

70/35-45-55

TAPE/DISC OPERATING SYSTEM

OPERATORS' GUIDE



SPECTRA 70

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SYSTEMS 70/35-45-55

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I. INTRODUCTION

◆ The RCA Spectra 70 Tape-Disc Operating System (TDOS) is an adaptation of the Tape Operating System (TOS). In addition to all TOS functions, TDOS provides a random access based operating and multiprogramming environment for the 70/35-45-55 Systems permitting the Control System, RCA-supplied routines, and installation programs to be executed using the 70/564 Disc or 70/565 Drum as the basic storage media. TDOS also provides extensive multichannel communications facilities for a wide range of data gathering and interrogation applications.

A Control System is provided to control and coordinate the execution of all programs, and to ensure that maximum efficiency is maintained through the use of common programming facilities, input/output devices, and other hardware features in the system. The Control System consists of the Executive, Monitor, and File Control Processor.

The Executive maintains complete control over the system and its physical resources such as core memory, peripheral devices, processor time, and the supervisory functions. The Executive controls the initiation, execution, and termination of programs. The Executive receives program requests for the allocation of memory and the assignment of devices, determines if these resources are available, and, if available, assigns them to the requesting program and protects these resources from other programs operating on the system. In addition to its program control function, the Executive decodes and services all interrupts, maintains control over the console typewriter, and controls all physical input/output operations.

The Executive permits the initiation and execution of a maximum of six programs concurrently. Each program that has been initiated is allocated a portion of memory and shares central processor time with other programs that have been initiated. Each program is assigned a priority number ranging from 1 to 6 with 6 being the highest. The highest priority program is serviced first, and control is given to the next higher priority program when the higher priority program temporarily relinquishes central processor time. This process is repeated for all programs being executed in a multiprogramming environment. When communications processing is required, the Multichannel Communications Program is assigned a priority of 7.

The Monitor, an extension of the Executive, requires resident core only when in use. It controls a run-to-run sequenced operation as determined by a job stream with little or no operator intervention. Program preparation (language translation and binding) is performed under control of the Monitor.

The File Control Processor (FCP) enables the program to perform input/output operations without regard to the physical constraints and controls required by the Executive. The FCP provides for the processing of files recorded in a serial mode on devices such as magnetic tape. It also provides for the processing of files recorded in a serial, sequential, or random mode on direct-access devices, such as disc, drum, and mass storage.

INTRODUCTION

(Cont'd)

Multichannel communications are provided through the ability to select a particular set of communications functions to be loaded with a user program for the control of input/output functions over standard communications lines. This package has three parts: the Communications Interrupt Analysis (CIA), the Multichannel Communications Program (MCP), and the Communications User Program (CUP).

The CIA is included with the Executive at system generation time and is loaded with the Executive as a resident function. It provides for the analysis and the linkages necessary to service all interrupts associated with communications processing. If communications are not a function of a given installation, the CIA may be omitted at system generation, thus conserving permanent memory. The MCP is composed of the actual control functions necessary for the operation of the communications systems and terminal devices serviced by the system. It is modular in construction, based upon the terminals and lines to be serviced and the processing functions required to service these terminals and lines. The CUP is a normal processing program containing linkages to the MCP for the execution of communications functions in much the same way that user programs link with the FCP through logical macroinstructions.

Four programming languages are provided for the 70/35-45-55. These are: Assembly, Report Program Generator, COBOL, and FORTRAN. For TDOS, COBOL and the Assembly access the COBOL and Macro libraries from disc or drum rather than from tape. Any one or a combination of these languages may be used to state the solution to a problem. Each language processor produces a common output format, which is termed an object module.

In order for a program to be executable, related object modules that constitute a program are read from magnetic tape and bound into segments by the Linkage Editor. A program can be designed as a single segment or as many segments overlapping one another as required. The programs on the resultant load library may be executed from magnetic tape or may be transcribed from tape to disc or drum for execution from there.

Three libraries are used in the preparation, maintenance, and execution of both installation and RCA-supplied programs: System Load library, Call library, and Program Load library. The System Load library contains the control programs, language translators, and other RCA-supplied system routines. It may also contain user production programs. The System Load library is required to control the loading and execution of all RCA system programs and user production programs. The Call library contains the macros and object modules, and is required by the language translators and the Linkage Editor to produce executable programs. The Program Load library contains the user production programs and may also contain some system routines. These libraries may be expanded or contracted using the System Maintenance routines.

Peripheral routines are provided to simplify data conversion. Many of these routines permit editing and printing of the data during the conversion process.

INTRODUCTION (Cont'd)

The TDOS Sort/Merge Generator provides for the generation of a tailored Sort/Merge program based upon supplied parameters.

An Automatic Integrated Debugging System (AIDS) facilitates the preparation and testing stages of program production. AIDS provides the ability to automatically perform the testing of one or more programs without requiring the programmer to be present. AIDS also enables the programmer to perform the console controlled testing of any program.

In addition to AIDS, a complete package of Diagnostic routines is provided, to meet all program testing requirements.

All of the routines included in the Tape-Disc Operating System are contained on the Master System tape supplied by RCA. This tape is then tailored for each specific user equipment configuration by use of the System Tape Generation Routine. Routines are also provided to print information from this tape and to update it.

TDOS consists of the following programming components:

Control System:

- Executive
- Monitor
- File Control Processor

Communications System:

- Communication Interrupt Analysis
- Multichannel Communications Program
- Communication Control-Multichannel Memory Generator Routine
- Multichannel Communications Program Disc Format Routine

Language Processors:

- Assembly System
- Report Program Generator
- COBOL
- FORTRAN

Automatic Integrated Debugging System

Diagnostic Routines:

- Self-Loading Memory Print
- Snapshot
- Self-Loading Tape Edit
- Tape Edit
- Tape Compare
- Test Data Generator
- Self-Loading Random Access Edit
- Random Access Edit
- Random Access Index Edit

INTRODUCTION
(Cont'd)

Peripheral Conversion Routines:

- Tape Volume Initializer
- Card-to-Tape
- Selective Card-to-Printer and/or Punch
- Tape-to-Tape
- Selective Tape-to-Printer and/or Punch
- Random Access Volume Initializer
- Random Access-to-Printer/Punch
- Random Access-to-Tape
- Random Access-to-Random Access
- Tape-to-Random Access
- Card-to-Random Access

System Maintenance Routines:

- Object Module Library Update
- Load Library Update
- Linkage Editor
- COBOL Library Update
- Macro Library Update
- Tape Field Maintenance
- Random Access Storage Allocator

Sort/Merge Generator

Library Conversion Routines:

- Executive Library Transcriber
- Program Library Transcriber
- Call Library Transcriber

Operating information for these components are covered in subsequent sections of this manual.

The components of the Tape-Disc Operating System are described in detail in the following manuals:

POS/TOS/TDOS Assembly System Reference Manual,
No. 70-00-602.

TOS/TDOS File Control Processor and Executive
Communication Macros Reference Manual, No. 70-00-608.

POS/TOS/TDOS Report Program Generator Reference
Manual, No. 70-00-606.

TDOS Control System Reference Manual, No. 70-00-611.

TDOS Utility Routines Manual 70-35-306.

TOS Utility Routines Manual 70-35-302.

TOS Sort/Merge System Manual, No. 70-35-303.

INTRODUCTION
(Cont'd)

TOS/TDOS COBOL Reference Manual, No. 70-00-607.

TOS FORTRAN IV Reference Manual, No. 70-00-604.

TDOS Multichannel Communications Program Reference Manual No. 70-00-612.

The minimum equipment requirements for TDOS are as follows:

Processor: Models 70/35-E, 70/45-E, or 70/55-E.

Console: Model 70/97.

Card Reader: Model 70/237.

Printer: Models 70/242 or 70/243.

*Magnetic Tape Devices: Models 70/432, 70/442, or 70/445.

**Disc Storage Unit: Model 70/564

*Three magnetic tape devices are required. At least two of these magnetic tape devices must be nine-channel; the third may be either nine-channel or seven-channel with the Pack/Unpack feature.

**Although the normal System Residence device is Disc Storage, an equivalent amount of storage on 70/565 Drum Memory Unit may be substituted.

2. TDOS CONTROL SYSTEM

SYSTEM INITIATION

◆ The operating procedures for loading the TDOS Executive Control System into memory are given in table 2-1.

Table 2-1. Operating Procedure for System Initiation

Operator Action	Result
1. Mount the System Load Library disc/drum.	None.
2. Press the GEN RES button on the console typewriter.	None.
3. Set the Load Unit Switches to the address of the device (channel and device number) from which the Executive is to be loaded.	None.
4. Press the LOAD button on the console typewriter.	a. The Executive Bootstrap is loaded into memory which loads the Initial Program Loader and the Executive resident elements into memory.
	b. The general registers used for Executive base addresses, the Interrupt Mask Register, and the Interrupt Status Registers are initialized.
	c. Program Counters of Processor States 3 and 4 are initialized.
	d. All of memory is set to a protection key of $F_{(16)}$.
	e. The System disc/drum device address is entered in the Load Library Table.

**SYSTEM
INITIATION**
(Cont'd)

Table 2-1. Operating Procedure for System Initiation (Cont'd)

Operator Action	Result
<p>5. The following system type-out occurs, identifying the system tape:</p> <p>SLLT IDENTIFICATION xxxxxxx SLLT CREATION DATE mm/dd/yy SLLT VERSION NUMBER nnn</p>	<p>Note: xxxxxxxx is a one-to-eight-character user-defined name, as contained in the Bootstrap.</p>
<p>6. A system timeout occurs, requesting that the current date be entered into the system:</p> <p>Typeout: *****V RSEXEC DATE Response: VΔ mmdyyjjj where: mm = Month. dd = Day of month. yy = Year. jjj = Day of year.</p>	<p>a. The operator is requested to key in the current date. The date is stored in the first nine bytes of the Executive Communication Region.</p>
<p>7. If the Elapsed Time Clock is included in the system and the Timer routine has been specified at system generation, the following system timeout occurs:</p> <p>Typeout: *****V RSEXEC TIME Response: VΔ hhmm where: hh = Hour of day. mm = Minutes. e.g., 2:30 p.m. would be entered as VΔ 1430</p>	<p>a. The operator is requested to key in the time of day, if applicable. The time is converted to binary form and stored in the Executive Time Slot area. The Elapsed Time Clock is set to its maximum value.</p>
<p>8. The system is initialized and the operator is notified by the following typeout:</p> <p>V RSEXEC SYSTEM READY</p>	<p>a. The Executive System is initialized and idles in Processor State 2. The operator may initiate a program or execute any of the Executive console routines.</p>

PROGRAM INITIATION

LOD Message Format

◆ Programs other than Communication Programs are initiated by issuing the Executive Load (LOD) Console routine. To load a program successfully, the required amount of contiguous memory must be available in the system. Also, an option is provided during initial program loading to enter runtime parameters.

◆ The format of the LOD console routine operator message for non-Monitor non-Communication programs is as follows:

E Δ LOD Δ program, [mn], [p], [pa], [H], [mmmmmm]

Where:

program = Program name. One-to-six-byte program name.

mn = Load library installation mnemonic.
Two-byte mnemonic for the device which contains the program to be loaded. If this entry is omitted, the System disc/drum is assumed.

Note: There may be up to three Alternate Libraries active at one time. Two of them may be disc/drum and one may be tape. If an additional Alternate Library is needed one of the active Alternate Libraries must be deallocated before another Library may become active (See Deallocate Device Console Routine).

p = Program priority number. Priority is a one-digit number (6,5,4,3,2 or 1). If omitted, the available priority closest to 6 is assigned to the program.

pa = Run-time device mnemonic. Two-byte mnemonic for the device which contains the program run-time parameters. This entry is omitted if there are no program run-time parameters.

H = High memory load indicator. H indicates that the program is to be assigned the highest available contiguous free memory. If this entry is omitted, the program is assigned the required contiguous memory that is available nearest to the beginning of memory.

mmmmmm = Contiguous memory specification. A maximum of six bytes which specifies the amount of contiguous memory that is to be assigned to the program. When this entry is included it preempts the program memory requirements specified in the program header block.

The format of the LOD console routine operator message for a Monitor Session is as follows:

E Δ LOD Δ $\left\{ \begin{array}{l} \text{MON} \\ \text{MONSNP} \end{array} \right\}$, [mn], [p], pa, [Y], mmmmmm

LOD
Message Format
(Cont'd)

Where:

MON = Monitor program name. To indicate that Monitor is to be called without the Snap function. This will allocate 4,096 bytes to the Monitor Session.

MONSNP = Monitor with SNAP program name. To indicate that Monitor with the Snap function is to be called. This will allocate 6144 bytes to the Monitor Session. This is required if a SNAP is to be taken in the Monitor job stream.

mn = Alternate Tape Load Library Installation Mnemonic. Two byte installation mnemonic for the tape which contains the program to be loaded. If any program within a Monitor session is to be loaded from an alternate tape library its installation mnemonic must be specified here. If any program is to be loaded from an alternate disc or drum it is only specified in the LOAD or EXEC Monitor control statement (see Monitor control statement formats).

Note: There may be up to three Alternate Libraries active at one time. Two of them may be disc/drum and one may be tape. If an additional Alternate Library is needed one of the active Alternate Libraries must be deallocated before another Library may become active (See Deallocate Device Console Routine).

p = Program priority number. Priority is a one-digit number (6,5,4,3,2, or 1). If omitted, the available priority closest to 6 is assigned to the program.

pa = Monitor job stream device installation mnemonic. Two byte installation mnemonic of the device which contains the Monitor input job stream.

Y = is an optional parameter. A Y indicates that an 808 character I/O area for batching is to be allocated in front of the memory used by the Monitor session. This indicates the input/output to Monitor is in batched card image format, up to 4 images per batch. If SYSOPT or SYSLST is tape, the records are automatically batched for the user.

mmmmmm = Contiguous memory specification. A maximum of six bytes which specifies the amount of contiguous memory that is to be assigned to the program. When this entry is included it preempts the program memory requirements specified in the program header block. When Monitor is being allocated a value greater than 4096 must be specified. The size specified here is the program size only; it does not include the size of Monitor.

**RUN-TIME
PARAMETERS
UNDER MONITOR**
(Cont'd)

it implies a load-and-execute) in the job input stream for the user program or subprocessor.

5. Only one group of these run-time parameters can be specified for a given user program or subprocessor; however, any number of user program and/or subprocessors can have run-time parameters in the job input stream. Any other group of run-time parameters, beyond the first group, for a given user program or subprocessor are rejected as out of sequence.

**ASSGN
Parameter
Format**

◆ This parameter may be used to assign a device to a user program. The actual device indicated in this parameter is assigned to the symbolic device name in the user program. This parameter obviates device assignment by the operator. Any or all of the devices for a given program (or successor chain of programs) may be assigned in this way. If a request for the assignment of a given symbolic device is not satisfied by an ASSGN parameter, the request is referred to the operator.

$$// \Delta \text{ASSGN} \Delta \text{Symbolic}, \left\{ \begin{array}{l} \text{mn} \\ \text{X'cuu'} \end{array} \right\}, \left[[\text{dt}] \left[\text{X'wc'} \right] \right]$$

Where:

Symbolic = Symbolic device name. One to six characters in length, assigned to the device.

mn = Two-byte installation mnemonic for the device to be associated with the symbolic device name.

**LOD
Message Format
(Cont'd)**

The format of the initiate console routine operator message for Communications is as follows:

EΔMCPΔprogram, [mn],, [pa], [H], [mmmmmm]

To load CUP the following is done:

EΔCUPΔprogram, [mn],, [pa], [H], [mmmmmm]

Note: The operand fields for the communication initiate messages are described under the E LOD message.

**RUN-TIME
PARAMETERS**

◆ Parameters may be supplied at the initiation of a program if the LOD operand command designates a parameter device. Since a successor chain of programs must use the memory assigned when the operator initiated it, the parameters are read at once and are available to all programs in the successor chain. The parameters must be on punch cards or in unblocked card images on nine-level magnetic tape. Program run-time parameters must be entered in a specific sequence. The valid types of parameters and the order in which the groups must appear for both individual and successor programs are as follows:

ASSGN

FILES	}	The FILES, VOL, and TPLAB must appear together for each file defined.
VOL		
TPLAB		

VDC

JOB

END

**RUN-TIME
PARAMETERS
UNDER MONITOR**

◆ Monitor only accepts the FILES,VOL,TPLAB, and VDC run-time parameters. When utilizing Monitor run-time parameters the user must take into consideration the following:

1. The run-time parameter information is stored at the end of the Monitor allocated area. When a user program or subprocessor is loaded, no check is performed to ensure that the load does not overlay this information. Therefore, it is important that the E LOD operator command contain sufficient memory to hold the user program or subprocessor and its run-time parameters.
2. The sequence specified for these run-time parameters must be maintained or the parameters are rejected as out of sequence.
3. Insufficient or invalid information causes the parameter to be rejected and can cause a parameter sequence error.
4. These run-time parameters must be placed before the LOAD Monitor control statement (or EXEC control statement providing

**ASSGN
Parameter
Format
(Cont'd)**

X'cuu' = Indicates the device to be assigned by channel and unit in hexadecimal.

- c = 0 - multiplexor channel.
- 1 - selector channel 1.
- 2 - selector channel 2.
- 3 - selector channel 3.
- 4 - selector channel 4.
- 5 - selector channel 5.
- 7 - selector channel 6.

uu = 00 to FF indicating the unit.

dt = This entry is present for compatibility. It is ignored by TDOS.

X'wc' = Indicates applicable write control information used for seven-level tapes (see table 2-2).

Table 2-2. Write Control Codes

wc	Density (bytes per Inch)	Parity	Pack/unpack mode	Translate mode
60	200	Odd	Off	Off
A0	556	Odd	Off	Off
E0	800	Odd	Off	Off
40	200	Even	Off	Off
80	556	Even	Off	Off
C0	800	Even	Off	Off
68	200	Odd	Off	On
A8	556	Odd	Off	On
E8	800	Odd	Off	On
48	200	Even	Off	On
88	556	Even	Off	On
C8	800	Even	Off	On
70	200	Odd	On	Off
B0	556	Odd	On	Off
F0	800	Odd	On	Off

**FILES
Parameter
Format**

◆ This parameter may be used to position tape files. The FILES information is also used when restarting a previously checkpointed job by storing tape positioning data for the file. This entry overrides the MRKCTR entry in the DTFSR.

//ΔFILESΔSymbolic,n

Where:

Symbolic - Symbolic device name. One to six characters assigned to this tape file.

n - Number (up to four decimal digits) of tape marks to be skipped (from present position) 1-9999.

**VOL
Parameter
Format**

◆ This parameter is for checking or writing standard labels for a tape file. It associates file information with a file name. It is rejected if it follows a FILES card and their symbolic names do not agree.

//ΔVOLΔSymbolic,ffffff

Where:

Symbolic - Symbolic device name. One to six characters, assigned to this tape file. (POS compatibility only).

ffffff - File name. One to seven character, which is used to identify this file in the DTF macro.

**TPLAB
Parameter
Format**

◆ This parameter contains the label information for label checking and writing. This parameter must immediately follow the volume (VOL) entry that it is associated with.

//ΔTPLABΔ'-----'

File labels may require two cards, the second being a continuation card. Label fields 3 through 10 are always written just as they appear in the label. These are the only fields used for label checking purposes. The additional fields (11 through 13) may be included. If the file is output, fields 11 through 13 are written in the output label; otherwise they are ignored. The TPLAB parameter may have either of the following formats:

'-----' = Input files. Any character string punched within apostrophes, identical to fields 3 through 10 of input files HDR1 label. If the character string is less than 49 characters it is space-filled to the right.

'-----' = Output files. Any character string punched within apostrophes. If these fields are too long to be punched in a single card, the character string must extend to position 71 with a continuation character (C) punched in position 72. The string is completed on the continuation card (beginning in position 16). On the continuation card, positions 1 through 15 are blank. If the character string is less than 69 characters, it is space-filled to the right.

Note: Monitor requires that '-----' must be a string of exactly 49 or 69 characters.

**TPLAB
Parameter
Format
(Cont'd)**

Information required for processing labels during program execution is specified by the VOL and TPLAB parameters. The edit run-time parameters routine converts this information into a convenient form for their use. A total of 84 bytes in memory is reserved for each set of VOL and TPLAB parameters.

**VDC
Parameter
Format**

◆ This parameter defines the volume serial numbers assigned to a direct-access file. This entry is required for direct-access files.

//△VDC△Filename,Matrix,Fileid,Serial-1,...,Serial-n

Where:

Filename = Name of the DTFSR or DTFDA (one to seven characters).

Matrix = The number (up to four decimal digits) of bytes to be allocated for the files extent matrix, if it was not specified at assembly time or it is desired to override the size specified at assembly time.

File id = File identification name (1 to 44 characters).

Serial 1 = Volume serial number (one to six characters).

Serial n = A volume serial number must be included for each volume that is to be opened.

**JOB
Parameter
Format**

◆ The JOB parameter indicates that a successor program is to be called and control is to be transferred to it. This parameter overrides all termination Executive Communication macros and console requests that are in a program. The functions of the individual macros such as TERM, TERMD, TERMS, and the console requests EHLT and EDUM are performed. The functions such as Device Allocation and dumping are performed before the successor program is called in. Control is then transferred to the program specified by this parameter.

//△JOB△Programe

Where:

Programe = Name of the user program to be called. One to six characters in length.

**END
Parameter
Format**

◆ This parameter indicates the end of the run-time parameters.

//△END

**EXAMPLE OF
RUNTIME
PARAMETERS
FOR ONE
PROGRAM**

Statement Number	Name	Operation	Operand
1	//	ASSGN	SYSLST, L1
2	//	ASSGN	SYS000, 02
3	//	ASSGN	WORK, 08, ,X'F0'
4	//	FILES	SYS000, 5
5	//	VOL	SYS000, MAS100
6	//	TPLAB	MASTER△FILE△100△△ 00000100010005000101△67013△68013'
7	//	VOL	WORK, WORK
8	//	TPLAB	'△△△△△△△△△△△△△△△△000800'
9	//	VDC	STAKEY, ,KO△FILE3,000777,000001
10	//	END	

NOTES

- 1 - ASSGN statement for assignment of SYSLST to installation mnemonic L1.
- 2 - ASSGN statement for assignment of SYS000 to installation mnemonic 02.
- 3 - ASSGN statement for assignment of WORK to installation mnemonic 08, and a write control code of X'F0' for the seven level tape.
- 4 - 5 - 6 - Must be in sets.
 - 4 - Positions the tape forward five tape marks to the desired file on this multi-file reel.
 - 5 - 6 - Supplies the label information needed for this input file.
- 7 - 8 - Must be in sets.
 - Supplies the label information needed for this output file.
- 9 - Assigns a random access file for logical level FCP. This file is located on two volumes, volumes 000777 and 000001.
- 10 - Terminates the run time parameters.

**EXAMPLE OF RUNTIME
PARAMETERS FOR THREE
SUCCESSOR PROGRAMS**

Statement Number	Name	Operation	Operand	Program in which Parameters Belong
1	//	ASSGN	SYSLST, L1	(First Program)
2	//	ASSGN	SYS000, 02	(First Program)
3	//	ASSGN	WORK, 08, , X'F0'	(First Program)
4	//	ASSGN	MASTER, X'107'	(Second Program)
5	//	ASSGN	TAPE1, 03	(Second Program)
6	//	ASSGN	TAPE4, 03	(Third Program)
7	//	FILES	SYS000, 5	(First Program)
8	//	VOL	SYS000, MAS100	(First Program)
9	//	TPLAB	'MASTER△FILE△100△ △00001000100050001 01△67013△68013'	(First Program)
10	//	VOL	WORK, WORK	(First Program)
11	//	TPLAB	'△△△△△△△△△△△△△△ △△△ 000800'	(First Program)
12	//	FILES	MASTER, 2	(Second Program)
13	//	VOL	MASTER, MAS002	(Second Program)
14	//	TPLAB	'MASTER△FILE△002△△ 000002'	(Second Program)
15	//	VOL	TAPE1, OUTPUT	(Second Program)
16	//	TPLAB	'MASTER△△△△△△△△△ △△000100'	(Second Program)
17	//	VOL	TAPE4, INPUT	(Third Program)
18	//	TPLAB	'MASTER△△△△△△△△△ △△000100'	(Third Program)
19	//	VDC	STAKEY, , KO△FILE3, 000777, 000001	(First Program)
20	//	VDC	MAST, 91, FICA△ MASTER△1967, 000777	(Third Program)
21	//	VDC	STAKEY, , KO△FILE3, 000001	(Third Program)
22	//	JOB	TWO	(First Program)
23	//	JOB	THREE	(Second Program)
24	//	END		

Notes

- ◆ 1 - ASSGN statement for assignment of SYSLST to installation mnemonic L1 for program one.
- 2 - ASSGN statement for assignment of SYS000 to installation mnemonic 02 for program one.
- 3 - ASSGN statement for assignment of WORK to installation mnemonic 08 and a write control code of X'F0' for the seven level tape for program one.
- 4 - ASSGN statement for assignment of MASTER to channel 1, device 07 for program two.
- 5 - ASSGN statement for assignment of TAPE1 to installation mnemonic 03 for program two.
- 6 - ASSGN statement for assignment of TAPE4 to installation mnemonic 03 for program three.
- 7 - 8 - 9 - Label statements for files must be in sets.
 - 7 - Positions the tape forward five tape marks to the desired file on device SYS000 for this multi-file reel for program one.
 - 8 & 9 - Supplies the label information needed for this input file on device SYS000 for program one.
- 10, 11 - Label statements for files must be in sets.
 - 10 & 11 - Supplies the label information needed for this output file WORK for program one.
- 12, 13, 14 - Label statements for files must be in sets.
 - 12 - Positions the tape forward two tape marks to the desired file on device WORK for this multi-file reel for program two.
 - 13, 14 - Supplies the label information needed for this input file on device WORK for program two.
- 15, 16 - Label statements for files must be in sets.
 - 15 & 16 - Supplies the label information needed for this output file on device TAPE1 for program two.
- 17, 18 - Label statements for files must be in sets.
 - 17 & 18 - Supplies the label information needed for this input file on device TAPE4 for program three.
- 19 - Assigns a random access file for logical level FCP. This file is located on two volumes, volumes 000777 and 000001 and is used in program one.

Notes
(Cont'd)

20 - Assigns a random access file for logical level FCP. This file is located on volume 000777 and the size of extent matrix is being changed to 91 bytes and is used in program three.

21 - Assign a random access file for logical level FCP. This file is located on volume 000001 and is used in program three.

Note: This file was used in program one but it must have another VDC to be used in program three.

22 - This JOB statement calls program two at the termination of program one.

23 - This JOB statement calls program three at the termination of program two.

Note: At the termination of program three, the successor chain terminates because there is not another JOB successor call.

24 - Terminates the run-time parameters.

DEVICE ASSIGNMENT

◆ Devices may be assigned to program files by the operator via the console typewriter. When this method of device assignment is employed, the following typeout occurs:

Typeout: Y progname 011GA ASSGN symbolic-device-name

Response: YΔ mn [,wc] [,W]

YΔNO

Where: mn = Installation mnemonic device (two bytes).

wc = Write control byte for seven-level tapes. (See table 2-2 for codes.)

W = Wait indicator. This causes a program to wait temporarily until the specified device is available. This device is already being used by a program that is running.

NO = This is used to indicate that an optional file is not present.

Notes:

1. The write control byte is given in the form of two EBCDIC characters representing the Write Control Code shown in table 2-2.

2. If this reply is given for a file that was not defined as being optional, the program is terminated.

**PROGRAM
IDENTIFICATION
NUMBER**

◆ Each time a program is successfully loaded, it is assigned a one-digit program identification number by the Executive. This program retains this identifier until it is terminated. This number is used to identify the program to the Executive for communication between the program and the operator.

PROGRAM IDENTIFICATION NUMBER (Cont'd)

The identifier codes range from 7 to 1 and are assigned at program initiation. These identifier codes are assigned to programs based on the order in which the programs are loaded. The operator is informed of the assigned program identifier code by the following typeout, which occurs immediately after a program has been successfully initiated:

Typeout: V program 02Ln or V program 02Ln hhmss

Where:

n = Program identifier code (one digit - 7 to 1).

Notes:

1. The program identifier code is not the same as the priority number assigned to the program at program initiation.
2. The second form of the message appears if the Elapsed Time Clock is specified to the Systems Generator. The hhmss is the Time of Day in hours, minutes, and seconds.

TYPEOUTS

◆ This section describes the two standard typeout formats used by the Tape/Disc Operating System to communicate with the operator. The first 15 or 17 positions of the typeouts are standard with each programming component identified by a unique code (item id of the typeout). The standard typeout format and each item's associated values are presented below. The remainder of this section contains individual typeout messages, oriented by type of device. For ease of reference, the typeout format is repeated for each device type.

The first portion of the standard TDOS typeout formats are as follows:

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Contents	i	Δ	p	p	p	p	p	p	Δ	i	d	c	c	A	Δ

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Contents	i	Δ	n	Δ	p	p	p	p	p	p	Δ	i	d	c	c	A	Δ

i Δ n Δ pppppp Δ idcc $\begin{bmatrix} A \\ \Delta \end{bmatrix}$ Δ mn Δ [device mode] CSSDB1B2B3FB Δ text

Where:

i - Program Identification Code (one byte).

Δ - Space (one byte).

n - Program Number as defined in the Program Table (one byte).

pppppp = Program name (1 to 6 bytes).

id = Component ID (two bytes).

cc = Error Code (two bytes).

A or Δ = A specifies operator response required.

TYPEOUTS
(Cont'd)

1 - The program is terminated and marked with unrecoverable error.
The reason '16' is set if the bit 7:3 in CCB is not set.

0 - Retry the I/O.

^ Specifies no operator response required.

mn = Installation mnemonic.

device = Name of device (TAPE, PUNCH, etc.).

mode = Mode of operation such as R for reading, W for writing. Present only where applicable.

CS* = Channel status byte.

SD* = Standard device byte.

B1* = Sense Byte 1.

B2* = Sense Byte 2.

B3* = Sense Byte 3.

FB* = Executive Flag Byte.

*Does not apply to tape write error recovery.

text - can be one of the following: (Executive Error Recovery only).

CHAN INOP - Channel Inoperable at Condition Code 3.

CHAN CONTROL CK - Channel Control Check set in CSB.

CHAN DATA CK - Channel Data Check set in CSB (at I/O termination only).

DEV INOP - Device inoperable set in SDB.

HARDWARE MALF - Hardware malfunction or sense information lost.

**Program
Identification
Code**

i^n^ppppp^idccA	Programming Component
i	
R	MCP Error Recovery Overlay.
T	Resident Executive.
U	Monitor.
V	Executive Program Control (LPOV).
W	CUP Error Recovery Overlay.
X	User Error Recovery Overlay.
Y	Executive Overlay.
Z	Console Request.

Program Name

nΔppppppΔidccA pppppp	Programming Component
DUP	Tape Duplicate
FORTRN	FORTRAN
LLT	Load Library to Tape
LLU	Load Library Update
LNKEDT	Linkage Editor
MCDF	Multi-Channel Communications Disc Formatting
MCDSF	Multi-Channel Communications Disc Snapshot Formatter
MCP	Multi-Channel Communications
MLU	Macro Library Update

Program Number

iΔnΔppppppΔidccA	Programming Component	
n		
1 2 3 4 5	} *User Program Numbers Assigned by Executive.	
6		User Program Number Assigned by Executive or CUP number if communications is in the System.
7		MCP.

*A program number is assigned to each program that is loaded. This number is used to identify the program to the Executive for communication between the program and the operator. Program numbers are assigned on the basis of the order in which programs are loaded, with 6 being the first program number assigned in a noncommunication system. In a communication system, 6 is assigned to the CUP program, and the other programs are assigned from 5 to 1. Five is assigned to the first program loaded.

Program Name

nΔppppppΔidccA	Programming Component
pppppp	
program	User Program Name
CONSOL	Executive Console Control
MON	Executive
MONSNP	Executive
RSEXEC	Executive
ASSMBL	Assembler
CARDCK	70/568 Magazine Card Check
CDCONV	Card Convert
CDPR	Card to Printer/Punch
CDRA	Card to Random Access
CDTP	Card to Tape
CLTR	Call Library Transcriber
CLU	COBOL Library Update
COBOL	COBOL
DDRL	Disc/Drum Dump and Reload
DIAGDG	Test Data Generator
DUMPRT	Executive Memory Print

Program Name
(Cont'd)

nAppppppΔidccA	Programming Component
PPPPPP	
OMLU	Object Module Library Update
PRGTRN	Program Library Transcriber
RAALLR	Random Access Storage Allocator
RAEDIT	Random Access Edit
RAINDX	Random Access Index Edit
RAINIT	Random Access Volume Initializer
RAMSUP	70/568 Service Program
RAPR	Random Access to Printer/Punch
RARA	Random Access to Random Access
RATP	Random Access to Tape
RPG	Report Program Generator
SLU	Source Library Update
SRTGEN	Sort/Merge
SYSGEN	System Generator
TDSAID	Automatic Integrated Debugging System
TPCOMP	Tape Compare
TPEDIT	Tape Edit
TPINIT	Tape Volume Initializer
TPMAIN	Tape File Maintenance
TPPR	Tape to Printer/Punch
TPRA	Tape to Random Access
TPTP	Tape to Tape
TSTCUP	Communications Test Package

Component Identification
(Cont'd)

nΔppppppΔidccA	Programming Component	Page Reference *
id		
10	Load Library Update	9-5
13	Self-Loading Memory Print	7-2
14	Tape Edit	7-8
16	Snapshot	7-3
17	Index-Sequential Logging	2-111
18	RADAR	9-69
20	Tape-to-Tape	8-11
22	Card-to-Tape	8-4
24	Card-to-Printer/Punch	8-7
26	Tape-to-Printer/Punch	8-13
27	Tape Volume Initializer	8-1
28	Tape Compare	7-10
29	Magazine Card Check	7-24
30	70/568 R/A Volume Initializer	8-16
31	R/A Storage Allocator	9-33
32	COBOL	5-10
33	FORTTRAN	5-13
34	Tape File Maintenance	9-29
35	Object Module Library Update	9-1
36	Macro Library Update	9-18
37	Disc/Drum Dump and Reload	9-54
38	Card-to-R/A	8-19
39	Tape-to-R/A	8-23
40	Load Library to Tape	9-67
41	R/A-to-Printer/Punch	8-33
42	R/A-to-Tape	8-30
43	R/A-to-R/A	8-27
44	Self-Loading Tape Edit	7-6
45	Random Access Edit	7-22
46	Test Data Generator	7-13

*Reference page for applicable programming component typeout.

**ERROR RECOVERY
TYPEOUTS**

◆ The following pages contain the error recovery messages for all devices supported by TDOS Error Recovery. In most cases, a response of 0 or 1 are the only responses accepted by error recovery:

0*- Retry the I/O

1 - Return control to the program after setting the unrecoverable error bit. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.

Entering an invalid response causes the following message typeout:

010nA YY INVALID RESPONSE

**MACHINE FAILURE
TYPEOUTS**

Message	Meaning	Action	Response
Machine Failure/ P/PS/aaaa	Machine check has occurred. The processor is set to idle in P4.	Reinitiate system.	None

Legend:

P = The program indicator from the ISR (0, 1, 2, or 3).

S = The state that was interrupted.

aaaa = The p-counter of the interrupted state.

**PURGE STANDARD
TYPEOUTS**

◆ Standard typeouts from the PURGE Macro used by all software components:

Message	Meaning	Action	Response
nΔppppppΔ			
nnP1A xx PD hdr labelid yyyyy	Unexpired purge date in HDR label on output tape.	Deallocate device; retry purge.	R
		Terminate and dump.	T
		Override purge date check; purge output tape.	I

Legend:

nn = component prefix.

xx = device number.

yyyyy = purge date in HDR label.

*A 0 response is not valid for magnetic tapes when message text is DEV INOP and condition code - 0 in Executive Flag Byte.

