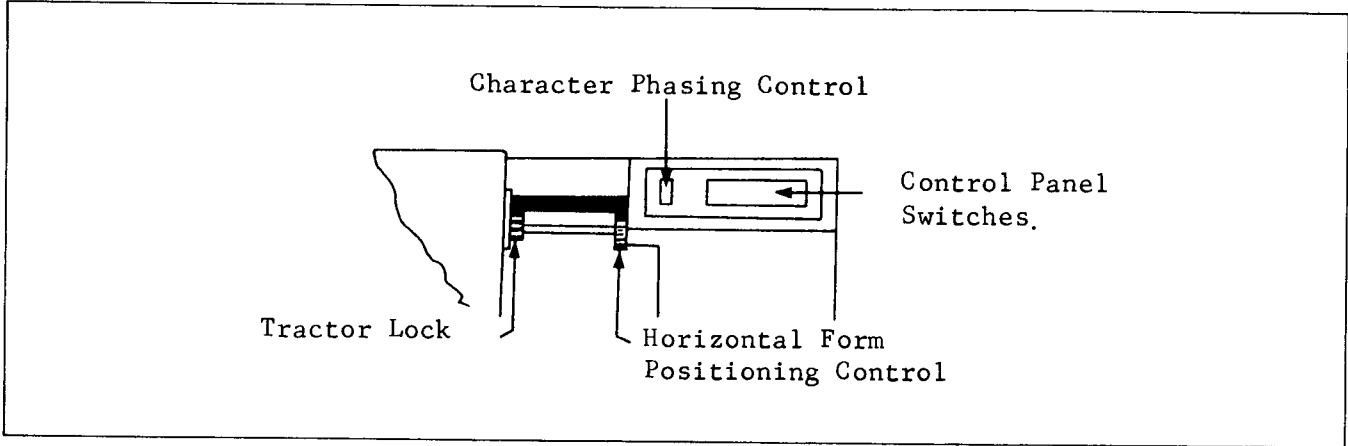


Figure 6-5a. Printer Operation Control (Front Controls)

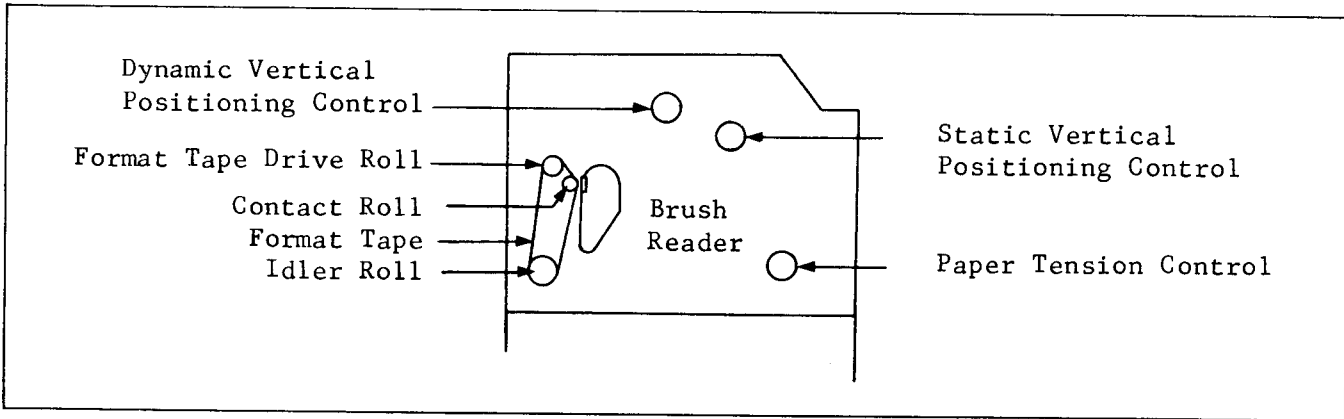


Figure 6-5b. Printer Operation Control (Side Controls)

- Allow the full weight of the idler roll to rest on the tape.
- Tighten the idler roll and latch the brush reader assembly.

Printer Ribbon

The two-inch wide, 25-yard long print ribbon runs directly from one spool to the other on a canted angle across the print drum (Figure 6-6). To change the ribbon, press the POWER OFF switch, unlatch and swing open the drum arm group as soon as the print cycle is completed. Turn the Ribbon Switch to OFF. Swing open the scale assembly into the forms loading position. (See Paper Scale below.) Lift the ribbon spools directly up and out of the machine. After a new ribbon is installed, turn the Ribbon Switch to ON, replace the scale assembly into the operation position, close the drum arm group, and push the START switch.

Note: When an application requires most of the printing on the left (or right) side of the paper, the ribbon spools can be exchanged end-for-end, placing the unused portion of the ribbon on the left (right) side of the page, thereby increasing ribbon life.

Paper Scale

The paper scale enables easy, accurate forms positioning. After the paper has been placed on the tractors, pivot the scale assembly away from the drum group and place it against the paper. (See Figure 6-7.) When the scale is so positioned, it indicates where the characters will be printed, both vertically and horizontally.

Caution: The drum arm must be fully opened to obtain an accurate reading when loading forms.

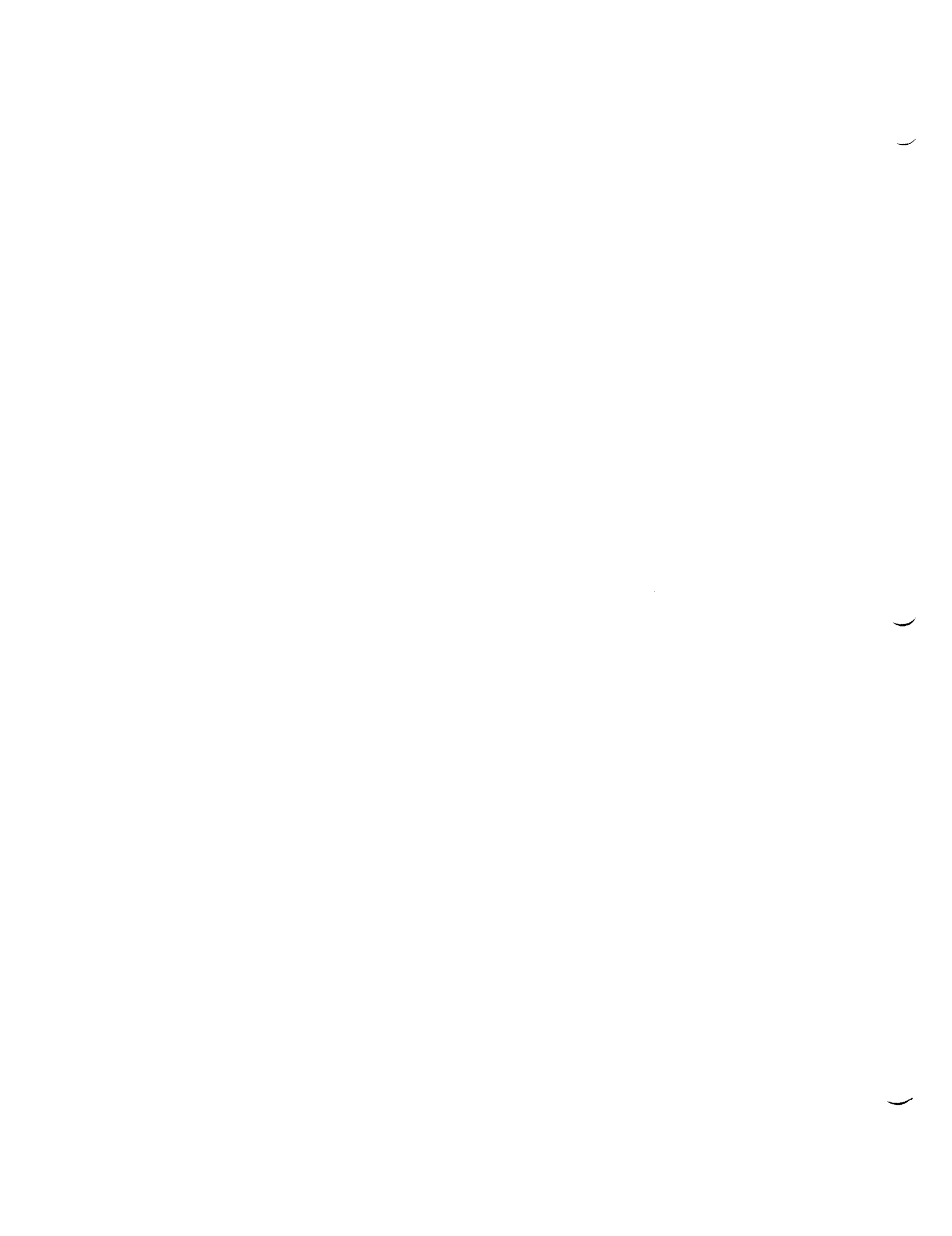
The small vertical hash marks on the upper metal plate of the paper scale assembly correspond to the left edge of each character space in a print line; the longer vertical hash marks correspond to the center of each character space at five space intervals. The top of the horizontal red line on the bottom Mylar plate corresponds to the bottom of a line of print at the print station. After loading the forms, swing the scale back onto the drum arm group and close the arm. In this position, the upper scale is still visible to indicate horizontal column position.

Forms Loading Procedure

- Where programmed operation calls for use of perfor-

ated format control tape, install tape (as described previously) at format tape reader:

- Press PAGE EJECT switch on Control Panel. This causes the tape to move and stop at "top of form."
- Unlatch and swing the drum arm group away from the print station, to gain complete access to the forms tractors.
- Raise tractor flaps.
- Loosen (pull up) tractor locks; space the tractors apart to match the width of the forms used.
- Insert forms on the tractor lugs and close tractor flaps.
- Pivot paper scale away from the drum arm group and against the paper.
- Adjust tractors for proper horizontal paper tension; move forms horizontally to the position desired by comparing the forms with the paper scale; lock tractors.
- Move the forms upward (static vertical forms positioning control), using the bottom plate of the paper scale assembly as a vertical position guide. To start printing at the top of the form, stop vertical movement when the top edge of the red line matches the bottom of the first print line position. (See Paper Scale above.)
- Pivot the paper scale back into the drum arm group. In this position, the scale will still be visible for horizontal column positioning when the drum arm is closed.
- Close and latch the drum arm group.
- Adjust paper tension with the paper tension control knob.
- Initiate printing; make final character positioning adjustments, if necessary, with the dynamic vertical forms positioning control, horizontal forms positioning control, character phasing control, and paper tension control. If horizontal paper tension requires adjustment, loosen the right tractor lock; move the tractor to obtain proper forms tension; lock the tractor.



CHAPTER SEVEN

DIAGNOSTIC PROCEDURES

Before calling a Customer Engineer to report equipment problems, the user should attempt to isolate the problem to a particular device. In many cases, the problem may be corrected by the user, e.g. replacing fuses or reconnecting a plug to an outlet. On-line diagnostic programs will be described in separate documents.

EQUIPMENT CONTROLLER PROBLEMS

- Is the unit plugged in?
- Is the power turned on?
- Are any fuses blown? (Refer to Figure 7-1 for fuse location and type.) A blown fuse is indicated by a glowing orange light.

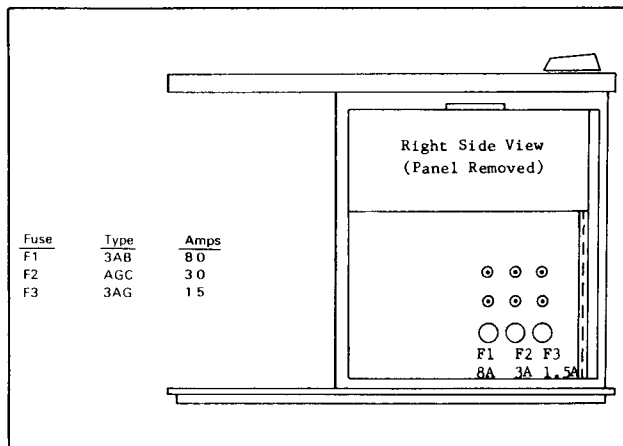


Figure 7-1. Equipment Controller Fuse Location

DISPLAY STATION PROBLEMS

- Is the Equipment Controller plugged in?
- Is the Equipment Controller power turned on?
- Is the ON/OFF/INTENSITY control turned up?
- Is the Display Station fuse blown? (The fuse, located at the back of the set, is a two-amp 3AG Slo-Blo)
- Try depressing the READER TEST/MC switch (refer to Page C-2; to Master Clear the controller.)

- Has the MAN REL switch been pressed?
- If data is missing or in error, manually enter the failing or missing character. If the character is properly displayed, load the CPI test deck in the card reader and push the LIST button. If the character is printed correctly, the problem probably lies in the communications area.
- If the keyboard is locked out and the INT key has no effect, press the MAN REL switch.

CARD READER PROBLEMS

- Is the unit plugged in?
- Is the power switch on?
- Are the cards loaded face down with the nine-row toward the back?
- Has the card been torn or the punch holes misaligned on the card?
- Is there dirt or dust in the Read Station photocell area? This area should be cleaned every other day during periods of heavy use.

LINE PRINTER PROBLEMS

- Is the unit plugged in?
- Is the power switch on?
- Is the format tape in position and the interlock closed?
- Is the ribbon switch turned on?
- Is the drum arm closed securely?
- Is the paper loaded correctly?

Note: PAGE EJECT cannot be operated while the printer is in the Ready condition (START indicator illuminated). Press the STOP switch first.

- If data is incorrect or missing, enter the failing or missing character at the keyboard and push the AUX SEND key. If the character is printed properly, load

the CPI test deck in the card reader and push the LIST button. If the character is printed properly, the problem probably lies in the communications area.

COMMUNICATION PROBLEMS

- Is the INT/EXT BCD switch in the proper position? (See Appendix C regarding the Equipment Controller and the appropriate software reference manual.)
- Are the rest of the Logic Assembly switches in the correct position?
- Are all the units plugged in and turned on?
- Have you dialed the correct number?
- Is the central site's polling signal audible on the line when the TALK button is pushed? If not, redial the central site.
- Try depressing the MAN REL switch and the READER TEST/MC switch to clear the controller and interface logic (refer to Pages C-1 and C-2).

CHAPTER EIGHT

SYSTEM INFORMATION

This chapter contains miscellaneous information on the EXPORT/IMPORT 200 System. Primarily, it is information the user will not be directly concerned about. It will, however, enlighten his understanding of how the system functions.

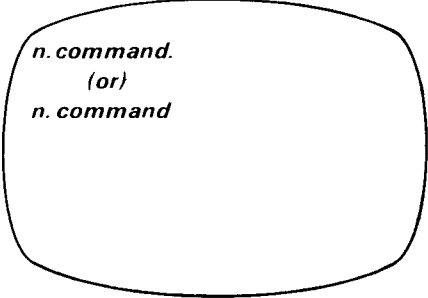
CONTROL OF JOBS AT CENTRAL SITE

The operator at the central computer, at his option, exercises certain controls over EXPORT/IMPORT 200 jobs. He may initialize the system, send and receive short messages, and drop the central site software (e.g., E/I 200) from the control point.

During normal operation, however, no action is required by the central operator. EXPORT/IMPORT 200 is called into action by the remote terminal user. Jobs are then entered into the SCOPE input queue and executed automatically by SCOPE. An operator may receive a request while a job is running (e.g., to assign a tape), but otherwise the job is completed and transmitted automatically.

Initializing the System

Programs that control the EXPORT/IMPORT 200 System may be called to a blank control point by the central operator. The PP, channel, and control point are assigned at this time. When the EXPORT/IMPORT 200 System is running, a remote user may call it from his MARC-II Terminal. All commands from the central site operator related to EXPORT/IMPORT 200 have the form:



n.command.
(or)
n.command

The diagram shows a rounded rectangular box containing the text *n.command.*, followed by (or) on a new line, and *n.command* on a third line. To the left of the box is a vertical column of seven small squares.

n is the control point number for EXPORT/IMPORT 200, and "*command*" designates the specific operation. The

final character must be followed by a carriage return. To initiate the system where only EXPORT/IMPORT 200 is available to remote site users, the central site operator types:



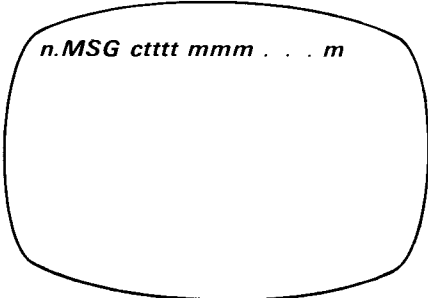
n.X.EI2.

The diagram shows a rounded rectangular box containing the text *n.X.EI2.* To the right of the box is a vertical column of seven small squares.

The control point must be blank before these commands are entered.

Sending Messages to Terminals

The operator at the central site may send short messages by entering:

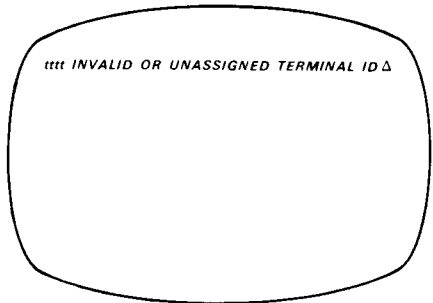


n.MSG ctttt mmm . . . m

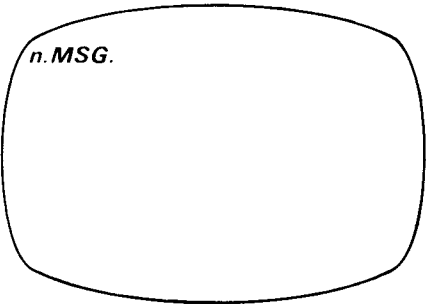
The diagram shows a rounded rectangular box containing the text *n.MSG ctttt mmm . . . m*. To the right of the box is a vertical column of three small squares.