**PURGE STANDARD
TYPEOUTS
(Cont'd)**

Message nΔpppppΔ	Meaning	Action	Response
nnP2A xx EX exec bootstrap id	Executive boot- strap sensed as first record on output tape device. Output tape con- sidered as invalid for use as an out- put tape.	Deallocate device; retry purge.	R
		Terminate and dump.	T
		Ignore executive boot- strap record and write a standard label set to output tape.	I
nnP3A xx AB	Abnormal termin- ation indicator sensed while writing a label to the output tape noted.	Deallocate device; retry purge.	R
		Terminate and dump.	T
		Ignore error and con- tinue processing. *	I
nnP4A xx UE	Unrecoverable error occurred on the tape device noted.	Deallocate device; retry purge.	R
		Terminate and dump.	T
		Input device; Unwind TM to position tape. Output device: Rewind to BT and write standard label set. **	I
nnP5A xx AB	TM/MTA has been recognized on tape xx.	Deallocate device; retry purge.	R
		Terminate and dump.	T
		Ignore and continue (tape may be mispositioned).	I
nnP6A xx AB	BT/MTA has occurred on tape xx.	Deallocate device; retry purge.	R
		Terminate and dump.	T
		Ignore and continue. This signal will probably be repeated each time tape is rewound and reused.	I

*It must be noted, that if the option to continue is requested by the operator, the output tape produced will most likely be unusable as generated due to the BT/ET indicator encountered while writing to the output tape.

**Tape will be mispositioned if read error occurred on the TM following the VOL, HDR.

Legend: nn = component prefix.
 xx = device number.
 yyyyy = purge date in HDR label.

Component Identification
(Cont'd)

nΔppppppΔidccA	Programming Component	Page Reference *
id		
47	Self-Loading R/A Edit	7-20
48	Automatic Integrated Debugging System (AIDS)	6-1
49	Random Access Index Edit	9-36
50-52	File Control Processor - Standard	2-93
53-55	File Control Processor - Random Access	2-100
56	COBOL Library Updata	9-23
57	System Tape Generator	4-3
58	Program Library Transcriber	11-2
59	Call Library Transcriber	11-6
60	Reserved for future use	
61	Source Library Update	9-37
62-66	Reserved for future use	
67	Autoform	**
68	70/568 Service Program	9-37
69	Reserved for future use.	
70	CCM Configurator	**
71	Communications Test Package and Card Convert.	12-1
72 & 73	1401 Emulator	**
74 & 75	1440 Emulator	**
76	1401 Emulator	**
77	1410 Emulator	**
78	301 Emulator	**
79	501 Emulator	**
80-99	Available to users	

*Reference page for applicable programming component typeout.
 **To be supplied.

Message Code

◆ Refer to the individual typeouts throughout the guide for the appropriate message code.

Operator Response

◆ Refer to the individual typeouts throughout the guide for the operator response codes and their appropriate meanings.

TAPE READ TYPEOUTS

◆ Format: n pppppp 000XA mn TAPE R CSSDB1,B2,B3,FB

Message	Meaning	Action	Response
000CA mn TAPE R	A condition code of 3 was returned for an error recovery I/O message. This indicates a selector not attached to the system was specified, or an inoperable device. Device was in local.	Retry the operation.	0
		Return control to the program.	1
000HA mn TAPE R	A program check, protection check, channel control check, first sense byte equal to zero device not inoperable on condition code 1, or device inoperable during execution occurred while performing an error recovery I/O command, or user program reads reverse into BT.	Return control to the program.	0 or 1
000MA mn TAPE R	A magnetic tape alarm (short or noise block) was detected while error recovery was trying to recover from an error.	Continue. (It is possible that a block has been lost)	0
		Return control to the program.	

Legend:

mn = Installation mnemonic.
 CS = Channel Status Byte.
 SD = Standard Device Byte.
 B1, B2, B3 = Sense Bytes 1, 2, and 3.
 FB = Executive Flag Byte.

TAPE READ TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
000NA mn TAPE R	Invalid information has been detected on tape during a read reverse into BT. Also, BT sensed as result of re-wind of one block.	Return Control to program w/abnormal termination bit set.	0
		Return Control to program w/unrecoverable bit set.	1
0001A mn TAPE R	Illegal operation sent to a tape station while reading.	Terminate the program by setting unrecoverable error bit.	0 or 1
0002A mn TAPE R	Channel data check. Error Recovery has retried unsuccessfully.	Retry error recovery.	0
		Return Control to program.	1
0004A mn TAPE R	Magnetic tape alarm (noise and short block) Error recovery has attempted to read a good block 25 times (blocks less than 12 bytes are discarded).	Retry error recovery.	0
		Return control to the program.	1
0006A mn TAPE R	Service request not honored. Error recovery has attempted to reread the block 25 times.	Retry error recovery.	0
		Return control to the program.	1

Legend: mn = Installation mnemonic.
 CS = Channel Status Byte.
 SD = Standard Device Byte.
 B1, B2, B3 = Sense Bytes 1, 2, and 3.
 FB = Executive Flag Byte.

TAPE READ TIMEOUTS
(Cont'd)

Message	Meaning	Action	Response
0008A mn TAPE R	Read error. Error recovery has attempted to reread with error correction 25 times.	Retry error recovery.	0
		Return control to the program.	1
0009A mn TAPE R	Inoperable. The device was inoperable when an I/O was initiated by error recovery.	Retry the I/O operation.	0
		Return control to the program.	1

Legend:

- mn = Installation mnemonic
- CS = Channel Status Byte
- SD = Standard Device Byte
- B1, B2, B3 = Sense Bytes 1, 2, and 3
- FB = Executive Flag Byte

TAPE WRITE TYPEOUTS

◆ Format: n pppppp 000XA mn TAPE W

Message	Meaning	Action	Response
000CA mn TAPE W	A condition code of 3 was returned for an error recovery I/O command. This indicates a selector not attached to the system was specified, or an inoperable device. Device was in local.	Retry the operation	0
		Return control to the program.	1
000HA mn TAPE W	A program check protection check, channel data check, channel control check, first sense byte equal to zero or device inoperable occurred on an error recovery I/O command.	Return control to the program.	0 or 1
000MA mn TAPE W	A magnetic tape alarm (short or noise block) was detected while re-winding a block following a read-after-write alarm.	Return control to the program.	1
		Retry the operation with possibility of losing valid block of information.	0
0002A mn TAPE W	Illegal operation when a Write command was sent to a tape station.	Retry the I/O operation (if the tape does not contain a ring, the operator should correct the condition).	0
		Return control to the program.	1
0005A mn TAPE W	Transmission parity. Error Recovery has attempted to rewrite the block 25 times.	Retry error recovery.	0
		Return control to the program.	1
0006A mn TAPE W	Service request not honored. Error recovery has attempted to rewrite the block 25 times.	Retry error recovery.	0
		Return control to the program.	1

Legend:

mn = Installation mnemonic.
 CS = Channel Status Byte.
 SD = Standard Device Byte
 B1, B2, B3 = Sense Bytes 1, 2, and 3
 FB = Executive Flag Byte

TAPE WRITE TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
0008A mn TAPE W	Read after write error. Error recovery has attempted to rewrite the block 25 times.	Retry error recovery.	0
		Return control to the program.	1
0009A mn TAPE W	Inoperable. The device was inoperable when an I/O was initiated by error recovery.	Retry the I/O operation.	0
		Return control to the program.	1

Legend:

- mn = Installation mnemonic.
- CS = Channel Status Byte.
- SD = Standard Device Byte
- B1, B2, B3 = Sense Bytes 1, 2, and 3.
- FB = Executive Flag Byte

CARD PUNCH TYPEOUTS
(70/236,1402, and
2540)

◆ Format: n pppppp 000XA PUNCH mn CSSDB1,B2,B3,FB

Message	Meaning	Action	Response
000DA PUNCH mn	Secondary Indicator is set, but no bits are set in the first sense byte.	Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	0 or 1
000EA PUNCH mn	Condition code 1 is set and the device is not inoperable on the initiation of an error recovery I/O.	Same as above.	Same
000FA PUNCH mn	The secondary indicator is set and the bits set in the first sense byte are invalid.	Same as above	Same
000HA PUNCH mn	A program check, protection check, channel data check, or channel control check alarm occurred on an error recovery I/O command.	Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	0 or 1
0001A PUNCH mn	Illegal operation attempted to Punch mn.	Terminate the program.	0 or 1

Legend:

mn = Installation mnemonic.
CS = Channel Status Byte.
SD = Standard Device Byte
B1, B2, B3 = Sense Bytes 1, 2, and 3.
FB = Executive Flag Byte

CARD PUNCH TYPEOUTS
(70/236, 1402, and
2540)
(Cont'd)

Message	Meaning	Action	Response
0002A PUNCH mn	The HOLD switch on the operators panel was pressed.	Retry the I/O operation. The operator must remove the hold condition.	0
		Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	1
0003A PUNCH mn	Intervention required. This condition can be caused by empty hopper, full stacker, or full chip box.	Correct the condition and continue processing.	0
		Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	1
0004A PUNCH mn	Punch memory parity error. Error recovery attempted to re-punch card 10 times.	Retry error recovery another 10 times.	0
		Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	1

Legend:

mn = Installation mnemonic.
CS = Channel Status Byte.
SD = Standard Device Byte
B1, B2, B3 = Sense Bytes 1, 2, and 3.
FB = Executive Flag Byte

**CARD PUNCH TYPEOUTS
(70/236,1402, AND
2540)
(Cont'd)**

Message	Meaning	Meaning	Response
0005A PUNCH mn	Transmission parity error. Error recovery has attempted to repunch the card 10 times.	Retry error recovery another 10 times.	0
		Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	1
0006A PUNCH mn	Punch compare error. Error recovery has attempted to repunch the current card and the back-up area 10 times.	Retry error recovery another 10 times.	0
		Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	1
0007A PUNCH mn	A condition code of 2 has occurred on the initiation of an error recovery I/O. Error recovery has tried to repunch the card 10 times.	Retry error recovery another 10 times.	0
		Return control to the program. If the program's Accept unrecoverable bit is not set to 1, the program is terminated.	1

Legend:

mn = Installation mnemonic.
CS = Channel Status Byte.
SD = Standard Device Byte
B1, B2, B3 = Sense Bytes 1, 2, and 3.
FB = Executive Flag Byte

CARD PUNCH TYPEOUTS
(70/236,1402, AND
2540)
(Cont'd)

Message	Meaning	Action	Response
0008A PUNCH mn	A condition code of 3 has occurred for an error recovery I/O command. Indicates an erroneous selector was specified or device controller inoperable. Punch in LOCAL.	Retry error recovery.	0
		Return control to program.	1
00009A PUNCH mn	Inoperable. The device was inoperable when an I/O was initiated by error recovery.	Retry the current I/O operation.	0
		Return control to the program.	1
		Retry the I/O condition punching previous card as well as current card.	3

Legend:

mn = Installation mnemonic.
CS = Channel Status Byte.
SD = Standard Device Byte
B1, B2, B3 = Sense Bytes 1, 2, and 3.
FB = Executive Flag Byte

**CARD PUNCH TYPEOUTS
(70/234)**

◆ Format: m pppppp 000XA 234 PUNCH mn CSSDB1,B2,B3,FB

Message	Meaning	Action	Response
000DA 234 PUNCH mn	The secondary indicator in the standard device byte was set in the first sense byte.	This condition is unrecoverable. Terminate the program.	0 or 1
000EA 234 PUNCH mn	Condition code 1 is set and the device is not inoperable on the initiation of an error recovery I/O.	This condition is unrecoverable. Terminate the program.	0 or 1
000FA 234 PUNCH mn	The secondary indicator in the standard device byte is set, and the only bits set in the first sense byte are invalid.	This condition is unrecoverable. Terminate the program.	0 or 1
000HA 234 PUNCH mn	A program check, protection check, Channel data check, or channel control check alarm occurred on an error recovery I/O command.	This condition is unrecoverable. Terminate the program.	0 or 1
0001A 234 PUNCH mn	Illegal operation sent to a 70/234 card punch.	Terminate the program.	0 or 1
0002A 234 PUNCH mn	The HOLD button was depressed.	Retry the I/O operation. The operator must remove the HOLD condition.	0
		Return control to the program. If the program's Accept Unrecoverable Error bit is not set to 1, the program is terminated.	1

Legend: mn = Installation mnemonic.
CS = Channel Status Byte.
SD = Standard Device Byte.
B1, B2, B3 = Sense Bytes 1, 2, and 3.
FB = Executive Flag Byte.

CARD PUNCH TYPEOUTS
(70/234)
(Cont'd)

Message	Meaning	Action	Response
0003A 234 PUNCH mn	Intervention re- quired. This con- dition can be caused by empty hopper, full stacker, or full chip box.	Correct the condition and continue pro- cessing.	0
		Return control to the program. If the program's Accept Unrecover- able Error bit is not set to 1, the pro- gram is terminated.	1
0004A 234 PUNCH mn	Punch Memory Parity Error has occurred.	Retry the I/O operation. (The operator must clear the punch and remove the last two cards from the stacker)	0
		Return control to the program. If the program's Accept Unrecoverable Error bit is not set to 1, the program is terminated.	1
0005A 234 PUNCH mn	Transmission parity error. Error Recovery has attempted to repunch the card 10 times.	Retry error re- covery.	0
		Return control to the program. If the program's Accept Unrecover- able Error bit is not set to 1, the program is ter- minated.	1

Legend:

mn = Installation mnemonic.
CS = Channel Status Byte.
SD = Standard Device Byte
B1, B2, B3 = Sense Bytes 1, 2, and 3.
FB = Executive Flag Byte

CARD PUNCH TYPEOUTS
(70/234)
(Cont'd)

Message	Meaning	Action	Response
0006A 234 PUNCH mn	Punch Compare Error has occurred.	Retry the I/O operation. (The operator must clear the punch and remove the last two cards from the stacker.)	0
		Return control to the program. If the program's Accept Unrecoverable Error bit is not set to 1, the program is terminated.	1
0007A 234 PUNCH mn	A condition code of 2 has occurred on initiation of an error recovery I/O and standard roll-back attempted unsuccessfully.	Retry the I/O operation. (The operator must clear the punch and remove the last two cards from the stacker.)	0
		Return control to the program. If the program's Accept Unrecoverable Error bit is not set to 1, the program is terminated.	1

Legend:

mn = Installation mnemonic.
CS = Channel Status Byte.
SD = Standard Device Byte
B1, B2, B3 = Sense Bytes 1, 2, and 3.
FB = Executive Flag Byte

CARD PUNCH TYPEOUTS
(70/234)
(Cont'd)

Message	Meaning	Action	Response
0008A 234 PUNCH mn	A condition code of 3 was returned for an error recovery I/O command. This indicates a selector not attached to the system was specified or an inoperable device controller was specified.	If device is in "LOCAL" mode, place in "REMOTE" and retry I/O.	0
		Return control to the program. If the program's Accept Unrecoverable Error bit is not set to 1, the program is terminated.	1
0009A 234 PUNCH mn	Inoperable. The device was inoperable when and I/O was initiated by error recovery.	Retry the current I/O operation.	0
		Return control to the program. If the program's Accept Unrecoverable Error bit is not set to 1, the program is terminated.	1

Legend:

mn = Installation mnemonic.
CS = Channel Status Byte
SD = Standard Device Byte
B1, B2, B3 = Sense Bytes 1, 2, and 3.
FB = Executive Flag Byte

**PRINTER TYPEOUTS
(Cont'd)**

Message	Meaning	Action	Response
0003A PRINTER	End of forms. Low paper has been detected.	To continue printing to the end of the page, press the SINGLE FORMS button on the operator console. Note: When the message is typed out the second time, a paper-out condition exists and new paper must be supplied.	0
		Return control to the program. If the pro- gram Accept unre- coverable error bit is not set to 1, the program is terminated.	1

Legend: mn = Installation mnemonic.
 CS = Channel Status Byte.
 SD = Standard Device Byte
 B1, B2, B3 = Sense Bytes 1, 2, and 3.
 FB = Executive Flag Byte

PRINTER TYPEOUTS

◆ Format: m pppppp 000XA PRINTER mn CSSDB1B2B3FB

Message	Meaning	Action	Response
0001A PRINTER	Illegal Operation sent to the printer.	There are three errors which cause this condition:	0 or 1
		1. Failure to depress the TOP OF FORM's button when the paper tape loop is changed.	
		2. The paper tape loop is not installed when paper movement is under its control.	
		3. An illegal CCW command is issued.	1
		The first two errors are recoverable, when a message response of mΔ0 is given. The third error is unrecoverable and the message response must be mΔ1. This response causes the unrecoverable error bit to be set in the executive flag byte.	
0002A PRINTER	The HOLD switch on the operator panel is on.	Retry the I/O operation. The operator must remove the hold condition.	0
		Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	1

Legend: mn = Installation mnemonic.
 CS = Channel Status Byte.
 SD = Standard Device Byte.
 B1, B2, B3 = Sense Bytes 1, 2, and 3.
 FB = Executive Flag Byte.

PRINTER TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
0004A PRINTER	Print line incomplete. This condition can be caused by a blown fuse or circuit breaker, yoke interlock open, stacker malfunction, invalid character sent to the printer hammers or inoperable buffer at load time. Error recovery has attempted to re-print the line 3 times.	Retry error recovery. (The operator should correct the condition.)	0
		Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	1
0005A PRINTER	Channel Data Check error has occurred.	Retry the operation.	0
		Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	1
0006A PRINTER	Channel Control Check error has occurred.	Retry the operation.	0
		Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	1

Legend:

- mn = Installation mnemonic.
- CS = Channel Status Byte.
- SD = Standard Device Byte
- B1, B2, B3 = Sense Bytes 1, 2, and 3.
- FB = Executive Flag Byte

PRINTER TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
0007A PRINTER	A condition code of 2 was returned for an error recovery I/O command. This indicates the channel or controller was busy or that a termination interrupt is pending. Error recovery has attempted to retry the I/O command 3 times.	Retry the operation 3 more times.	0
		Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	1
0008A PRINTER	Inoperable with condition code 0 (ribbon rewind point reached when ribbon push-button has been pressed, or forms check).	Retry the operation.	0
		Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	1
0009A PRINTER	Inoperable with condition code 1.	Retry the operation.	0
		Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	1

Legend:

mn = Installation mnemonic.
 CS - Channel Status Byte.
 SD - Standard Device Byte.
 B1,B2,B3 = Sense Bytes 1, 2, and 3.
 FB = Executive Flag Byte

PRINTER TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
000CA PRINTER	A condition code of 3 was returned for an error recovery I/O command. This indicates a selector not attached to the system was specified, or an inoperable device. Device was in local.	Retry the operation	0
		Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	
000HA PRINTER	A program check protection check, channel data check, or channel control check alarm occurred on an error recovery I/O command, or if condition code 1 is given and the device does not appear inoperable.	Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	0 or 1
000SA	Sense information lost during printer error recovery.	Return control to the program. If the program's accept unrecoverable bit is not set to 1, the program is terminated.	0 or 1.

Legend: mn = Installation mnemonic.
 CS = Channel Status Byte.
 SD = Standard Device Byte.
 B1, B2, B3 = Sense Bytes 1, 2, and 3
 FB = Executive Flag Byte

**PAPER TAPE
READER/PUNCH
TYPEOUTS**

◆ Format: n pppppp 000XA PTR/P $\left. \begin{array}{l} \text{Punching} \\ \text{Reading} \end{array} \right\} mn \text{ CSSDB1, B2, B3, FB}$

Message	Meaning	Action	Response
0001A PTR/P PUNCHING READING	Illegal operation sent to the paper tape punch.	Return control to the program. If the program's Accept Unrecoverable error bit is not set to 1, the program is terminated.	0 or 1
0002A PTR/P PUNCHING READING	The HOLD switch on the operator console is on.	Retry the I/O operation.	0
		Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	1
0003A PTR/P PUNCHING READING	A Channel Control Check error has occurred.	Retry the I/O operation. (NOTE: If error occurred during reading, the tape should be moved back to the gap before responding. If error occurred during punching, the tape should be moved back to the gap and if any punching took place, the punched data must be deleted before responding.)	0
		Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	1

Legend: mn = Installation mnemonic.
CS = Channel Status Byte.
SD = Standard Device Byte
B1, B2, B3 = Sense Bytes 1, 2, and 3.
FB = Executive Flag Byte

**PAPER TAPE
READER/PUNCH
TYPEOUTS**
(Cont'd)

Message	Meaning	Action	Response
0004A PTR/P PUNCHING READING	Inoperable with condition code 0.	Retry the I/O operation. (NOTE: If error occurred during reading, the tape should be moved back to the gap before responding. If error occurred during punching, the tape should be moved back to the gap and if any punching took place, the punched data must be deleted before responding.	0
		Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	1
0005A PTR/P PUNCHING READING	Intervention required. This condition can be caused by no tape, tight tape, mechanical failure, or electrical failure.	Retry the I/O operation. (NOTE: If error occurred during reading, the tape should be moved back to the gap before responding. If error occurred during punching, the tape should be moved back to the gap and if any punching took place, the punched data must be deleted before responding.	0
		Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	1

**PAPER TAPE
READER/PUNCH
TYPEOUTS**
(Cont'd)

Message	Meaning	Action	Response
0006A PTR/P PUNCHING READING	Service request not honored.	Retry the I/O operation. (NOTE: If error occurred during reading, the tape should be moved back to the gap before responding. If error occurred during punching, the tape should be moved back to the gap and if any punching took place, the punched data must be deleted before responding.	0
		Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	1
0007A PTR/P PUNCHING READING	A condition code 2 has occurred on an error recovery I/O.	Retry the I/O operation 3 more times.	0
		Return control to the program. If the program's Accept unrecoverable bit is not set to 1, the program is terminated.	1
0008A PTR/P PUNCHING READING	Parity Error	Retry the I/O operation. (NOTE: If error occurred during reading, the tape should be moved back to the gap before responding. If error occurred during punching, the tape should be moved back to the gap and if any punching took place, the punched data must be deleted before responding.	0

**PAPER TAPE
READER/PUNCH
TYPEOUTS**
(Cont'd)

Message	Meaning	Action	Response
		Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	1
0009A PTR/P PUNCHING READING	Inoperable. The device was inoperable when an I/O was initiated by error recovery. (Condition code 1)	Retry the I/O operation.	0
		Return control to the program. If the program's Accept unrecoverable bit is not set to 1, the program is terminated.	1
000BA PTR/P PUNCHING READING	A channel data check error has occurred.	Retry the I/O operation. (NOTE: If the error occurred during reading, the tape should be moved back to the gap before responding. If error occurred during punching, the tape should be moved back to the gap and if any punching took place, the punched data must be deleted before responding.	0
		Return control to the program. If the program's Accept unrecoverable bit is not set to 1, the program is terminated.	1

*Paper Tape
Reader/Punch
Typeouts*

**PAPER TAPE
READER/PUNCH
TYPEOUTS**
(Cont'd)

Message	Meaning	Action	Response
000CA PTR/P PUNCHING READING	A condition code of 3 was returned for an error recovery I/O command. This indicates a selector not attached to the system was specified, or an inoperable device. Device was in local.	Retry the operation.	0
		Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	1
000DA PTR/P PUNCHING READING	A low tape condition has occurred.	Correct the low tape condition and continue processing.	0
		Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	1
000HA PTR/P mn PUNCHING	A program check, protection check, channel data check, or channel control check alarm occurred on an error recovery I/O command.	Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	0 or 1

Legend: mn = Installation mnemonic.

**CARD READER
TYPEOUTS**

◆ Format: m pppppp 000XA READER mn CSSDB1B2B3FB

Message	Meaning	Action	Response
0001A READER	Illegal operation sent to the card reader.	Terminate the program.	0 or 1
0002A READER	The HOLD switch on the operator's panel is on.	Retry the I/O operation. The operator must remove the hold condition.	0
		Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	1
0003A READER	Stacker selection too late.	Return control to the instruction following the stacker selection instruction.	0
		Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	1
0004A READER	End of file.	Return control to the program with an abnormal termination.	0
		Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	1
		Return control to the program with a normal termination.	2

Legend: mn = Installation mnemonic.
 CS = Channel Status Byte.
 SD = Standard Device Byte.
 B1,B2,B3 = Sense Bytes 1, 2, and 3.
 FB = Executive Flag Byte.

**CARD READER
TYPEOUTS
(Cont'd)**

Message	Meaning	Action	Response
0005A READER	Invalid punch code.	Retry the I/O operation. (The operator must place the card that is in the reject stacker back into the hopper.)	0
		Return control to the program. If the program's Accept unrecoverable bit is not set to 1, the program is terminated.	1
0006A READER	Service request not honored.	Retry the I/O operation. (The operator must place the last card in the reject stacker back into the hopper).	0
		Return control to the program. If the program's Accept unrecoverable bit is not set to 1, the program is terminated.	1
0007A READER	A condition code of 2 was returned for an error recovery I/O command which was attempted 10 times.	Retry the I/O operation.	0
		Return control to the program. If the program's Accept unrecoverable bit is not set to 1, the program is terminated.	1
0008A READER	Read error.	Retry the I/O operation again. (The operator must place the last card in the reject stacker back into the hopper.)	0
		Return control to the program. If the program's Accept unrecoverable bit is not set to 1, the program is terminated.	1

Legend: mn = Installation mnemonic.
 CS = Channel Status Byte.
 SD = Standard Device Byte.
 B1,B2,B3 = Sense Bytes 1, 2, and 3
 FB = Executive Flag Byte

**CARD READER
TYPEOUTS
(Cont'd)**

Message	Meaning	Action	Response
0009A READER	Inoperable. The device was inoperable when an I/O was initiated by error recovery.	Retry the I/O operation.	0
		Return control to the program. If the program's Accept unrecoverable bit is not set to 1, the program is terminated.	1
000BA READER	A condition code of 3 was returned for an error recovery I/O command. This indicates a selector not attached to the system was specified, or an inoperable device. Device was in local.	Retry the operation.	0
		Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	1
000CA READER	A channel data check occurred on an error recovery I/O command.	Retry the I/O operation. (The operator must place the card that is in the reject stacker back into the hopper.)	0
		Return control to the program. If the program's Accept unrecoverable bit is not set to 1, the program is terminated.	1
000DA READER	The secondary indicator is set and no bits are set in the first sense byte.	Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	0 or 1

Legend:

- mn = Installation mnemonic.
- CS = Channel Status Byte.
- SD = Standard Device Byte.
- B1, B2, B3 = Sense Bytes 1, 2, and 3.
- FB = Executive Flag Byte.

**CARD READER
TYPEOUTS
(Cont'd)**

Message	Meaning	Action	Response
000FA READER	The secondary indicator is set and the only bit set in the first sense byte is invalid.	Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	0 or 1
000HA READER	A program check, protection check, or channel control check alarm occurred on an error recovery I/O command.	Return control to the program. If the program's Accept unrecoverable error bit is not set to 1, the program is terminated.	0 or 1

Legend: mn = Installation mnemonic.
 CS = Channel Status Byte.
 SD = Standard Device Byte.
 B1, B2, B3 = Sense Bytes 1, 2, and 3.
 FB = Executive Flag Byte.

Pages 2-45 thru 2-66 have been deleted by
Revision 3, dated August, 1968.

**RANDOM ACCESS
ERROR RECOVERY
TYPEOUTS**

◆ The Random Access Error Recovery typeout format is as follows:

00xyA mn 112233 hhΔ ccc ttt m

The x position denotes the command on which the failure occurred:

- 0 - Seek command
- 2 - Search command
- 3 - Set file mask command
- 4 - Read command
- 5 - Other X'07' type or invalid command
- 6 - WRITE command

The y position denotes sense data from the failure:

- 0 - Command code reject and file protect
- 1 - Count field parity error or seek check
- 2 - Invalid sequence
- 3 - Read (read after write) parity error
- 4 - Command code reject
- 5 - Not found and missing markers, or missing markers
- 6 - Command code reject and head switch error
- 7 - Service request not honored
- 9 - Transmission parity error

Legend:

- mn - installation mnemonic
- 11 - hexadecimal equivalent of sense byte 1
- 22 - hexadecimal equivalent of sense byte 2
- 33 - hexadecimal equivalent of sense byte 3
- h - head # of the track on which the error occurred
- ccc - cylinder # of the track on which the error occurred
- ttt - card # of the track on which the error occurred if device is 70/568
- m - magazine # of the track on which the error occurred if device is 70/568

**RANDOM ACCESS
ERROR RECOVERY
TYPEOUTS**
(Cont'd)

Codes not included in the above:

- AL - Unrecoverable error on alternate track
- DE - Unrecoverable error on defective track
- D1 - Unrecoverable error on defective track plus 1
- TC - Unable to trace users chain
- UD - Unmapped defective track
- 06 - Extract counter equal
- 16 - Extract counter equal during error recovery I/O
- 80 - RESTORE has been issued
- 81 - During attempt to check for mispositioning, an error has occurred which prevents further processing
- 86 - No seek at start of users chain
- 88 - Invalid alternate assigned
- 89 - Cannot classify sense data
- 90 - Channel or controller inop, during error recovery I/O
- 91 - Unrecoverable error during error recovery I/O
- 92 - Device inoperable during error recovery I/O

Responses to all the above messages are as follows:

Action	Response
Retry the operation.	0
Return control to program. If the program's Accept Unrecoverable bit is not set to 1, the program is terminated.	1

**EXECUTIVE
TIMEOUTS**

Message nΔppppppΔ	Meaning	Action	Response
0101A mn CHAN INOP	Channel inoperable occurred at Start Device. Condition Code is equal to 3.	Type in the applicable response:	0
		Retry the I/O again.	
		Return control to the program with the unrecoverable error bit set to 1. If the program's Accept unrecoverable bit is not set to 1, the program is terminated.	1
0101A mn CHAN CONTROL CK	Channel control check is set in the Channel Status Byte at Start Device time.	Type in applicable response:	0
		Retry the I/O again.	
		Return control to the program with the unrecoverable error bit set to 1. If the program's Accept unrecoverable bit is not set to 1, the program is terminated.	1
0101A mn DEV INOP	Device inoperable at Start Device time. Note: For magnetic tape, a response of 0 is invalid if cc = 0.	Type in the applicable response:	0
		Retry the I/O again.	
		Return control to the program with the unrecoverable error bit set to 1. If the program's Accept unrecoverable bit is not set to 1, the program is terminated.	1

Legend: mn = installation mnemonic.

**EXECUTIVE
TYPEOUTS**
(Cont'd)

Message	Meaning	Action	Response
n△pppppp△			
0101A mn HARDWARE MALF	Sense information lost at Start Device time or hardware malfunction.	Type in the applicable response:	0
		Retry the I/O again.	
		Return control to the program with the unrecoverable error bit set to 1. If the program's Accept unrecoverable bit is not set to 1, the pro- gram is terminated.	1
0102A mn CHAN INOP	Channel inoperable occurred at I/O ter- mination. Condition Code is equal to 3.	Return control to the program with the unre- coverable error bit set to 1. If the program's Accept unrecoverable bit is not set to 1, the program is terminated.	0 or 1
		Halt program.	HLT
0102A mn CHAN CONTROL CK	Channel control check is set in the Channel Status Byte at I/O termination.	Return control to the program with the unre- coverable error bit set to 1. If the program's Accept unrecoverable bit is not set to 1, the program is terminated.	0 or 1
		Halt program.	HLT

Legend: mn - installation mnemonic

**EXECUTIVE
TYPEOUTS**
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
0102A mn CHAN DATA CK	Channel data check is set in the Channel Status byte at I/O termination.	Return control to the program with the unrecoverable error bit set to 1. If the program's Accept unrecoverable bit is not set to 1, the program is terminated.	0 or 1
		Halt program.	HLT
0102A mn DEV INOP	Device inoperable at I/O termination.	Return the control to the program with the unrecoverable error bit set to 1. If the program's Accept unrecoverable bit is not set to 1, the program is terminated.	0 or 1
		Halt program.	HLT
0102A mn HARDWARE MALF	Sense information lost at I/O termination or hardware malfunction.	Return control to the program with the unrecoverable error bit set to 1. If the program's Accept unrecoverable bit is not set to 1, the program is terminated.	0 or 1
		Halt program.	HLT

Legend: mn - installation mnemonic

**EXECUTIVE
TYPEOUTS**
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
0132	On-line catalog routine was requested and no on-line catalog area was specified at systems generation (SYSGEN) time.	Do a SYSGEN and include an OLC area.	None.
01MR mn EXTERNAL ΔREQUEST ΔPENDING	DXC mn is not assigned to any user on the computer and the connected computer issued a write to the DXC, causing an interrupt.	Type in applicable response: The request will be satisfied by a program the operator will load. The request write is waited until the program is loaded.	0
		The request (write) is terminated and an incompatible write is issued to the other computer, terminating the write.	1

Legend: mn = installation mnemonic.

**EXECUTIVE
TYPEOUTS**
(Cont'd)

Message	Meaning	Action	Response
nΔPPPPPPΔ			
011GA ASSGN symdev	Assign a device to the symbolic device name symdev. Program waits for the device assignment.	Assign a device with mn, wc, W or NO: Installation device mnemonic Optional write control code for seven-level tape. Optional request to wait for a device assigned to another program. Do not assign the requested optional file.	mn wc W NO
011GA ASSGN symdev AGAIN	Invalid device assignment was made. Either the device was already assigned or the assignment was invalid. Program waits for device assignment. The installation mnemonic might not be in the Device List or the CCB and Device List-device class do not match. Note: Installation mnemonic might not be in device list. CCB and DL classes do not match.	Assign a device with mn, wc, W or NO: Installation device mnemonic. Optional write control code for seven-level tape. Optional request to wait for a device assigned to another program. Do not assign the requested optional file.	mn wc W NO
012G MESSAGE IGNORED	The last message typed in is ignored. Processing continues.	Retype message.	None.
0130A MNΔB	Uninitialized Volume on device "mn" and magazine "b".	Continue Terminate	1 0
0131A	END OF OLC	Typeout volumes on line. Terminate.	0 1

Legend: mn - installation mnemonic

EXECUTIVE TYPEOUTS
(Cont'd)

Message nΔpppppΔ	Meaning	Action	Response
02KO mn ident.Δcchh	Checkpoint dump is taken on device mn, cylinder cc, head hh, and the checkpoint identification is ident. Processing continues.	None.	None.
02Ln	Program has been loaded into memory. Processing continues.	None.	None.
02MC	An attempt was made to initiate a Monitor session while one was running. Only one Monitor session may be run at a time. Console request is rejected.	Retry console request when the Monitor session terminates.	None.

Legend: mn - installation mnemonic

**EXECUTIVE
TYPEOUTS**
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
02CC	An attempt is made to load MCP and there is no CIA extension in the Executive.	Do a SYSGEN and include CIA.	None.
	Or an attempt to load CUP and there is no MCP.	Load MCP before loading CUP.	None.
02CM	Changing memory was not possible. Console request is rejected.	Retry console request.	None.
02IA	1) Operator console request designates invalid Load Library device. Either there are already three alternate devices in operation (only two random access and one tape alternate is allowed) or the designated device is not a Load Library. Console request is rejected. 2) While loading system, Load Device not contained in IODS card during SYSGEN.	Retry console request.	None.
02IM	Insufficient memory is available for the program. Console request is rejected.	Retry console request.	None.
02KI	Operator console request has an invalid format or nonnumeric memory is specified. Console request is rejected.	Retry console request.	None.

Legend: mn - installation mnemonic

**EXECUTIVE
TYPEOUTS**
(Cont'd)

Message	Meaning	Action	Response
n△pppppp△			
02RT	Invalid format in run-time parameters or they are not in order. Program is terminated.	Put run-time parameter in order and initiate program again.	None.
02UE	Unrecoverable error loading root load from tape.	Retry console request.	None.

Legend: mn = installation mnemonic.

**EXECUTIVE
TYPEOUTS**
(Cont'd)

Message nΔpppppΔ	Meaning	Action	Response
02NF	The program or console routine cannot be located. Console request is rejected.	None.	None.
02NH	Normal halt (End of Job).	None.	None.
02NP	Operator attempted to multiprogram seven programs. Only six are allowed. Console request is rejected.	If there is enough memory available when a program terminates, retry console request.	None.
02R0A	Type in Restart parameters: mn, CHID [,WC] or mn, CHID , CCHH or RHLT	Type in applicable Restart parameters. Commas must be used if a field is omitted.	
		Installation mnemonic of device containing check-point records.	mn
		Five-byte check-point identification.	CHID
		Optional write control code for seven level tape.	WC
		Disc (or drum) cylinder and head address (in decimal) of where the check-point information is located.	CCHH
		Halt program being restarted.	RHLT
02R1A	Restart successful, but trailer record invalid.	Continue program being restarted.	C
		Halt program being restarted.	RHLT
02Rn	Program has been restarted. n = program number.	None.	None.

Legend: mn = installation mnemonic.

**EXECUTIVE
TYPEOUTS**
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
02WP	The program priority requested in the LOD console request is not available. Another program is already assigned this priority. Console request is rejected.	Retry console request with a different priority.	None.
021GA ASSGN DUMP	Assign a tape to which a dump may be written. Program waits for device assignment. If executing a COBOL Program, I/P record size differs from size of record or wrong recording mode specified in source program.	Assign a device with mn, wc or NO:	mn
		Installation device mnemonic.	
		Optional write control code for seven-level tape.	wc
		Do not assign the requested optional file. The dump will not be taken and the program will terminate.	NO.
021GA ASSGN DUMP AGAIN	Invalid Device assignment was made. Either the device was already assigned or the assignment type in was invalid. Program waits for device assignment.	Type in the applicable response:	mn
		Installation device mnemonic.	
		Do not assign requested optional file. The dump will not be taken and the program will be terminated.	NO
0211	There was a CCB address or instruction error.	Type in the applicable response:	{ U } { E } ΔDUMΔn (See*footnote)
		Dump and halt program.	
		Halt program.	

Legend: mn - installation mnemonic.

*: n - the program number of the program to be halted or dumped.

Note: This is the complete operator response.

You respond with a UΔDUMΔn or UΔHLTΔn if the typeout you are answering was prefixed with a U. If it was prefixed with any other identifier you must respond with EΔDUMΔn or EΔHLTΔn.

EXECUTIVE
TIMEOUTS

(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
0212	There was a Device List address error. The assignment half-word does not address the first byte of a Device List entry which is assigned to this program.	Type in the applicable response:	$\left\{ \begin{array}{l} \text{U} \\ \text{E} \end{array} \right\} \Delta \text{DUM} \Delta n$ (See * footnote)
		Dump and halt program.	
		Halt program.	
0213	An error in the SVC calling sequence. An expected field was invalid.	Type in the applicable response:	$\left\{ \begin{array}{l} \text{U} \\ \text{E} \end{array} \right\} \Delta \text{DUM} \Delta n$ (See * footnote)
		Dump and halt program.	
		Halt program.	
0215	An unrecoverable error occurred on an I/O channel such as data error or protection check error.	Type in the applicable response:	$\left\{ \begin{array}{l} \text{U} \\ \text{E} \end{array} \right\} \Delta \text{DUM} \Delta n$ (See * footnote)
		Dump and halt program.	
		Halt program.	

*: n = the program number of the program to be halted or dumped.

Note: This is the complete operator response.

You respond with a UΔDUMΔn or UΔHLTΔn if the timeout you are answering was prefixed with a U. If it was prefixed with any other identifier you must respond with EΔDUMΔn or EΔHLTΔn.

EXECUTIVE
TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
0216	Device went inoperable after initiation of an I/O or program will not accept unrecoverable I/O errors.	Type in the applicable response:	
		Dump and halt program.	{U} {E}ΔDUMΔn (See * footnote)
		Halt program.	{U} {E}ΔHLTΔn (See * footnote)
0217	An invalid SVC code was issued. The SVC does not exist, or no timer specified during SYSGEN in a communication system, or CMGET or CMPUT issued by non CUP program, or CMINT issued by non MCP program, or PR issued by program other than CUP or MCP.	Type in applicable response:	
		Dump and halt program.	* {U} {E}DUM n
		Halt program.	* {U} {E}HLT n
0218	An invalid interrupt occurred.	Type in the applicable response:	
		Dump and halt program.	{U} {E}ΔDUMΔn (See*footnote)
		Halt program.	{U} {E}ΔHLTΔn (See*footnote)

*: n = program number of the program to be halted or dumped.

Note: This is the complete operator response:

You respond with a UΔDUMΔn or UΔHLTΔn if the typeout you are answering was prefixed with a U. If it was prefixed with any other identifier you must respond with EΔDUMΔn or EΔHLTΔn.

**EXECUTIVE
TYPEOUTS**
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
0219	An unrecoverable program error occurred; such as an invalid operation code or an address error and the program had no STXIT routine.	Type in the applicable response:	$\left\{ \begin{array}{l} U \\ E \end{array} \right\}$ DUM n (See * footnote)
		Dump and halt program.	
		Halt program.	
0220	Unrecoverable error occurred while loading an executive overlay from disc; system is halted.	Type in the applicable response:	$\left\{ \begin{array}{l} U \\ E \end{array} \right\}$ DUM n (See * footnote)
		Dump and halt program.	
		Halt program.	
0221A	Assignment for a required device was NO. A device must be assigned to a required device.	Type in the applicable response:	$\left\{ \begin{array}{l} U \\ E \end{array} \right\}$ DUM n (See * footnote)
		Dump and halt program.	
		Halt program.	
0227	Monitor Sub-processor or successor program cannot be found.	Type in the applicable response:	$\left\{ \begin{array}{l} U \\ E \end{array} \right\}$ DUM n (See * footnote)
		Dump and halt program.	
		Halt program.	

*: n = program number of the program to be halted or dumped.

Note: This is the complete operator response:

You respond with a UΔDUMΔn or UΔHLTΔn if the typeout you are answering was prefixed with a U. If it was prefixed with any other identifier you must respond with EΔDUMΔn or EΔHLTΔn.

**EXECUTIVE
TYPEOUTS**

(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
0228	The load address for a Monitor Subprocessor or successor program is too high.	Type in the applicable response:	$\left. \begin{array}{l} \{U\} \\ \{E\} \Delta DUM \Delta n \\ (See * footnote) \end{array} \right\}$
		Dump and halt program.	
		Halt program.	
0229	An unrecoverable error occurred searching for Program Directory or the Program Directory cannot be found.	Type in the applicable response:	$\left. \begin{array}{l} \{U\} \\ \{E\} \Delta DUM \Delta n \\ (See * footnote) \end{array} \right\}$
		Dump and halt program.	
		Halt program.	
0230	User overlay cannot be loaded because of insufficient memory assigned.	Type in the applicable response:	$\left. \begin{array}{l} \{U\} \\ \{E\} \Delta DUM \Delta n \\ (See * footnote) \end{array} \right\}$
		Dump and halt program.	
		Halt program.	
0232	User overlay cannot be loaded because of insufficient memory assigned.	Type in the applicable response:	$\left. \begin{array}{l} \{U\} \\ \{E\} \Delta DUM \Delta n \\ (See * footnote) \end{array} \right\}$
		Dump and halt program.	
		Halt program.	

*: n = program number of the program to be halted or dumped.

Note: This is the complete operator response:

You respond with a UΔDUMΔn or UΔHLTΔn if the typeout you are answering was prefixed with a U. If it was prefixed with any other identifier you must respond with EΔDUMΔn or EΔHLTΔn.

**EXECUTIVE
TIMEOUTS**
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
0233	Load Directory entry not found for user program segment or user overlay.	Type in the applicable response:	$\left\{ \begin{array}{l} U \\ E \end{array} \right\} \Delta DUM \Delta n$ (See * footnote)
		Dump and halt program.	
		Halt program.	
0235	Unrecoverable error reading user program segment from disc or tape or the device went inoperable while reading a segment.	Type in the applicable response:	$\left\{ \begin{array}{l} U \\ E \end{array} \right\} \Delta DUM \Delta n$ (See * footnote)
		Dump and halt program.	
		Halt program.	
0236	The user load exceeds the memory limit or the FLOAT or FLODR macros are asking to be loaded outside of the program area.	Type in the applicable response:	$\left\{ \begin{array}{l} U \\ E \end{array} \right\} \Delta DUM \Delta n$ (See * footnote)
		Dump and halt program.	
		Halt program.	
0237	Essential Monitor overlay cannot be found.	Type in the applicable response:	$\left\{ \begin{array}{l} U \\ E \end{array} \right\} \Delta DUM \Delta n$
		Dump and halt program.	
		Halt program.	

*: n = program number of the program to be halted or dumped.

Note: This is the complete operator response:

You respond with a UΔDUMΔn or UΔHLTΔn if the timeout you are answering was prefixed with a U. If it was prefixed with any other identifier you must respond with EΔDUMΔn or EΔHLTΔn.

**EXECUTIVE
TYPEOUTS**
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
0240	Reply to restart request for parameters or reply to message caused by invalid tailor record was RHLT. Program is terminated.	None.	None.
0241	The designated check point records were not found before logical end of tape. Console request is rejected.	None.	None.
0242	The original memory space is not available to the program being restarted. Console request is rejected.	None.	None.
0243	Unrecoverable error occurred during restart I/O. Console request is rejected.	None.	None.
0244	An abnormal termination occurred during attempted restoration of user memory blocks. Console request is rejected.	None.	None.

**EXECUTIVE
TYPEOUTS**
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
0250	Invalid user key- in address in TYPE macro.	Type in the applicable response:	
		Dump and halt program.	{U} {E}ΔDUMΔn (See * footnote)
		Halt program.	{U} {E}ΔHLTΔn (See * footnote)

*: n = program number of the program to be halted or
dumped.

Note: This is the completé operator response:

You respond with a UΔDUMΔn or UΔHLTΔn if the typeout you
are answering was prefixed with a U. If it was prefixed with
any other identifier you must respond with EΔDUMΔn or
EΔHLTΔn.

**MONITOR
TYPEOUTS**

Message	Meaning	Action	Response
n△pppppp△			
03A5	Insufficient information in the ASSGN statement. Statement is ignored and processing continues.	None.	None.
03A6	A number in the ASSGN statement is too long or contains a nonnumeric. Statement is ignored and processing continues.	None.	None.
03A7	A number in the ASSGN statement has an inadmissible value. Statement is ignored and processing continues.	None.	None.
03A8	A field in the ASSGN statement that is required is omitted. Statement is ignored and processing continues.	None.	None.
03A9	A symbolic name in the ASSGN statement is too long. Statement is ignored and processing continues.	None.	None.
03C5	Insufficient information in the COMM or PAUSE statement. Statement is ignored and processing continues.	None.	None.
03C6	A number in the COMM statement is too long or contains a nonnumeric. Statement is ignored and processing continues.	None.	None.

**MONITOR
TYPEOUTS**
(Cont'd)

Message	Meaning	Action	Response
n△pppppp△			
03C7	A numeric in the COMM statement has an inadmissible value. Statement is ignored and processing continues.	None.	None.
03C8	A field in the COMM statement that is required is omitted. Statement is ignored and processing continues.	None.	None.
03C9	A symbolic name in the COMM statement is too long. Statement is ignored and processing continues.	None.	None.
03D5	Insufficient information in the DEALOC statement. Statement is ignored and processing continues.	None.	None.
03D6	A number in the DEALOC statement is too long or contains a nonnumeric. Statement is ignored and processing continues.	None.	None.
03D7	A number in the DEALOC statement has an inadmissible value. Statement is ignored and processing continues.	None.	None.
03D8	A field in the DEALOC statement that is required is omitted. Statement is ignored and processing continues.	None.	None.

**MONITOR
TYPEOUTS**
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
03D9	A symbolic name in the DEALOC statement is too long or it is omitted after a comma. Statement is ignored and processing continues.	None.	None.
03E5	Insufficient information in the EQUATE statement. Statement is ignored and processing continues.	None.	None.
03E6	A number in the EQUATE statement is too long or contains a nonnumeric. Statement is ignored and processing continues.	None.	None.
03E7	A number in the EQUATE statement has an inadmissible value. Statement is ignored and processing continues.	None.	None.
03E8	A field in the EQUATE statement that is required is omitted. Statement is ignored and processing continues.	None.	None.
03E9	A symbolic name in the EQUATE statement is too long. Statement is ignored and processing continues.	None.	None.
03F5	Insufficient information in the DUMP statement. A standard dump is given of the program area and processing continues.	None.	None.

**MONITOR
TYPEOUTS**
(Cont'd)

Message nΔPPPPPPΔ	Meaning	Action	Response
03F6	A number in the DUMP statement is too long or contains a nonnumeric. A standard dump is given of the program area and processing continues.	None.	None.
03F7	A number in the DUMP statement has an inadmissible value. A standard dump is given of the program area and processing continues.	None.	None.
03F8	A field in the DUMP statement that is required is omitted. A standard dump is given of the program area and processing continues.	None.	None.
03F9	A symbolic name in the DUMP statement is too long. A standard dump is given of the program area and processing continues.	None.	None.
03G5	Insufficient information in the dump operand of a SNAP statement. A standard dump is given of the program area and processing continues.	None.	None.
03G6	A number in the dump operand of the SNAP statement is too long or contains a nonnumeric. A standard dump is given of the area and processing continues.	None.	None.

**MONITOR
TYPEOUTS**
 (Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
03G7	A number in the dump operand of the SNAP statement has an inadmissible value. A standard dump is given of the program area and processing continues.	None.	None.
03L5	Insufficient information in the LOAD or EXEC statement. Statement is ignored and processing continues.	None.	None.
03L6	A number in the LOAD or EXEC statement is too long or contains a non-numeric. Statement is ignored and processing continues.	None.	None.
03L7	A number in the LOAD or EXEC statement has an inadmissible value. Statement is ignored and processing continues.	None.	None.
03L8	A field in the LOAD or EXEC statement that is required is omitted or illegal alternate library has been specified. Statement is ignored and processing continues.	None.	None.
03L9	A symbolic name in the LOAD or EXEC statement is too long. Statement is ignored and processing continues.	None.	None.

**MONITOR
TYPEOUTS**
(Cont'd)

Message nΔppppppΔ	Message	Action	Response
03P5	Insufficient information in the PARAM statement. Statement is ignored and processing continues.	None.	None.
03P6	A number in the PARAM statement is too long or contains a nonnumeric. Statement is ignored and processing continues.	None.	None.
03P7	A number in the PARAM statement has an inadmissible value. Statement is ignored and processing continues.	None.	None.
03P8	A field in the PARAM statement that is required is omitted. Statement is ignored and processing continues.	None.	None.
03P9	A symbolic name in the PARAM statement is too long. Statement is ignored and processing continues.	None.	None.
03RT hh:mm:ss	Elapsed program running time between job cards. hh = hours mm = minutes ss = seconds	None.	None.
03R5	Insufficient information. Statement is ignored.	None.	None.
03R6	A number is too long or contains a nonnumeric. Statement is ignored.	None.	None.
03R9	A symbolic name is too long. Statement is ignored.	None.	None.

**MONITOR
TYPEOUTS**

(Cont'd)

Message nΔPPPPPPΔ	Meaning	Action	Response
03S5	Insufficient information in the SNAP statement. Statement is ignored and processing continues.	None.	None.
03S6	A number in the SNAP statement is too long or contains a non-numeric. Statement is ignored and processing continues.	None.	None.
03S7	A number in the SNAP statement has an inadmissible value. Statement is ignored and processing continues.	None.	None.
03S8	A required field in the SNAP statement is omitted. Statement is ignored and processing continued.	None.	None.
03S9	A symbolic name in the SNAP statement is too long. Statement is ignored and processing continues.	None.	None.
0301 xxxxxx	A device was not assigned to symbolic device name xxxxxx because of an error in the ASSGN parameter. When the device is used the first time the device will be assigned via the typewriter. Processing continues.	None.	None.

**MONITOR
TYPEOUTS**
 (Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ 0302 xxxxxx	The symbolic device xxxxxx was not de- allocated because of an error in the DEALOC parameter. The device remains assigned. Processing continues.	None.	None.
0303 xxxxxx	The symbolic device xxxxxx was not equated because of an error in the EQUATE parameter. Processing continues.	None.	None.
0304	Control statement cannot be identified. Statement is ignored.	None.	None.
0310	A LOAD or EXEC statement is en- countered and the error flag is set. Statement is ignored.	None.	None.
0311	A LOAD or EXEC statement specified ALT (an alternate library) and no al- ternative library was allocated in the LOD console request. Statement is ignored.	None.	None.
0312	A LOAD statement does not contain a program name and a program has not been previously bound to SYSUT2 or translated to SYSUT1; or, an EXEC statement does not contain a program name and a program is not loaded and a program has not been previously bound to SYSUT2 or transla- ted to SYSUT1. Statement is ignored.	None.	None.

MONITOR
TYPEOUTS

(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
0313	Invalid symbolic in PARAM statement. Any recognizable operands before the invalid symbolic are processed; from the point of error this statement is ignored. Processing continues.	None.	None.
0314	The error flag is set and a subprocessor statement is encountered. This statement is ignored. Processing continues.	None.	None.
0315	A control statement is ignored because a portion of the job stream is being skipped. Processing continues.	None.	None.
0316	A SNAP request is received and no SNAP memory is allocated. Statement is ignored. Processing continues.	None.	None.
0317	A DUMP, SNAP, or PATCH is encountered and no program is in memory. Statement is ignored. Processing continues.	None.	None.
0318	A request to load from SYSUT2 is received but no SYSUT2 device is assigned. Statement is ignored and processing continues.	None.	None.
0320	Sequence error in run time parameters. Statement ignored.	None.	None.

**MONITOR
TYPEOUTS**
 (Cont'd)

Message	Meaning	Action	Response
n△pppppp△			
0321	TPLAB format error-no starting apostrophe. Statement is accepted. First non-space character assumed to be label information.	None.	None.
0322	TPLAB format error-no ending apostrophe. Statement is accepted.	None.	None.
0323	Format error. Label information exceeds maximum number of characters. Statement accepted. Excesses truncated.	None.	None.
0329	User allocated insufficient memory. Statement ignored.	None.	None.
0330	Previous parameter out of sequence. Previous statement ignored.	None.	None.
0340	Previous parameter has insufficient information for lack of a continuation parameter. Previous statement ignored.	None.	None.
0341	Same as 0340. Also TPLAB has format error-no starting apostrophe. Previous statement ignored. This statement is accepted with first non-space character assumed to be label information.	None.	None.

**MONITOR
TYPEOUTS**
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
0342	Same as 0340. Also this TPLAB has format error-no ending apostrophe. Previous statement ignored. This statement is accepted.	None.	None.
0343	Same as 0340. Also label information exceeds maximum number of characters.	None.	None.
0350A	The first record in the job stream is not a STARTM console statement.	Type in the applicable response:	0
		Monitor is to terminate.	
		Monitor is to continue and ignore the first card.	
		Monitor is to continue and process the first card.	2
0351 xxxxxx	A non-recoverable error was detected on the Monitor device as designated by xxxxxx. Monitor is terminated.	If corrective action can be taken, restart Monitor Session.	None.
0352	Non-critical overlay cannot be found.	None.	None.
0353	Incorrect byte count on WRTO T or PROUT.	None.	None.
0354	A critical monitor overlay cannot be found.	None.	None.
0355A	SYSOPT is assigned to a tape. SYSLST is not assigned and a request for its use is made.	Type in the applicable response:	Y
		SYSLST is a tape.	
		SYSLST is the printer.	

**MONITOR
TYPEOUTS**
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
0356A	SYSLST is assigned to a tape, SYSOPT is not assigned and a request for its use is made.	Type in the applicable response:	
		SYSOPT is a tape.	Y
		SYSOPT is the punch.	NΔP1
0357A	SYSIPT was not assigned by the E LOD typein or a SYSLST statement is not the second statement in the job stream.	Type the installation mnemonic mn of the device to be assigned to SYSIPT or SYSLST.	mn
0358	Patch format error. Patch is not applied. Processing continues.	None.	None.
0359	Patch format error. Patch is applied. Processing continues.	None.	None.
0360	Patch area is not within the area allocated to the program. Any portion of the patch within the program area is applied. The remainder of the patch is ignored. Processing continues.	None.	None.
0361A mn	End of reel reached on SYSLST/SYSOPT/SYSIPT as indicated by mn.	Reply when new reel is mounted.	1
0362	User has exceeded allocation of SYSOPT file.	Reallocate SYSOPT with additional file size.	None.
0399	A program has been terminated. Processing continues.	None.	None.

Legend: mn = installation mnemonic.

**FCP STANDARD
TYPEOUTS**
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
5002A ffffff mn	Unrecoverable I/O error on Open or EOVS. Error recovery was unsuccessful.	Terminate and dump.	T
		Retry.	R
		Type record causing error, user supplied label information, and repeat error message.	M
		Ignore error and continue processing.	I
		Read or write next record.	S
5003A ffffff mn	Unrecoverable write error on Close (output file). Error recovery was unsuccessful.	Terminate and dump.	T
		Type record causing error, user supplied label information, and repeat error message.	M
5004A ffffff mn	Wrong length record read. Standard label format was expected.	Terminate and dump.	T
		Retry.	R
		Type record causing error, user label information, and repeat error message.	M
		Process record as is.	I
		Read next record.	S
5005A ffffff mn	Standard labels specified and a TM was found in place of a VOL1, (output file).	Terminate and dump.	T
		Retry.	R
		Type record causing error and user supplied label information and repeat error message.	M
		Backspace over TM and write HDR1.	I

Legend: fffffff = filename.
nm = installation mnemonic.

This page was deleted by revision dated
February, 1969.

**FCP STANDARD
TYPEOUTS**
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
5006A ffffff mn	Type mark found where not expected. TM was found where label record should have been (in place of VOL, HDR, etc.). Input file only.	Terminate and dump.	T
		Retry.	R
		Consider file opened.	I
		Read next record.	S
5007A ffffff mn	Tape mark found where not expected on volumn change. TM found in place of label record. Input file only.	Terminate and dump.	T
		Retry.	R
		Read next record.	S
5008A ffffff mn	Standard labels specified, LABNAME missing on Open and no run time parameter.	Terminate and dump.	T
		Retry only after changing program, modifying parameter, etc.	R
5010A ffffff mn	No VOL1 encountered on tape at BT during Open or EOv processing on input or output files.	Terminate and dump.	T
		Retry.	R
		Type record causing error, user supplied label information, and repeat error message.	M
		Output file only: Write HDR1 record.	I
		Output File only: Check if HDR1.	S
		Input File only: Check if HDR1	I
5012A ffffff mn	VOL serial number discrepancy during Open of input or output file.	Terminate and dump.	T
		Retry.	R
		Type record causing error, user-supplied label information, and repeat error message.	M
		Update user-supplied serial number from serial number on VOL1.	I

Legend: fffffff = filename.
mn = installation mnemonic.

**FCP STANDARD
TYPEOUTS
(Cont'd)**

Message nΔppppppΔ	Meaning	Action	Response
5014A ffffff mn	Close issued to tape file not previously Opened.	Terminate and dump.	T
5016A ffffff mn	HDR1 not found where needed on input. HDR1 does not follow VOL.	Terminate and dump.	T
		Retry.	R
		Type record causing error, user-supplied label information, and repeat message.	M
5018A ffffff mn	HDR1 does not agree with user-supplied label information. Input file only.	Terminate and dump.	T
		Retry.	R
		Type record causing error, user-supplied label information, and repeat error message.	M
		Update user-supplied HDR1 on Open.	I
5019A ffffff mn	EOF/EOV label does not agree with user-supplied label information. Input file only.	Terminate and dump.	T
		Type record causing error, user-supplied label information, and repeat error message.	M
		Ignore discrepancy on volume change.	I
5020A ffffff mn	Unexpired tape on output.	Terminate and dump.	T
		Retry.	R
		Type record causing error, user-supplied label information, and repeat error message.	M
		Override check.	I

Legend: fffffff = filename.
mn = installation mnemonic.

**FCP STANDARD
TYPEOUTS**
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
5022A ffffff mn	Unrecognizable record following standard labels. Input file only.	Terminate and dump.	T
		Retry.	R
		Type record causing error, supplied label information, and repeat error message.	M
		Read next record.	S
5023A ffffff mn	Unrecognizable record following EOVS or EOF.	Terminate and dump.	T
		Retry.	R
		Type record causing error, supplied label information, and repeat error message.	M
		Read next record.	S
5024A ffffff mn	Rewind specified on reverse processing and MRKCTR = 0.	Terminate and dump.	T
		Bypass rewind and continue processing. Open file in place.	S
5026A ffffff mn	LABADDR has been omitted and there are more than 24 nonstandard labels to be bypassed on input forward.	Terminate and dump.	T
		Retry.	R
		Search through 24 more records for tape mark.	I
5028A ffffff mn	No initial TM on reverse processing.	Terminate and dump.	T
		Retry.	R
5030A ffffff mn	Unrecognizable record on reverse processing during Open or EOF.	Terminate and dump.	T
		Retry.	R
		Type record causing error, user-supplied label information, and repeat error message.	M
		Read next record.	S

Legend: fffffff = filename.
mn = installation mnemonic.

**FCP STANDARD
TYPEOUTS**
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
5032A ffffff mn	TM missing between standard labels and data on reverse processing during Open.	Terminate and dump.	T
		Retry.	R
		Type record causing error, user-supplied label information, and repeat error message.	M
		Read next message.	I
5034A ffffff mn	LABADDR has been omitted and there are more than 24 nonstandard labels to be bypassed on input reverse processing.	Terminate and dump.	T
		Retry.	R
		Search through 24 more records for tape mark.	I
5036A ffffff mn	Logical EOVS on input no EOVS/EOFS following tape mark.	Terminate and dump.	T
		Type record causing error, user-supplied label information, and repeat error message.	M
		Read next record.	S
5037A ffffff mn	FEOVS for DTFPH input file and no EOVS or EOFS.	Terminate and dump.	T
		Type record causing error, user-supplied label information, and repeat error message.	M
		Read next record.	S
5038A ffffff mn	EOFS condition and no EOFSADDR.	Terminate and dump.	T
5050A ffffff mn	Volume swap time and no ALTTAPE on input.	Reply when next volume is ready.	R
5052A ffffff mn	Volume swap time and no ALTTAPE on output.	Reply when next volume is ready.	R

Legend: fffffff = filename.
mn = installation mnemonic.

FCP STANDARD
TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
5060A ffffff mn	Alternate device specified. No primary or alternate device assigned.	Terminate and dump. Retry.	T R
5062AΔ FFFFFF mn	A CLOSE has been issued to a unit record file that has not previously been OPENed.	Terminate and dump.	T
5070A ffffff mn	Unrecoverable data write error when tape output file is closed or at EOv.	Terminate and dump.	T
5072A ffffff mn	Unrecoverable data write error on close other than magnetic tape.	Terminate and dump. Ignore error.	T I
5080 ffffff mn	Tape output file closed block count xxxxxx.	None.	None.
5081 ffffff mn xxxxxx	Tape output file EOv block count xxxxxx.	None.	None.
5082 ffffff mn xxxxxx	Tape input file closed, block count is xxxxxx.	None. On reverse processing count is number of blocks remaining to be read.	None.
5084 ffffff mn	End of volume on tape input file, FILENAME and block count xxxxxx.	None.	None.
5086 ffffff mn xxxxxxx	Device other than magnetic tape closed, block count xxxxxxxx.	None.	None.

Legend: fffffff = filename.
mn = installation mnemonic.

**FCP RESTART ERROR
TYPEOUTS**

Message	Meaning	Action	Response
5100A ffffff	HDR1 missing on standard labeled file.	Ignore error and continue as if HDR1 was read and checked.	I
		Rewind tape to BT and go through positioning again. This may need operator inter- vention such as mounting a new tape.	R
5101A ffffff	HDR1 does not agree with information in either LABNAME or run time parameter.	Ignore discrepancy.	I
		Same as for mes- sage 5100A.	R
5102A ffffff	Record following HDR1 is not TM or UHL.	Backspace over questionable block and position tape by block count from that point.	I
		Same as for mes- sage 5100.	R
5103A ffffff	Negative block count on other than Read Reverse File.	Illegal reply.	I
		Same action as message 5100. This necessitates a change of FILE- NAME in the subject file region.	R
5104A ffffff	TM found in tape positioning by block count.	Ignore TM.	I
		Same as for mes- sage 5100A.	R

**FCP STANDARD
TYPEOUTS**
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
5087 ffffff mn xxxxxx	EOV omitted labeled file block count xxxxxx.	None.	None.
5088 ffffff mn xxxxxx	FEOV input file, block count xxxxxx.	None.	None.
5090A ffffff mn xxxxxx yyyyyy	Block count dis- crepancy at EOv/ EOF (forward processing), accumulated block count xxxxxx, followed by EOv/ EOF block count yyyyyy.	Terminate and dump.	T
		Ignore discrepancy.	I
5092A ffffff mn yyyyyy xxxxxx	Block count dis- crepancy at EOF time on reverse processing, the difference, and the block count from Open is displayed.	Terminate and dump.	T
		Ignore discrepancy .	I

Legend: **ffffff** = filename.
mn = installation mnemonic.

**FCP RANDOM ACCESS
TYPEOUTS**

Message	Meaning	Action	Response
nΔppppppΔ			
5301 fffffff	A Volume Displacement Card (VDC) cannot be located for this file.	Program is terminated.	None.
5302A fffffff	A Volume Serial Number cannot be located for this file within the On-Line Catalog (OLC).	Terminate and dump.	T
		Reattempt OLC Search.	R
5303A fffffff	On-Line Catalog does not agree with Volume Serial Number contained on the physical volume's VTOC 1 record.	Terminate and dump.	T
		Retry.	R
5304A fffffff	The first VTOC record for this volume is not a Format 4.	Terminate and dump.	T
		Retry.	R
		Ignore error condition and assume Format 4 record.	I
5305A fffffff	A Format 1 VTOC record cannot be located for this file.	Terminate and dump.	T
		Retry.	R
5306A fffffff	An illogical end-of-cylinder or an end-of-file condition encountered while accessing VTOC Format 1 records for this file.	Terminate and dump.	T
		Retry.	R
		Ignore illogical conditions and continue processing.	I

Legend: fffffff = filename.

**FCP RANDOM ACCESS
TYPEOUTS**
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
5307A fffffff	Format identification is not 1 for a VTOC Format 1 record for this file.	Terminate and dump.	T
		Retry.	R
		Ignore condition and continue processing.	I
5308A fffffff	The Volume Serial Numbers contained on the Volume Displacement Card for this file are not in volume sequence order.	Terminate and dump.	T
		Ignore out-of-sequence condition and continue.	I
5309A fffffff	Format identification is not 3 for a VTOC Format 3 record for this file.	Terminate and dump.	T
		Ignore condition and continue processing.	I
5310A fffffff	Unable to read the standard volume label on which this file is contained.	Terminate and dump.	T
		Retry.	R
		Ignore condition and continue processing.	I
5311A fffffff	Unable to read the VTOC Format 4 record for this file.	Terminate and dump.	T
		Retry.	R
		Ignore condition and continue processing.	I
5312A fffffff	Unable to read the VTOC Format 3 record for this file.	Terminate and dump.	T
		Retry.	R
		Ignore condition and continue processing.	I

Legend: fffffff = filename.

**FCP RANDOM ACCESS
TYPEOUTS**
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
5313A fffffff	An attempt was made to open this file and the file is already opened.	Ignore condition.	I
5314A fffffff	A matrix area has not been defined in a VDC parameter or DTF (LABNAME) operand.	Terminate and dump.	T
5350A fffffff	Abnormal termination occurred when reading user header labels.	Terminate and dump.	T
		Retry.	R
		Ignore condition and continue processing.	I
5351A fffffff	Abnormal termination occurred when writing user header labels.	Terminate and dump.	T
		Retry.	R
		Ignore condition and continue processing.	I
5352A fffffff	Abnormal termination occurred when writing user EOF trailer label record.	Terminate and dump.	T
		Retry.	R
		Ignore condition and continue processing.	I
5353A fffffff	Abnormal termination occurred when reading user trailer labels.	Terminate and dump.	T
		Retry. .	R
		Ignore condition and continue processing.	I
5354A fffffff	Abnormal termination occurred when writing user trailer labels.	Terminate and dump.	T
		Retry.	R
		Ignore condition and continue processing.	I
5355A fffffff	File's header label EOF record is missing.	Terminate and dump.	T
		Retry.	R
		Ignore condition and continue processing.	I
5356A fffffff	File's trailer label EOF record is missing.	Terminate and dump.	T
		Retry.	R
		Ignore condition and continue processing.	I

Legend: fffffff = filename.

**FCP RANDOM
ACCESS TYPEOUTS**
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
5357A fffffff	Abnormal termination occurred when writing back user header label during update processing.	Terminate and dump.	T
		Retry.	R
		Ignore condition and continue processing.	I
5358A fffffff	Abnormal termination occurred when writing back user trailer label during update processing.	Terminate and dump.	T
		Retry.	R
		Ignore condition and continue processing.	I
5401 fffffff	Abnormal termination upon accessing track descriptor record. No response required. Program is terminated with dump.	None.	None.
5402A fffffff	Abnormal termination occurred when updating track descriptor record.	Terminate and dump.	T
		Retry.	R
		Ignore condition and continue processing.	I
5403A fffffff	Abnormal termination occurred when updating user data record.	Terminate and dump.	T
		Retry.	R
		Ignore condition and continue processing.	I
5404 fffffff	Abnormal termination occurred when writing user data record. No response required. Program terminated with dump.	None.	None.
5405A fffffff	Abnormal termination occurred when reading user data record.	Terminate and dump.	T
		Retry.	R
		Ignore condition and continue processing.	I
5406 fffffff	Seek address is incorrect. No response required. Program is terminated with a dump.	None.	None.

Legend: fffffff = filename.

**FCP RANDOM ACCESS
TYPEOUTS
(Cont'd)**

Message	Meaning	Action	Response
nΔppppppΔ			
5506A fffffff	User has issued a WRITE AFTERID macro but has not specified AFTERID in his DTF. (AFTERID must be specified in at least one DTF for this message to be applicable)	Terminate and dump.	T
		Bypass Write and return to program.	S
5507A fffffff	User has issued a CNTRL macro but has not specified CNTRL in his DTF.	Terminate and dump.	T
		Bypass CNTRL and return to program.	S

Legend: fffffff = filename.

FCP RANDOM
ACCESS TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
n△pppppp△			
5407 fffffff	Overflow Record Error. Program is terminated if an ERROPT entry has not been specified for this file.	None.	None.
5408 fffff	A I/O operation was attempted against a random access file that had not been previously OPENed.	None.	None.
5501A fffffff	User has issued a READ ID macro but has not specified READID in his DTF.	Terminate and dump.	T
		Ignore condition and continue processing.	I
5502A fffffff	User has issued a READ KEY macro but has not specified READKY in his DTF.	Terminate and dump.	T
		Bypass Read and return to program.	S
5503A fffffff	User has issued a WRITE ID macro but has not specified WRITEID in his DTF.	Terminate and dump.	T
		Bypass Read and return to program.	S
5504A fffffff	User has issued a WRITE KEY macro but has not specified WRITEKY in his DTF.	Terminate and dump.	T
		Bypass write and return to program.	S
5505A fffffff	User has issued a WRITE AFTER macro but has not specified AFTER in his DTF.	Terminate and dump.	T
		Bypass Write and return to program.	S

Lengend: fffffff = filename.