\underline{c} = check digit

The message (*mmm...m*) is entered into the display at the central site and sent to terminal *tttt* at the first opportunity. When the message is transmitted, the control point message area in the B display is cleared automatically. If the central operator transmits a message with a terminal identification code which references a terminal not currently assigned or which is otherwise incorrect, this message is displayed at the central site:

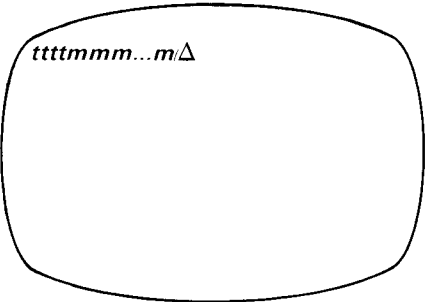


The central operator must then re-enter the message or manually clear the control point message area by entering:



Receiving Messages From The Central Site

Messages from a remote terminal (entered by the M,mmm...m command) are displayed at the central site as:



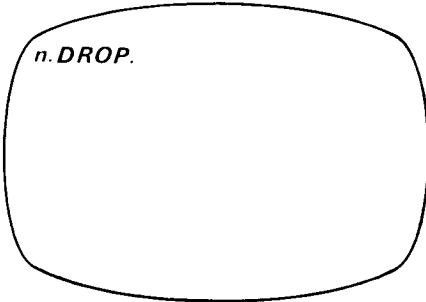
These messages appear in the central site B display at the control point running EXPORT/IMPORT 200.

tttt is the terminal identification code and mmm...m is the message. The central site operator must acknowledge receipt of each message by clearing the control point message area so that other messages from remote sites can be displayed.

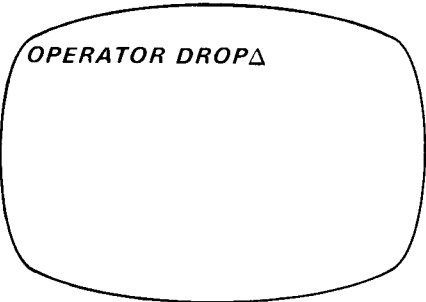
Messages are entered into the SCOPE dayfile which contains the processing history of all jobs.

DROPPING CENTRAL SITE PROGRAMS

Normally if no terminals are active, the central operator drops EXPORT/IMPORT 200 from its control point by entering:

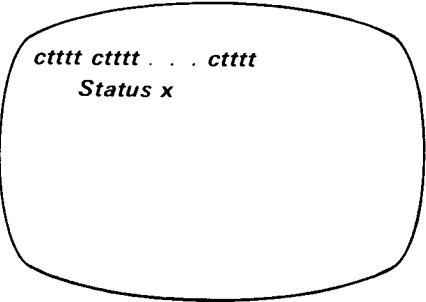


If this command is issued when terminals are being serviced, the files of jobs being read are rewound and unloaded, the files of jobs being printed are rewound and returned to the system, and EXPORT/IMPORT 200 drops from its control point. This message appears at the remote site:



Central Site Displays

The bottom line of the control point area display shows the number of terminals assigned to each subsystem. EXPORT is the only subsystem available for the current CYBERNET Service version of EXPORT/IMPORT 200. The format of the display is:



ctttt = terminal names currently on-line

Status = mode of leftmost terminal displayed in the line immediately above *Status*:

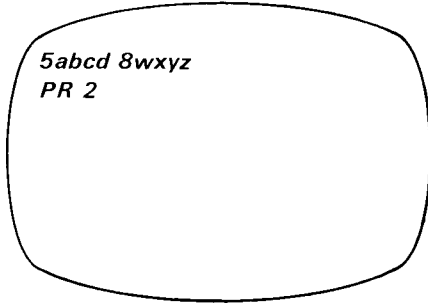
IDLE (in idle mode)

PR (in printing mode)

RD (in reading mode)

X = number of terminals currently on-line

An example of a typical display is:



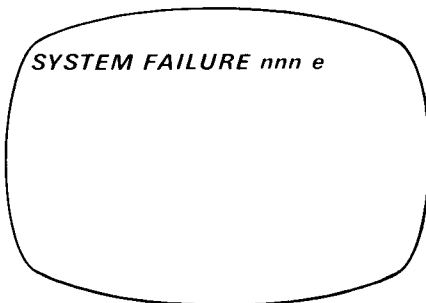
This means:

Terminals 5abcd and 8wxyz are on-line. The first terminal, 5abcd, is in printing mode (PR). Two terminals are currently on-line (2).

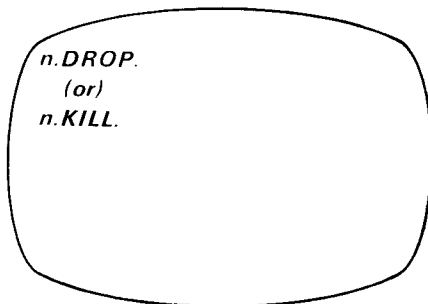
When subsystems are not available, the area normally used for these subsystems is blank except for a period.

Central Site Error Detection

If EXPORT/IMPORT 200 detects that it is in error, it produces this diagnostic message:



In normal operation, this message should never appear. *nnn* is the name of the PP program which sensed the error and *e* is the type of error. The central operator can drop the system by typing:



Otherwise, he can dump (list out) the system.

Non-printable Output from Remote Jobs

If remote jobs produce output which is not printable (such as punch output, the EXPORT/IMPORT 200 System removes the remote designation from the disposition code of remote files in the file name table (FNT) so that all except printer output is considered local (diverted) to the central site. Consequently, any punch output is punched at the central site.

IDENTIFYING TERMINALS AND JOBS

Identifying Terminals

The hardware at each terminal identifies the terminal to the central site by transmitting a 4-bit site-address code with each message. Within a single group of 16 terminals connected to one data set controller (DSC), each terminal may be uniquely identified.

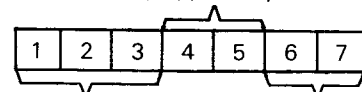
When more than 16 terminals are connected to a DSC (by allowing more than one terminal on one or more of the 16 private party lines), all terminals may be uniquely identified by combining a line number with the terminal address code.

In cases where a user may dial the central site on any of several telephone lines in a group, each line group is assigned an identifying address code by the software; this code is combined with the address code for each specific terminal. To assign such group numbers, the user makes entries in a line group table before assembling the EXPORT transient PP program.* He may then create as many groups as there are lines into the DSC's and may assign any line to any group.

Identifying Jobs

The software associates each job with a terminal by replacing two characters of the job name with an identifying code unique to the terminal. When the job name is read into the computer, the first three characters (as shown below) remain as read from the job card.

jobname zeros|supplied by EXPORT



taken from
jobcard

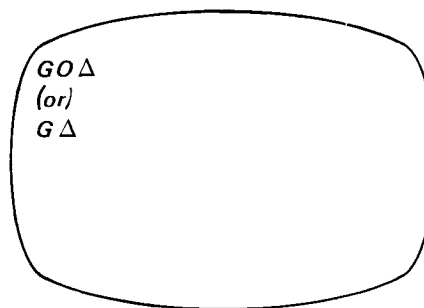
sequence number
supplied by SCOPE

* As noted in the Installation Handbook for EXPORT/IMPORT 200.

The fourth and fifth characters are replaced by zeros.

The sixth and seventh characters are assigned by SCOPE for sequence control and maintenance of unique names.

The disposition codes of all jobs submitted through EXPORT/IMPORT systems differ from those of jobs submitted from the central site; therefore, the job names used at remote sites in no way restrict those used for jobs submitted at the central site — the same names can be used in both cases without confusion.



Four printer carriage-control characters are recognized by EXPORT/IMPORT, as follows:

SYSTEM PERFORMANCE

The operating capabilities and characteristics of EXPORT/IMPORT 200 vary depending upon the hardware and software used.

Card Reader

The 224-12 card reader processes cards at a rated speed of 330 cards per minute. (Rated speeds involve the operation of the equipment on a stand-alone basis without telephone line hookup or interrupting activity.) Effective speed under a voice-grade hookup is 140 cpm. It accepts jobs in the same format and deck arrangement as jobs submitted at the central site, with the single exception that binary decks are not permitted. All Hollerith codes used are the same as those for 6000 SCOPE with two exceptions: the logical not (12-8-6 punch) is sent as a blank, and the percent sign (8-6 punch) is sent as a logical not (⌋) to the central computer.

However, when the terminal LIST button is used to list the cards off-line, both characters are listed as punched.

The normal 7-8-9 (end-of-record) and 6-7-8-9 (end-of-information) punches are allowed in column 1. Record-level numbers on the end-of-record card are recognized.

Printer

Output printed at the terminal is identical with that printed at the central site, with the exception that the logical not (⌋) character is represented as a % sign at the MARC-II System. (The ⌋ character is valid for SCOPE, but not for the MARC-II Terminal, the % character is valid for the MARC-II Terminal, but not for SCOPE.)

If the first two characters of a print line are PM, the line is not printed but instead is displayed on the terminal display screen. These characters represent a printer message and are normally used to tell the operator to load a particular kind of paper. The operator performs the action requested in the line beginning with PM and then types the following to resume operations.

Table 8-1. Carriage Control Characters

First Character of Print Line	Carriage Action
1	Ejects to top of page before printing
0	Double-spaces before printing
+	Suppresses space before printing
P (When M is second character)	No carriage action; printer message appears on screen

Any other character in the first character position is not printed, and the line is single-spaced.

The printer is rated at a nominal speed of 300 lines per minute, but the effective speed depends upon the number of characters printed per line. Tests indicate this speed is approximately 180 lpm. The printer produces 10 characters per inch horizontally, and 6 lines per inch vertically. The printer accommodates forms up to 22 inches long.

Display Console

Messages to and from the terminal are presented on the Cathode Ray Tube (CRT) screen at the display station. Visual images of data are entered from the display station keyboard, card reader, or central computer. The standard display format is presented in 20 lines of 50 characters each; an optional format of 13 lines of 80 characters each is also available. The intensity of symbols displayed can be adjusted by the user.

Error Recovery

The following methods enable EXPORT/IMPORT to detect and recover from possible errors.

Parity Errors. The terminal hardware performs an individual parity check on each character and a longitudinal parity check on each message it receives. The terminal also sends messages with the same parity format.

The software at the central site checks and sends messages using both the character and message parity-checking devices.

If a parity error occurs in a message sent to the terminal, a block is inserted in the display to represent the bad character and an error message is returned automatically. Retransmission of the original message is then attempted. This procedure is repeated until the message is correctly transmitted.

When the central site receives a message containing a parity error, it requests a retransmission causing a continuously-moving entry marker under the erroneous set of data in the display. The procedure is repeated if the error recurs, if another error is present, if the terminal answers with a message stating it received an error, or if no message is received after a certain period of time. If no message is received from the terminal after 31 attempts, the terminal is logged out, the current read file is terminated, and the current print file is saved.

Lost Messages and Garbled Response. A device included in the system hardware enables the system to recover from lost messages or garbled responses from the terminal. Each message sent to the terminal which changes the condition of the terminal (a write message) contains a special message sequence bit. Every response from the terminal contains the same sequence bit found in the last properly-received write message from the central site; the central site changes this sequence bit with every successful write message. If a message from the terminal is lost or garbled, the central site must check to be certain that its previous message to the terminal was not also lost or garbled. It requests the terminal to send its last response again and checks the sequence bit. As long as some response is received from the terminal, the central site continues to request the correct response. However, if no response is received, the terminal is logged out after 31 attempts are made.

CENTRAL SITE SOFTWARE INSTALLATION

Before the EXPORT/IMPORT 200 System can be used, the system software must be installed and assembled as directed in the Installation Handbook, and entries must

be made to the equipment status table (EST) for each Data Set Controller (multiplexor) attached to the system. These entries are made in the following non-allocatable standard 6000 format:

59	47	35	23	11	0
z	00 cc	e0 uu	f	h	0000

z = Status assigned by system (assembled as zero)

cc = Channel number to which the 6671 DSC is attached

e = Equipment number of 6671 DSC (Set by switches on the DSC)

uu = Ordinal to entry in DSC descriptor table assembled into the I/O driver

f = On/Off switch (assembled as zero)

h = Hardware mnemonic in display code. For a 6671 DSC, this is DC (0403₈).

The uu parameter is the ordinal to an entry in the DSC descriptor table which is assembled into the initialization section of the I/O driver. This table contains a detailed description of the configuration of devices connected to the DSC; it tells which lines connect to teletypes, which connect to single MARC-II Terminals, and which join multiple MARC-II Terminals in a party-line configuration. The table also gives the site address of each terminal. The precise table configuration is presented in the Installation Handbook.

Although the EST may contain entries for several DSC's, the driver can support no more than 32 MARC-II Terminals.

ACCOUNTING

A record is maintained of the time that each terminal is used. EXPORT/IMPORT 200 writes a message to the SCOPE dayfile when a terminal is logged in and again when it is logged out. From these messages, the terminal's total "connect time" is counted.

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APPENDIX A

SUMMARY OF HARDWARE FEATURES

Physical and operating characteristics of each of the three units comprising the MARC-II Remote Terminal include:

■ 217-12 ENTRY/DISPLAY STATION AND CONTROLLER

- 14-inch CRT display screen
- 63 alphanumeric characters on keyboard and display
- 64 additional internal control codes
- 1000 or 1040 characters may be displayed as 20 lines of 50 symbols or 13 lines of 80 symbols
- Adjustable intensity — clearly legible in office or plant lighting
- Flicker-free data — display screen is refreshed 50 times per second
- Entry marker — indicates the next character position to be filled; may be repositioned anywhere in the display
- Line or block mode data entry and display
- Automatic error detection and retransmission
- Character compression (receive only)

- Integrated circuitry for low power consumption and high reliability
- Compatible with 201A Data Sets or its equivalent

224-12 CARD READER ■

- 330 cards per minute — rated speeds
- 140 cards per minute — effective speeds
- 63-alphanumeric character set
- 1200-card capacity ■
- 80-column BCD cards
- 1000-character buffer

222-12 LINE PRINTER ■

- 300 lines per minute — rated speed
- 180 lines per minute — effective speed
- 136 columns
- 1000-character buffer
- 63-alphanumeric character set
- Unattended printing
- Blank/zero compression



APPENDIX B

REFERENCES

1. Control Data Corporation, **CONTROL DATA 6400/6500/6600 Computer Systems EXPORT/IMPORT 200 Reference Manual**, Publication Number 60234600.
2. Control Data Corporation, **CYBERNET Service — MARC-II Terminal General Information Manual**, Publication Number D0028040031.
3. Control Data Corporation, **CYBERNET Service — MARC-II Terminal Operator Information Manual**, Publication Number D0028040034.

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APPENDIX C

EQUIPMENT SWITCHES AND FUNCTIONS

EQUIPMENT CONTROLLER

Operator's Panel

A description of the various Equipment Controller Operator Panel pushbuttons and their functions is given in Table C-1.

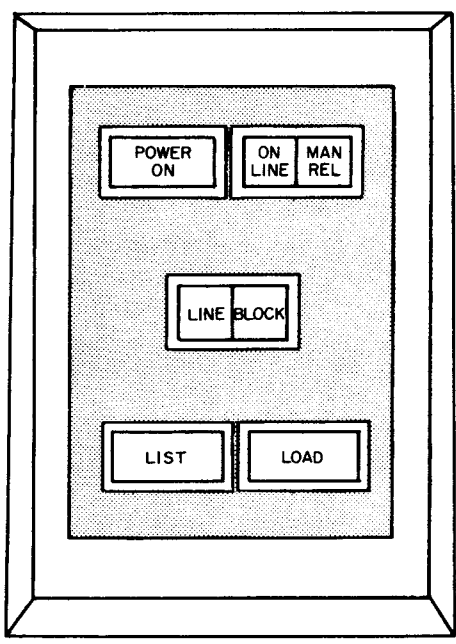


Table C-1. Equipment Controller Operator's Panel

<u>Switch/Indicator</u>	<u>Function</u>
POWER ON	Pressing this alternate-action, illuminated pushbutton applies primary power to the Equipment Controller and generates an initial master clear of logic. The lens is illuminated while power is on. A second depression turns power off.

<u>Switch/Indicator</u>	<u>Function</u>
ON LINE	Indicator is illuminated while the equipment transmits or receives information.
MAN REL (Manual Release)	Pressing this momentary-action, lighted pushbutton unlocks the keyboard for operator use. In addition, the entry marker is reset without affecting displayed data, and the interface is cleared.
LINE/BLOCK	Pressing this alternate-action, illuminated pushbutton to LINE specifies that the line indicator will be used in communications and message composition. BLOCK position prevents use of the line indicator.
LIST	Pressing this momentary-action, lighted pushbutton initiates a read operation from the card reader to the printer. Data is not displayed or transmitted to the central site. Completion of print-out extinguishes the light and returns the Equipment Controller to an inactive state.
LOAD	Pressing this momentary-action, lighted pushbutton performs the initial read operation from the card reader to central site. Subsequent data transmissions are under control of the central site. When the read operation is completed, the light is turned off.

Logic Assembly Switches

A description of the various Equipment Controller logic

assembly switches and their functions is given in Table C-2.