**FCP RANDOM
ACCESS TYPEOUTS**
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
5508A fffffff	An unrecoverable error has been encountered. (other than Read Parity, Count Field Data Error, or Track End).	Terminate and dump.	T
		Bypass I/O and return to program.	S
5509A fffffff	User has issued an I/O to a DTFDA which requires a WAITF.	Terminate and dump.	T
		Bypass I/O and return to program.	S
5510A fffffff	An internal I/O error has occurred in reading count block during the AFTERDID macro.	Terminate and dump.	T
		Bypass I/O and return to program.	S
		Ignore error and continue processing.	I
5511A fffffff	An internal I/O error has occurred in reading track descriptor record.	Terminate and dump.	T
		Bypass error and return to program.	S
		Ignore error and continue processing.	I
5512 fffffff	System error. A section of logical coding has been executed which was not indicated within the DTF.	Terminate and dump.	T
5513A ffffff	Get or put issued to a file which has not been opened.	Terminate and dump.	T

Legend: fffffff = filename.

TYPEINS

◆ All responses to typeouts, both to system and user programs, must be in the following format:

nΔ...r

n = One-byte program identification code that is the first byte of typeout which this message is a response to. *

r...r = One to seventy-byte response.

*Exceptions to this rule are listed under the individual typeouts.

**INDEXED-SEQUENTIAL
FCP TYPEOUTS**

Message	Response and Action	Meaning
5200	TERMD	Executive has no OLC.
5201	TERMD	No Run-Time Parameters.
5202	TERMD	No VDC card for file.
5203A	Reply R or T	OLC Update must be run. Run OLC and type R or type T and cause a TERMD.
5204	TERMD	File not in VTOC.
5206	TERMD	File not allocated as indexed-sequential file.
5207	TERMD	File BLKSIZE in VTOC \neq DTFIS BLKSIZE.
5208	TERMD	File RECSIZE in VTOC \neq DTFIS RECSIZE.
5209	TERMD	File KEYSIZE in VTOC \neq DTFIS KEYSIZE.
5210	TERMD	File KEYLOG in VTOC \neq DTFIS KEYLOC.
5211	TERMD	UPINDEX device not specified in VDC card.
5212	TERMD	Device types mixed (both disc and drum specified).
5213	TERMD	File labels are missing or incorrect.
5214	TERMD	Insufficient room for extents list.
5215	TERMD	No data extent has been specified for the file.
5216	TERMD	No index extent has been specified for the file.
5217A	Reply I or T	Not possible to resind any index level due to insufficient space. Reply I to ignore and continue processing, reply T to cause a TERMD.
5218	TERMD	File volume not mounted while trying to RESIND.
5219	TERMD	File RECFORM in VTOC \neq DTFIS RECFORM.
5223	TERMD	No exit declared for contingency endfile.
5224	TERMD	No exit declared for contingency macrosyn.

**INDEXED-SEQUENTIAL
FCP TYPEOUTS**
(Cont'd)

Message	Response and Action	Meaning
5281	TERMD	Illegal KEYSIZE as specified in DTFIS macro.
5282	TERMD	Illegal BLKSIZE as specified in DTFIS macro.
5283	TERMD	Incompatible values for KEYSIZE and BLKSIZE as specified in the PTFIS macro.
5284	TERMD	Illegal KEYLOC as specified in DTFIS macro.
5285	TERMD	Illegal RECSIZE as specified in DTFIS macro.
5286	TERMD	Illegal CYLOF as specified in DTFIS macro.
5287	TERMD	Illegal ISDEN as specified in DTFIS macro.
5288	TERMD	Illegal PRINDEX as specified in DTFIS macro.
5289	TERMD	Did not open in output mode when trying to load a file.
5290A	Reply I or T	Opened in output mode but file purge date has not expired. Reply I to ignore and destroy file or T to cause a TERMD.

**INDEXED-SEQUENTIAL
FCP TYPEOUTS**
(Cont'd)

Message	Response and Action	Meaning
5225	TERMD	No exit declared for contingency writerr.
5226	TERMD	No exit declared for contingency readerr.
5227	TERMD	No exit declared for contingency indext.
5228	TERMD	No exit declared for contingency dataext.
5229	TERMD	No exit declared for contingency daterr.
5230	TERMD	No exit declared for contingency extfile.
5231	TERMD	ISFCP destroyed.
5233	TERMD	File volume not mounted or attempted I/O with illegal seek address. An illegal seek address can be caused by an incorrect format 2 label.
5235	TERMD	Overflow record cannot be found.
5240A	Reply R or I	Device busy. Type R for retry, I to ignore and continue processing.
5241A	Reply R or I	Missing magazine. Insert proper magazine and type R or type I to ignore and continue processing.
5243A	Reply R or I	Device inoperable. Type R for retry, I to ignore.
5244	TERMD	NOFIND exit on GETKY has been aborted by user.
5245	No action	XXXXX Y ZZZ. Card extract counter = 0. Replace later. XXXXX = Vol. serial no. , Y = Bin, ZZZ = card no.
5246A	Clean R/W heads on MSU. Type R if it recurs, type I	Unrecoverable Read/Write error.
5247	TERMD	Duplicate key exit on INSRT has been aborted by user.
5248	TERMD	SEQCK exit on PUTIS has been aborted by user.
5280	TERMD	Flagged file not allowed for DISC/DRUM file.

**INDEXED-SEQUENTIAL
LOGGING TYPEOUTS**

Message	Meaning	Action	Response
1710A ΔAction	Unrecoverable I/O error on the log tape file. The operator has replied "1" to executive and error recovery console message.	Abort all logging and resume processing.	T
		Inhibit logging on this tape and resume processing.	I
		Transfer to the user's routine at exit name + 4.	E
1711A ΔNOΔ CLOCK	DTFIS specified LOGTOD = YES but the system is not equipped with a time clock.	Terminate the program.	T
		Use block count rather than time clock value.	C
		Abort all logging and continue the program.	A
1712A ΔLOGΔ FILEΔ UNOPENED ΔORΔ NOTΔ OUTPUT	The logging output tape (dtfname 1 or dtfname 2) was either described as an input or was not opened.	Terminate the program.	T
		Abort logging but continue the program.	A

DELETED

3. CONSOLE ROUTINES

EXECUTIVE CONSOLE ROUTINES

◆ The operator communicates with the Executive by means of console requests via the console typewriter. These console routines are initiated after a console request is issued. The console routines are an external means of communicating with the Executive to request an action to be performed.

To give a command to the Executive, the operator must:

1. Press COIN button on the console typewriter,
2. Type in the valid operator routine, and
3. Press EOT button on the console typewriter.

The Executive Console Routines available are summarized in the table below:

Executive Console Routines

Console Routines	Function
EΔLOD	Load Program.
EΔRST	Restart Program.
EΔHLT	Terminate Program.
EΔDDV	Deallocate Device.
EΔPRY	Change Priority.
EΔDUM	Dump and Terminate Program.
EΔINT	Interrupt Program.
EΔDDA	Display Device Assignments.
EΔDMA	Display Memory Assignments.
EΔMIX	Display Program Mix.
EΔMEM	Display Free Memory.
EΔDUD	Display Unassigned Devices.
EΔOLC	Update On-Line Catalog.
EΔKIL	Terminate Successor Chain.
EΔCNG	Change Memory Requirements.
EΔBSY	Request Device Status.

**LOAD PROGRAM
(EALOD)**

Format

◆ The Load Program console routine initiates the loading and execution of a program. It may also inform the Executive of the priority of the program, the tape, disc, or drum on which it is located, and the relative position in memory it is to be loaded.

◆ The format of the LOD console routine operator message for non-Monitor non-Communication programs is as follows:

EALODA program, [mn], [p], [pa], [H], [mmmmmm]

Where:

program = Program name. One-to-six-byte program name.

mn = Load library installation mnemonic. Two-byte mnemonic for the device which contains the program to be loaded. If this entry is omitted, the System disc/drum is assumed.

Note: There may be up to three Alternate Libraries active at one time: two may be disc/drum, one may be tape. If an additional Alternate Library is needed, one of the active Alternate Libraries must be deallocated before another Library may become active (see Deallocate Device Console Routine). Once a tape alternate library has been activated, its positioning must not be disturbed. If any operator intervention occurs, for example, change library tape, rewind tape, etc., the library must be deallocated and reassigned.

Exception: When requesting the Monitor to be loaded, this entry refers to programs running under Monitor and not Monitor itself. The Monitor is always loaded from the System resident device.

p = Program priority number. Priority is a one-digit number (6,5,4,3,2 or 1). If omitted, the available priority closest to 6 is assigned to the program.

pa = Run-time device mnemonic. Two-byte mnemonic for the device which contains the program run-time parameters. This entry is omitted if there are no program run-time parameters.

H = High memory load indicator. H indicates that the program is to be assigned the highest available contiguous free memory. If this entry is omitted, the program is assigned the required contiguous memory that is available nearest to the beginning of memory.

The format of the LOD console routine operator message for a Monitor Session is as follows:

EALODA $\left\{ \begin{array}{l} \text{MON} \\ \text{MONSNP} \end{array} \right\}$, [mn], [p], pa, [Y], mmmmmm

Where:

MON = Monitor program name. To indicate that Monitor is to be called without the Snap function. This will allocate 4,096 bytes to the Monitor Session.

Format
(Cont'd)

MONSNP = Monitor with SNAP program name. To indicate that Monitor with the Snap function is to be called. This will allocate 6144 bytes to the Monitor Session. This is required if a SNAP is to be taken in the Monitor job stream.

mn = Alternate Tape Load Library Installation Mnemonic. Two byte installation mnemonic for the tape which contains the program to be loaded. If any program within a Monitor session is to be loaded from an alternate tape library its installation mnemonic must be specified here. If any program is to be loaded from an alternate disc or drum it is only specified in the LOAD or EXEC Monitor control statement (see Monitor control statement formats).

Note: There may be up to three Alternate Libraries active at one time. Two of them may be disc/drum and one may be tape. If an additional Alternate Library is needed one of the active Alternate Libraries must be deallocated before another Library may become active (See Deallocate Device Console Routine).

p = Program priority number. Priority is a one digit number (6, 5, 4, 3, 2, or 1). If omitted, the available priority closest to 6 is assigned to the program.

pa = Monitor job stream device installation mnemonic. Two byte installation mnemonic of the device which contains the Monitor input job stream.

Y = is an optional parameter. A Y indicates that an 808 character I/O are for batching is to be allocated in front of the memory used by the Monitor session. This indicates the input/output to Monitor is in batched card image format, up to 4 images per batch. If SYSOPT or SYSLST is tape, the records are automatically batched for the user.

mmmmmm = Contiguous memory specification. A maximum of six bytes which specifies the amount of contiguous memory that is to be assigned to the program. When this entry is included it preempts the program memory requirements specified in the program header block. When Monitor is being allocated a value greater than 4096 must be specified. The size specified here is the program size only; it does not include the size of Monitor.

The format of the initiate console routine operator message for Communications is as follows:

Format
(Cont'd)

EΔMCPΔprogram, [mn], [pa], [H], [mmmmmm]

To load CUP the following is done:

EΔCUPΔprogram, [mn], [pa], [H], [mmmmmm]

Note: The operand fields for the communication initiate messages are described under the E LOD message.

RESTART PROGRAM
(EΔRST)

◆ The Restart Program console routine initiates the restart of a previously checkpointed program. The program name, priority, and device on which the program is located must be supplied.

Format

◆ EΔRSTΔprogram, [mn], [p]

Where:

program = Program name. One to six-byte program name.

mn = Program Load library installation mnemonic. Two-byte mnemonic for the device on which the program's Load Library is mounted. This entry may be omitted - for omission rule, see Load Program.

p = Program priority number. Priority is a one-byte number (6,5,4,3,2 or 1). If omitted the available priority closest to 6 is assigned to the program.

TERMINATE PROGRAM
(EΔHLT)

◆ The Terminate Program console routine terminates the specified program and deallocates the programs memory and devices.

Format

◆ EΔHLTΔprgm

Where:

prgm = One-byte program number displayed when the program was started or restarted.

DEALLOCATE DEVICE
(EΔDDV)

◆ The Deallocate Device console routine deallocates any device assigned to a user program. The device to be deallocated is specified by its installation mnemonic. This console routine is also used to deallocate alternate Load Libraries.

Format

◆ EΔDDVΔmn

Where:

mn = Two-byte installation mnemonic of the device to be deallocated.

CHANGE PRIORITY
(EΔPRY)

◆ The Change Priority console routine changes the priority of a user program. The designated program priority is changed to 6 in a non-communications system the highest priority or to 5 in a communication system. If necessary, the other programs in the Operation List are pushed down in order to change the designated program to a 6 or 5 priority as applicable.

Format	◆ E△PRY△prgm
	<p>Where:</p> <p>prgm = One-byte program number displayed when the program was started or restarted. It is the program number of the program to be given the priority of 6 or 5 as applicable.</p>
Typeout	◆ prgm△progrm△priority
	<p>Where:</p> <p>prgm = One-byte program number assigned to this program when it was started or restarted.</p> <p>program = One-to- six-byte program name.</p> <p>priority = One-byte priority assigned to the program at program initiation or by the change priority console routine.</p>
DUMP AND TERMINATE PROGRAM (E△DUM)	◆ The Dump and Terminate console routine causes the specified program and its Executive Storage Area (ESA) to be dumped to tape and the program to be terminated.
Format	◆ E△DUM△prgm
	<p>Where:</p> <p>prgm = One-byte program number of the program to be terminated and dumped, which was displayed when the program was started or restarted.</p>
INTERRUPT PROGRAM (E△INT)	◆ The Interrupt Program console routine causes the specified program to jump to the Operator Communication subroutine specified in the program Set Contingency Routine Address (STXIT-OC) macro. The program identifier of the program to be interrupted must be indicated.
Format	◆ E△INT△prgm
	<p>Where:</p> <p>prgm = One-byte program number of the program to be interrupted which was displayed when the program was started or restarted.</p>
DISPLAY DEVICE ASSIGNMENTS (E△DDA)	◆ The Display Device Assignment console routine displays all devices assigned to the program. The program identifier must be supplied.
Format	◆ E△DDA△prgm

Format
(Cont'd)

Where:

prgm = One-byte program number of the program whose devices are to be displayed. It is the number that was displayed when the program was started or restarted.

Typeout

◆ mnΔsymdev

Where:

mn = Two-byte installation mnemonic for the device that is assigned to this program.

symdev = Symbolic device name of the device assigned to this program.

**DISPLAY MEMORY
ASSIGNMENTS
(EΔDMA)**

◆ The Display Memory Assignment console routine displays the low and high memory limits of the program including the Executive storage area and run-time parameter storage.

Format

◆ EΔDMAΔprgm

Where:

prgm = The one-byte program number of the program whose memory limits are to be displayed. It is the number that was displayed when the program was started or restarted.

Typeout

◆ xxxx-yyyΔΔzzzz

· ·
· ·
· ·

xxxx-yyyΔΔzzzz

Where:

xxxx = Low-memory limit in hexadecimal of the specified program.

yyyy = High-memory limit in hexadecimal of the specified program.

zzzz = The decimal number of bytes assigned to this program.

**DISPLAY
PROGRAM
MIX
(EΔMIX)**

◆ The Display Program Mix console routine displays the program names, priorities, and program numbers up to six, of the programs currently running.

Format

◆ EΔMIX

Typeout

◆ prgm Δ program Δ priority

Typeout
(Cont'd)

Where:

prgm = One-byte program number assigned to this program when it was started or restarted.

program = One to six-byte program name.

priority = One-byte priority assigned to this program at program initiation or by the change priority console routine.

**DISPLAY FREE
MEMORY
(EΔMEM)**

◆ The Display Free Memory console routine displays the low- and high-order boundaries of continuous segments of unassigned memory. The low-order memory address is the first byte of unassigned memory and the high-order address is the last byte.

Format

◆ E ΔMEM

Typeout

◆ xxxx-yyyΔΔzzzz

.

.

.

xxxx-yyyΔΔzzzz

Where:

xxxx = Low-memory limit in hexadecimal of the free memory in this contiguous segment.

yyyy = High-memory limit in hexadecimal of the free memory in this contiguous segment.

zzzz = The decimal number of bytes available in this contiguous segment.

**DISPLAY UNASSIGNED
DEVICES
(EΔDUD)**

◆ The Display Unassigned Devices console routine displays the installation mnemonic device name for all unassigned devices on the system.

Format

◆ E ΔDUD

Typeout

◆ mn, . . . , mn

Where:

mn = Two-byte installation mnemonic name of the unassigned device.

**UPDATE ON-LINE
CATALOG
(EΔOLC)**

◆ The Update on-line Catalog console routine updates the On-Line Catalog by posting the serial number of the random access volumes that are on line at the current time. Whenever the system is initialized, or random access volumes are changed the On-Line Catalog must be updated with this console routine.

Typeout No. 2
(Cont'd)

This message requires a response of YΔI to ignore the outstanding I/O and await normal termination, or YΔT to terminate the outstanding I/O with unrecoverable error, clear byte 17 of the CCB, free the overlay area and key-in area, and exit.

If the response is YΔT and termination has already been received (the indicator has been cleared by storage of the hardware registers at termination), the "not busy" message is typed, indicating it was not necessary to force the termination.

If the mnemonic is omitted from the EΔBSY type-in, the count of unidentifiable I/O interrupts received by the Exec and hardware information (CAR, CSB, and SDB) relating to the last nine of these interrupts is typed out. The count and the storage area are then cleared to zero.

The format of this typeout is:

Typeout No. 3

◆ Y RSEXEC NNNN CCCCCCAABB₁ CCCCCCAABB₂
...CCCCCAABB₉

Where:

NNNN indicates the count of unidentifiable interrupts received, and

CCCCCAABB_m indicates the CAR, CSB, and SDB for the mth most recent unidentifiable interrupt received.

**MONITOR CONSOLE
ROUTINES**

◆ The operator communicates with the Monitor by means of console requests via the console typewriter. These console routines are initiated after a console request is issued. The console routines are an external means of communicating with the Monitor to request an action to be performed. The Monitor console routines and all of the Executive console routines may be issued in a Monitor session.

To give a command to the Monitor, the operator must:

1. Press COIN button on the console typewriter,
2. Type in the valid operator command, and
3. Press EOT on the console typewriter,

The Monitor Console Routines available are summarized in the table below:

<p>Format</p> <p>TERMINATE SUCCESSOR CHAIN (EΔKIL)</p>	<p>◆ EΔOLC</p> <p>◆ The Terminate Successor Chain console routine cancels all unstarted job orders in the program run-time parameters. The program currently running runs to completion.</p>
<p>Format</p>	<p>◆ EΔKILΔprgm</p> <p>Where:</p> <p style="padding-left: 40px;">prgm = One-byte program number displayed when the program was started or restarted.</p>
<p>CHANGE MEMORY REQUIREMENTS (EΔCNG)</p>	<p>◆ The Change Memory Requirements console routine increases or decreases the amount of memory assigned to a program.</p>
<p>Format</p>	<p>◆ EΔCNGΔprgm, size</p> <p>Where:</p> <p style="padding-left: 40px;">prgm = One byte program number displayed when the program was started or restarted.</p> <p style="padding-left: 40px;">size = Size is a one to six byte decimal number specifying the number of bytes the program is to be increased or decreased. The first byte must be a plus or minus. Size must be a multiple of 2048 bytes in a memory-protected system.</p>
<p>REQUEST DEVICE STATUS (EΔBSY)</p>	<p>◆ The Request Device Status console routine requests the status of a device indicated by the mnemonic mn.</p>
<p>Format</p>	<p>◆ EΔBSY[Δ mn]</p> <p>Where:</p> <p style="padding-left: 40px;">mn = Two byte mnemonic device number assigned at Systems Generation time.</p> <p style="padding-left: 40px;">If this device has no outstanding I/O (an I/O issued for which no termination has been received), the following message is typed:</p>
<p>Typeout No. 1</p>	<p>◆ YΔ mnΔNOTΔBUSY</p> <p style="padding-left: 40px;">After completion of this typeout, the key-in area and overlay area are freed.</p> <p style="padding-left: 40px;">If there is an outstanding I/O for this device, an indicator (FF₁₆) is set in byte 17 of the CCB pending, and the following message is typed:</p>
<p>Typeout No. 2</p>	<p>◆ *****YΔXΔRSEXECΔmnΔISΔBUSY</p>

**MONITOR CONSOLE
ROUTINES**
(Cont'd)

Monitor Console Routines

Console Routines	Function
MΔHLTP	Terminate Program.
MΔHLTJ	Terminate Job.
MΔDUMPP	Dump Program.
MΔDUMPJ	Dump Job.
MΔSKIP	Monitor Skip.
MΔEND	Terminate Monitor.
MΔCONT	Continue Processing After PAUSE.

**TERMINATE
PROGRAM
(MΔHLTP)**

◆ The Terminate Program console routine terminates the current program running in the Monitor job stream. This request then initiates and executes the next program in the job stream unless the current program was the last one. In this case Monitor terminates.

Format

◆ MΔHLTP

**TERMINATE JOB
(MΔHLTJ)**

◆ The Terminate Job console routine terminates the current job running in the Monitor job stream. This request then initiates and executes the next Job in the job stream; however, if the current Job was the last one, Monitor terminates.

Format

◆ MΔHLTJ

**DUMP PROGRAM
(MΔDUMPP)**

◆ The Dump Program console routine dumps the current program running in the Monitor job stream. This request then initiates and executes the next program in the job stream; however, if the current program was the last one, Monitor terminates. The program dump is in hexadecimal format with a group of four.

Format

◆ MΔDUMPP

**DUMP JOB
(MΔDUMPJ)**

◆ The Dump Program console routine dumps the current program running in the Monitor job stream. This request then initiates and executes the next job in the job stream; however, if the current program was the last one, Monitor terminates. The program dump is in hexadecimal format with a grouping of four.

Format

◆ MΔDUMPJ

**MONITOR SKIP
(MΔSKIP)**

◆ The Monitor Skip console routine terminates the current job running in the Monitor job stream and skips to the indicated parameter in the job stream. It then executes that parameter.

Format	<p>MΔSKIPΔ Parameter</p> <p>Where Parameter is up to 16 characters in length of the information on the control statement you want to skip to. This will instruct the monitor to skip all input in the job stream until the first control statement with the indicated information is encountered.</p>
TERMINATE MONITOR (MΔEND)	<p>◆ The Terminate Monitor console request terminates the current Monitor session.</p>
Format	<p>◆ MΔEND</p>
CONTINUE PROCESSING AFTER PAUSE (MΔCONT)	<p>◆ The continue console request allows the job stream to continue.</p>
Format	<p>◆ MΔCONT</p>
MONITOR PARAMETER SUMMARY	<p>◆ A Monitor control language is used to direct the processing of jobs contained within a given session. This control language consists of a series of control language parameter statements, with each statement indicating a particular function that is to be performed. The following summary of these control parameters indicates their general function and the order in which they must appear:</p>
STARTM	<p>◆ The STARTM control statement must be the first input record in the job stream. This parameter identifies the Monitor job stream.</p>
ASSGN	<p>◆ The ASSGN control statement may appear in the job stream to define and to allocate devices required by the Monitor session. This entry may appear anywhere in the job stream prior to the first access to the device.</p>
JOB	<p>◆ The JOB control statement indicates that a job is to be initialized in the Monitor job stream.</p>
PARAM	<p>◆ The PARAM control statement provides the user with the facility to indicate subprocessor options for the job. This parameter may only indicate options for a subprocessor.</p>
SUBPROCESSOR	<p>◆ The subprocessor control statement requests the loading and execution of a system program from the system tape SYSRES.</p>
LOAD	<p>◆ The LOAD control statement requests a program to be loaded by the Monitor.</p>
EXEC	<p>◆ The EXEC control statement for the execution of a program which has been loaded or requests that a program be loaded and executed.</p>
DUMP	<p>◆ The DUMP control statement requests the program or a portion of the program last loaded by Monitor to be dumped to the SYSLST device.</p>
SNAP	<p>◆ The SNAP control statement requests a memory dump at specified intervals of the resident program in memory running under Monitor control.</p>

PATCH	◆ The PATCH control statement allows a program in the job stream to be patched.
EQUATE	◆ The EQUATE control statement equates a previously assigned symbolic device to another symbolic device.
DEALLOC	◆ The DEALLOC control statement calls for the deallocation of a device allocated to the Monitor session.
COMM	◆ The COMM control statement allows comments of the user to be written to SYSLST.
LOG	◆ The Log control statement request Monitor to write all control statements to SYSLST.
NOLOG	◆ The NOLOG control statement inhibits Monitor from writing control statements to SYSLST.
ENDMON	◆ The ENDMON control statement terminates the Monitor session.
PAUSE	◆ The PAUSE control statement causes the Monitor session to halt until an operator response is given to continue.

4. SYSTEM GENERATION

DESCRIPTION

◆ The Tape Disc Operating System Generation is the process by which a TDOS System is created on random access, tailored to the hardware and software requirements of a particular user installation. In addition, System Generation has the ability to produce a Call Library Tape (CLT).

◆ The complete generation of a system is divided into five separate functions. The five functions (Random Access Volume Initialization, Random Access Volume Allocation, Executive System Generation, Call Library Generation, and Executive Library Transcription) are executed by the Generation Controller as they are selected by user parameters. Within a System Generation, any number of the five functions may be requested with the following restrictions: If more than one function is to be executed they must be requested in the order listed below, and to perform a function its input must be present on the indicated device. The order in which the functions must be executed is:

Random Access Initialization

Random Access Allocation

Executive System Generation

Call Library Generation

Executive Library Transcription

The Program Library Transcriber and Call Library Transcriber do not run under the control of TDOS System Generator. They must be run by themselves outside of SYSGEN.

For a description of program and call library transcription see "Library Transcription Procedure" at the end of the System Generation section.

DEVICE ASSIGNMENTS

Symbolic Device Name	Device Type	Remarks
SYSTAP	Magnetic Tape (Nine-Level)	Output device which contains the generated System Load Library tape.
SYSLIB	Magnetic Tape (Nine or Seven Level Tape)	Output device which contains the generated Call Library tape.
SYSRES	Disc or Drum	Output device which contains the Executive Library.
SYSLST	Printer	Contains the listings of the routines. This is required for Random Access Allocation and Executive Transcription.
MASTAP	Magnetic Tape (Nine-Level)	Input device (addressed from Load unit switches).

PARAMETER SUMMARY

Routine Parameter	Remarks
//ΔLOG	Causes all succeeding parameters to be listed for the console typewriter. It must be before any EXEC parameters.
//ΔASSGN	This parameter indicates the devices required. It must be before any EXEC parameter.
//ΔDATE	This parameter is used to record the date of the System Generation. This information is retained in the Executive bootstrap. It must be before any EXEC parameter.
//ΔEXEC	This parameter calls the indicated function to be executed.
EXEC P	This parameter calls the indicated function to be executed.
IODS	This parameter is used in generating a SLLT and it contains information regarding each I/O device except the console typewriter.
ENDP	This parameter indicates the end of the parameter set for generating a SLLT.
//ΔEND	This parameter indicates the last parameter in the System Generation input stream.

OPERATING PROCEDURES

Operator Action	Result
1. Mount input Master System Tape (MASTP).	None.
2. Mount input SYSIPT on card reader or tape.	
3. Mount output tape or tapes as required by options used in Systems Generation.	
4. Set the address of the device (channel and device number) from which the Executive (MASTAP) is to be loaded into the Load unit switches.	

OPERATING PROCEDURES
(Cont'd)

Operator Action	Result
5. Press the GEN RES button.	
6. Press the LOAD button.	
<p>7. A system typeout occurs requesting that the input that the input parameters device (SYSIPT) be assigned.</p> <p><u>Typeout:</u></p> <p>6 Δ GENCTL Δ 5799A Δ SYSGEN INPUT DEVICE</p> <p><u>Response:</u></p> <p>6 Δ mn, cuu, R</p>	<p>mn - Two character installation mnemonic</p> <p>cuu - physical device address</p> <p>R - required if card reader is assigned as parameter device. If omitted 9-level tape is assumed.</p> <p>NOTE: Parameters may be read from any 9-level tape except MASTAP.</p>
<p>8. No further specific operator action is required for System Generation. When the generation session is completed the following is typed:</p> <p>X Δ GENCTL Δ COMEX Δ TERMINATED</p>	None.

Typeouts and responses for Initialization, and Allocation are described in the operation procedures for the pertinent routines.

Typeouts and responses for Executive Transcription are described in detail on page 4-7.

Transcription procedures for program and call libraries are described on page 4-9.

TYPEOUTS

Message	Meaning	Action	Response
5700 SYSGEN ABNORMAL TERMINATION	Parameter card order invalid.	Program is terminated.	None.
5701 SYSGEN ABNORMAL TERMINATION	Parameter card identification field error.	Program is terminated.	None.

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
5703 SYSGEM ABNORMAL TERMINATION	Parameter card operand field error.	Program is terminated.	None.
5704 SYSGEN ABNORMAL TERMINATION	Parameter card field missing.	Program is terminated.	None.
5705 SYSGEN ABNORMAL TERMINATION	Too many co-channels per channel.	Program is terminated	None.
5707 SYSGEN ABNORMAL TERMINATION	Too many trunks per channel.	Program is terminated	None.
5708 SYSGEN ABNORMAL TERMINATION	Address or mnemonic specified twice.	Program is terminated.	None.
5709 SYSGEN ABNORMAL TERMINATION	No configuration parameter in EXECPC card.	Program is terminated.	None.
5715 SYSGEN ABNORMAL TERMINATION	Invalid bootstrap or IPL.	Program is terminated.	None.
5716 SYSGEN ABNORMAL TERMINATION	Text block missing from MASTAP.	Program is terminated	None.
5717 SYSGEN ABNORMAL TERMINATION	Tape block larger than 1044.	Program is terminated.	None.
5718 SYSGEN ABNORMAL TERMINATION	Tape block type or name invalid.	Program is terminated.	None.
5719 SYSGEN ABNORMAL TERMINATION	Unexpected double tape mark.	Program is terminated.	None.

TYPEOUTS
 (Cont'd)

Message	Meaning	Action	Response
5720 SYSGEN ABNORMAL TERMINATION	HI DUMMY (Program Dummy Block) missing.	Program is terminated.	None.
5721 SYSGEN ABNORMAL TERMINATION	Call Library identification block missing.	Program is terminated.	None.
5723 SYSGEN ABNORMAL TERMINATION	Modifier block length invalid.	Program is terminated.	None.
5724 SYSGEN ABNORMAL TERMINATION	Text block length invalid.	Program is terminated.	None.
5725 SYSGEN ABNORMAL TERMINATION	End of tape encountered when writing SYSLIB.	Program is terminated.	None.
5726 SYSGEN ABNORMAL TERMINATION	No selector channel specified.	Program is terminated.	None.
5727 SYSGEN ABNORMAL TERMINATION	Multiplexor specified as co-channel.	Program is terminated.	None.
5728 SYSGEN ABNORMAL TERMINATION	Co-channel specified for multiplexor.	Program is terminated.	None.
5729 SYSGEN ABNORMAL TERMINATION	Invalid device type.	Program is terminated.	None.
5730 SYSGEN ABNORMAL TERMINATION	Too many devices per trunk.	Program is terminated.	None.

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
5731 SYSGEN ABNORMAL TERMINATION	Invalid device type for multiplexor.	Program is terminated.	None.
5733 SYSGEN ABNORMAL TERMINATION	End tape encountered writing SYSTAP.	Program is terminated.	None.
5734 SYSGEN ABNORMAL TERMINATION	A device required by System Generation is not assigned.	Program is terminated.	None.
5735 SYSGEN ABNORMAL TERMINATION	System Generation function call (// EXEC) out of order.	Program is terminated.	None.

**EXECUTIVE
TRANSCRIPTION**

◆ The TDOS Executive Transcriber (LDISK) places the TDOS Executive routines on disk or drum in the correct TDOS system format. It also produces an edited listing of the Program Directory and Load Directories that are created for the TDOS Executive. The program can only be run under SYSGEN control.

Note:

Since this program can be run only under SYSGEN control, the following device assignments follow the normal SYSGEN convention requiring all assignments to be made via // ASSGN cards at the initiation of the entire SYSGEN process.

DEVICE ASSIGNMENTS

◆ Under SYSGEN Control:

SDN	Device Type	Remarks
SYSTAP	Magnetic Tape.	Input device containing TDOS Executive.
SYSRES	Disc or drum.	Output device. Must be initialized and allocated before routine is run.
SYSLST	Printer.	Output listing device.

TYPEOUTS

Message nΔpppppΔ	Meaning	Action	Response
1	The input tape format is incorrect.	Correct problem and restart.	None.
2	Non-recoverable disk or drum error.	Correct problem and restart.	None.
3	Insufficient area allocated on disk or drum for the TDOS Executive.	Reallocate the disk or drum and restart.	None.
4	Non-recoverable tape error.	Correct problem and restart.	None.
6	Non-recoverable printer error.	Correct problem and restart.	None.

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
7	An Executive component being transcribed is too large.	Correct problem and restart.	None.
8	Disc format error. VTOC found on cylinder 0, track 0.	Reinitialize volume with VTOC not on cylinder 0, track 0.	None.
9	No END card found after patches or all patches were not applied.	Correct patches and restart.	None.

In addition to the above typeouts, the following standard typeout will occur:

Message	Meaning	Action	Response
nΔppppppΔ			
PATCHES?	Are there any patches to be applied to the executive during its transcription to the disc (drum).	Respond with applicable response: If no patches are to be applied.	N
		If patches are to be applied.	Y

**LIBRARY
TRANSCRIPTION
PROCEDURE**

◆ After System Generation has been completed, the Executive has been transcribed to the System resident device and System Load Library (SLLT) and Call Library (CLT) tapes have been generated. Disc or drum storage for the program library (PGML1B) should be allocated under SYSGEN. These libraries must then be transcribed to the system resident device (SYSRES). * This is the procedure to be followed:

1. Load the TDOS executive from SYSRES.
2. Load the Program Library Transcriber (PRGTRN) from the TDOS MASTAP, using MASTAP as an alternate load library.

Assign SYSUT2 to the SLLT generated by SYSGEN.

Note: PRGTRN parameters and general operating instructions can be found in the TDOS Utility Manual and TDOS Operators' Guide.

3. Load the Call Library Transcriber (CLTR) from either the MASTAP as an alternate load library, or from SYSRES.
 - a. If space has not been allocated for the libraries, the compute function (using the CDS entry in the parameter) can be used to determine how much disc storage is required. Then the storage allocator (RAALLR) must be run to allocate for the libraries.
 - b. After allocation is completed, load the CLTR again to perform the actual transcription.

Assign SYSUT2 to the previously generated Call Library tape.

Note: CLTR parameters and general operating instructions can be found in the TDOS Utility Manual and the TDOS Operators' Guide.

*Note:

The program library and object module library do not have to be disc-resident. They may remain on tape as alternate libraries.

5. LANGUAGE PROCESSORS

ASSEMBLY SYSTEM

DEVICE ASSIGNMENTS

◆ The TDOS Assembly System translates symbolic source program statements into machine-coded Object Module Files (OMF). The Object Module Files are produced on magnetic tape in nonloadable format and must be bound by the Linkage Editor to produce a loadable program.

Symbolic Device Name	Type Device	Remarks
SYSLIB	Disc or Drum.	Contains Macro Library.
SYSIPT	Card Reader or magnetic tape.	System input device containing Monitor control cards and, optionally, the source deck.
SYSLST	Printer or magnetic tape.	If neither a printer nor punch is assigned to either SYSLST or SYSOPT respectively, both SYSLST and SYSOPT must be assigned to a single magnetic tape.
SYSOPT	Magnetic tape or card punch.	
SYSUT1	Magnetic tape.	Work tape or Object Module File output.
SYSUT2	Magnetic tape.	Work tape (Required).
SYSUT3	Magnetic tape.	Work tape (Required).
SYSUT4	Magnetic tape.	Optional work tape assigned if SYSUT1 is unavailable. (See below.)

The assembly allocates work tapes in one of three ways:

1. SYSUT1, 2, 3 if SYSUT1 is available.
2. SYSUT4, 2, 3 if SYSUT1 is not available but SYSUT4 is.
3. SYSUT2, 3 only if neither SYSUT1 or SYSUT4 is available.