**Table C-2. Equipment Controller Logic
Assembly Switch Functions**

<u>Switch</u>	<u>Function</u>
INT BCD/EXT BCD	The INT BCD position enables transmission of data and interpretation of transmitted data in internal binary-coded decimal format. The EXT BCD position enables transmission of data and interpretation of transmitted data in external binary-coded decimal format.
ALARM TEST	The ON position activates the ALERT light and alarm on the Display Station. The alarm cannot be turned off at the Display Station keyboard. This switch serves as a maintenance feature.
AUTO ANSWERING	Allows the controller to operate with the automatic answering feature.
ERROR ENABLE/DISABLE	The ENABLE position allows transmission of an error message — should an error condition arise. The DISABLE position blocks transmission of any pending error messages.
POLL NORMAL/WAIT	The NORMAL position causes the controller to transmit a reject message in

Switch

Function

response to a poll — if no read message is pending. In WAIT position, the controller transmits an acknowledge message in response to a poll — if no read message is pending. Any subsequent read message is then transmitted without the aid of another poll — as long as no other message is received in the meantime.

Allows modem connection in either 2 or 4-wire half-duplex.

2 WIRE/4 WIRE READER TEST/MC

The ON position initiates a read operation at the card reader. Data is transferred to the display memory for observation on the CRT. The MC position initiates a momentary-action to master clear the controller and adaptor kits. The switch is off in a center position.

PRINTER TEST The ON position prevents completion of print operation (except for a manual release or master clear condition) — causing continual printout of a message. Always consider whether any data stored after the “end of print” symbol will appear in the second and subsequent printouts. The first character **after** the “end of print” symbol becomes the first character in the second printout. To alleviate this situation and have all printouts resemble the CRT presentation, the “end-of print” symbol should be placed in the last display position (lower right-hand corner).

KEYBOARD/DISPLAY CONSOLE

A description of the various Keyboard/Display Console Keys and Switches with their functions is given in Table C-3.

Table C-3. Keyboard/Display Console Key/Switch Functions

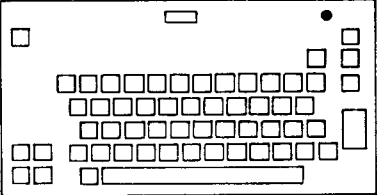
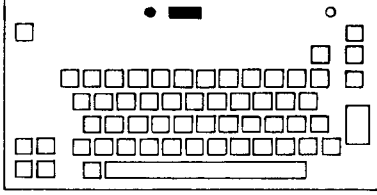
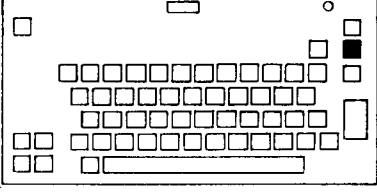
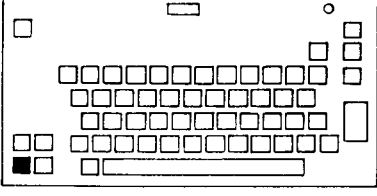
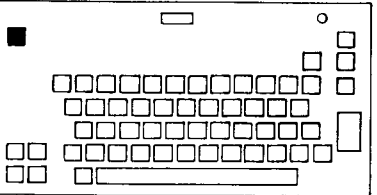
Key/Switch	Key/Switch	Function
ALERT		<p>Activates (in attended mode) the ALERT indicator and audible alarm. This message informs the terminal that the central site has a message ready for transmission. The ALERT audible alarm may be turned off by depressing the ALERT indicator/pushbutton or the SEND key. The ALERT audible alarm is not activated again until another alert message is received. In unattended mode, the ALERT audible alarm is deactivated.</p>
ATTENDED/UNATTENDED		<p>Controls the remote terminal response to an alert message. The ALERT audible alarm can be activated only while the ATTENDED/UNATTENDED switch is in the ATTENDED position. The UNATTENDED indicator is illuminated when a reply to the read message is received. This indicator is deactivated by switching the ATTENDED/UNATTENDED switch to the ATTENDED position.</p>
AUX SEND		<p>Initiates output to a printer. An E2 code is sent into display memory and the associated symbol (') is displayed at the current entry marker position. Data then transfers from the display memory to the printer beginning at the upper left corner and ending at the E2 code.</p>
BKSP		<p>Causes entry marker to move back one symbol position without affecting data at that position.</p>
CLEAR		<p>Clears all data from the CRT and Equipment Controller memory; resets entry marker and line indicator to upper left corner of CRT.</p>

Table C-3. Keyboard/Display Console Key/Switch Functions (cont'd)

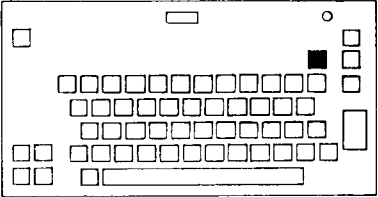
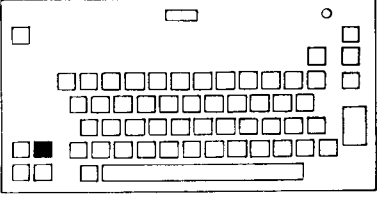
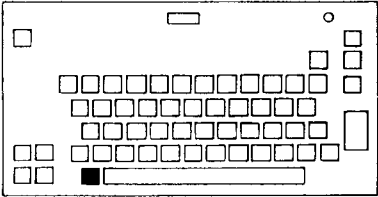
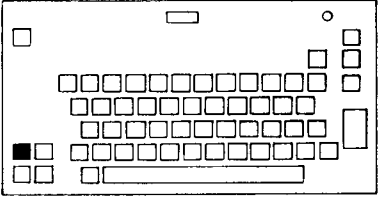
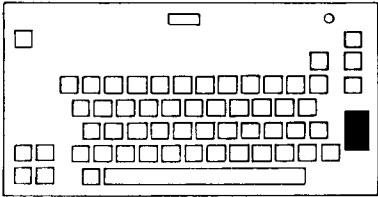
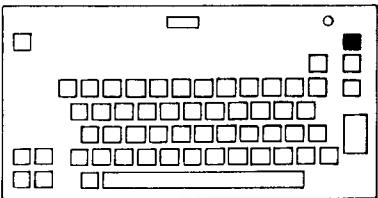
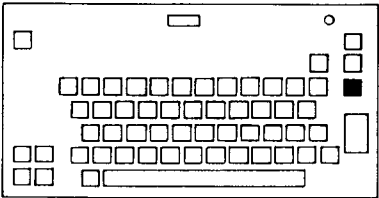
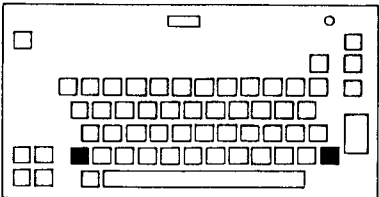
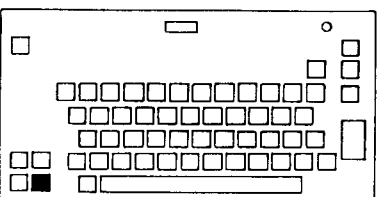
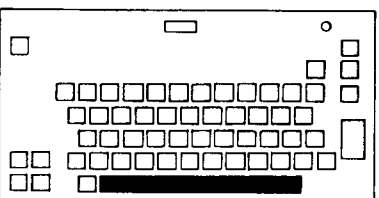
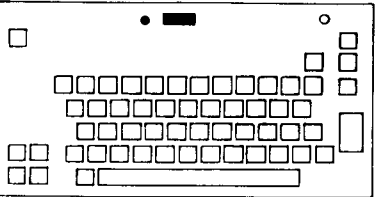
	Key/Switch	Function
INT (Interrupt)		<p>Allows operator to intervene during on-line operation. Communication between the Equipment Controller and central site is interrupted, the keyboard is released, and the operator can begin a new operation.</p>
LINE SKIP		<p>Advances entry marker to the beginning of the next line; does not affect data or the line indicator.</p>
REPT		<p>Continuously writes a selected symbol on the display when the REPT key and a symbol key are depressed simultaneously. If a function key is depressed along with the REPT key, the function will be repeated with the exception of RESET, AUX SEND, SEND, CLEAR, and INT.</p>
RESET		<p>Resets entry marker to upper left corner of CRT; does not affect data.</p>
RETURN		<p>Inserts carriage return code and symbol (-), and advances entry marker to beginning of next line. All data to the right of the symbol is erased from the CRT and display memory.</p>
SEND		<p>Transmits a displayed message (or a portion of a message) to the central site. In block mode, an E1 code is inserted into the display memory and the associated symbol (Δ) appears at the current entry marker position. The entry marker is then repositioned to the</p>

Table C-3. Keyboard/Display Console Key/Switch Functions (cont'd)

Key/Switch		Function
SEND (Cont'd)		<p>upper left corner of the CRT. This begins the transmission of the displayed data which continues until an E1 code is reached. In line mode, where the line indicator is used, an E1 code is inserted into the display memory when the SEND key is depressed and the symbol (Δ) appears at the current entry marker position. Transmission then occurs beginning from the line preceded by the SEND INDEX mark; upon completion of on-line operation, the line indicator and entry marker are repositioned to the beginning of the next line.</p>
SEND INDEX		<p>Advances the line indicator to the next line without affecting data or the entry marker. Each depression causes the line indicator to advance one line and, upon reaching the last line, to reposition it back to the first line. This key is not used in block mode.</p>
SHIFT		<p>Puts keyboard in upper-case mode while depressed.</p>
SKIP		<p>Advances entry marker one symbol position without affecting data at that position.</p>
SPACE		<p>Advances entry marker one symbol position, storing a space code at that position.</p>
UNATTENDED		<p>In unattended mode, the UNATTENDED indicator is illuminated after the remote terminal has automatically responded to an alert message from the central site.</p>

CARD READER

A description of the various Card Reader switches and their functions is given in Table C-4.