SYSUT1 is considered unavailable as a work tape if it already contains an object module, or the Assembler is to produce an object module to the unit. An alternate work tape, SYSUT4, is made available by specifying the WORK operand of the Monitor PARAM message.

Note: Each work tape must contain a single TM or a standard volume label followed by a TM.

**DEVICE
ASSIGNMENTS**

(Cont'd)

The Assembler will generate the object program to

1. No unit (See TAPE and CARD operands).
2. SYSOPT (output to this unit is always controlled by Monitor).
3. SYSUT1 or an alternate device (as specified to Monitor).
4. Both units specified by 2 and 3 above.

The Assembler interrogates the Monitor table to determine which one of the four cases is specified. The alternate device can never be SYSUT2 or SYSUT3. It cannot be SYSUT4 if the WORK parameter is specified to Monitor and the Assembler will not use SYSUT1 as a work tape (i. e. , an object module already exists on SYSUT1).

The Macro Library cannot be on magnetic tape.

**SOURCE
LANGUAGE
CORRECTION**

◆ The source language correction feature requires up to two additional magnetic tape devices depending on the options chosen. Assignment of devices to these units is controlled by Monitor and they cannot be the same devices assigned to the assembly (i. e. , SYSUT1-UT3).

1. Source Library Tape Input - The symbolic name to be assigned to this device must be specified using the INPUT operand of the Monitor PARAM statement. In addition, an ASSGN card must be used to specify the physical device assignment.
2. Updated Source Output - Symbolic device name SYSUT5 is reserved by Monitor for the updated source program.

A unique symbolic name (i. e. , other than SYSUT5) can be assigned by use of the SOURCE operand in the Monitor PARAM statement.

In either case, an ASSGN message must also be used to denote physical device assignment.

**OPERATIONAL
PARAMETERS**

◆ The Monitor PARAM statement may optionally be used to designate or to omit specific assembly system output files. The PARAM operands that override normal output assumptions are listed below. Refer to the TDOS Control System Reference Manual (70-00-611) for complete format information.

TYPEOUTS

◆ Typeouts are generated by the Assembly system when 1) SYSLIB is available and the Macro Library has been requested (LIBRY=YES) or 2) Source Language Maintenance From Tape has been requested. In these cases, the following typeouts apply:

Message	Meaning	Action	Response
nΔppppppΔ			
0500A MACRO LIBRARY NOT ON R. A.	The Macro Library was not correctly transcribed to disc.	1. Continue without Macro Library. 2. Dump & terminate**.	Any letter except T. T
0501 CONTINUING WITHOUT MACRO LIBRARY	Response of other than T for above message was received. Assembly continues without the Macro Library.	None.	None.
0502A MACRO LIBRARY BAD ON R. A.	Macro Library cannot be read from R. A. ; however, assembly may continue without macro being called.	1. Continue without the macro. 2. Dump & terminate**.	Any letter except T. T
0503 CONTINUING WITHOUT MACRO XXXXX	Response of other than T for above message was received. Assembly continues without macro XXXXX for this call.	None.	None.
0504 MACRO XXXXX BAD ON R. A. — JOB TERMINATED	The Macro Library on R. A. was detected as bad during expansion of macro XXXXX. Job is automatically dumped and terminated**.	None. Job terminated.	None.

**Note:

Dumping occurs only when // DUMP card is present before the //ΔEXEC or //ΔSubprocessor card.

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
052nA ERROR, device REWOUND TO BT INSTEAD OF A TM n=1 - TDOS Pass 1 4 - TDOS Pass 2 5 - TDOS Pass 2A 6 - TDOS Pass 2B 7 - TDOS Pass 2C 8 - TDOS Pass 3	Hardware error doing rewind to logical device. Job will be ter- minated after response & dumped.	Call C. E. to examine com- puter before responding to message.	Any
0530A LIBRARY DEVICE TYPE?	Needs type of device library is on.	Respond appropriately.	DISC DISK DRUM
0531 LIBRARY DEVICE INVALID	Type for 0530A message above invalid.	None.	None
0540 *STARTC XXXXXXXX	XXXXXXXX is name of segment being assembled from tape, when source Language Maintenance is used.	None.	None

**OPERATIONAL
PARAMETERS**
(Cont'd)

Param Operand	Meaning
TAPE=NO	Indicates that tape output is not to be generated.
CARD=YES	Indicates that card image output is to be written to SYSOPT.
INPUT=symbolic	Source input device, if other than SYSIPT. (See Source Language Correction.)
OUTPUT=symbolic	Indicates symbolic device, if other than SYSUT1, that is to receive the generated Object Module File(s).
WORK=YES	Indicates assignment of the additional work tape SYSUT4.
LIBRY=NO	Indicates absence of Macro Library.
SOURCE=symbolic	Updated source symbolic device, if other than SYSUT5. (See Source Language Correction.)
ERRLST=NO	Indicates that a listing of error flags is not to be printed.
ASMLST=NO	Indicates that the program listing is not to be produced. Statements containing errors, however, will be printed.
XREF=YES	A cross reference listing is to be produced.
MAP=NO	Indicates that the Symbol Table listing is not to be produced.

Note:

If both `ERRLST=NO` and `ASMLST=NO` are specified then no listing information is produced.

OPERATING PROCEDURES

◆ The Assembly System is a subprocessor component of the Tape/Disc Operating System and operates under control of the TDOS Monitor, accepting standard Monitor control messages from the job stream. To request loading and execution of the Assembler, a subprocessor control statement of the format // ASSMBL must be entered into the job stream. If the operational Monitor PARAM message is used, it must precede the above call message.

SOURCE INPUT COMPOSITION

◆ The Assembly source deck must immediately follow the // ASSMBL message. Multiple assemblies can be performed by placing the START card of each successive assembly behind the END card of the preceding assembly, with no intervening Monitor Control messages. Each source deck will thus generate an individual Object Module File which, in turn, must be bound by the Linkage Editor. (See Example 1, below.) If appropriate Linkage Editor control cards are reproduced onto the OMF between each object module, it becomes possible to direct the binding of each object module into separately loadable object modules.

If the source program is contained on magnetic tape (INPUT operand of PARAM message specified) and no source corrections are to be applied, the following control message must immediately follow the // ASSMBL call message:

```
*STARTC  program name, ASSEMBLE
```

The *ENDC card must not be present when this option is used.

ASSEMBLE, BIND AND EXECUTE

◆ The following three examples illustrate the control cards required to perform an assembly, to bind the object module with the Linkage Editor, and to execute the generated loadable program:

Example 1

◆ Assemble three programs, bind each object module produced into one loadable program and execute.

```
//ΔSTARTM
```

```
//ΔJOB
```

```
//ΔASSMBL
```

```
START
.   }
.   } Source 1
.   }
END
```

```
START
.   }
.   } Source 2
.   }
END
```

Example 1
(Cont'd)

```

START
.   }
.   } Source 3
.   }
END

//ΔEXEC

(Data, if required)

//ΔENDMON
    
```

Example 2

◆ A multiple assembly of three programs, each containing the appropriate Linkage Editor parameters to direct the binding of each into separately loadable programs. In this case, the // EXEC message will load and execute only the last program.

```

//ΔSTARTM

//ΔJOB

//ΔASSMBL

START
.   }
.   } Source 1
.   }
END

(Appropriate Linkage Editor parameters)

START
.   }
.   } Source 2
.   }
END

(Appropriate Linkage Editor parameters)

START
.   }
.   } Source 3
.   }
END

(Appropriate Linkage Editor parameters)
    
```

Example 2
(Cont'd)

```
//Δ EXEC
(Data, if required)

//Δ ENDMON
```

Example 3

◆ Assemble three programs, bind and execute each after it has been assembled.

```
//Δ STARTM

//Δ JOB

//Δ ASSMBL

START
.   } Source 1
.
.
END

//Δ EXEC
(Data, if required)

//Δ JOB

//Δ ASSMBL

START
.   } Source 2
.
.
END

//Δ EXEC
(Data, if required)

//Δ JOB

//Δ ASSMBL

START
.   } Source 3
.
.
END

//Δ EXEC
(Data, if required)

//Δ ENDMON
```


**REPORT PROGRAM
GENERATOR**

◆ The TDOS Report Program Generator (RPG) is an automatic programming system that produces a report program from problem specifications. The result is an Object Module which must be bound by the Linkage Editor prior to execution.

An RPG compile and execute function is an option that causes compilation of the problem specifications, linking and execution of the resultant Object Module.

**DEVICE
ASSIGNMENTS**

Symbolic Device Name	Device Type	Remarks
SYSLST	Printer or magnetic tape.	If neither a printer nor punch is assigned to SYSLST or SYSOPT, both SYSLST and SYSOPT must be assigned to the same tape unit.
SYSOPT	Card punch or magnetic tape.	
SYSUT1	Magnetic tape.	Work tape.
SYSUT2	Magnetic tape.	Work tape.
SYSUT3	Magnetic tape.	Work tape.

**PROBLEM
SPECIFICATIONS**

◆ The problem specification cards must enter the compiler in a fixed sequence. Those form types not needed for problem solution may be omitted.

Form Type (col. 6-)	Description
H	Header card (RPG control card).
F	File description specification.
E	File extension specification.
L	Line counter specification.
I	Input specifications.
C	Calculation specifications.
O	Output format specifications.

The termination symbol for the problem specification deck is a card with /* in columns 1 and 2.

HEADER CARD

◆ The header card (H Col. 6) determines the RPG options to be performed; e.g., compile, compile and execute with Library tape, compile and execute without a Library tape.

COMPILE

◆ The RPG compilation is started by inclusion of one of the following cards, in the job stream, in front of the problem specifications:

Control Card Type	Remarks
//ΔRPG	These two cards produce the same Monitor function; either may be used when the compiler is not on an alternate tape.
//ΔEXECΔRPG	
//ΔEXECΔRPG,ALT	Used if the compiler is on an alternate tape.

COMPILE AND EXECUTE WITH LIBRARY

◆ Compile and execute with Library allows immediate execution of the Object Module. The inclusion of the Library allows RPG FCP and any other Object Modules called from the library to be bound into the Object program during operation of the Linkage Editor. The fully bound program can then be executed from tape or a random access device.

When the header card (H Col. 6) specifies compile and execute with Library, the following control cards are required in addition to those used for normal compilation:

Control Card Type	Remarks
//ΔASSGNΔSYSLIB	Specifies random access device containing Object Module Library.
//ΔEXEC	Immediately follows the /* card that terminates the problem specifications. This causes the binding and execution of the newly generated Object Module.

COMPILE AND EXECUTE WITHOUT LIBRARY

◆ Compile and Execute without a Library has the same functions as compile and execute with Library.

When the header card (H Col. 6) specifies Compile and Execute without a Library, the following is needed in addition to that necessary for normal compilation:

1. RPG FCP package and any other Object Module decks to be linked to RPG program must be in the job stream.
2. The following additional control cards are needed:

**COMPILE AND
EXECUTE WITHOUT
LIBRARY**
(Cont'd)

Control Card Type	Remarks
//ΔLNKEDT	Call Link Editor.
Δ INCLUDEΔSYSUT1	Informs Link Editor that the root segment is on SYSUT1.
//Δ EXEC	Causes execution of the bound program.

**COMPILER ERROR
HALTS**

◆ There are no compiler error halts or typeouts. All diagnostics are printed on SYSLST with the program listing.

**OBJECT PROGRAM
ERROR TYPEOUT**

Message	Meaning	Action
06Hn	n = 0 through 9. Halt condition set up by the programmer.	Take action specified in programmers instructions.

**TDOS COBOL
COMPILER**

◆ The TDOS COBOL Compiler is designed to accept source programs written in the COBOL language described in the TDOS COBOL Reference Manual (70-00-607) and translate these programs into machine-coded Object Module Files that must be bound by the Linkage Editor before execution.

**DEVICE
ASSIGNMENTS**

Symbolic Device Name	Device Type	Remarks
SYSLIB	Tape, Drum or Disk	Contains COBOL Source Program Library and is required when the library is referenced by a source program. This device also contains COBOL object time sub-routines and FCP coding.
SYSIPT	Card Reader or Magnetic Tape	System input device containing Monitor Control cards and the source program.
SYSLST	Printer or Magnetic Tape	If neither a printer nor punch is assigned, both SYSLST and SYSOPT must be assigned to the same magnetic tape.
SYSOPT	Card Punch or Magnetic Tape	
SYSUT1	Magnetic Tape	Work Tape.
SYSUT2	Magnetic Tape	Work Tape.
SYSUT3	Magnetic Tape	Work Tape.
SYSUT4	Magnetic Tape	Optional work tape, required for stacked compilations.
SYSUT5	Magnetic Tape	Alternate Source Input Tape.

Note: SYSUT4 must be used if stacked object modules for multiple complications are generated for subsequent processing by the Linkage Editor, or if SYSUT1 contains object modules produced by a processor executed prior to the current COBOL compilation.

**OPERATIONAL
PARAMETERS**

◆ The Monitor PARAM statement may optionally be used to designate or omit specific COBOL compiler output files. The PARAM operands that override normal output assumptions are listed below. Refer to the TOS Control System Manual (70-00-609) for complete formal information.

Param Operand	Meaning
TAPE=NO	Tape object modules are not to be generated to SYSUT1.
CARD=YES	Card image output is to be generated to SYSOPT.
LIST=YES	A source program listing is to be written to SYSLST.

Example 1 ◆ Compile a single program, bind the object module into a loadable program, and execute.

```
//ΔJOB
```

```
//ΔCOBOL
```

(COBOL Source Deck or BASIS Cards)

```
//ΔEXEC
```

(Data, if required)

Example 2 ◆ Compile two programs, bind each object module produced into one loadable program, and execute the generated loadable program.

```
//ΔJOB
```

```
//ΔCOBOL
```

(1st COBOL Source Deck or BASIS Cards)

```
//ΔCOBOL
```

(2nd COBOL Source Deck or BASIS Cards)

```
//ΔEXEC
```

(Data, if required)

Example 3. ◆ Compile two programs, bind each object module produced as a separate loadable program, and execute the last loadable program.

```
//ΔJOB
```

```
//ΔCOBOL
```

(1st COBOL Source Deck or BASIS card)

(Appropriate Linkage Editor Cards)

```
//ΔJOB
```

```
//ΔCOBOL
```

(2nd COBOL Source Deck or BASIS card)

```
//ΔEXEC
```

(Data, if required)

Example 4.

◆ Compile three programs without binding or execution of the object modules.

```
//ΔJOB
```

```
//ΔCOBOL
```

(1st COBOL Source Deck or BASIS card)

```
//ΔCOBOL
```

(2nd COBOL Source Deck or BASIS card)

```
//ΔCOBOL
```

(3rd COBOL Source Deck or BASIS card)

**COBOL STACK
COMPILATION**

◆ This option permits automatic generation of the Linkage Editor PROG parameter by the compiler. This feature facilitates the binding of object modules generated by a stacked compilation into separate loadable programs without the need for submitting additional parameters to the Linkage Editor routine during the binding process.

The entry DUPL=YES in the // PARAM card(s) preceding the // EXEC COBOL card will notify the compiler that a PROG parameter is to be generated preceding each object module produced from the ensuing COBOL source programs in the monitor job stream until either a // JOB card, or a // PARAM card with DUPL=NO specified, or the // ENDMON card is encountered. The Linkage Editor will then produce a loadable program from the modules following a PROG entry on SYSUT1 until the next PROG entry, or the end of the object module file on SYSUT1.

The only parameter required in the monitor job stream pertaining to the Linkage Editor routine is the // LNKEDT card. In this situation SYSUT1 is the primary input, there is no secondary input. The name of the loadable program(s) is the same as the name given in the PROGRAM-ID entry of the IDENTIFICATION DIVISION in the source program.

**COBOL STACK
COMPILATION
(Cont'd)**

Examples:

Monitor Job Stream	Program Load Library (SYSUT2)
<pre>// STARTM // JOB // PARAM DUPL=YES // EXEC COBOL (source program-A) // EXEC COBOL (source program-B)</pre>	<p>Program-A</p>
<pre>// PARAM DUPL=NO // EXEC COBOL (source program-C) // EXEC COBOL (source program-D)</pre>	<p>Program-B (implicitly includes modules C and D)</p>
<pre>// PARAM DUPL=YES // EXEC COBOL (source program-E) // LNKEDT // ENDMON</pre>	<p>Program-E</p>

Notes:

1. The predefined option is DUPL=NO, therefore no changes in operating procedures are required if this facility is not desired.
2. If it is desired to create an overlay structure or to explicitly include modules from an OMF or OML this feature should not be used.
3. When a COBOL source program in the monitor job stream contains the SORT feature the parameter DUPL=YES must be in effect for both the source program containing the SORT and the source program following it in the same monitor job stream (re: Note 2 above).
4. If all of the source programs in a given monitor job stream, including any that may contain the SORT feature, are to be bound as one loadable program, the DUPL=YES parameter is not required. Also, no Linkage Editor parameters are permitted.

USE OF AN ALTERNATE SOURCE TAPE AS INPUT TO COMPILATION

General

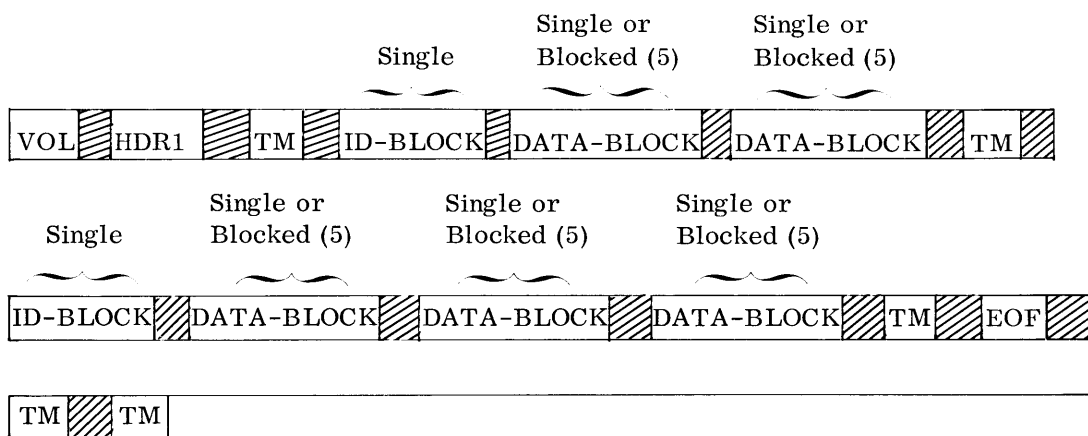
◆ This option allows source input to a COBOL compilation to reside on a symbolic device other than SYSIPT. When this option is desired it is necessary to employ the INPUT=SYSUT5 Monitor parameter option to specify which magnetic tape device contains the source program to be compiled.

Source Tape Format

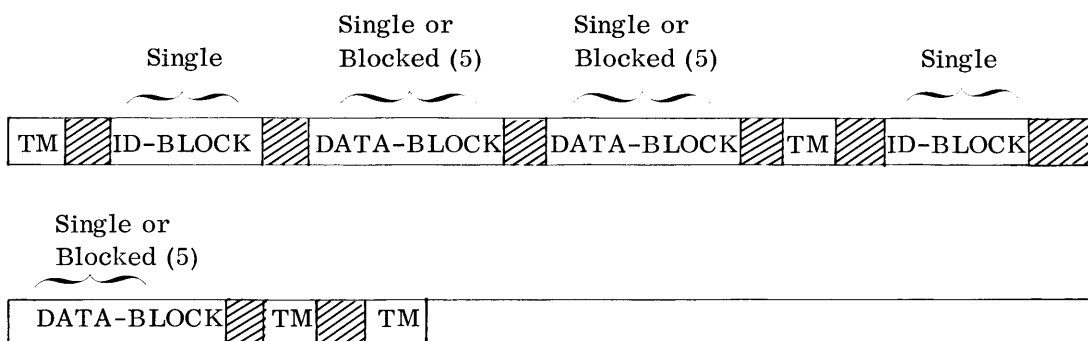
◆ The run-time parameter cards for a COBOL compilation job stream remain the same with the addition of the INPUT=SYSUT5 entry in the // Δ PARAM card. However, in place of the source program cards in the job stream the control message *STARTC is required to specify which program on SYSUT5 is to be compiled. The format of the source input tape and the control message are described below.

◆ The source tape, (SYSUT5) , may have either Standard Labels, Omitted Labels, or be Unlabeled.

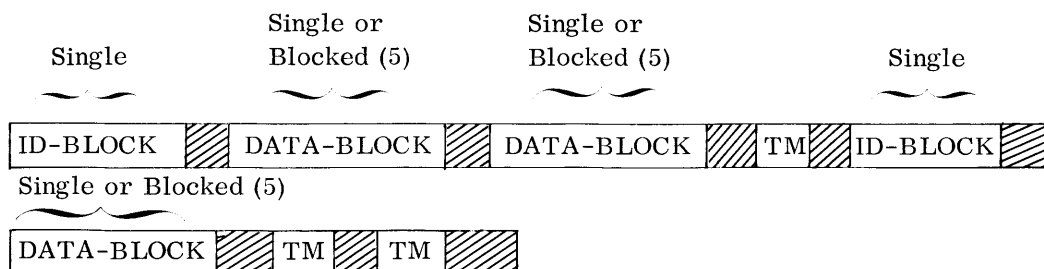
STANDARD LABELS



LABELS OMITTED



UNLABELED



ID-BLOCK Format

◆ All programs whether blocked or unblocked on the source tape must be preceded by a single record ID-BLOCK of 80 characters. The ID-BLOCK must be in the following format.

80 bytes, unblocked

*STARTC Δ PROGRAM-NAME

Position	Contents
1 - 7	*STARTC
8	(SPACE)
9 - 16	PROGRAM-NAME (1 to 8 characters <u>NOT</u> surrounded with quotes, left justified, space filled)
17 - 80	NOT USED

Note: PROGRAM-NAME must be the same as that specified in the PROGRAM-ID entry in the source program.

Data Record Format

◆ Each data record must be 80 characters in length, unblocked or blocked five records to a block. The data records may not be in compressed form. The last data block of a source program may contain from one to five records but must be an even multiple of 80 bytes.

The COBOL compiler will terminate reading of a source program from the input tape upon encountering a single tape mark. A double tape mark indicates the end-of-file. Standard labels and initial tape marks are processed under normal system standards.

***STARTC Control Message**

◆ An *STARTC control card must immediately follow the // Δ COBOL run time parameter. The control card specifies the name of the source program to be compiled and tape positioning prior to searching for the program on the input tape. Searching is always done in a forward direction, and the tape is not rewound after a compilation.

***STARTC Card Format**

- ◆ *STARTC program-name $\left[, \left\{ \begin{array}{l} \text{NO} \\ \text{RWD} \end{array} \right\} \right]$
1. *STARTC must be punched in columns 1 through 7.
 2. The program-name may be 1 to 8 characters in length starting in column 9 of the *STARTC card.
 3. RWD means rewind the source input tape before searching for the program, NO means search for the program without first rewinding the tape.
 4. If the $\left[, \left\{ \begin{array}{l} \text{NO} \\ \text{RWD} \end{array} \right\} \right]$ operand is specified a comma must precede it. If this option is omitted the comma is also omitted and NO rewind is assumed. Redundant spaces preceding the comma are not permitted.
 5. The program-name in the STARTC card and the PROGRAM-ID entry in the source program must be identical.

**OPERATIONAL
PARAMETERS
(Cont'd)**

Param Operand	Meaning
MAP=NO	A locator/map is not to be written to SYSLST.
OBJLST=YES	An object program listing is to be written to SYSLST.
DIAG=NO	A diagnostic listing is not to be written to SYSLST.
XREF=YES	A cross reference listing is to be written to SYSLST.
DUPL=YES	COBOL Stack Compilations
INPUT= SYSUT5	Alternate Source Tape as Input

TYPEOUTS

Message	Meaning	Action	Response
32FF Complication Aborted.	Self-explanatory.	None.	None.
3200 Compilation Completed.	Self-explanatory.	None.	None.
3201 Re-Run Work tape. Non- recoverable error. Compilation aborted.	Self-explanatory.	None.	None.

**OPERATING
PROCEDURES**

◆ The COBOL compiler is a subprocessor of TDOS and operates under the control of the TDOS Monitor, accepting standard Monitor Control messages from the job stream.

To request loading and execution of the COBOL compiler, a subprocessor Control statement of the format // Δ COBOL must be entered into the job stream. If the optional Monitor PARAM message is used, it must precede the COBOL call message.

**SOURCE INPUT
COMPOSITION**

◆ The COBOL source deck must immediately follow the // Δ COBOL control statement. Multiple compilations can be performed by placing one source program after the other separated by a // Δ COBOL card. Each source deck will generate an individual object Module File which must be bound by the Linkage Editor into a loadable program.

**COMPILE, BIND, AND
EXECUTE**

◆ The following examples illustrate the control cards required to perform COBOL Compilations, bind the object module using the Linkage Editor, and execute the generated loadable programs. SYSLIB is always required as input to the Linkage Editor to bind COBOL object time sub-routines and File Control Processor coding with the Object Module File.

Diagnostic

◆ If the program-name entered in the *STARTC card is not found on the source tape the following diagnostic will be issued:

Program-name

XXXXXXXX NOT FOUND ON ALTERNATE SOURCE TAPE

Example of SYSIPT

Card Column 1

- (1) //Δ JOB
- (2) //Δ PARAM LIST=YES, OBJLST=YES, INPUT=SYSUT5
- (3) //Δ COBOL
- (4) *STARTC EXAMP2,NO
- (5) //Δ COBOL
- (6) *STARTC EXAMP1,RWD
- (7) //Δ COBOL
(Source Deck)
- (8) //Δ LNKEDT

Card 1: Initiates a monitor job stream.

Card 2: Specifies that source and object code listings are desired in addition to the map listing, and that the tape unit assigned to SYSUT5 contains an alternate source program input file.

Card 3: Causes loading of the COBOL compiler.

Card 4: Specifies that the program "EXAMP2" is on the alternate input tape and searching is to commence without rewinding the tape.

Card 5: Causes reloading of the COBOL compiler.

Card 6: Specifies that the program "EXAMP1" is on the alternate input tape and searching is to commence after the tape is rewind. (The tape is assumed to be positioned after program "EXAMP1".)

Card 7: Causes reloading of the COBOL compiler. The source program following in SYSIPT is to be compiled.

Card 8: Causes the Linkage Editor to be loaded and the process initiated.

FORTRAN

DESCRIPTION

◆ The FORTRAN compiler accepts programs written in the FORTRAN IV language described in the TOS FORTRAN IV Reference Manual and translates them into Object Module Files acceptable to the Linkage Editor which prepares a bound program for execution.

DEVICE ASSIGNMENTS

Symbolic Device Name	Device Type	Remarks
SYSIPT	Card Reader Magnetic Tape	System input device containing monitor control cards and possibly the source program.
SYSLST	Printer or Magnetic Tape	System list device containing possibly the source list and storage maps.
SYSOPT	Punch or Magnetic Tape	Optional systems output device possibly containing the object module files. If both SYSLST and SYSOPT are assigned to a magnetic tape, it must be the same.
SYSUT1	Magnetic Tape	Work tape and possibly the object module file.
SYSUT2	Magnetic Tape	Work tape.
SYSUT3	Magnetic Tape	Work tape.

OPERATIONAL PARAMETERS

◆ The monitor PARAM statement may optionally be used to designate specific compiler functions. The PARAM operands which override normal designations are listed below. See the TDOS Control System Reference Manual, 70-00-611 for complete explanation.

**OPERATIONAL
PARAMETERS**
(Cont'd)

Param Operand	Meaning
TAPE=NO	The object module file is not to be written to SYSUT1.
CARD=YES	The object module file is to be written to SYSOPT.
LIST=YES	The input source program is to be written to SYSLST.
MAP=NO	The storage maps in alphameric and assignment sequence are not to be written to SYSLST.
DEBUG=YES	The statement number for each executable statement is to be saved so that it can be output if an error message occurs. (This adds 8 bytes for each executable statement.)
CODE=2	7094 code is used for source program input.
CODE=3	3301 code is used for source program input.
INPUT=symbolic	The device which contains the source input.

ERROR TYPEOUTS

◆ None

**OPERATING
PROCEDURES**

◆ There are two forms of the FORTRAN compiler:

1. FORTRN - requires 44872 bytes of memory for compilation.
2. FOR131 - requires 80000 bytes of memory for compilation.

The only difference between the two is that FOR131 allows more variable names and constants.

Both compilers are subprocessors of the TOS Operating System and operate under control of the TOS Monitor.

To request compilation, a statement of the form

//FORXXX

where XXX=TRN or 131 must be in the job stream, preceded by any PARAM statements.

SOURCE INPUT

◆ The FORTRAN source deck must either immediately follow the //FORXXX statement or be on the source input tape. If it is on tape, then there can be no labels and the source program must be blocked four card images per block, the first block of which must be the first block on tape.

EXECUTION

◆ Before execution, the object module file must be bound by the Linkage Editor. This will require a Call Library which contains certain modules necessary for execution. (The user may have assembled his own ITFDATAD module or he may use the one or the Call Library. This will depend on his input/output file requirements. Information relevant to this area can be found in the FORTRAN IV Reference Manual.

TYPEOUTS

Message	Meaning	Action	Response
nΔppppppΔ			
3301A FORTRAN **PAUSE** xx...xx	A PAUSE, PAUSE n or PAUSE 'ss...s' is being executed. (xx...xx is either n or ss...s).	Continue	C
		Terminate.	T
3302 xx...xx	The program is being run under the executive without the monitor and some error has occurred. (xx...xx is a description of the error).	None.	None.
3303A *dddddd*	Input to the program from the Console Type-writer has been re-quested. (dddddd is the device address, DEVADDR in the DATAD for this data set reference number.)	Enter the input.	Input.
3304A xxxx ll...ll	An error has been encountered in opening or closing a tape with standard labels. (xxxx is VOL1, HDR1, or EOF1 and refers to the label in error. ll...ll is the label.)	Ignore & Continue.	I
		Terminate.	T

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
n△pppppp△			
3305A xxxx	The block count in the EOF1 label of a tape with standard labels does not agree with the number of blocks read.	Ignore & Continue.	I
		Terminate	T
3306A xxxxxx PURGE DATEyydoy	The purge date in the HDR1 label of the tape on unit xxxxxx is yydoy (year and day of year) which is less than today's date.	Ignore & Continue.	I
		Terminate.	T

6. AUTOMATIC INTEGRATED DEBUGGING SYSTEM (TDSAID)

GENERAL DESCRIPTION

◆ The TDOS Automatic Integrated Debugging (TDSAID) System provides console-controlled and automatic methods of testing a single program or a series of programs. The console-controlled AIDS routine is controlled by parameters entered from the console typewriter. In this case, the user runs the routine or tells the operator what parameters to use.

The automatic AIDS routine needs no operator input for test parameters. The parameters are entered automatically from a card reader or magnetic tape device.

OPERATING PROCEDURE

AUTOMATIC AIDS

◆ 1. Place the AIDS control cards for all programs to be tested, in the card reader, in the order they are to be tested. The operator should place an Δ END Δ AIDS card at the end of the AIDS control cards. The complete card deck may be transcribed to tape, and the tape used as AIDS input.

2. Load AIDS for automatic testing using the following Executive message:

```
E $\Delta$ LOD $\Delta$ TDSAID,mn,, ,H
```

where mn = mnemonic for device containing AIDS if it is not on the System resident device.

H = high memory load. Automatic AIDS must always be loaded high.

3. AIDS then types the following message:

```
AUTO OR CONSOLE?
```

The response to this message is:

```
AUTO $\Delta$ mn
```

where mn = mnemonic for the device containing the programs to be tested.

4. The Executive then asks for assignment of AIDIPT and AIDOPT. When this is accomplished, AIDS processes device cards, asks for device assignments, and loads the program to be tested.

If the program to be tested cannot be found on the indicated device, the routine cycles with the Executive message n Δ pppppp Δ 02NF. The operator must then load the program to be tested using the E Δ LOD message indicating low-order memory.

AUTOMATIC AIDS
(Cont'd)

5. When the program under test and AIDS share the reader, AIDS types the message ARE CARDS dddddd AVAIL? (dddddd is the symbolic used for the reader by the program under test). The operator should remove any AIDS control cards, place the card input for the current program in the reader, and respond n Y. If the card input is not available, respond nΔN; AIDS will proceed to the next program.
6. When the testing of a program terminates, AIDS types the message RELOAD CARD READER WITH AIDS JOBSTREAM. The operator should remove any cards that may be in the reader and replace the remaining AIDS control cards.
7. When AIDS and a program under test that requires card input do not share the card reader, AIDS types the message ARE READER AND FILE dddddd AVAIL? The operator should place the card input for the current program in the reader, and respond nΔY. If the card input is not available, respond n N; AIDS will proceed to the next program.

**CONSOLE-CONTROLLED
AIDS**

- ◆ 1. Console-controlled AIDS is loaded using the following Executive message:

EALODATDSAID,mn

where mn = mnemonic for the device containing AIDS if it is not on the System resident device.

2. AIDS then types the following message:

AUTO OR CONSOLE?

The response to this message is explained on page 6-09.

After the response to AUTO OR CONSOLE? is made, AIDS determines if the program to be tested is in memory. If it has not been loaded, AIDS cycles until an EALOD message from the user loads the program.

If the program is in memory and it has a higher priority than AIDS, the change Priority Console routine must be used to make the priority of AIDS higher than that of the program to be tested.

3. When both AIDS and the program to be tested are in memory, the message AIDS REQUEST REQUIRED is typed. The user can then submit any of the AIDS parameters.

DEVICE ASSIGNMENTS

◆ *Under Executive Control:*

Automatic Testing

SDN	Device Type	Remarks
AIDIPT	Card reader or magnetic tape.	Parameter input device.
AIDOPT	Printer or magnetic tape.	Output device.

Console-Controlled Testing

SDN	Device Type	Remarks
AIDRDV	Card reader or magnetic tape.	Input device for Snapshot, Trace, and Patch parameters.
AIDOPT	Printer or magnetic tape.	Output device for Memory Print, Snapshot, and Trace results.

PRINTOUTS

AUTOMATIC TESTING

Message	Meaning
A DATA ERROR INTERRUPT HAS OCCURRED AT PROG REL nnnnnn, P CTR mnnnnn	A decimal arithmetic error, editing error, or Convert to Binary instruction error occurred.
A DECIMAL OVERFLOW INTERRUPT HAS OCCURRED AT PROG REL nnnnnn, P CTR mnnnnn	The result field of an instruction was too small to contain the result of the decimal operation.
A DIVIDE ERROR INTERRUPT HAS OCCURRED AT PROG REL nnnnnn, P CTR mnnnnn	A fixed-point, floating-point, or decimal divide error or Convert to Binary instruction error occurred.
A FIXED POINT OVERFLOW INTERRUPT HAS OCCURRED AT PROG REL nnnnnn, P CTR mnnnnn	High-order significant bits were lost or a high-order carry occurred in a fixed-point operation.

AUTOMATIC TESTING
(Cont'd)

Message	Meaning
AN ADDRESSING ERROR INTERRUPT HAS OCCURRED AT PROG REL nnnnnn, P CTR nnnnnn	An addressing, specification, or protection key error occurred.
AN ELAPSED TIME CLOCK INTERRUPT HAS OCCURRED AT PROG REL nnnnnn, P CTR nnnnnn	The Elapsed Time Clock cycle for the test program was completed.
AN EXPONENT OVERFLOW INTERRUPT HAS OCCURRED AT PROG REL nnnnnn, P CTR nnnnnn	The result exponent of a floating-point operation was greater than 127.
AN EXPONENT UNDERFLOW INTERRUPT HAS OCCURRED AT PROG REL nnnnnn, P CTR nnnnnn	The result exponent of a floating-point operation was less than zero.
AN OPERATN CODE TRP INTERRUPT HAS OCCURRED AT PROG REL nnnnnn, P CTR nnnnnn	The test program attempted to execute an instruction that was either not assigned or not available to the processor.
A PRIVILEGED OPERATN INTERRUPT HAS OCCURRED AT PROG REL nnnnnn, P CTR nnnnnn	The test program attempted to execute a privileged operation and the processor was in the non-privileged mode.
A SIGNIFICANT ERROR INTERRUPT HAS OCCURRED AT PROG REL nnnnnn, P CTR nnnnnn	The result mantissa of a floating-point add or subtract instruction was zero.
A SUPRVSR CALL INSTR INTERRUPT HAS OCCURRED AT PROG REL nnnnnn, P CTR nnnnnn	The test program attempted to execute an invalid Supervisor Call.
(Parameter) CARD SEQUENCE ERR	The sequence number in the parameter is in error.
(Parameter) DEC FIELD ERROR	A decimal field in the parameter is in error.
(Parameter) EXCH PATCHES EXCEED PROG RHE	The right-hand-end of the ex- change patch data is outside the test program memory limit.

AUTOMATIC TESTING
(Cont'd)

Message	Meaning
(Parameter) INVALID HEX CHAR	The parameter contains an invalid hexadecimal character.
(Parameter) INVALID TEST NAME	The test name in the parameter is not SNAPS, TRACE, or PATCH.
(Parameter) NO END SENTINAL	There is no end sentinal (11, 8, 7 punch) immediately following the last graphic character in the PATCH parameter.
NO PROG END CARD	There was no END PROG parameter following the AIDS cards for a program. Information only.
OPERATOR REQUESTED TERMINATION HAS OCCURRED AT PROG REL nnnnnn, P CTR nnnnnn	The operator interrupted the program and terminated it.
(Parameter) PAR TAB FILLED	This parameter caused the limits of the AIDS parameter table to be exceeded.
(Parameter) PATCH TYPE ERR	The Add or Exchange Patch parameter format is incorrect.
(Parameter) PROG NAME ERR	The program name in the parameter does not agree with the name in the previous PROG parameter.
(Parameter) SNAP AREA INVALID	All or part of the Snap area defined in the parameter was outside the program limits or the lhc was greater than the rhe.
(Parameter) TEST POINT INVALID	The test point given in the parameter was outside the program limits.
(Parameter) TRACE AREA INVALID	All or part of the Trace area defined in the parameter was outside the program limits.

TYPEOUTS

AUTOMATIC TESTING

Message	Meaning	Action	Response
nΔppppppΔ			
AIDS ABORT REQUEST REQUIRED	An unsolicited inter- rupt was entered.	1. Terminate current program testing, continue AIDS.	A
		2. Complete current program testing, terminate AIDS.	B
		3. Terminate current program testing and AIDS immediately.	C
AIDS O/P TAPE FULL, MOUNT NEW TAPE ON mn. REPLY WITH ΔA WHEN MOUNTED	EOT sensed on AIDS output tape.	Mount new tape on device mn.	A
ALL I/P TESTED, NO ID RCD FOUND	AIDS could not find a program identifi- cation record (PROGcard).	AIDS terminates.	None.
ANY MORE AIDS INPUT?	AIDS requests additional control card input; no END AIDS card was found.	1. AIDIPT is reader; place additional AIDS control cards in reader.	Y
		2. AIDIPT is tape or no more AIDS input.	N
ARE READER AND FILE dddddd AVAIL?	Are cards for device dddddd in card reader? AIDS and program under test <u>do not share</u> reader.	1. Place cards in reader.	Y
		2. Cards are not available. AIDS proceeds to next program.	N
DEVICE REQUESTS FOR PROG pppppp	AIDS is processing device cards for program pppppp.	None.	None.

AUTOMATIC TESTING
 (Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
ARE CARDS dddddd AVAIL?	Are data cards for device ddddd in card reader? AIDS and program under test <u>share</u> the reader.	1. Remove AIDS control cards and place data cards in reader.	Y
		2. Cards are not available. AIDS proceeds to next program.	N
PROGRAM pppppp TESTING TERMI- NATED	Testing of program pppppp has termi- nated.	None. AIDS proceeds to next program.	None.
RELOAD CARD READER WITH AIDS JOBSTREAM	Place remaining AIDS control cards in card reader.	Remove any data cards and place AIDS control cards in reader.	None.
011GA ASSGN dddddd	Assign program under test input tape device ddddd.	1. Assign ddddd.	mn
		2. Device or input tape is not avail- able. AIDS proceeds to next program.	N
011GA ASSGN PRINTER	Assign printer to program under test.	1. Assign printer.	mn
		2. Printer is not available. AIDS proceeds to next program.	N
011GA ASSGN PUNCH	Assign card punch to program under test.	1. Assign punch.	mn
		2. Punch is not available. AIDS proceeds to next program.	N
011GA ASSGN TAPE	Assign work tape to program under test.	1. Assign tape.	mn
		2. Work tape is not available. AIDS proceeds to next program.	N

AUTOMATIC TESTING
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
48PRA AUTO OR CONSOLE ?	Is AIDS to be auto- matic or console- controlled?	AIDS is automatic and programs to be tested are on device mn.	AUTO Δmn

Note

◆ Additional Typeouts may occur during testing from the program under test and the Tape Edit and Test Data Generator routines contained in AIDS.

**CONSOLE-
CONTROLLED
TESTING**

Message	Meaning	Action	Response
nΔppppppΔ			
AIDS REQUEST MSG UN- ACCEPTABLE	Parameter just entered was not recognized.	Submit correct parameter.	
AIDS REQUEST REJECTED (reason for rejection)	Parameter just entered was re- jected for reason given.	Submit correct parameter.	
AIDS REQUEST REQUIRED	Request for AIDS input parameter.	Submit correct parameter.	
AIDS REQUEST REQUIRED EOJ AT hhhhh	Program under test has executed EOJ SVC at location hhhhh. AIDS requests input parameter.	Submit any AIDS parameter. If Continue or Proceed is submitted, it must contain an address where control is to be transferred to.	
AIDS REQUEST REQUIRED SGMT sssss LOADED	Segment ssssss has been loaded. AIDS requests input parameters.	Submit any AIDS parameter.	

**CONSOLE-
CONTROLLED
TESTING**
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
AIDS REQUEST STOP AT hhhhh	Address Stop test point hhhhhh has been executed required number of times. AIDS requests input parameter.	Submit any AIDS parameter.	
48PRA AUTO OR CONSOLE?	Is AIDS to be automatic or console-controlled?	AIDS is console-controlled and:	
		1. AIDS and program under test <u>do not share reader</u> or printer.	pppppp pppppp = name of program under test.
		2. AIDS and program under test <u>share card reader</u> .	ppppppΔaaaaaa aaaaaa = program under test name for card reader.
		3. AIDS and program under test <u>share printer</u> .	ppppppΔ,bbbbbb bbbbbb = program under test name for printer.
		4. AIDS and program <u>share card reader and printer</u> .	ppppppΔ aaaaaa,bbbbbb

Notes

- ◆ 1. Additional typeouts may occur during testing from the program under test.
- 2. Refer to TDOS Utility Routines manual, Section 4, for AIDS parameters.

7. DIAGNOSTIC ROUTINES

SELF-LOADING MEMORY PRINT

◆ The Self-Loading Memory Print routine is an emergency testing aid that provides a listing of all, or part, of main memory and the contents of scratch-pad memory. This routine is used when a program has terminated in an abnormal or unexpected manner and the standard memory print (Dump and Terminate console request) cannot be used.

This routine contains its own bootstrap, loader, and device control. As a result, it is not dependent on any other programming system and is loaded without the Executive or Monitor.

Operating procedures for this routine are as follows:

1. Place routine object deck in card reader. Set load unit on control panel to address the card reader.
2. Press LOAD.
3. The following typeout occurs:

FLOAT

The print routine may be floated in memory as low as 00080₍₁₆₎, or loaded at the end of memory, based on the following core sizes:

65K - 0F610
121K - 1F610
262K - 3F610
524K - 7F610

4. Type in the LHE address of where print routine is to be loaded (five-character hexadecimal address ending in zero).
5. The program will then load itself and display the following message:

ENTER COMPLETE PARA

6. Type in the following parameter:

llllrrrrrΔcuuΔd

Where:

llll = hexadecimal address of left-hand end of memory area to be printed (five characters).

rrrrr = hexadecimal address of right-hand end of memory area to be printed (five characters).

**SELF-LOADING
MEMORY PRINT**
(Cont'd)

Δ = space.

cuu = channel and device number of the output device.

d = output device type: space for printer; T for nine-level magnetic tape, S for seven-level magnetic tape.

7. Press EOT.
8. After the memory print has been completed, the routine types out the following message:

ENTER MEM LIMIT PARA

9. To print an additional area of memory, type in the limits of the area as shown below and press EOT.

llllrrrrr

10. To terminate the routine, type in END and press EOT.

◆ None.

**DEVICE
ASSIGNMENTS**

TYPEOUTS

Message	Meaning	Action
1301	Parameter input error.	Type correct parameter input.
1316	Output device inoperable.	Correct condition. Press START.
1317	Error writing to output device.	1. If printer output, press COIN to print line.
		2. If magnetic tape output, press COIN to rewrite record.

SNAPSHOT

◆ The Snapshot routine is a program testing aid that provides an edited listing of the general registers of the P1 state, the floating-point registers, and selected areas of main memory.

Listings are obtained during program execution time as a result of SNAPS macro call lines placed in the assembly source deck. Any or all snapshot points can be inhibited at run time.

DEVICE ASSIGNMENTS

◆ *Under Executive Control*

SDN	Device Type	Remarks
SNPRDR	Card reader	For INHIBIT parameters if they are to be entered from card reader.
SNAPOP	Printer or magnetic tape.	Output device. If magnetic tape, pre-edit option of Tape Edit routine must be used to print tape.

Under Monitor Control

SDN	Device Type	Remarks
SYSIPT	Card reader	For INHIBIT parameters.
SYSLST	Printer or magnetic tape.	Output device. If magnetic tape, pre-edit option of Tape Edit routine must be used to print tape.

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
16PDA SNAPS	Request for source of INHIBIT parameters, if any.	1. Card reader	R
		2. Console typewriter.	T
		3. None.	EOT
16PRA ENTER INHIB PARAM	Request for number of snappoints to be inhibited.	Insert number of snappoints to be inhibited.	nnn ... n Where n's are number of snappoints to be inhibited.
16PRA ENTER SNAP x PARAM	Request for left and right-end of snapshot point x.	Insert left-hand end and right-hand end of snapshot point x.	Type lllllrrrrrrfn where: lllll = (LHE) ₁₆ rrrrr = (RHE) ₁₆ f = H hexadecimal = G EBCDIC graphics. = C EBCDIC graphics and hexadecimal. = M mnemonics. = F floating-point, double precision. = S floating-point, single precision. n = 1 one-byte print group. = 2 two-byte print group. = 4 four-byte print group.
160DA OP/DEV	Request for output device type.	1. Magnetic tape.	T
		2. Printer.	P
1601	Parameter format error.	Processing continues.	None
1601 F = x N = y	Format and/or grouping factor error.	Processing continues.	None
1601	Parameter not recognized.	Repeat parameter input when requested.	None

SELF-LOADING TAPE EDIT

◆ The Self-Loading Tape Edit routine is an emergency testing aid that displays the contents of a magnetic tape reel in hexadecimal format, EBCDIC graphic format, or both. The format in which the data are to be displayed is determined from an input parameter message entered from the console typewriter.

This routine contains its own bootstrap, loader, and device control. As a result, it is not dependent on any other programming system and is loaded without the Executive or Monitor.

Operating procedures for this routine are:

1. Place routine object deck in card reader. Set load unit number on control panel to address the card reader.
2. Press LOAD.
3. The program loads itself, and the following typeout occurs:

```
44RDA ENTER OUTPUT PARAM
```

4. Type in the following parameter:

```
ccu^d
```

Where:

ccu = channel and device number of the output device.

d = output device type: T for magnetic tape, space for printer.

5. Press EOT.
6. The following typeout occurs:

```
44PRA ENTER INPUT PARAM
```

7. Type in the following parameter:

```
ccu^f^ss
```

Where:

ccu = channel and device number of the input device.

f = 1 rewind to BOT and print in EBCDIC graphics.

= 2 rewind to BOT and print in hexadecimal.

= 3 rewind to BOT and print in EBCDIC graphics and hexadecimal.

**SELF-LOADING
TAPE EDIT**
(Cont'd)

f = 4 begin at present position and print in EBCDIC graphics.

= 5 begin at present position and print in hexadecimal.

= 6 begin at present position and print in EBCDIC graphics and hexadecimal.

ss = seven-level magnetic tape control information. If nine-level input, these positions are not used.

8. Press EOT.

9. The routine edits the first tape and displays the following message:

44PRA ENTER INPUT PARAM

10. If additional tapes are to be edited, repeat steps 7 and 8; otherwise type END and press EOT.

Note: To terminate the routine before the tape edit is completed, press COIN.

**DEVICE
ASSIGNMENTS**

◆ None.

PRINTOUTS

Message	Meaning
****SHORT BLOCK****	A block of less than 12 bytes was read.
TAPE MARK	A tape mark was read.
'CONSOLE INTERRUPT'	The routine was terminated by pressing COIN.

TYPEOUTS

Message	Meaning	Action	Response
4401	Parameter input error.	Type correct parameter when requested.	None.
4402	Invalid reply to message.	Type correct reply when requested.	None.
4403	Read error on input tape.	The read of the input tape will be tried five times.	None.

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
4403A	Read error on input tape.	1. Reread five more times.	R
		2. Terminate.	T
		3. Bypass record.	N
4404	Write error on output tape.	The write to the output tape will be tried five times.	None.
4404A	Write error on output tape.	1. Retry the write five more times.	R
		2. Terminate.	T
4405	Printer error.	Press COIN to retry.	None.
4408A	End of output tape.	1. Continue with same device and mount new tape.	C
		2. Continue with new device and mount new tape.	N Δ cuu Where: cuu = channel and device number of new tape.
		3. Terminate.	T
4409A DOUBLE TAPE MARK	Double tape mark read on input tape.	1. Continue past double tape mark.	C
		2. Terminate.	T
4416cuu	Device cuu is inoperable.	Make device operable.	None.

**TAPE EDIT
(TPEDIT)**

- ◆ The Tape Edit routine edits and displays all, or selected portions, of a magnetic tape on the printer. The contents of the tape may be displayed in character mode (EBCDIC graphics), hexadecimal mode, or both. Edit options and the display format are determined by parameter inputs.

**DEVICE
ASSIGNMENTS**

- ◆ *Under Executive Control*

SDN	Device Type	Remarks
EDTRDR	Card reader.	Parameter input.
EDTnnn	Magnetic tape.	Input device.
EDTLST	Printer or magnetic tape.	Output device.

Under Monitor Control

SDN	Device Type	Remarks
SYSIPT	Card reader.	Parameter input.
EDTnnn	Magnetic tape.	Input device.
SYSLST	Printer or magnetic tape.	Output device.

TYPEOUTS

Message	Meaning	Action	Response
nΔppppppΔ			
14PDA ENTER PARAM DEVICE	Request for parameter input device.	1. Preset parameters are to be executed.	0
		2. Card reader.	C
		3. Console typewriter.	T

TYPEOUTS
 (Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
14PRA ENTER TAPE EDIT PARAM	Request for Edit parameter information.	1. Insert Edit parameter (Refer to TOS Utility Routines manual for description of this parameter.) 2. No additional tape edits are desired.	EDIT Δ Snnn, Oo, Cnnnnn, Ff, Pp, Ln, Rnnn
1401A	Invalid parameter.	1. Terminate. 2. If card input, correct card in reader. 3. If typewriter input, wait for new parameter request.	T C C
1402	Invalid reply to 14PDA.	Repeat reply.	None.
1403A BLOCK xxxxx	Input tape error at block number xxxxx.	1. Terminate. 2. To print block and continue.	T C
1408A	EOT sensed on output tape.	Double tape mark written and tape is rewound. To continue, mount new tape and press EOT.	None.
1409 EDTnnn OPTIONn	BOT sensed on tape nnn before block count exhausted.	Processing continues. Tape is positioned as specified in EDIT parameter.	None.
1409A EDTnnn OPTIONn	Double tape mark sensed on tape nnn before count exhausted.	1. Continue past double tape mark. 2. Terminate.	C T
1421 BLOCK TRUN- CATED	Block greater than allowable size.	Processing continues. Block is truncated to allowable size.	None.

**TAPE COMPARE
(TPCOMP)**

◆ The Tape Compare routine is a diagnostic aid used to compare information recorded on one magnetic tape with that of a second magnetic tape. It provides a printed listing of any portions of the tapes that are unequal.

Comparison of data is done on a decade basis which allows for the printing of five groups of variant data on a 132-line printer or six groups on a 160-line printer.

**DEVICE
ASSIGNMENTS**

◆ *Under Executive Control*

SDN	Device Type	Remarks
COMRDR	Card reader	Parameter input.
COMLST	Printer or magnetic tape.	Output device.
COM001	Magnetic tape.	First input tape.
COM002	Magnetic tape.	Second input tape.

Under Monitor Control

SDN	Device Type	Remarks
SYSIPT	Card reader.	Parameter input.
SYSLST	Printer or magnetic tape.	Output device.
COM001	Magnetic tape.	First input tape.
COM002	Magnetic tape.	Second input tape.

TYPEOUTS

Message	Meaning	Action	Response
nΔppppppΔ			
28PDA PARAM DEVICE	Request for parameter input device.	1. If preset parameters are to be executed, press EOT.	None.
		2. Card reader.	C
		3. Console typewriter.	T

TYPEOUTS
 (Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
28PRA ENTER COM PARAM	Request for Compare parameter.	1. If preset param- eters are to be executed, press EOT.	None.
		2. Insert compare parameter. (Refer to TOS Utility Routines manual for description of this parameter.)	COM Δstcnmmn
28PRA ENTER POS PARAM	Request for Position parameter.	1. If preset param- eters are to be executed, press EOT.	None.
		2. Insert Position parameter. (Refer to TOS Utility Routines manual for description of this parameter.)	POSn ΔppppnnnnΔ POS2 Δppppnnnn
		3. Additional tapes are to be com- pared, mount new tapes.	RESTART
		4. No more tapes are to be positioned.	END
28PRA ENTER RCD PARAM	Request for Record parameter.	1. If preset param- eters are to be executed, press EOT.	None.
		2. Insert Record parameter. (Refer to TOS Utility Routines manual for description of this parameter.)	RCD Δt Δnnnnn

TYPEOUTS
 (Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
2801A	Invalid parameter format.	1. If card input, correct card in reader and press EOT.	None.
		2. If typewriter input, press EOT and wait for new parameter request.	None.
2803	Block read is greater than block size specified.	Program will terminate.	None.
2807A	Invalid input device character.	Type correct character and press EOT.	
2808A	End of tape sensed on output tape.	Double tape mark written and tape is re-wound. To continue, mount new tape and press EOT.	
2809A	While positioning input tape, double tape mark or BOT sensed before specified number of blocks or file ID was reached.	1. Terminate.	T
		2. Continue. Tape will rewind and restart if initial positioning. If final positioning, final printout will occur.	C
2810A	Double tape mark during compare before specified block count or file ID was reached.	1. Terminate.	T
		2. Continue. Remaining tape will be printed.	C
2821A	Record read is less than fixed-length specified.	1. Terminate.	T
		2. Continue.	C
2830 yyyyy BLOCK IPTx READ ERROR	Unrecoverable read error in yyyyy block on input tape where x = 1 for first tape and x = 2 for second tape.	Block yyyyy is compared with corresponding block of other tape. Processing continues.	None.

**TEST DATA
GENERATOR
(DIAGDG)**

**GENERAL
DESCRIPTION**

- ◆ The Test Data Generator routine automatically prepares files of program test data on random access volumes, punched cards, magnetic tape, or paper tape. The routine can be used to produce single volume or multivolume files or multifile volumes.

DEVICE ASSIGNMENT

- ◆ *Under Executive Control*

SDN	Device Type	Remarks
TDGRDR	Card reader or magnetic tape.	Parameter input.
TDG001	Random access, magnetic tape, card punch, or paper tape punch.	Output device.
TDGLST	Printer.	To display parameters.

Under Monitor Control

SDN	Device Type	Remarks
SYSIPT	Card reader or magnetic tape.	Parameter input.
TDG001	Random access, magnetic tape, card punch, or paper tape punch.	Output device.
SYSLST	Printer or magnetic tape.	To display parameters.

TYPEOUTS

Message	Meaning	Action	Response
nΔppppppΔ			
46PDA PARAM DEVICE	Request for parameter input device.	1. If preset options, are to be executed, press EOT. 2. Card reader or magnetic tape. 3. Console typewriter.	None. C T
46PRA ENTER PARAM	Request for a parameter.	Enter parameter on typewriter. (See TOS Utility Routines Manual for format.)	None
4601A aaaaa xxxx	Parameter input error: aaaaa = first five characters of card in error. xxxx will be one of the following: SEQ ERR: improper sequence. NUMyyyy: non-numeric field. yyyy = non-numeric characters. INVyyyy: invalid field. yyyy = invalid characters. SIZEyyyy: invalid record size. yyyy = size in error. IMPR DESC: device assignment is in conflict with the file descriptor parameter.	1. Continue. Cards will be read and ignored until the next FILE, RECRD, EOD, or END parameter is encountered. 2. Correct card. 3. Terminate.	C R T

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
4601A aaaaa xxxx (Cont'd)	INSUF KEY: data to be used as Key for test record was not supplied.		
	EXCS KEY: more than twelve data fields were defined.		
4602	Invalid reply.	Repeat reply when requested.	None.
4607A REQ MAG	Request for out- put magazine number.	Type in magazine number (00-07)	nn
4608	End of Mag- netic tape reel.	Assign new output device when requested.	None.
4620A NO VOL LABEL	No file identi- fication supplied on VOL label parameter for random access output.	1. Supply start address (LHE) of file area.	C, mmcccch mm = maga- zine number for mass storage. (Use 00 for disc or drum) cccc = cylin- der number. h = head.
		2. Terminate.	T
4621A	Block or record size too large for allocated memory.	1. Continue. Cards will be read and ignored until the next FILE, RECRD, EOD, or END parameter is encountered.	C
		2. Terminate.	T
4632 FILE ABSENT VTOC	File identifica- tion in VOL label parameter not found in VTOC.	None. Program terminates.	None.

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
4634 RECORDS GENERATED nnnnnn	For random access, the number of records generated to a file.	None.	None.
4634 FILEn GENERATED RECORDS nnnnnn	File n has been created and contains nnnnnn records.	None.	None.
4635 VTOC PROTECT	The RHE address supplied does not fall within an extent allo- cated for this file; or when LHE and RHE addresses are supplied, the VTOC indicates that this area contains previ- ously allocated storage.	None. Program terminates.	None.
4636 INVAL OPTION	When the LHE ad- dress of the file area is furnished through the console type- writer, the RHE ad- dress must be in the RECRD parameter.	None. Program terminates.	None.
4640 STARTING ADR:MAGn, CARDnnn, CYLnnn, HDn	The RHE address of the file area that was supplied by the programmer.	None.	None.
4642 FILE PROTECT MAGn, CARDnnn, CYLnnn, HDn	The track descriptor record (R0) indicates data is already re- corded at displayed address.	1. Continue. Overlay data on this track and all subsequent tracks within this file area.	C
		2. Terminate.	T

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
4643 VOLUME FULL BE- FORE CRITERIA REACHED	Total number of records specified could not be contained within this file's extent.	None. Program continues.	None.
4644 RECORD TOO LARGE FOR TRACK	The recording of this record or block would create an overflow condition.	None. Program terminates.	None.

EXECUTIVE DUMP PRINT (DUMPRT)

◆ The Executive Dump Print routine produces an edited listing of memory dumps recorded on magnetic tape by the Executive Dump console routine.

Any or all memory dumps on the input tape may be selected for editing.

DEVICE ASSIGNMENTS

◆ *Under Executive Control*

SDN	Device Type	Remarks
DUMPMT	Magnetic tape.	Input tape containing Executive memory dumps.

TYPEOUTS

Message	Meaning	Action	Response
nΔppppppΔ			
ASSGN DUMPMT	Request for input tape assignment.	Enter actual device for input tape.	dd
02DNA NEXT DUMP PRINT	Request for tape print directions <u>Note:</u> A response of A or AΔpppppp must be made for the first print after the routine is loaded. This is to make sure that the tape is re-wound. Additional prints from the same tape are then made by responding B or BΔpppppp.	1. Request assignment of first or new input tape. After tape is assigned it is re-wound and the first program is printed. 2. Request assignment of first or new input tape. After tape is assigned it is re-wound and program pppppp is printed. 3. Print next program on current tape. 4. Print program pppppp on current tape. 5. Terminate.	A AΔpppppp B BΔpppppp C
DUMP NOT ON TAPE	Double tape mark has been sensed on input tape before requested program was found.	Input tape is re-wound to BOT. Routine will again request dump instructions from operator.	None.

**SELF-LOADING
RANDOM ACCESS
EDIT**

◆ The Self-Loading Random Access Edit routine is an emergency testing aid that provides an edited listing of selected areas of a random access device. The areas to be displayed, the listing format, and the input device type are determined from parameters entered by way of the console typewriter or from the card reader.

This routine contains its own bootstrap, loader, and device control. As a result, it is not dependent on any other programming system and is loaded without the Executive or Monitor.

Operating procedures for this routine are as follows:

1. Place routine object deck in card reader; set load unit number on control panel to address the card reader.
2. Press LOAD.
3. The following typeout occurs:

47PDA ENTER I/O PARAM DEVICE

- a. To enter parameters from typewriter, reply with: T,ocuu
- b. For card input reply with: C,ocuu

where: o = output listing device; P for printer or T for tape.

cuu = channel and device number of output device.

4. Press EOT.
5. The routine proceeds to read edit parameters from the device specified until an END parameter is recognized.

Note

When parameters are entered from the typewriter, the message 47PDA ENTER INPUT PARAM is displayed for each input parameter. To terminate the routine the operator must respond with the message: END.

DEVICE ASSIGNMENTS

◆ None.

PRINTOUTS

Message	Meaning
THIS RECORD OVERFLOWS TO NEXT TRACK	Record being edited overflows to next track.
THE FOLLOWING RECORD WAS INCORRECTLY WRITTEN	Data length in count field does not agree with actual data length. Actual data length used to determine what is printed.

PRINTOUTS
(Cont'd)

Message	Meaning
HEAD RECORD NOT FOUND nnn ccc h	Next track will be edited and printed.
4718 nnn ccc h IS A DEFECTIVE TRACK	Track specified is defective and alternate track will be processed.
4718 nnn ccc h IS AN ALTERNATE TRACK	Track specified is being processed as an alternate track.
4718 BAD ALTERNATE TRACK	Track specified as an alternate track does not contain a 1 bit in 2 ⁰ of its Home Address record. Original track is ignored, and routine processes next track.

TYPEOUTS

Message	Meaning	Action	Response
47PDA ENTER I/O PARAM DEVICE	Request for I/O assignments.	See step 3 of operating procedures.	
47PRA ENTER IN- PUT PARAM	Request for Edit parameter.	Type in Edit parameter as described in Utility Manual. Do <u>not</u> type leading space.	
4701	Parameter format error (console typewriter).	None. Routine will reissue parameter request.	
4701A	Parameter format error (card reader).	Read next parameter.	C
4702	Invalid reply from typewriter.	None. Routine will reissue parameter request.	
4704	Output tape error.	None. Write will be retried five times.	
4704A	Five successive tape write errors.	1. Retry.	R
		2. Terminate.	T
4705	Printer error.	None. I/O will be reissued.	

TYPEOUTS
 (Cont'd)

Message	Meaning	Action	Response
4708A	End of reel on output tape.	Mount next reel.	Ccuu where: cuu is channel and device number of new output tape.
4712	Card reader error.	Correct card.	COIN
4716 cuu	Device inoperable, where cuu is channel and device number.	Made device operable	None.
4719A nnn ccc h TRANS PARITY	Error detected while reading from random access device. nnn = card number, if mass storage device. ccc = cylinder number. h = head number.	1. Retry.	R
		2. Skip current track.	N
		3. Terminate and read next input parameter.	T
4719A nnn ccc h SEEK CHECK	Same as 4719A .		
4719A nnn ccc h READ PARITY	Same as 4719A .		
4719A nnn ccc h MISS ADDR MARKERS	Same as 4719A .		
4719A nnn ccc h COUNT FIELD ERR	Same as 4719A .		
4719A nnn ccc h NOT FOUND	Home address missing, track descriptor record missing, no data recorded on track, etc.	Same as 4719A .	

**RANDOM
ACCESS EDIT
(RAEDIT)**

◆ The Random Access Edit (RAEDIT) routine is a diagnostic aid that provides an edited listing of selected areas of a random access device. The areas to be displayed, the listing format, and the input device type are determined from parameters entered by way of the console type writer or from the card reader.

**DEVICE
ASSIGNMENTS**

◆ *Under Executive Control*

SDN	Device Type	Remarks
RDPARM	Card reader.	Parameter input.
RAOUT	Printer or magnetic tape.	Output listings.
ssssss	Random access volume.	Symbolic name of input device.

Under Monitor Control

SDN	Device Type	Remarks
SYSIPT	Card reader.	Parameter input.
SYSLST	Printer or magnetic tape.	Output listings.
ssssss	Random access volume.	Symbolic name of input device.

PRINTOUTS

Message	Meaning
THIS RECORD OVERFLOWS TO NEXT TRACK	Record being edited overflows to next track.
THE FOLLOWING RECORD WAS INCORRECTLY WRITTEN	Data length in count field does not agree with actual data length. Actual data length used to determine what is printed.
HEAD RECORD NOT FOUND	Next track will be edited and printed.
4518 nnn ccc h IS A DEFECTIVE TRACK	Track specified is defective and alternate track will be processed.
4518 nnn ccc h IS AN ALTERNATE TRACK	Track specified is being processed as an alternate track.
4518 BAD ALTERNATE TRACK	Track specified as an alternate track does not contain a 1 bit in 2 ⁰ of its Home Address record. Original track is ignored, and routine processes next track.

TYPEOUTS

Message	Meaning	Action	Response
nΔppppppΔ			
45PDA ENTER I/O PARAM DE- VICE	Request for param- eter input device.	1. Console typewriter. 2. Card reader.	T C
45PRA ENTER INPUT PARAM	Request for a pram- eter.		
4501	Parameter is incor- rect (entered from typewriter).	None. Request for parameter will be re- issued.	None
4501A	Parameter is incor- rect (from card reader).	Read next parameter.	C
4507	Invalid device as- signed after End of Tape.	None. Request for assignment will be reissued.*	None

*For magnetic tape output devices, the routine writes two tape marks and rewinds the tape. The Executive then issues a request for a new assignment.

**70/568 MAGAZINE
CARD CHECK
(CARDCK)**

**GENERAL
DESCRIPTION**

◆ The 70/568 Magazine Card Check routine is designed to allow a rapid check of one or more 70/568 magazines for missing, duplicate, or unselectable cards.

**DEVICE
ASSIGNMENTS**

◆ Under Executive or Monitor Control:

SDN	Device Type	Remarks
SYSMAG	Mass Storage unit.	Symbolic name of device containing magazine to be checked.

TYPEOUTS

Message	Meaning	Action	Response
2900A BIN NO?	Request for bin number of magazine to be analyzed.	1. Type in bin number	y = bin number (0-7)
		2. Terminate program.	NO
2901A-mn b ccc	Mass storage unit became inoperable when attempting to select a card. mn = installation mnemonic. b = bin number. ccc = card number.	Correct inoperable condition. To continue, press EOT.	EOT.

STATISTICAL AND HISTORICAL INFORMATION ON RECOVERABLE AND UNRECOVERABLE ERRORS (SHIRUE)

◆ The TDOS Statistical and Historical Information on Recoverable and Unrecoverable Errors, (SHIRUE), gathers and displays hardware error statistics for analysis of device and system efficiency by maintenance personnel. Also, it permits the accumulation of the number of Input/Output operations performed. Statistics are maintained on Magnetic Tape and Random Access devices only.

SHIRUE operates under TDOS with other programs and itself occupies a program slot. When initially loaded, SHIRUE obtains control, modifies the Executive routine, and builds a statistics table from the Executive device list table. The Executive modification establishes linkage between the Executive routine and SHIRUE.

DEVICE ASSIGNMENTS

◆ None: (Refer to TDOS Utility Manual.)

TYPEOUTS

Message nΔppppppΔ	Meaning	Action	Response
0910 END OF STATISTICS THIS BATCH	All statistics accumulated have been displayed.	The 0915 message is repeated.	None.
0915A SHIRUE READY	SHIRUE has begun accumulating errors. Reply when statistics are desired.	Answer as desired. (Refer to TDOS Utility Manual.)	xyΔcuu
0920 BAD X PARAM	X parameter not T, C, S, D, or N.	The 0915 message is repeated.	None.
0925 BAD Y PARAM	Y parameter not C, E, P, or blank.	The 0915 message is repeated.	None.
0930 BAD BLANK PARAM	Blank parameter not blank.	The 0915 message is repeated.	None.
0935 BAD CUU PARAM	Channel and/or unit incorrect in console reply.	Repeat request with correct channel and unit.	xyΔcuu
0940 NO ERROR TO REPORT	No statistics have been accumulated for the device or devices requested.	The 0915 message is repeated unless the previous reply specified termination.	None.

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
0945 UNRE- PORTED EXEC CHANGE SHIRUE TERMINATED	Exec has been modified in such a way that SHIRUE cannot link properly.	SHIRUE cannot be used with this version of the Executive.	None.
0950 CCDDTP (See Output section for complete typeout).	Header preceding SHIRUE output data.	None.	None.
0955 aaaaaa/etc.	Detail error information. A complete display of all command categories for each device on which I/O activity occurred. One line for each device.	None.	None.
0960 DEVICE NOT FOUND IN TABLE	Executive furnished a channel and unit number that was incorrect.	Machine should be checked by maintenance.	None.
0965 OVER- FLOW REPLY REQUIRED	One of the table counters has exceeded its capacity. Processing to this counter will be inhibited.	Either clear counters or terminate using the 0915 message reply options to answer.	xyΔcuu
0970A IS I/O COUNT DESIRED	Program allows user the option of counting I/O's fired on each device.	If count is desired.	Y
		If count is not desired.	N
0975 TABLE FULL RELOAD SHIRUE & ASSIGN MORE CORE	The number of eligible device list entries, in the Executive device list, exceeds the space available in the SHIRUE statistics table. SHIRUE terminates after this message.	Reload SHIRUE, assigning more memory at load time.	None.
0999 END SHIRUE	SHIRUE has been terminated.	None.	None.

TYPEOUTS

Message	Meaning	Action	Response
n\pppppp\			
27DD UTVPRM DEALLO- CATED	UTVPRM has been deallocated.	None.	None.
27EE END TPINIT. END CARD NOT REACHED.	Processing completed but TPINIT parameter cards remain in reader.	None.	None.
27WCA WRITE CONTROL IS NOT C8	Write control code for 7-level tape is not X'C8'. C8 is the standard for all 7-level tape labels.	1. Continue with specified code.	R
		2. Change code to C8 and continue.	C

8. PERIPHERAL CONVERSION ROUTINES

TAPE VOLUME INITIALIZER (TPINIT)

◆ The Tape Volume Initializer routine prepares reels of magnetic tape for label processing by writing up to eight Volume labels, a dummy HDR1 label, and a tape mark on each tape initialized. All labels are written as 80-character blocks.

Up to 16 tape reels (UTV001 through UTV016) can be initialized in one cycle of this routine. Additional cycles may be executed if more than one reel is to be initialized and sufficient tape drives are not available.

DEVICE ASSIGNMENT

◆ *Under Executive Control*

SDN	Device Type	Remarks
UTV001	Magnetic tape.	First reel to be initialized.
UTV002	Magnetic tape.	Second reel to be initialized.
.		
.		
.		
UTV016	Magnetic tape.	Final reel to be initialized.
UTVPRM	Card reader.	Parameter input.