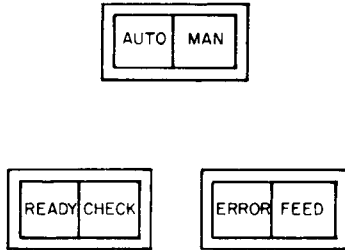


Table C-4. Card Reader Switch Functions

<u>Switch</u>	<u>Type and Function</u>
AUTO/MAN	<p>(Alternate action switch, illuminated split indicator) Pressing either indicator causes main ac power, together with photocell lamp and solenoid power, to be turned on.</p> <p>The AUTO indicator signifies that the Card Reader is linked to the user terminal and will honor FEED commands, provided that the Ready indicator is illuminated and the ERROR indicator is extinguished.</p> <p>The MAN indicator signifies that the Card Reader is logically isolated from the Equipment Controller.</p>
READY/CHECK	<p>(Momentary switch, illuminated split indicator). Pressing the READY indicator signifies that the Card Reader can accept FEED commands from and supply data to a remote source (provided the AUTO indicator is illuminated and the ERROR indicator is extinguished). The READY/CHECK indicators are mutually exclusive; therefore, when READY is illuminated, CHECK is always extinguished and vice versa.</p> <p>An illuminated CHECK indicator signifies that card movement is inhibited until one or more of the following conditions are corrected: empty input hopper, feed jam, stacker jam, full stacker, or remote logic power off.</p>

Switch

Type and Function

	<p>Release of the UNIT CLEAR switch, which is part of the READY/CHECK indicator assembly, resets the machine status control logic and extinguishes both the CHECK and ERROR indicators.</p>
ERROR/FEED	<p>(Momentary switch, illuminated split indicator). Detection of a light/dark error causes the ERROR indicator to be illuminated. In AUTO operating mode, the Reader stops when the ERROR indicator is illuminated; in MAN operating mode it does not stop. The ERROR indicator is extinguished by releasing the UNIT CLEAR switch.</p> <p>The FEED switch functions in conjunction with the AUTO-MAN switch. When in a MAN condition, releasing the FEED switch initiates a continuous card feed operation for a stopped machine and initiates a stop for an already-feeding machine. When in an AUTO condition, releasing of the FEED switch initiates a single card feed cycle for feed priming and/or clearing purposes.</p> <p>Note: Main ac power to the Reader is controlled by the ac circuit breaker switch assembly, accessible through the front machine cover.</p>

LINE PRINTER

A description of the various Line Printer switches and their functions is given in Table C-5.

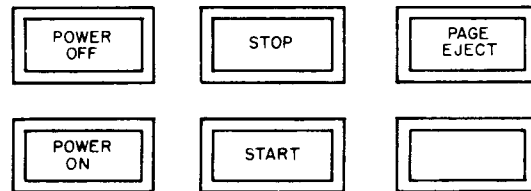
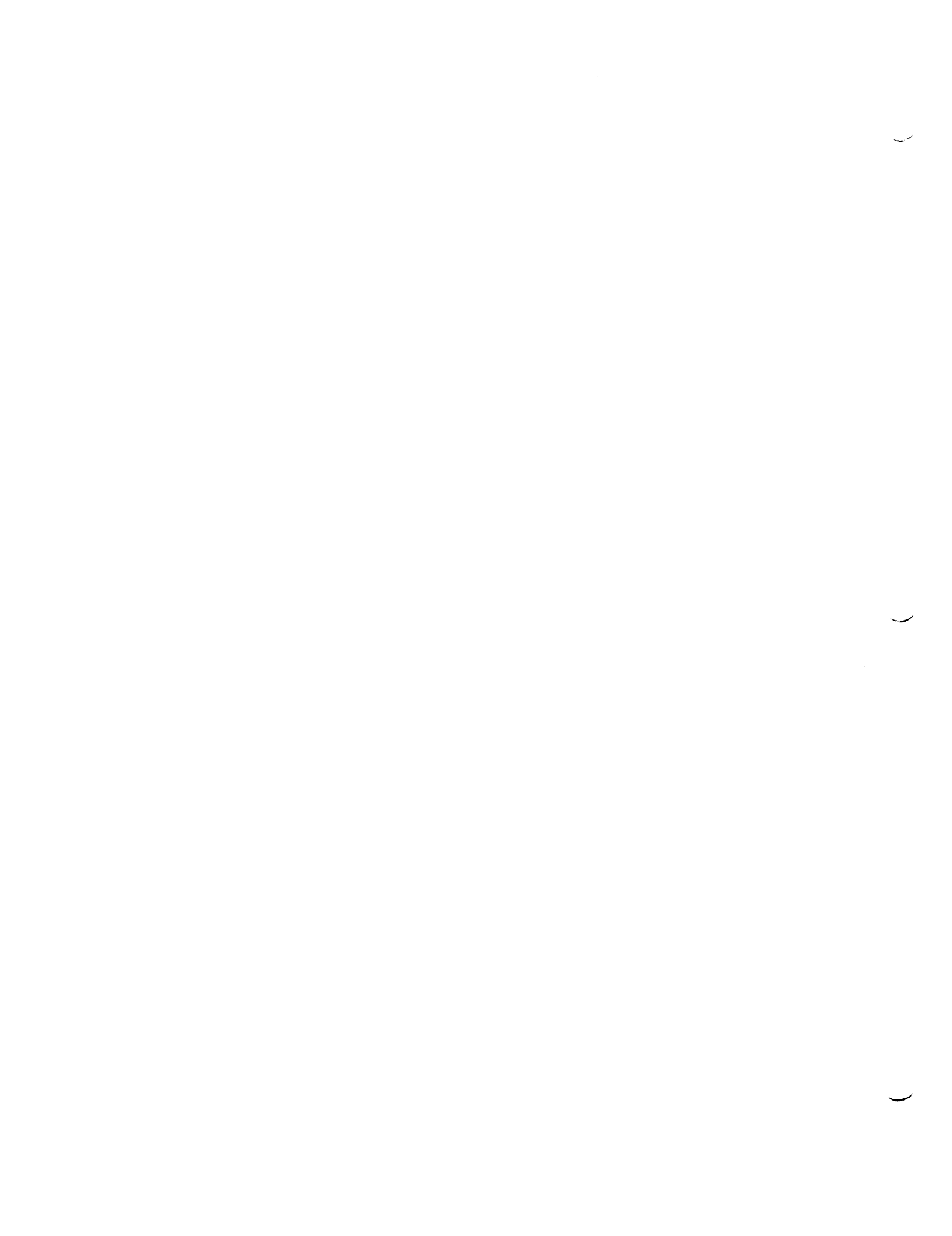


Table C-5. Line Printer Switch Functions

<u>Switch</u>	<u>Function</u>
POWER ON	<p>Pressing this momentary contact switch applies ac power to all power supplies, fans, and motors. It also applied a manual MASTER CLEAR which</p>

Table C-5. Line Printer Switch Functions (cont'd)

<u>Switch</u>	<u>Function</u>	<u>Switch</u>	<u>Function</u>
	clears specified logic circuits to initial state condition. When the indicator is illuminated, power is on.		Ready status at termination of the current print cycle. The indicator is illuminated if the printer is Not Ready for any reason.
POWER OFF	Pressing this momentary contact switch disconnects ac power from internal power supplies, motors and fans. If POWER ON and POWER OFF switches are pressed simultaneously, power turns off.	PAGE EJECT	Pressing this momentary contact switch causes the paper to move to the position indicated by a punched hole in Format Tape Level 1, which indicates the top of the next form. This switch is inactive when the printer is in the Start/Ready condition.
START	Pressing this momentary contact switch causes the printer to become Ready if all other (logic) prerequisites for a Ready condition prevail. When the indicator is illuminated, the printer is Ready. If the printer is Not Ready because it is out of paper, each time the START switch is pressed, one additional line is printed until the bottom of the form is reached.		Note: If the printer fails to become Ready when the START switch is pressed, the operator should make certain that the print drum latch (interlock) is firmly closed, and that the format-tape brush-reader interlock is engaged before checking for other conditions which can cause a Not Ready condition.
STOP	Pressing this momentary contact switch disables the printer to Not		



APPENDIX D

INSTALLATION INFORMATION

EQUIPMENT SPECIFICATIONS

Physical, environmental and electrical specifications for the MARC-II Remote Terminal are provided in Table D-1.