Under Monitor Control

SDN	Device Type	Remarks
UTV001	Magnetic tape.	First reel to be initialized.
UTV002	Magnetic tape.	Second reel to be initialized.
.		
.		
.		
UTV016	Magnetic tape.	Final reel to be initialized.
SYSIPT	Card reader.	Parameter input.

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
27LG VOL... UTVnnn=T/U yy	Volume label data written to output tape. Device to which label was written: nnn=symbolic unit. yy=device mnemonic	None.	None.
27NDA UTV nnn NOT ASSIGNED	Device nnn has not been assigned.	1. Request device as- signment message from Executive.	R
		2. Terminate.	T
2700A	Illegal control card.	1. To continue, insert correct parameter.	R
		2. Terminate.	T
2701	Illegal entry in utility control card.	None. Job automatically terminates.	None.
2702	Serial number is not six characters or is nonnumeric.	Same as 2701.	
2703	Parameter entry specified twice on utility card.	Same as 2701.	
2704	Punctuation error in utility control card.	Same as 2701.	
2705A	Illegal Volume label image.	1. End current output tape and continue to next tape.	I
		2. Retry and insert correct card.	R
2706A	Volume label card is out of sequence, or more than eight cards have been submitted.	1. End current output tape and continue to next tape.	T
		2. Terminate.	T

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
2707	Utility control card does not contain re- quired entries.	None. Job automatically terminates.	None.
2708	Illegal combination of entries in utility control card.	None. Job automatically terminates.	None.
2709	Tnn or Unn entry in utility control card is illegal.	Same as 2708.	
2710A	Unrecoverable error while trying to write to current output tape.	1. Ignore current out- put tape and continue to next tape.	I
		2. Terminate.	T
2711A	End of one initiali- zation cycle; additional tapes to be labeled.	1. Mount new tape.	R
		2. Terminate.	T
2799 END TPINIT	Processing has been completed.	None.	None.

**CARD-TO-TAPE
(CDTP)**

The Card-to-Tape routine transcribes 80-column card records to magnetic tape in standard Spectra 70 format. Input cards are punched in EBCDIC format, with the final card containing /* in the first two columns to signify the end of file. The generated output file contains standard Spectra labels and may be single or multivolume.

**DEVICE
ASSIGNMENTS**

◆ *Under Executive Control*

SDN	Device Type	Remarks
PRIPT	Card reader or paper tape reader.	Data input device.
PROPT1	Magnetic tape.	Primary output device.
PROPT2	Magnetic tape.	Alternate output device.
PRPRM	Card reader, paper tape reader, or magnetic tape.	Parameter input device.

Under Monitor Control

SDN	Device Type	Remarks
SYSIPT	Card reader or magnetic tape.	Parameter and card data or card image input device.
PRIPT	Paper tape reader or card reader.	Paper tape or card data input device.
PROPT1	Magnetic tape.	Primary output device.
PROPT2	Magnetic tape.	Alternate output device.

TYPEOUTS

Message	Meaning	Action	Response
nΔppppppΔ			
2231 INVAL- ID FORMAT	Input format is invalid or not as specified.	The no-go flag is set and processing continues.	None.
2232 INVAL- ID INPUT RECORD LENGTH	Input record length is not as specified.	Same as 2231.	
2233 INVAL- ID OUTPUT RECORD LENGTH	Record less than 12 bytes or output parameter is in error.	Same as 2231.	

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
2234 INVALID JOB FOR THIS PROGRAM	Function parameter is not C, F, R, or RF.	Same as 2231.	
2235 INVALID INPUT OPTION	I parameter is not 1.	Same as 2231.	
2236 INVALID OUTPUT OPTION	O parameter is not R, N, or U.	Same as 2231.	
2237 LOAD CORRECT PARAMETERS AND RESTART	The no-go flag was set during validation.	Correct the parameters in error and restart the program.	None.
2238 WRONG DEVICE, TRY AGAIN	Incorrect input device assignment was made.	Make new assignment when requested by Executive.	None.
2261A	Input record out of sequence.	1. Accept record and sequence number and continue sequence checking.	A
		2. Accept record and continue sequence checking using number of previous record.	B
		3. Accept record and discontinue sequence checking.	C
		4. Reject record and continue sequence checking.	D
		5. Terminate routine.	E
2262A	Input record exceeds maximum allowable size.	1. Accept record.	A
		2. Reject record.	D
		3. Terminate.	E

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
2263A	Incorrect reply to error message.	Give correct reply.	
2268 NO GO FLAG SET JOB TERMI- NATED	The routine was terminated because the no-go flag was set.	None.	None.
2269 NO TERMINAL MESSAGE JOB TER- MINATED	The routine was not terminated by a /*.	None.	None.
226E TOTAL RECORDS IN xxxxxxxx	The number of records read in was xxxxxxxx.	None.	None.
2291 OUT- PUT RECORD xxxxxxx BLOCK yyyyyyyy	Output record xxxxxxxx in block yyyyyyyy was truncated.	None.	None.
2292A	End of tape reached on output tape.	Mount new tape.	C
2293 REC- ORDS xxxxxx BLOCKS yyyyyy WRITTEN THIS TAPE	Output tape just written contained xxxxxx records and yyyyyy blocks.	None.	None.
2294 TOTAL BLOCKS OUT yyyyyyyyyyyy RECORDS OUT xxxxxxxxxxxx	Total blocks written were yyyyyyyyyyyy; total records were xxxxxxxxxxxxxxxx.	None.	None.

Additional typeouts that can occur for the Card-to-Tape routine are shown beginning on page 8-36.

**SELECTIVE CARD-
TO-PRINTER
AND/OR PUNCH
(CDPR)**

**DEVICE
ASSIGNMENTS**

◆ The Selective Card-to-Printer and/or Punch routine transcribes 80-column card records or paper tape to punched cards or paper tape and/or the printer. The card files are punched in EBCDIC and the final card contains /* in the first two columns to signify the end of file. The output may be printed in character (EBCDIC graphics) or hexadecimal (two characters per byte) mode and the print format may be List or Display.

◆ *Under Executive Control*

SDN	Device Type	Remarks
PRIPT	Card reader or paper tape reader.	Data input device.
PROPT	Card punch or paper tape punch.	Output device.
PRLST	Printer or magnetic tape.	Output device.
PRIPRM	Card reader, paper tape reader, or magnetic tape.	Parameter input device.

Under Monitor Control

SDN	Device Type	Remarks
SYSIPT	Card reader or magnetic tape.	Parameter and card data or card image input device.
PRIPT	Paper tape reader or card reader	Paper tape or card data input device.
PROPT	Paper tape punch.	Output device.
SYSLST	Printer or magnetic tape.	Output device.
SYSOPT	Card punch or magnetic tape.	Output device.

TYPEOUTS

Message	Meaning	Action	Response
nΔppppppΔ			
2405A SHORT BLK READ, REPLY 0 TO ACCEPT, 1 TO TERM	Paper tape input record is shorter than specified length.	1. Accept record and continue processing.	0
		2. Terminate.	1
2406A LONG BLK READ, REPLY 0 TO ACCEPT, 1 TO TERM	Paper tape input record is longer than specified length.	Same as 2405.	

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
2407A IN- VALID RE- SPONSE TRY AGAIN	Incorrect response to message 2405 or 2406.	Make correct response.	
2431 FIXED LENGTH RECORD FORMAT REQUIRED	Input format is invalid or not as specified.	The no-go flag is set and processing con- tinues.	None.
2432 IN- VALID INPUT RECORD LENGTH	Input record length is not as specified.	Same as 2431.	
2433 IN- VALID JOB FOR THIS PROGRAM	Incorrect function parameter.	Same as 2431	
2434 IN- VALID OUTPUT OPTION	O entry in utility modifier card is not 1, X, or C.	Same as 2431.	
2435 IN- VALID IN- PUT OPTION	I entry in utility modifier card is not 1.	Same as 2431.	
2436 LOAD CORRECT PARAM- ETERS AND RESTART	The no-go flag was set during validation.	Correct the parameters in error and restart the program.	None.
2437 WRONG DEVICE ASSIGNED, TRY AGAIN	Incorrect input device assignment was made.	Make new assignment when requested by Executive.	None.
2438 IN- VALID SPACING PARAMETER	Spacing parameter is 4 when display format is selected.	Same as 2431.	

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
2439 WRONG DEVICE ASSIGNED, TRY AGAIN	An illegitimate output device has been assigned.	Reassign correct device.	
2461A	Input record out of sequence.	1. Accept record and sequence number and continue sequence checking.	A
		2. Accept record and continue sequence checking using number of previous record.	B
		3. Accept record and discontinue sequence checking.	C
		4. Reject record and continue sequence checking.	D
		5. Terminate routine.	E
2462A	Input record exceeds maximum allowable size.	1. Accept record.	A
		2. Reject record.	D
		3. Terminate.	E
2468 NO GO FLAG SET JOB TER- MINATED	The routine was terminated because the no-go flag was set.	None.	None.
2469 NO TERMINAL MESSAGE JOB TERMI- NATED	The routine was not terminated by a /*	None.	None.
246E TOTAL RECORDS IN XXXXXXXX	The number of rec- ords read in was XXXXXXXX.	None.	None.

Additional typeouts that can occur for the Selective Card-to-Printer and/or Punch routine are shown on page 8-36.

**TAPE-TO-TAPE
(TTP)**

**DEVICE
ASSIGNMENTS**

◆ The Tape-to-Tape routine transcribes data from one magnetic tape to another in standard Spectra 70 format. The generated output file contains standard Spectra labels and may be single or multivolume.

◆ *Under Executive Control*

SDN	Device Type	Remarks
PRIPT1	Magnetic tape.	Primary input device.
PRIPT2	Magnetic tape.	Alternate input device.
PRPRM	Card reader, paper tape reader, or magnetic tape.	Parameter input device.
PROPT1	Magnetic tape.	Primary output device.
PROPT2	Magnetic tape.	Alternate output device.

Under Monitor Control

SDN	Device Type	Remarks
PRIPT1	Magnetic tape.	Primary input device.
PRIPT2	Magnetic tape.	Alternate input device.
SYSIPT	Card reader or magnetic tape.	Parameter input device.
PROPT1	Magnetic tape.	Primary output device.
PROPT2	Magnetic tape.	Alternate output device.

TYPEOUTS

Message	Meaning	Action	Response
nΔppppppΔ			
2031 IN- VALID xxxxx BLOCK LENGTH	Input or output block xxxxx length was less than 12 bytes or not equal to, or a multiple of, the record length.	The no-go flag is set and processing continues.	None.
2032 IN- VALID xxxxx RECORD LENGTH	Input or output record xxxxx is not as specified or less than 12 bytes.	Same as 2031.	
2033 IN- VALID JOB FOR THIS PROGRAM	Incorrect function parameter.	Same as 2031.	
2034 IN- VALID OUT- PUT OPTION	O parameter is not R, N, or U.	Same as 2031.	
2035 IN- VALID IN- PUT OPTION	I parameter is not R, N, U, or M.	Same as 2031.	
2036 RE- LOAD COR- RECT PAR- AMETERS AND RE- START	The no-go flag was set during validation.	Correct the parameters in error and restart the program.	None.
2071A IN- VALID IN- PUT LENGTH yyyyy	Size of input record xxxxx in block yyyyy is not as specified.	1. Accept truncated record.	A
		2. Reject record.	D
		3. Terminate.	E
2072A IN- VALID BLOCK LENGTH xxxxx	Size of input block xxxxx is not as specified.	Same as 2071A.*	
2073A	Incorrect reply to error message.	Give correct reply.	

*An "A" reply to this message may also cause error 2071A to occur.

TYPEOUTS
 (Cont'd)

Message	Meaning	Action	Response
2074 ΔΔ MNΔΔ xxxxxxx	Input EOF block count. Unlabeled or nonstandard.	None.	None.
2075 RCDSΔ OUTΔΔ xxxxxxxxx	Total records read were xxxxxxxx.	None.	None.
2076 RCDSΔΔ INΔxxxxxxxx	Total records read in is xxxxxxxx.	None.**	
2077A READΔ ERRORΔ BLOCK Δ xxxxxx ***_-----***	Record block in error xxxxxx.	Ignore block; continue processing.***	I
		Terminate.***	T
2078ΔΔ MN ΔΔ xxxxxx	Input EOv block count. Nonstandard only.	None.	None.
2079 JOB TERMINATED	End of routine.	None.	None.
207E JOB TERMINATED NO GO FLAG SET	Routine terminated because the no-go flag was set.	None.	None.
2091 OUTPUT RECORD xxxxxxxxxx BLOCK yyyyyy	Output record xxxxxxxxx in block yyyyyyy was truncated.	None.	None.
2092A	End of tape reached on output tape.	Mount new tape.	C
2093 ΔΔ MNΔΔ xxxxxxxxx	Output EOv block count. Nonstandard only.	None.	None.
2094 ΔΔ MNΔΔ xxxxxxxxx	Output EOF block count. Unlabeled or Nonstandard only.	None.	None.

**If an unrecoverable read error occurs which is ignored (see message 2077A), 2076 will not correctly reflect such ignored records.

***The *'s with error halt 2077A reflect the first 27 bytes of the block ignored. xxxxxx is the block number.

Additional typeouts that can occur for the Tape-to-Tape routine are shown beginning on page 8-36.

**SELECTIVE TAPE-
TO-PRINTER
AND/OR PUNCH
(TPPR)**

**DEVICE
ASSIGNMENTS**

◆ The Selective Tape-to-Printer and/or Punch routine transcribes data from magnetic tape to punched cards or paper tape and/or the printer. The output card file is punched in EBCDIC and the final card contains /* in the first two columns to signify the end of file. The output may be printed in character (EBCDIC graphics) or hexadecimal (two characters per byte) mode and the print format may be List or Display.

◆ *Under Executive Control*

SDN	Device Type	Remarks
PRIPT1	Magnetic tape or paper tape reader.	Primary input device.
PRIPT2	Magnetic tape or paper tape reader.	Alternate input device.
PROPT	Card punch or paper tape punch.	Output device.
PRLST	Printer.	Output device.
PRPRM	Card reader, paper tape reader, or magnetic tape.	Parameter input device.

Under Monitor Control

SDN	Device Type	Remarks
PRIPT1	Magnetic tape or paper tape.	Primary input device.
PRIPT2	Magnetic tape or paper tape.	Alternate input device.
PROPT	Paper tape punch.	Output device.
SYSLST	Printer or magnetic tape.	Output device.
SYSIPT	Card reader or magnetic tape.	Parameter input device.
SYSOPT	Card punch or magnetic tape.	Output device.

TYPEOUTS

Message nΔppppppΔ	Meaning	Action	Response
2632 INVALID INPUT RECORD LENGTH	Input record format is invalid or not as specified.	The no-go flag is set and processing continues.	None.
2633 INVALID JOB FOR THIS PROGRAM	Function parameter is not R or RF.	Same as 2632.	
2634 INVALID OUTPUT OPTION	O parameter is not X or C.	Same as 2632.	
2635 INVALID INPUT OPTION	I parameter is not R, U, M, or N.	Same as 2632.	
2636 LOAD CORRECT PARAMETERS AND RESTART	The no-go flag was set during validation.	Correct the parameters in error and restart the program.	None.
2637 INVALID SPACING PARAMETER	Spacing parameter is 4 when display format is selected.	Same as 2632.	
2639 WRONG DEVICE ASSIGNED, TRY AGAIN	An illegitimate output device has been assigned.	Reassign correct device.	
2671A INVALID INPUT LENGTH xxxxxx BLOCK yyyyyy	Size of input record xxxxxx in block yyyyyy is not as specified.	1. Accept truncated record.	A
		2. Reject record.	D
		3. Terminate.	E
2672A INVALID BLOCK LENGTH xxxxxx	Size of input block xxxxxx is not as specified.	Same as 2671A*.	
2673A	Incorrect reply to error message.	Give correct reply.	

Additional typeouts that can occur for the Selective Tape-to-Printer and/or Punch routine are shown on page 8-36.

*An "A" reply to this typeout may cause error 2671A to occur.

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
2674 ΔΔ MNΔΔ xxxxxx	Input EOF block count. Unlabeled or nonstandard only.	None.	None.
2675 RCDSΔOUT ΔΔ xxxxxxxx	The tape just read out xxxxxxxx records.	None.	None.
2676 RCDS Δ INΔΔ xxx xxxxx	Number of records read in xxxxxxxx.	None. See Note 1.	None.
2677A READΔERROR Δ BLOCKΔxx xxxxx ***-----***	Block in error xxxxxxx.	1. Ignore block; continue processing. 2. Terminate. See Note 2.	I T
2678ΔΔ MNΔΔ xxxxxxx	Input EOv block count. Nonstandard labels only.	None.	None.
2679 JOB TERMINATED	End of routine.	None.	None.
267E JOB TERMINATED NO GO FLAG SET	Routine terminated because the No-Go flag was set.	None.	None.
2684 PARAM- ETER ERROR	User has specified paper tape records that are variable in length.	None. Routine terminates.	None.

MN = Mnemonic device.

1. If an unrecoverable read error occurs which is ignored (see message 2677A), 2676 will not correctly reflect such ignored records.
2. *'s reflect first 27 bytes of block ignored; xxxxxx is the block number.

Additional typeouts that can occur for the selective tape-to-printer and/or punch are shown on page 8-36.

**RANDOM ACCESS
VOLUME INITIALIZER
(RAINIT)**

**DEVICE
ASSIGNMENTS**

◆ The Random Access Volume Initializer routine prepares and formats random access volumes for use with the Spectra 70 TOS programming system. A volume is defined here as being a disc pack (70/564), a drum (70/565), or a magazine (70/568).

◆ *Under Executive Control*

SDN	Device Type	Remarks
CDRR01	Card reader.	Parameter input.

Note: As the type of random access input device is defined in the volume parameter, it is not necessary to make this device assignment at load time.

TYPEOUTS

Message	Meaning	Action	Response
nΔppppppΔ			
3001	End of job.	None.	None.
3002	Invalid parameter name.	None. Routine terminates.	None.
3003A- sssss	Invalid serial number sssss in parameter.	1. Enter correct number from console.	1Δ ssssss
		2. Read next parameter.*	2
3004A- dd	Device name (dd) invalid.	1. Enter correct device name from console.	1Δ dd
		2. Read next parameter.*	2
3005A- m	Magazine number (m) invalid.	1. Enter correct number from console.	1Δ m
		2. Read next parameter.*	2
3006	Invalid character in numeric parameter field.	None. Routine ignores parameter and reads next card.	None.
3007	Alternate track area overlays VTOC.	Same as 3006.	

*Initialization of current volume will be terminated.

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
3008	Invalid alternate track area assignment.	Same as 3006.	
3009	Invalid VTOC extent.	Same as 3006.	
3010A- file label	Purge-date of file on volume to be initialized has not expired.	Bypass purge-date check.	1
		Read next parameter.*	2
3011A	Alternate track area exhausted.	1. Continue initialization.**	1
		2. Read next parameter.	2
3012A	Unable to read volume label on RA device.	1. Bypass label check and begin initialization.	1
		2. Read next parameter.*	2
3014A- t-ccc- ddd	Unable to write Track Descriptor Record to track t, cylinder ccc, card ddd.	1. Continue surface analysis of volume.***	1
		2. Read next parameter.*	2
3015A- t-ccc- ddd	Unable to write Home Address to track t, cylinder ccc, card ddd.	Same as 3014A.	
3016- t-ccc- ddd	Defective track on track, cylinder ccc, card ddd.	None. Alternate track will be used.	None.

*Initialization of current volume will be terminated.

**Any subsequent defective tracks will not be flagged nor assigned an alternate track.

***For disc and drum, volume initialization will terminate after surface analysis has been completed; no volume labels will be written.

For mass storage, volume labels will be written. Before the volume is to be processed, any card included in this typeout must be replaced and initialized separately by the 70/568 Service Program. In this case, it is suggested that the operator respond with a "1", so that all defective cards are detected.

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
3017A	Unable to write volume label to RA unit.	1. Retry initialization.	1
		2. Read next parameter.*	2
3018	Unrecoverable I/O error.	None. Program terminates.	None.
3019 INITIALIZE nn x	Device nn Magazine x (if mass storage) initialization has been started.	None.	None.
3020A ccchh	An invalid cylinder or track on Mart parameter.	1. That particular entry will be dropped and not processed.	1
		2. A correct parameter may be entered via the console. Leading zeros must be used to complete field ccchh = 00705.	2Δccchh
3021	More than 60 marginal tracks have been entered on the input parameter.	None.	None.
LABELS WILL BE WRITTEN - CHANGE CARDS WITH HA or R0 ERROR	For mass storage magazine only. Volume labels will be written to this magazine, but before it can be processed, the defective cards listed in 3014A and 3015A typeouts must be changed and initialized separately.	None.	None.

*Initialization of current volume will be terminated.

CARD-TO-RANDOM ACCESS (CDRA)

DEVICE ASSIGNMENTS

◆ The Card-to-Random Access routine transcribes 80-column card records or paper tape to a random access file. Input cards are punched in EBCDIC format, with the final card containing /* in the first two columns to signify the end of the file. The generated output file may be single or multi-volume, provided all volumes are on-line.

◆ *Under Executive Control*

SDN	Device Type	Remarks
PRIPT	Card reader.	Data input device.
PRPRM	Card reader, magnetic tape, or paper tape reader.	Parameter input device.

Under Monitor Control

SDN	Device Type	Remarks
SYSIPT	Card reader or magnetic tape.	Parameter and card data or card image input device.
PRIPT	Paper tape reader or card reader.	Paper tape or card data input device.

Note: As the random access device is defined in the VDC card at run-time, it is not necessary to make this assignment at load time.

TYPEOUTS

Message	Meaning	Action	Response
nΔppppppΔ			
3831 INVALID FORMAT	Input format is invalid or not as specified.	The no-go flag is set and processing continues.	None.
3832 INVALID INPUT RECORD LENGTH	Input record length is not as specified.	Same as 3831.	
3833 INVALID OUTPUT RECORD LENGTH	For fixed-length records, record length is less than 12; for undefined records, record length is not zero, or output parameter is in error.	Same as 3831.	

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
3834 INVALID OUTPUT BLOCK LENGTH	For fixed-length records, block length is not equal to or a multiple of the record length; for undefined records, block length is less than 12 or output parameter is in error.	Same as 3831.	
3835 INVALID JOB FOR THIS PROGRAM	Function entry is not C, F, R, or RF.	Same as 3831.	
3836 INVALID OUTPUT OPTION	The Output entry is not Y or N.	Same as 3831.	
3837 INVALID INPUT OPTION	The Input entry is not a 1.	Same as 3831.	
3838 LOAD CORRECT PARAM- ETERS AND RE- START	The no-go flag was set during validation.	Correct the parameters in error and restart the program.	None.
3839 WRONG DEVICE ASSIGNED, TRY AGAIN	Incorrect input device assignment was made.	Make new assignment when requested by the Executive.	None.
383B FIXED LENGTH FORMAT REQUIRED FOR KEYS	Output not fixed length and Key fields are specified.	Same as 3831.	

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
3861A	Input record out of sequence.	1. Accept record and sequence number and continue sequence checking.	A
		2. Accept record and continue sequence checking using sequence number or previous record.	B
		3. Accept record and discontinue sequence checking.	C
		4. Reject record and continue sequence checking.	D
		5. Terminate routine.	E
3862A INPUT RECORD EXCEEDS MAXIMUM SIZE	Input record exceeds maximum allowable size.	1. Accept record.	A
		2. Reject record.	D
		3. Terminate routine.	E
3863A INCOR- RECT RE- PLY TO ERROR TYPEOUT	Incorrect reply to error message.	Give correct reply.	
3869 NO TER- MINAL MESSAGE JOB TER- MINATED.	The routine was not terminated by a/*.	None.	None.
386E RCDS IN xxxxxxx.	The number of records read.	None.	None.
38C1 BLKS WRITTEN xxxxxxx.	The number of blocks written.	None.	None.

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
38C2 RCDS WRITTEN xxxxxxx.	The number of records written.	None.	None.
38C3 FS REQUIRED TO PROCESS KEYS	Keys specified but function entry is not F or RF.	None. Routine terminates..	None.
38C5	Input exceeds extents allocated.	None. The output block count is typed out and job is termi- nated.	None.

Additional typeouts that can occur for the Card-to-Random Access routine are shown beginning on page 8-36.

**TAPE-TO-RANDOM
ACCESS (TPRA)**

**DEVICE
ASSIGNMENTS**

◆ The Tape-to-Random Access routine transcribes data from magnetic tape to a random access file. The generated output file may be single or multivolume, provided all volumes are on-line.

◆ *Under Executive Control*

SDN	Device Type	Remarks
PRIPT1	Magnetic tape.	Primary input.
PRIPT2	Magnetic tape.	Alternate input.
PRPRM	Card reader, magnetic tape, or paper tape reader.	Parameter input.

◆ *Under Monitor Control*

SDN	Device Type	Remarks
PRIPT1	Magnetic tape.	Primary input.
PRIPT2	Magnetic tape.	Alternate input.
SYSIPT	Card reader or magnetic tape.	Parameter input.

Note As the random access device is defined in the VDC card at run time, it is not necessary to make this assignment at load time.

TYPEOUTS

Message	Meaning	Action	Response
nΔppppppΔ			
3931 INVALID INPUT RECORD LENGTH	For fixed-length records, the record length is less than 12 bytes. For undefined or variable-length records, the record length is not zero.	The no-go flag is set and processing continues.	None.
3932 INVALID INPUT BLOCK LENGTH	For fixed-length records, block length is not equal to or a multiple of record length. For undefined or variable-length records, block length is less than 12 bytes.	Same as 3931.	

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
3933	Keys are specified, but output format is not fixed length.	Same as 3931.	
3934 INVALID OUTPUT RECORD LENGTH	For fixed-length records, record length is less than 12 bytes. For undefined or variable-length records, record length is not zero.	Same as 3931.	
3935 INVALID OUTPUT BLOCK LENGTH	For fixed-length records, block length is not equal to or a multiple of record length. For undefined or variable-length records block length is less than 12 bytes.	Same as 3931.	
3936 INVALID JOB FOR THIS PROGRAM	Function entry is not C, F, R, or RF.	Same as 3931.	
3937 INVALID OUTPUT OPTION	The Output entry is not Y or N.	Same as 3931.	
3938 INVALID INPUT OPTION	The Input entry is not R, U, M, or N.	Same as 3931.	
3939 LOAD CORRECT PARAM- ETERS AND RESTART	The no-go flag was set during validation.	Correct the parameters in error and restart the program.	None.

TYPEOUTS
(Cont'd)

Message nΔpppppΔ	Meaning	Action	Response
3971A INVALID INPUT LENGTH xxxxxxx BLOCK yyyyyy	Size of input record xxxxxxx in block yyyyyy is not as specified.	1. Accept truncated records.	A
		2. Reject record.	D
		3. Terminate record.	
3972 INVALID BLOCK LENGTH xxxxxxx	Size of input block xxxxxxx is not as specified.	Same as 3971A.*	
3973A IMPROPER REPLY TO ERROR TYPEOUT	Incorrect reply to error message.	Give correct reply.	
3974 mn xxxxxx	Input EOF block count for tape mn. (Non-standard labels only.)	None.	None.
3975 RCDS OUT xxxxxx	Total records out was xxxxxx.	None.	None.
3976 RCDS IN xxxxxx	Total records in was xxxxxx.	None.	None.
3977A READ ERROR BLOCK xxxxxx ***...***	Read Error occurred on block xxxxxx.	See Note 1. Ignore block; continue processing.	I
		Terminate. See Note 2.	T

mn = Mnemonic device.

Notes:

1. If an unrecoverable read error occurs, which is ignored (see message 3977A), 3976 will not correctly reflect such ignored records.
2. *'s reflect first 27 bytes of block ignored; xxxxxx is the block number.

TYPEOUTS
(Cont'd)

Message nΔpppppΔ	Meaning	Action	Response
3978 mn xxxxxx	Input EOV block count for tape mn. (Nonstandard labels only.)	None.	None.
397E JOB TERMI- NATED NO GO FLAG SET	Routine terminated because the no-go flag was set.	None.	None.
39C1 BLKS WRITTEN xxxxxxxx	Total blocks written.	None.	None.
39C2 RCDS WRITTEN xxxxxxx	Total records written.	None.	None.
39C3 FS REQUIRED TO PROCESS KEYS	Keys specified for output, but field-select is not specified.	None. Routine terminates.	None.
39C5	Input exceeds extents allocated.	None. The output block count is typed out and job is terminated.	None.

Additional typeouts that can occur for the Tape-to-Random-Access routine are shown beginning page 8-36.

*A reply of "A" to error halt 3972 may cause error 3971A to occur if record size is also oversize.

**RANDOM
ACCESS-TO-
RANDOM ACCESS
(RARA)**

**DEVICE
ASSIGNMENTS**

◆ The Random Access to Random Access routine transcribes data from one random access file to another. Multivolume input and output are accepted, provided all volumes are on-line.

◆ *Under Executive Control*

SDN	Device Type	Remarks
PRPRM	Card reader, magnetic tape, or paper tape reader.	Parameter input.

Under Monitor Control

SDN	Device Type	Remarks
SYSIPT	Card reader or magnetic tape.	Parameter input.

Note: As the random access devices are defined in the VDC cards at run time, it is not necessary to make this assignment at load time.

TYPEOUTS

Message	Meaning	Action	Response
n△pppppp△			
4331 INVALID RECORD LENGTH	For fixed-length records, record length is less than 12 bytes; for undefined or variable-length records, record length is not zero.	No-go flag is set and processing continues.	None.
4332 INVALID OUTPUT RECORD LENGTH	Same as 4331.	Same as 4331.	
4333 FIXED LENGTH REQUIRED FOR KEYS	Input and/or output records have keys, but format specified is not fixed-length.	Same as 4331.	

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
4334 INVALID INPUT BLOCK LENGTH	For fixed-length records, block length is not equal to or a multiple of record length; for undefined or variable-length records, block length is less than 12 bytes.	Same as 4331.	
4335 INVALID OUTPUT BLOCK LENGTH	For fixed-length records, block length is not equal to or a multiple of record length; for undefined or variable-length records, block length is less than 12 bytes.	Same as 4331.	
4336 INVALID JOB FOR THIS PROGRAM	Function entry is not C, F, R, or RF.	Same as 4331.	
4337 INVALID OUTPUT OPTION	The Output entry is other than Y or N.	Same as 4331.	
4338 LOAD CORRECT PARAM- ETERS AND RESTART	The no-go flag was set during validation.	Correct the parameters in error and restart the program.	None.
43B1 BLKS READ XXXXXXXX	Total blocks read.	None.	None.
43B2 RCDS READ XXXXXXXX	Total records read.	None.	None.

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
43B3 JOB TER- MINATED	End of routine.	None.	None.
43C1 BLKS WRITTEN xxxxxxxx	Total blocks written.	None.	None.
43C2 RCDS WRITTEN xxxxxxxx	Total records written.	None.	None.
43C3 FS REQUIRED TO PROCESS KEYS	Keys specified for input and/or output, but field-select not specified.	None. Routine terminates.	None.
43C4 BLOCK COUNT EXCEEDS RECORD COUNT	Block count exceeds record count.	None. Routine terminates.	None.
43C5	Input exceeds extents allocated.	None. The output block count is typed out and job termi- nated.	None.

Additional typeouts that can occur for the Random Access-to-Random Access routine are shown beginning on page 8-36.

**RANDOM ACCESS
-TO-TAPE
(RATP)**

**DEVICE
ASSIGNMENT**

◆ The Random Access-to-Tape routine transcribes data from a random access file to magnetic tape. The generated output file may be single or multivolume.

◆ *Under Executive Control*

SDN	Device Type	Remarks
PROPT1	Magnetic tape.	Primary output.
PROPT2	Magnetic tape.	Alternate output.
PRPRM	Card reader, magnetic tape, or paper tape reader.	Parameter input.

Under Monitor Control

SDN	Device Type	Remarks
PROPT1	Magnetic tape.	Primary output.
PROPT2	Magnetic tape.	Alternate input.
SYSIPT	Card reader or magnetic tape.	Parameter input.

Note: As the random access device is defined in the VDC card at run time, it is not necessary to make this assignment at load time.

TYPEOUTS

Message	Meaning	Action	Response
nΔppppppΔ			
4231 INVALID INPUT RECORD LENGTH	For fixed-length records, record length is less than 12 bytes; for undefined or variable-length records, record length is not zero.	No-go flag is set and processing continues.	None.
4232 INVALID INPUT BLOCK LENGTH	For fixed-length records, block length is not equal to or a multiple of record length; for undefined or variable-length records, block length is less than 12 bytes.	Same as 4231.	

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
4233	Input records have keys and fixed-length format not specified.	Same as 4231.	
4234 INVALID OUTPUT RECORD LENGTH	For fixed-length records, record length is less than 12 bytes; for undefined or variable-length records, record length is not zero.	Same as 4231.	
4235 INVALID OUTPUT BLOCK LENGTH	For fixed-length records, block length is not equal to or a multiple of record length; for undefined or variable length records, block length is less than 12 bytes.	Same as 4231.	
4236 INVALID JOB FOR THIS PROGRAM	Function entry is not C, F, R, or RF.	Same as 4231.	
4237 INVALID OUTPUT OPTION	The Output entry is other than R, N, or U.	Same as 4231.	
4238 LOAD CORRECT PARAM- ETERS AND RESTART	The no-go flag was set during validation.	Correct the parameters in error and restart the program.	None.
4275 RCDS OUT xxxxxx	Total records out was xxxxxx	None	None.
4291 OUTPUT RECORD xxxxxxx BLOCK yyyyyy	Output record xxxxxxxx in block yyyyyy was truncated.	None.	None.

TYPEOUTS
(Cont'd)

Message n Δ pppppp Δ	Meaning	Action	Response
4292A	End of tape reached on output tape.	Mount new tape.	C
42B1 BLKS READ xxxxxxxxxx	Total blocks read.	None.	None.
42B2 RCDS READ xxxxxxx	Total records read.	None.	None.
42B3 JOB TER- MINATED	End of routine.	None.	None.
4293 mn xxxxxx	Output EOVS block count for tape mn. (Non-standard labels only.)	None.	None.
4294 mn xxxxxx	Output EOF block count for tape mn. (Non-standard labels only.)	None.	None.

Additional typeouts that can occur for the Random Access-to-Tape routine are shown beginning on page 8-36.

**RANDOM ACCESS
-TO-PRINTER
AND/OR PUNCH
(RAPR)**

**DEVICE
ASSIGNMENTS**

◆ The Random Access to Printer and/or Punch routine transcribes data from a random access file to punched cards or paper tape and/or the printer. The output card file is punched in EBCDIC with the final card containing /* in the first two columns to signify the end of the file. The output may be printed in character mode (EBCDIC graphics) or in Hexadecimal mode (two characters per byte), and the print format may be List or Display.

◆ *Under Executive Control*

SDN	Device Type	Remarks
PROPT	Card punch or paper tape punch.	Output device.
PRLST	Printer.	Output device.
PRPRM	Card reader, magnetic tape, or paper tape reader.	Parameter input device.

Under Monitor Control

SDN	Device Type	Remarks
SYSOPT	Card punch or magnetic tape.	Output device.
SYSLST	Printer or magnetic tape.	Output device.
SYSIPT	Card reader or magnetic tape.	Parameter input device.
PROPT	Paper tape punch.	Output device.

Note: As the random access device is defined in the VDC cards at run time, it is not necessary to make this assignment at load time.

TYPEOUTS

Message	Meaning	Action	Response
nΔppppppΔ			
4131 INVALID INPUT RECORD LENGTH	For fixed-length records, record length is less than 12 bytes or block length is not equal to or a multiple of record length; for undefined or variable-length records, record length is not zero or block length is less than 12 bytes.	No-go flag is set and processing continues.	None.