Table D-1. MARC-II Remote Terminal Equipment Specifications

Specifications	222-12 Line Printer	224-12 Card Reader	217-12 Equipment Controller Keyboard/Display	Keypunch (Typical)
PHYSICAL				
Width (in.)	46	48 1/2	31	36
Depth (in.)	25	27 1/2	31	29
Height (in.)	44	33	43 1/2	38
Weight (lbs.)	675	500	210	230
ENVIRONMENTAL				
Op. Temp Range (°F)	+60 to 90	+55 to 90	+65 to 85	*
Op. Rel. Humidity (%)	30 – 80	25 – 75	30 – 80	*
Heat Dissip. (Btu/Hr)	3000	1600	950	525
Storage Temp (°F)	+40 to 140	*	-20 to 150	*
Stor. Rel. Humidity (%)	5 – 95	*	10 – 90	*
ELECTRICAL				
Voltage (120 vac nominal)	104 – 128	102 – 128	105 – 125	*
Frequency (Hz)	59.0 – 60.6	59.0 – 60.6	47 – 400	*
Phase	Single	Single	Single	*
Current (amps)	12A	7A	2.25A	3.3A
Voltage (220 vac nominal)	190 – 235	187 – 235	210 – 250	*
Frequency (Hz)	49.2 – 50.5	49.2 – 50.5	47 – 400	*
Phase	Single	Single	Single	*
Current (amps)	7A	4.5A	1.1A	*
Circuit Breaker Req's	15A	15A	15A	15A
Connection	Hubbell Locking Connector	Std. Wall Outlet	Std. Wall Outlet	Std. Wall Outlet

*Data unavailable

(See notes on next page)

Notes for Table D-1:

1. All specifications are on a per-unit basis.
2. All wiring shall be in accordance with applicable local and national codes.
3. The circuit breaker panels, circuit breakers, magnetic contactors, main power disconnect switches, junction boxes and all wiring shall be furnished by the customer prior to computer equipment installation.
4. Customer should allow for circuit breaker additions commensurate with system expansion plans.
5. Customer should allow four feet extra power cord for connection of Hubbell Locking Connector.
6. Ambient room temperature range: 65 degrees - 90 degrees F. Relative humidity range: 35 - 60 per cent.
7. For specifications on equipment not shown, contact Control Data's site planning representative.

DATAphone* SERVICE SPECIFICATIONS

Data Set Type 201A3 (2000 bps)

Options required for the MARC-II Terminal:

- DATAphone Service — controlled carrier
- Interface: EIA RS-232A voltage
- Selective attended/unattended
- 801 ACU (201A3 and 201A4 only): Not required
- New sync: No (For multi-party private line only: Yes)
- Provide Echo delay: required on two-wire private line and DATAphone service (requires approximately 150-millisecond turnaround time)
- Timing: internal (Data Set to provide)
- Provide 804A1 data auxiliary set

FLOOR LAYOUT

Figure D-1 represents a typical floor layout for the MARC-II Terminal.

*Trademark of Bell Telephone System

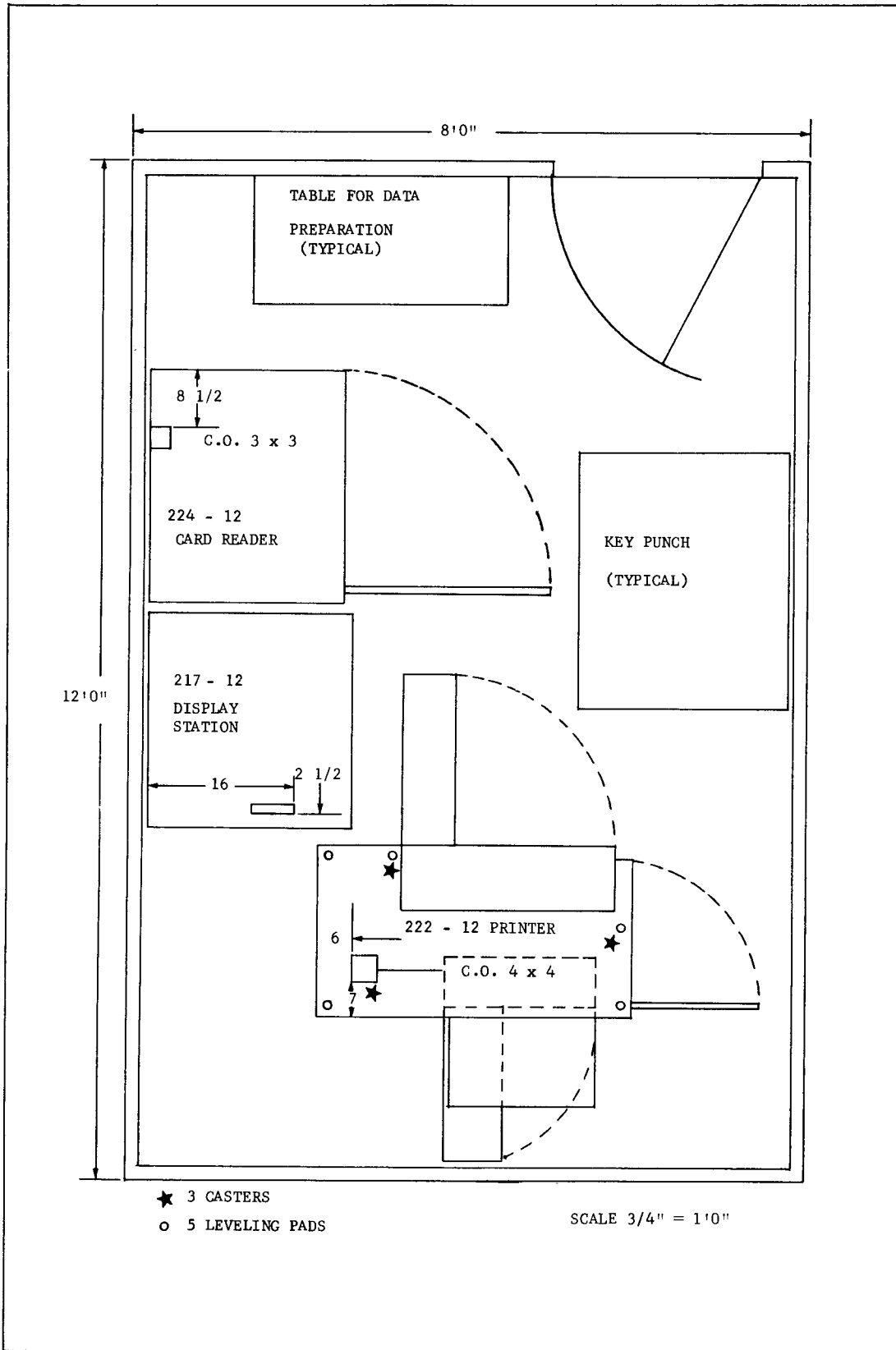
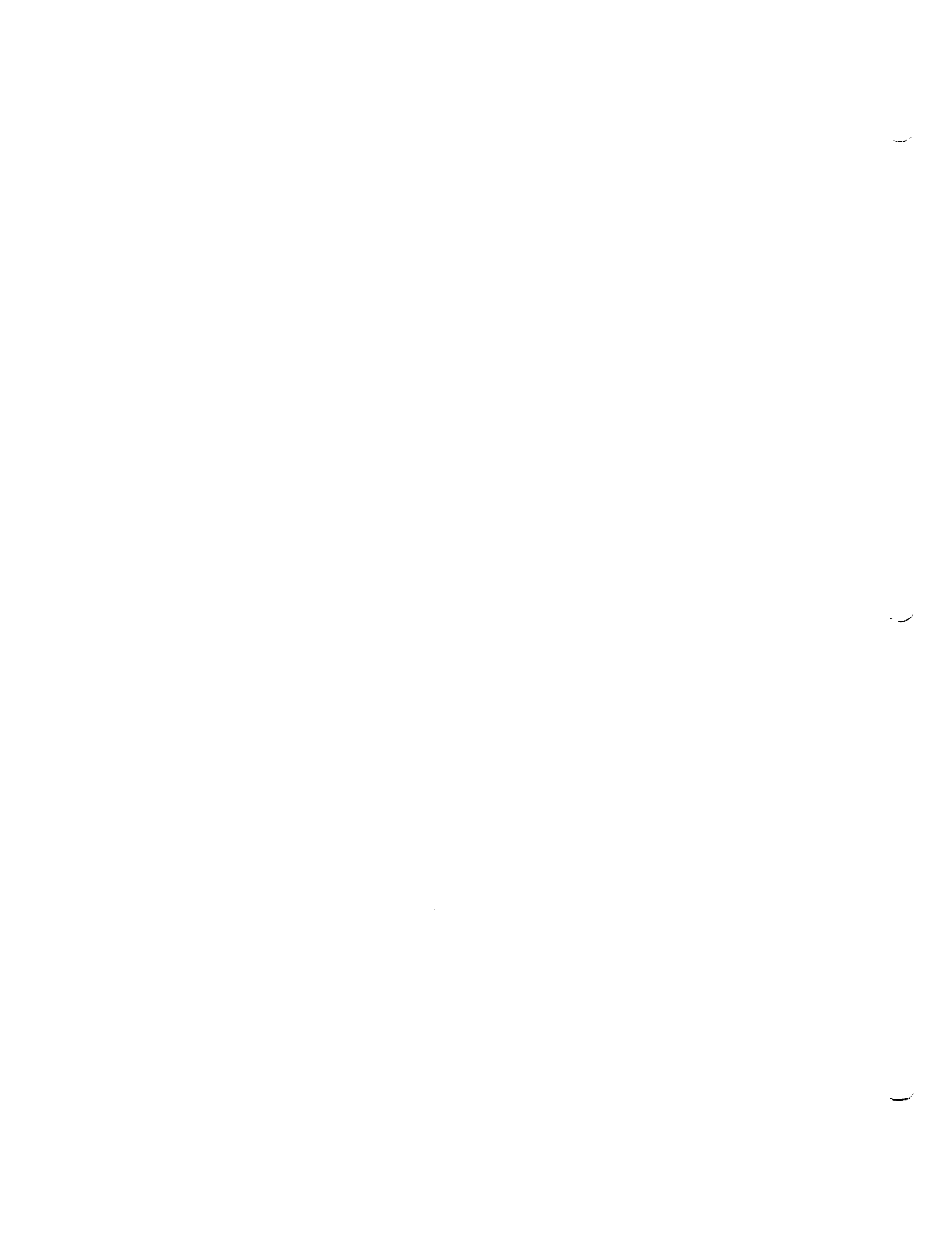


Figure D-1. MARC-II Terminal Floor Layout



APPENDIX E

INSTANT EXPORT/IMPORT 200

Below is a quick reference to EXPORT/IMPORT 200 commands and messages. This sheet may be detached and placed near your MARC-II terminal.

Keyboard Commands

Command	Meaning	Command	Meaning
A	Rewind this OUTPUT file and retransmit.	H,d	Display the input, output or dependency status for this terminal (H display).
B	Display control point status (B display).	IMPORT, cttt	Connects terminal with E/1 200 which replies with time, date, and TID.
C	Resume the print operation after SUSPEND.	LOGOUT	About to disconnect the terminal.
D, jobname	Drop this job from the system.	M, mmm . . . m	Sends 28-character message (mmm . . . m) to central operator.
E, CR	End card reader operation.	O, jobname	Print this job at central site.
E, LP	End line printer operation.	O, jobname, tttt	Print this job at terminal tttt.
G	Go. Resume active operation after a message or request.	P, jobname, p	Change priority of output file to p.
		R	Begin card read operation.
		S	Suspend the print operation.

Central Site Messages

Message	Reason/Action Required	Message	Reason/Action Required
tttt mmm . . . m	Central site operator comment to remote (tttt = terminal id).	INVALID TERMINAL ID	Incorrect terminal id entered when diverting output to another terminal. Push CLEAR. Retype command with proper terminal id.
CARD READ ERROR	Correct error in punching on one of last 24 cards.	JOB CARD ERROR	Correct deck and restart operation.
FILE NOT FOUND	Non-existent file referenced in a control statement.	OPERATOR DROP	The central site operator has dropped EXPORT2.
FORMAT ERROR	Unrecognized statement. Re-enter message.	OUTPUT FILE ERROR	Try again or reposition output file.
INPUT FILE ERROR	Parity error has occurred. Repeat.	PMmmm . . . m	Printer message halts printing usually with instructions for paper form change.
INVALID OR MISSING TERMINAL NAME	Mistake was made in entering terminal ID. Push CLEAR. Retype IMPORT, cttt.		

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APPENDIX F

GLOSSARY

Batch — A collection of similar jobs.

Batch processing — A systems approach to processing, where a number of similar input items (jobs) are grouped for processing during the same machine run.

Batch system — A computer's operating system which processes batched jobs.

Block mode — On the MARC-II display screen, the line indicator (■) is blocked and permanently set in the upper left-hand corner. When the SEND key is pressed, the data to be transmitted always starts at the upper left-hand corner and ends at the Δ

Buffer — A temporary storage device of relatively small capacity, capable of receiving and transmitting data at different rates of speed. Used as an equalizer when positioned between any set of components that operate at different speeds than the computer itself, such as a card reader.

Central site — The central computer to which the user has remote access.

Commands — Words issued by a user to control actions of a remote multi-access responsive computing system.

Compute time — The actual central processor time expanded, exclusive of those small increments devoted to handling communications requirements.

Connect time — The time that a terminal is electrically connected to the multi-access computer.

Control point — Areas with a computer's central memory to which jobs are assigned when they enter memory. Control point areas also contain the job's exchange package information.

CYBERNET Service — Control Data's nationwide system of CYBERNET Centers and remote terminals.

Data — Information or facts presented to, or generated by, a suitably programmed computer.

DATaphone — Devices which permit data communications over telephone channels — a trademark of the Bell Telephone System.

Debugging — The process of removing errors from a program.

Disposition code — A code indicating the destination of job output after processing.

Effective speed — Actual speed of equipment operation when linked with other equipment and operating under normal conditions.

Entry marker — On the MARC-II display screen, the underline indicating the position at which data will next appear.

Execution — Performance of a program on a computer. Also called "running".

EXPORT/IMPORT 200 — A remote job entry system that allows MARC-II Terminal users to submit batched jobs (programs and data) to centrally located Control Data 6600 Computers. There, they are processed under CDC SCOPE, a multi-programmed operating system. In addition, EXPORT/IMPORT 200 allows users to give SCOPE special instructions for running their jobs.

File — A collection of one or more similar units of information.

Hands-on operation — The actual user operates the computing machinery himself.

Input data — Information to be processed by a program to produce results.

Input queue — Group of jobs waiting at the central computer for processing.

Job — One or more programs designed to achieve a specific result.

Job status — Indication of whether a job is in the input or output queue, or in execution.

Local processing — Processing that can be done at the remote terminal site; i.e., for MARC-II Terminals this includes card reader-to-printer and display screen-to-printer operations.

Multi-access — Multiple users utilizing a central computer simultaneously.

Multiplexor — A specialized computer, with stored program capability, for handling input-output functions of a real-time system.

Multi-programming — A technique for processing numerous routines or programs simultaneously by allowing them to reside in memory and overlapping or interleaving their execution; i.e., permitting more than one program to time share machine components.

Off-line — The state of a terminal device when it is not electrically connected to a computer.

On-line — The state of a terminal device when it is electrically connected to a computer.

Operating systems — An organized collection of techniques and procedures for operating a computer.

Output — The product produced by use of a program; generally, the result.

Peripheral equipment station — Card reader, printer, and necessary controllers used to access a multi-access system.

Program — The step-by-step description of the actions a computer is directed to take to affect the generation of useful results.

Rated speed — Speed of equipment operation when running on a stand-alone basis without interference from other equipment or processes.

Real-time — Actions responsive to stimulus which are rapid enough to be useful.

Remote — A user, at a terminal, on-line to a computer located some distance away.

Remote job entry — A technique of submitting jobs to a batch servicing, multi-programmed computer system from one or more remote sites, and receiving output at remote sites. Remote job entry can be of two types:

- **Uninterrupted** — a job enters the computer (having been selected from the input job queue) and retains control of the computer when the computer is not servicing the real-time communication needs
- **Interrupted** — several jobs are multi-programmed whenever the computer is not servicing the real-time communication needs

Remote terminal devices — Peripheral equipment combined with telephone lines that allow remote users to access a central system.

Run instructions — Written directions from a user to an operator describing how to process a job.

Running — Act of processing a program.

SCOPE — Operating system for the CDC 6600 Computer System.

Serial batch system — A system which processes batched jobs one at a time.

Set-up — To ready a job for computer processing.

System — Usually, the computer (under discussion) and its operating system. Can also mean a large program of any type.

Task — Parts of jobs designed to effect certain commonly recurring activities, often in a real-time system.

Terminal — Any equipment which a responsive system user applies to carry on a dialogue with the system.

Terminal time — Amount of time during which a terminal is on-line to a computer.

Through-put — Productivity based on all facets of an operation. Specifically, the measure of the number of jobs a computer may perform over a specified period of time, which is a relative measure of system efficiency.

Time-sharing — A mode of computer operation which permits multiple, simultaneous users to be serviced at one time.

User's ID number — The accounting and validation number which identifies each user to a system.

COMMENT SHEET

MANUAL TITLE MARC-II EXPORT/IMPORT 200 Terminal User Guide

PUBLICATION NO. D0028073033 REVISION A June 1971

FROM: NAME: _____
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COMMENTS:

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