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
4149 SEQ. NUMBER- ING REQUESTED WITHOUT OUTPUT	Sequence numbers specified with printer only output.	Same as 4139.	
4184	Parameter error User has specified paper tape records that are variable-length.	None. Routine terminates.	None.
41B1 BLKS READ XXXXXXXX	Total blocks read.	None.	None.
41B2 RCDS READ XXXXXXXX	Total records read.	None.	None.

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
4132 INVALID JOB FOR THIS PROGRAM	Function entry is R or RF.	Same as 4131.	
4133 FIXED LENGTH FORMAT REQUIRED FOR KEYS	Input records have keys and format is not fixed-length.	Same as 4131.	
4134 INVALID OUTPUT OPTION	The Output entry is other than 1, X, or C.	Same as 4131.	
4135 INVALID INPUT BLOCK LENGTH	Same as 4131.	Same as 4131.	
4136 F. S. REQUIRED TO PROCESS KEYS	Self-explanatory.	Same as 4131.	
4137 LOAD CORRECT PARAM- ETERS AND RESTART	The no-go flag was set during validation.	Correct the param- eters in error and restart the program.	None.
4139 WRONG DEVICE ASSIGNED TRY AGAIN	An illegitimate out- put device has been assigned.	Reassign correct device.	

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
41B3 JOB TER- MINATED	End of routine.	None.	None.

Additional typeouts that can occur for the Random Access-to-Printer and/or Punch routine are shown beginning on page 8-36.

**ADDITIONAL
TYPEOUTS**

◆ The typeouts and logging messages in this section can occur for any of the peripheral conversion routines listed below. Each message is preceded by a code in the form xxnn:

- where: xx = 20, Tape-to-Tape routine.
- = 22, Card-to-Tape routine.
- = 24, Selective Card-to-Printer and/or Punch routine.
- = 26, Selective Tape-to-Printer and/or Punch routine.
- = 38, Card-to-Random Access and Card-to-Random Access/
 Mass Storage routine.
- = 39, Tape-to-Random Access and Tape-to-Random Access/
 Mass Storage routine.
- = 41, Random Access-to-Printer and/or Punch routine.
- = 42, Random Access-to-Tape routine.
- = 43, Random Access-to-Random Access and Random Ac-
 cess-to-Random Access/Mass Storage routine.
- nn = error number.
- = 50, peripheral routine identifier for logging message.
- = 51, logging message.

When an error occurs in a utility modifier or field select card, the card image is typed below the error message. The utility modifier card image is preceded by xx16 CARD#nnn and the field select card image is preceded by xx2E CARD#nnn. The nnn is the read count of the card type; e.g., xx16 CARD#003 precedes the card image of the third utility modifier card read and xx2E CARD#009 precedes the card image of the ninth field select card read.

The logging messages may be typed in any combination depending on the input parameters. The message that identifies the peripheral conversion routine to which the logging messages apply is typed preceding the logging message.

Message	Meaning	Action	Response
nΔppppppΔ			
xx01A ASSIGN PA- RAM RESPOND 1 = TYPE, 2 = PRPRM, 3 = NONE	Request for param- eter input device.	Type 1, 2, or 3 as necessary.	
xx02 INVALID RESPONSE	Operator response to xx01A typeout was not a 1, 2, or 3.	Type correct reply when requested.	None.
xx03A FURNISH PARAM- ETERS	Request for param- eter input.	Type in parameters. (Refer to TOS Utility Routines manual for parameter descriptions.)	

**ADDITIONAL
TYPEOUTS**

(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
xx04 UN-IDENTIFI-ABLE PARAMETER	A parameter has been read that is not recognized.	The parameter is ignored; processing continues.	None.
xx05 FIELD SELECT CARD NOT EXPECTED	A field select parameter has been read and the utility modifier parameter (or preset options) do not specify field select.	Same as xx04.	
xx06 INVALID PRINT HEADER PARAMETER	Either a duplicate H1, H2, or H3 parameter has been read or the character following the H is not a 1, 2, or 3.	Same as xx04.	
xx07 SELECTION CHARACTERS NOT PROCESSED	A Print or Punch selection parameter has been read and no print or punch output is designated.	Same as xx04.	
xx08 UTILITY MODIFIER PARAMETER IGNORED	A utility modifier parameter has been read after a field select parameter.	Same as xx04.	
xx09 SELECTION CARD INCORRECTLY TERMINATED	A Print or Punch selection parameter was not terminated by //.	Processing continues.	None.
ss0B FIELD SELECT CARD(S) REQUIRED	Preset or utility modifier parameters indicated field selection was specified but END parameter was read and field select parameters had not been processed.	Same as xx09.	

**ADDITIONAL
TYPEOUTS**
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
xx0C FIELD SELECT CARD IGNORED- FORMAT NOT FIXED	A field select card has been read; however, the record format is not fixed.	Same as xx04.	
xx11ΔΔa ILLEGAL FORMAT UTILITY MODIFIER CARD	<p>Format of utility modifier card is incorrect. The a indicates the parameter in the card that is in error:</p> <p>where a = U, parameter identifier. = N, program-type. = J, job type. = F, record format. = A, input format. = B, output format. = I, input option. = O, output option. = S, spacing option. = P, page number. = C, sequence numbering. = Q, sequence checking. = R, starting record. = W, tape positioning.</p>	The no-go flag is set and processing continues.	

**ADDITIONAL
TYPEOUTS**

Message nΔppppppΔ	Meaning	Action	Response
	= L, un- labeled magnetic tape. = Z, logging. = X, spaces between param- eters.		
xx12 INCOR- RECT PRO- GRAM	Program type param- eter on utility modi- fier card is correct.	The routine terminates. Correct the card(s) and restart.	None.
xx13 a ILLEGAL FORMAT UTILMOD CARD	A Utility Modifier card specified a key field for a non- random access file. a = A input file. b = B output file.	Same as xx11.	
xx15 INVAL- ID INPUT or OUTPUT CARD SEQUENCE PARAM- ETER	The input or output card sequence param- eter is in error.	Same as xx 11.	
xx16 CARD# nnn (80 column card image)	When an error of any type is detected on the Utility Modifier Card, the entire card is typed out after it is processed.	Processing continues	None.
xx17 INVAL- ID INPUT or OUTPUT RECORD LENGTH	The input or output record length was zero or greater than 4096.	Same as xx11.	
xx18 INVAL- ID INPUT or OUTPUT BLOCK LENGTH	The input or output block length was zero or greater than 4096.	Same as xx11.	

**ADDITIONAL
TYPEOUTS**

(Cont'd)

Message	Meaning	Action	Response
nΔPPPPPPΔ xx22 yyyy a PARA EQUALS ZERO	A parameter in a field select card is punched as zero. The a field in parameter set yyyy is in error: where: a = R, starting position of input field. = S, size of input field. = T, starting position of output field. = N, size of input field (for pack/unpack option). = M, size of output field.	The parameter set is ignored and processing continues with the next set designated by a /.	None.
zz23 yyyy CANNOT PROCESS HEX PARA	Hexadecimal option selected in parameter set yyyy for non-printer output.	Same as xx22.	
xx24 yyyy CANNOT PROCESS PACK PARA	Pack option selected in a parameter set yyyy for printer output.	Same as xx22.	
xx25 yyyy R + S EX- CEEDS IN- PUT LENGTH	R + s or r + n in parameter set yyyy is greater than the input record or key length.	Same as xx22.	
xx26 yyyy S + T EXCEEDS OUTPUT LENGTH	S + T or t + m in parameter set yyyy is greater than the output record or key length.	Same as xx22.	

**ADDITIONAL
TYPEOUTS**
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
xx27 yyyy a PARA CON- TAINS A NON- NUMERIC	A parameter field starts with a non-numeric. Refer to error xx22 for description of yyyy a.	Same as xx22.	
xx28 yyyy ILLEGAL BREAK CHARACTER	A break character in parameter set yyyy is not a comma, parenthesis, or /.	If the error is before t parameter, the parameter set is ignored. If the error is after t, the parameter is accepted and processing continues.	None.
xx29 S IS ILLEGALLY MODIFIED	The s parameter modifier is not a P, U, or X.	Same as xx22.	
xx2B ILLEGAL FORMAT	There is no space following the FS parameter identifier.	Processing continues.	None.
xx2C yyyy R OR T IS ILLEGALLY MODIFIED	R or t in parameter set yyyy is modified by an illegal character; only K is allowed.	Processing continues.	None.
xx2D COL 80 FOUND BE- FORE A TERMI- NATING SYMBOL FOUND	An r or s parameter found in column 80.	Same as xx22 or the next parameter card is read.	None.
xx2E	Indicates that preceding error typeout(s) have been generated by the Field Select module.	None.	None.
xx2F ADDI- TIONAL PARA(S) FOUND AFTER A SPACE(S)	One or more parameters found after a space or spaces following the t parameter.	The parameters are accepted as normal.	None.

**ADDITIONAL
TYPEOUTS**
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
xx40 RELOAD REQUESTING xxxxx BYTES FOR MAXIMUM I/O BUFFERS OR yyyyy FOR MINIMUM I/O BUFFERS or xx40 RELOAD REQUESTING xxxxx BYTES FOR MAXIMUM I/O BUFFERS	Generated field select coding, required I/O buffer sizes, or both, requires additional core to operate.	Restart the routine and request the needed core.	None.
xx71A	Block size not multiple of record size for fixed records or block size of variable record read does not agree with parameter (it does not exceed read-in area).	1. Truncate record and continue processing.	A
		2. Bypass record and continue processing.	D
		3. Terminate.	E
xx72A	Input block exceeds read-in area.	Same as xx71A.	
xx73A	Incorrect response to error typeout.	Type in correct reply.	
xx81 RECORDS PRINTED nnnnnn	Number of records printed.	None.	None.
xx82 CARDS PUNCHED nnnnnn	Number of cards punched.	None.	None.
xx83 DEVICE NOT ASSIGNED	Device not assigned for printer or punch.	Routine terminates.	None.

Pages 8-43 and 8-44
have been deleted by
the December 1968 re-
vision to this manual.

**TAPE DUPLICATE
(DUP)**

◆ The Tape Duplicate routine makes one or more copies of a tape from BT to a double tape mark, or to the special EOVS record if the tape is a RCA Master tape. The input tape may be 7 or 9-level, labeled or unlabeled, and contain interspersed tape marks. If the input is 7-level and contains labels, both the labels and data must be in the same recording mode.

DEVICE ASSIGNMENT

◆ Under Monitor or Executive:

SDN	Device Type	Remarks
SYSIPT	Card reader or magnetic tape.	Parameter input under Monitor.
TAPEIN	Magnetic tape.	Input device.
TAPE01	Magnetic tape.	First output tape.
TAPE02	Magnetic tape.	Second output tape.
TAPE03	Magnetic tape.	Third output tape.
TAPE04	Magnetic tape.	Alternate for first output when tape swapping is used.
TAPE05	Magnetic tape.	Alternate for second output when tape swapping is used.
TAPE06	Magnetic tape.	Alternate for third output when tape swapping is used.

TYPEOUTS

Message	Meaning	Action	Response
0401A ENTER PARAM: 1-3 OP, 001-999 TOTAL OP, S-N SWITCH OR NOT, *OPTIONAL* Y FOR READ EOV, *OPTIONAL* Y FOR READ OP TO BT	Enter input parameter.	Type input parameter on console.	dupΔa,bbb,c,Y,Y,N where: a = No. of tapes per pass (1-3). bbb = total No. of outputs (001-999). c = S tape swap. = N no tape swap. Y = check master tape EOVS record. Y = check output byte count. N = do not purge output tape(s). Refer to TOS Utility Manual for parameter details.

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
0402 BLOCKS COPIED xxxxx	Total number of blocks copied from input to output, exclud- ing tape marks, is xxxxxx.	Processing continues.	None.
0403 TAPE MARKS COPIED xxxxx	Total number of tape marks copied from input to output is xxxxxx.	Processing continues.	None.
0404 BYTES COPIED xx, xxx,xxx	Total number of bytes copied from input to output is xx, xxx,xxx. Each tape mark is counted as a byte.	Processing continues.	None.
0405 IP BYTE COUNT DOES NOT CHECK.	Total number of bytes read from Master Tape does not agree with total in EOVS record.	Processing continues. The output tape should be considered bad un- less it is known that the EOVS record is bad.	None.
0406A EOT SENSED ON TAPExx, RESPOND B TO BYPASS EOT WARN- ING, ANY OTHER RESPONSE WILL PROCESS OTHER OP TAPES ONLY	EOT has been sensed on TAPExx.	1. Bypass EOT.	B
		2. Terminate output to TAPExx. Other tapes will be processed.	Any.
0407 TAPExx BYTE COUNT DOES NOT CHECK	Read reverse check on TAPExx indicates number of bytes (blocks on 7-level tape) does not agree with what was read from input.	Processing continues. TAPExx is a bad tape.	None.

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
0408A INVALID PARAMETER, TRY AGAIN	Parameter entered from typewriter or card reader is incorrect.	Type in correct parameter.	
0409 INPUT BLOCK ENCOUNTERED LARGER THAN BUFFER SIZE.	Insufficient memory for input block size.	Routine terminates. Reload routine requesting more memory. Refer to Appendix X.	None.
0410 PASS COMPLETED	A pass utilizing tape swapping has been completed.	Processing continues. Take down tape(s) from previous pass and mount tape(s) for next pass if necessary.	None.
0410A PASS COMPLETED, HIT EOT TO CONTINUE	A pass that does not utilize tape swapping has been completed.	Take down tape(s) from previous pass and mount tape(s) for this pass; then press EOT.	
0413 DESTROY VOL LABEL ON TAPE _{xx}	A VOL label on TAPE _{xx} has been destroyed. Type-out 0415 will display the label.	Processing continues.	None.
0414 PARAMETER NOT DUP	DUP is missing in input parameter.	Reenter parameter.	
0415 xxx...xx	VOL label xxx...xx has been destroyed.	Processing continues.	None.
0417A DO YOU ACCEPT TAPE _{xx} AS VALID	Read reverse check on TAPE _{xx} failed. Is tape to be accepted?	1. Yes.	Y
		2. No. Tape will be duped again.	N
0418 CANT READ INPUT TAPE	Attempt to read input tape in both label and data mode has failed.	Program terminates.	None.
0499 DUP EOJ	End of Job.	Routine terminates.	None.

PRINTOUTS
(Cont'd)

Message	Procedure
ERROR-RESUBMITTED (Parameter card image)	Parameter resubmitted via operator response.
END OF ACTIONS AND ERRORS	All parameters read in and validated; Phase III begins.
RCD BYPASSED OMF - xxxxxxxx DEV. dddddd INVALID OMF CD (Card Image)	OMF record is ignored, and processing continues.
RCD BYPASSED OMF - xxxxxxxx DEV. dddddd BLANK OMF RCD	OMF record is ignored, and processing continues.
RCD BYPASSED OMF - xxxxxxxx DEV. dddddd INCLUDE INVAL. (Card Image)	OMF record is ignored, and processing continues.
RCD BYPASSED OMF - xxxxxxxx DEV. dddddd EXTRA INCLUDE. (Card image)	OMF record is ignored, and processing continues.
RCD BYPASSED OMF - xxxxxxxx DEV. dddddd TYPE CODE ERR. (Card image)	OMF record is ignored, and processing continues.
*OM BYPASSED OMF - xxxxxxxx DEV. dddddd TXT ADDR. ERR. (OMF card image)	The designated module is not processed, and the input file is positioned to the next module or parameter. Processing continues.
TM ASSUMED OMF - xxxxxxxx DEV. dddddd BLOCK SIZE ERROR (first 80 characters in read-in area)	When an erroneous block size is encountered on an OMF, processing continues as if a tape mark had been read.
*OM BYPASSED OMF - xxxxxx DEV. dddddd NO END CARD	This message occurs when a parameter has been read in, and a module has not been completely processed. The module is bypassed and the parameter read in, is processed.
*OM BYPASSED DEV. ddddd NO FO ESD CARD	This message occurs after an End card for the OMF is encountered. The module designated is not added and the input file is positioned to the next module or parameter. Processing continues.

PRINTOUTS
(Cont'd)

Message	Procedure
*OM BYPASSED OMF - xxxxxxxx DEV. dddddd BYTE COUNT ERR. (OMF card image)	The module designated has an ESD, RLD, or TXT card with an erroneous byte count field. The module is bypassed. Processing continues.
*OM BYPASSED OMF - xxxxxxxx DEV. dddddd RLD ITEM ERROR. (OMF card image)	The module designated has an RLD card with an erroneous ESID #, flag, or address field. The module is bypassed and processing continues.
*OM BYPASSED OMF - xxxxxxxx DEV. dddddd ESD ITEM ERROR. (OMF card image)	The module designated has an ESD card with an erroneous type address field. The module is bypassed and processing continues.
*OM BYPASSED OMF - xxxxxxxx DEV. dddddd ESD ESID # ERR. (OMF card image)	The module designated has an ESD card with an erroneous ESID #. The module is bypassed and processing continues.
*OMF BYPASSED OMF - xxxxxxxx DEV. dddddd ESD EXCEED MAX. (OMF record that caused overflow)	The module designated has more than 255 ESD's. The module is bypassed and processing continues.
NAME OF MODULE ON SYSIPT xxxxxxx DOES NOT MATCH NAME ON PARAMETER, PROCESSED AS zzzzzzzz	The name designated by the parameter has been assigned to an OMF with a blank name, and processing of the OMF continues.
WARNING FLAG OMF - xxxxxxxx DEV. dddddd OMF SEQ # ERR.	Out of sequence TXT and RLD cards for the module specified. Module is processed as usual except that a flag bit is set in the descriptor block on the OML.
PARAMETER BYPASSED - NO OMF FOLLOWS ON SYSIPT (Parameter card 80 cc)	A "CATALO" parameter is immediately followed by another parameter; the first is bypassed and the second is processed.

PRINTOUTS
(Cont'd)

Message	Procedure
BLANK MODULE NAME ON dddddd, PROCESSED AS Xyydddmm	The module is assigned a name, where X = constant yyddd = date of run mm = sequential number assigned during run starting with 01. Processing continues.
OM - xxxxxxxx on ddddd SUPERSEDES IDENTICALLY NAMED MODULE ON ddddd.	Processing continues.

Notes:

1. xxxxxxxx is the name of the Object Module.
2. ddddd is the symbolic name of the device on which the module is to be found.

TYPEOUTS

Message nΔppppppΔ	Meaning	Action	Response
3502A	Insufficient memory allocated to routine.	Terminate the routine. Refer to Appendix D for memory requirements.	Use a console routine, e.g., E HLT n or M HLTP.
3503A SYSxxx	SYSxxx does not contain directory block for OML file to be merged.	Terminate the routine.	Use a console routine, e.g., E HLT n or M HLTP.
3504A SYSxxx	SYSxxx does not contain directory block on OML file from which OML's are to be extracted.	Same as 3503A	
3506A	End of tape sensed on output.	Same as 3503A.	
3508A SYSxxx	Body of OML file on SYSxxx does not agree with directory block.	Same as 3503A.	

9. SYSTEM MAINTENANCE ROUTINES

OBJECT MODULE LIBRARY UPDATE (OMLU)

◆ The Object Module Library Update routine is used to create, to modify, to copy, and to display object module libraries. The functions performed by the routine are completely dependent on user-supplied parameters.

DEVICE ASSIGNMENTS

◆ *Under Executive or Monitor Control*

SDN	Device Type	Remarks
SYSIPT	Card reader or magnetic tape.	For input parameters and OMF's to be added. *
SYSLST	Printer or magnetic tape.	Output listing device. *
SYSLIB	Magnetic tape.	Primary input for any merge, update, or copy.
SYSUT1	Magnetic tape.	Object module file input, if used.
SYSUT2	Magnetic tape.	Output library tape.
SYSUT3	Magnetic tape.	Work tape if OMF's are used.
SYSUT4	Magnetic tape.	Required for 2 or 3-way merge.
SYSUT5	Magnetic tape.	Required for 2 or 3-way merge.
SYSUT6	Magnetic tape.	Source of OML's to be extracted or OMF's to be added.

*When under Executive control, SYSIPT must be assigned to the card reader and SYSLST to the printer.

PRINTOUTS

Message	Procedure
ACTION TAKEN (Parameter card image)	None.
OMF CATALOGUED FROM dddddd, xxxxxxxx	None.
ERROR-BYPASSED (Parameter card image)	Parameter bypassed as a result of operator response.

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
3511A SYSxxx	OML or Call Library file SYSxxx format error.	1. Continue and mount correct tape.	R
		2. Terminate	Same as 3503A.
3512A SYSxxx	Call Library file SYSxxx format error.	1. Continue and mount correct tape.	R
		2. Terminate.	Same as 3503A.
3513	AL, EL or CL specified in COPY parameter cannot be found on call Library.	Processing continues.	None.
3521A (parameter)	Copy parameter displayed has improper format or invalid operands.	1. Bypass parameter.	B
		2. Resubmit the parameter. Note: Parameters greater than 70 characters cannot be corrected.	RA (Corrected parameter)
		3. Terminate.	Same as 3503A.
3522A (parameter)	Merge parameter displayed does not have operand of 1, 2, or 3.	Same as 3521A.	
3523A	Call Library file format error at beginning of Executive Library copy. (May also be caused by Call Library tape with no Executive Library.)	1. Bypass copying Executive Library.	B
		2. Continue and mount Call Library with correct Executive Library on SYSxxx.	R
3524A (parameter)	Rename parameter has invalid device name.	Same 3521A.	
3525A (parameter)	Device name in parameter is not valid.	Same as 3521A.	

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
3526A (parameter)	Extract parameter has invalid device name or improper format.	Same as 3521A.	
3528A (parameter)	Add parameter has invalid device name or improper format.	Same as 3521A.	
3540A (parameter)	Invalid operation name in parameter.	Same as 3521A.	
3541A (parameter)	Parameter is out of sequence.	Same as 3521A.	
3560A (parameter)	Input device in parameter does not have program to be extracted.	Same as 3521A.	
3562 (parameter)	Program to be deleted is not on OML input given in parameter.	Same as 3521A.	
3564A (parameter)	Program to be re-named is not on input given in parameter.	Same as 3521A.	
3566A (parameter)	OMF to be added is not on input given in parameter.	Same as 3521A.	
3568A (parameter)	Program to be displayed is not on SYSLIB (if display only) or is not scheduled to be written to the output.	Same as 3521A.	
3582A	Invalid card type in an OMF.	1. Continue and ignore OMF record.	R
		2. Go to parameter error 3583A.	B

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
3583A (parameter)	Invalid card type in an OMF. Card will not be processed.	Same as 3521A.	
3584A	Invalid field in OMF card image.	1. Continue and skip this OMF.	B
		2. Terminate.	Same as 3503A
3585A	Block size for OMF is not a multiple of 80.	1. Continue and ignore block.	R
		2. Go to parameter error 3583A.	B
3586A (parameter)	Maximum number of ESD Cards exceeded.	Same as 3521A.	

**LOAD LIBRARY
UPDATE (LLU)**

◆ The Load Library Update routine produces an updated Load Library from previously generated Load Libraries by adding, deleting, replacing or altering programs. A System Load Library, Program Load Library, or Executive Load Library can be updated by this routine.

**DEVICE
ASSIGNMENTS**

◆ *Under Executive or Monitor Control :*

SDN	Device Type	Remarks
SYSIPT	Card reader.*	Parameter input device.
SYSLST	Printer.*	Output listing device.
SYSLIB	Magnetic tape.	Executive Library input, if used and not on another device.
SYSUT1	Magnetic tape.	Primary input for any merge, update, or copy.
SYSUT2	Magnetic tape.	Output Library tape.
SYSUT3	Magnetic tape.	Work tape for SSL output if Executive Library is not on SYSLIB.
SYSUT4	Magnetic tape.	Required for 2 or 3-way merge.
SYSUT5	Magnetic tape.	Required for 3-way merge.
SYSUT6	Magnetic tape.	Required for Load Library from which programs are to be extracted.
SYSUT7	Magnetic tape.	Same as SYSUT6.
SYSUT8	Magnetic tape.	Same as SYSUT6.

*May be magnetic tape under Monitor.

TYPEOUTS

Message	Meaning	Action	Response
nΔppppppΔ			
1001A (parameter)	Parameter displayed could not be identified and caused illogical error in phase I.	Terminate the program.	

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
1002A (parameter)	First parameter was not a Copy or Display parameter.	1. Bypass parameter.	B
		2. Resubmit parameter. Note: Parameters greater than 70 characters can not be corrected.	R Δ (Cor- rected param- eter.)
		3. Terminate the program.	
1003A (parameter)	Field one of parameter is in error.	Same as 1002A.	
1004A (parameter)	Parameter is out of sequence.	Same as 1002A.	
1005A (parameter)	Field three of parameter is too large.	Same as 1002A.	
1006A (parameter)	Field two of parameter is in error.	Same as 1002A.	
1007A (parameter)	Field two of Copy parameter is missing.	Same as 1002A.	
1008A (parameter)	Invalid device name in parameter.	Same as 1002A.	
1009A	First block on SYSLIB is not a bootstrap or VOL header label.	Mount correct tape on SYSLIB.	B
1010A	Illogical error in I/O routine.	Same as 1001A.	
1011A (parameter)	Parameter could not be identified and caused illogical error in phase II.	Same as 1001A.	

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
1012A (parameter)	Program named in parameter was not found on input.	Same as 1001A.	
1013A	End of Input sensed before last parameter was processed.	Same as 1001A.	
1014 (program name)	Extract program was not found on input specified.	Processing continues; output tape will not contain the requested program.	None.
1015A (parameter)	Field four of Patch parameter is in error.	Same as 1002A.	
1016A (parameter)	Field six of Patch parameter is in error.	Same as 1002A.	
1017A (parameter)	Parameter patch data is in error.	Same as 1002A.	
1018A (parameter)	Field two of Patch parameter is missing.	Same as 1002A.	
1019A (parameter)	Field three of Patch parameter is missing.	Same as 1002A.	
1020A (parameter)	Field three of Patch parameter is too large.	Same as 1002A.	
1021A (parameter)	Field four of Patch parameter is missing.	Same as 1002A.	
1022A (parameter)	Field four of Patch parameter is too large.	Same as 1002A.	

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
n△pppppp△			
1023A	Illogical error in processing executive overlay.	Same as 1001A.	
1024A	Load to be displayed was not found.	Bypass display.	B
1025A (parameter)	Another Display parameter was read after a DSPLY ALL or DSPLYA ALL parameter.	Same as 1002A.	
1026A	Program named in Display parameter is before present tape position.	Same as 1002A.	
1027A (parameter)	Copy parameter mnemonic indicator is not N, D, V, or F.	Same as 1002A.	
1028A (parameter)	Format error on input tape.	1. Continue and mount correct tape.	R
1029 pppppp	Program pppppp in DSPLY parameter cannot be found.	Processing continues.	None.
1030A	Table overflows. Too many functions used or input programs too large for memory.	Assign more memory or reduce number of functions and restart the routine.	
1031A (parameter)	Program-name entry in parameter card is invalid (contains all spaces).	Same as 1002A.	
1032 pppppp ON SYSUTn	Program pppppp is duplicated on SYSUTn.	The first program is retained; all other duplicates are ignored.	None.
1033 pppppp ON SYSUTn	Program pppppp on SYSUTn is out of sequence.	The program is ignored.	None.
1099	End of job.	None.	None.

PRINTOUTS
(Cont'd)

Message	Meaning
***LNKERR A05 SYMBOLIC DEVICE (xxxxxx) DOES NOT CONTAIN AN EXECUTIVE SYSTEM	Executive program not on tape specified. Routine terminated.
***LNKERR A06 SYSTEM MALFUNCTION	An apparent error was detected by the I/O Control section of the Linkage Editor or the Interspersed Executive Overlays could not be located on the device from which they were previously copied. The routine terminated and a memory dump was taken.
***LNKERR B01 (t) INCLUDE LIST EXCEEDED (See note on page 9-16.)	The INCLUDE parameter waiting exceeds 30. Binding of current program terminated.
***LNKERR B02 (t) INVALID CARD TYPE (See Note on page 9-16.)	The record printed above was not an object module card image or Linkage Editor parameter. Record was ignored and binding continued. (This error can also be caused by a misplaced ACTION statement.)
***LNKERR B03 (t) INVALID ESD CODE (See Note on page 9-16).	The record printed above contained an invalid ESD type code. Binding of current program terminated.
***LNKERR B04 (t) INVALID OPERAND FIELD (See Note on page 9-16.)	The operand field in the record printed above was invalid. Binding continued on a diagnostic basis unless the LET option was exercised.
***LNKERR B05 (t) ILLEGAL PLACEMENT (See Note on page 9-16).	The parameter printed above was out of order. Binding continued on a diagnostic basis.
***LNKERR B06 (t) PUNCTUATION ERROR (See Note on page 9-16).	Punctuation error in parameter displayed above. The fields after the error were ignored and binding continued on a diagnostic basis unless the LET option was exercised.
**LNKERR B07 (t) SYMBOL TOO LONG (See Note on page 9-16).	The symbol indicated above by the caret (^), contained too many characters. The excess right-hand characters were ignored. Binding continued on a diagnostic basis unless the LET option was exercised.

PRINTOUTS
(Cont'd)

Message	Meaning
<p>***LNKERR B08 (t) INVALID SOURCE (See Note on page 9-16.)</p>	<p>The parameter displayed was read from an invalid source. The parameter was ignored and binding continued on a diagnostic basis unless the LET function was exercised.</p>
<p>***LNKERR B09 (t) RESERVED SYMBOL (See Note on page 9-16.)</p>	<p>The REGION symbol was misused in the OVERLAY parameter operand displayed above. The symbol was processed as given in the parameter. Binding continued on a diagnostic basis unless the LET option was exercised.</p>
<p>***LNKERR B10 (t) BAD LOAD STRUCTURE (See Note on page 9-16.)</p>	<p>The node point specified in the OVERLAY statement printed above was in error. Binding continued on a diagnostic basis.</p>
<p>***LNKERR B11 (t) ddname NOT ASSIGNED (See Note on page 9-16.)</p>	<p>A NO FILE reply was made to the executive's request for assignment of the symbol indicated by a caret (^) in the statement displayed above. Binding continued on a diagnostic basis.</p>
<p>***LNKERR B12 (t) EXTRN (xxxxxxx) APPEARS IN MORE THAN ONE LIBRARY CARD (See Note on page 9-16.)</p>	<p>The EXTRN symbol xxxxxxxx was used on two LIBRARY cards. Binding continued on a diagnostic basis.</p>
<p>***LNKERR B13 (t) OBJECT MODULE (xxxxxxx) NOT FOUND (See Note on page 9-16.)</p>	<p>Object module xxxxxxxx was not found on the file specified by the INCLUDE statement printed above. Binding continued on a diagnostic basis.</p>
<p>***LNKERR B14 (t) END CARD NOT FOUND FOR OBJECT MODULE (xxxxxxx) (See Note on page 9-16.)</p>	<p>Object module xxxxxxxx did not contain an END card. Binding of the current program terminated.</p>
<p>***LNKERR B15 (t) SD/PC TYPE ESD MISSING (See Note on page 9-16.)</p>	<p>A TXT, RLD, or END card preceded the ESD SD/PC card. Binding of the current program terminated.</p>

PRINTOUTS
(Cont'd)

Message	Meaning
<p>***LNKERR B16 (t) INTERNAL TABLE CAPACITY EXCEEDED (See Note on page 9-16.)</p>	<p>The amount of memory available was insufficient to process the program. Binding of the current program terminated.</p>
<p>***LNKERR B17 (t) OMF HAS WRONG LENGTH RECORD (See Note on page 9-16.)</p>	<p>Tape block read was not a multiple of 80 or exceeded the maximum permitted length. EOF was assumed and binding continued on a diagnostic basis.</p>
<p>***LNKERR B18 (t) NO OBJECT MODULE (See Note on page 9-16.)</p>	<p>Input to current program terminated and no object modules were found. Binding of current program terminated.</p>
<p>***LNKERR B19 (t) FILE IS NOT AN OMF or FILE IS NOT AN OML (See Note on page 9-16.)</p>	<p>The ddname in the statement above referenced a file with an invalid format. The statement was ignored and binding continued on a diagnostic basis.</p>
<p>**LNKERR B20 (t) SYSLIB: NOT OML; OR NOT ASSIGNED (See Note on page 9-16.)</p>	<p>SYSLIB was not an OML or no assignment was made when an Executive request for assignment was issued. Binding continued on a diagnostic basis.</p>
<p>**LNKERR B21 (t) EOT REACHED ON SYSUT3 (See Note on page 9-16.)</p>	<p>EOT detected on Linkage Editor work tape. Binding of the current program terminated.</p>
<p>***LNKERR B22 (t) GENERATED PROGRAM NAME - NONAME (See Note on page 9-16.)</p>	<p>The current program did not specify a program name. The linkage editor supplied NONAME. This is a warning message. Binding continued.</p>
<p>**LNKERR B23 (t) PROGRAM NAME NOT SEQUENTIAL (See Note on page 9-16.)</p>	<p>A program that was bound is out of sequence. This is a warning message. Binding continued.</p>

PRINTOUTS
(Cont'd)

Message	Meaning
<p>***LNKERR B24 (t) INVALID FORMAT</p> <p>(See Note on page 9-16.)</p>	<p>The format of the statement displayed above was invalid. Binding continued on a diagnostic basis unless the LET option was exercised.</p>
<p>***LNKERR B25 (t) CARD BYTE COUNT INVALID</p> <p>(See Note on page 9-16.)</p>	<p>The byte count in the record above exceeds the maximum permitted. Binding of the current program terminated.</p>
<p>***LNKERR B26 (t) ESID NUMBER INVALID</p> <p>(See Note on page 9-16.)</p>	<p>The ESID number in the record above exceeds the maximum permitted. Binding of the current program terminated.</p>
<p>***LNKERR B27 (t) WARNING! OBJECT CARD NOT SEQUENTIAL</p> <p>(See Note on page 9-16.)</p>	<p>The sequence number in the record above is not one greater than the number in the preceding TXT or RLD record. This is a warning. The bound program may not be executable.</p>
<p>***LNKERR B28 (t) NCAL INEFFECTIVE WITH LIBRARY PARAMETER</p> <p>(See Note on page 9-16.)</p>	<p>A NCAL statement was used with a library statement. This is not logical. The NCAL statement was ignored and binding continued.</p>
<p>***LNKERR B29 (t) ORIGIN/LOAD ADDRESS INVALID</p>	<p>The indicated address in the record displayed above is less than the address of the first SD of the object module. Binding continued on a diagnostic basis.</p>
<p>***LNKERR C01 EXTRN (xxxxxxx) SATISFIED FROM (yyyyy) NOT FROM (zzzzz)</p>	<p>EXTRN (xxxxxxx) was satisfied from symbolic device (yyyyy) rather than from symbolic device (zzzzz) as specified by a LIBRARY statement. Binding continued on a diagnostic basis unless the LET option was exercised.</p>
<p>***LNKERR C02 SYMBOLIC DEVICE (xxxxxx) DOES NOT CONTAIN AN OML</p>	<p>Symbolic device (xxxxxx) contains an OMF rather than OML. Binding continued on a diagnostic basis.</p>
<p>***LNKERR C03 INTERNAL TABLE CAPACITY EXCEEDED</p>	<p>The amount of memory allotted for storage area is insufficient to process the current program. Binding of the current program was terminated.</p>

PRINTOUTS
(Cont'd)

Message	Meaning
***LNKERR C04 EXTRN (xxxxxxxx) NOT SATISFIED	At the completion of the Automatic Call Procedure, EXTRN (xxxxxxxx) was not satisfied. Binding continued on a diagnostic basis unless the LET option was exercised.
***LNKERR C05 SYSLIB NOT ASSIGNED	SYSLIB was required by the Automatic Call Procedure but was not assigned by the operator when the executive request for assignment was issued. Binding continued on a diagnostic basis.
***LNKERR D01 DUPLICATE MODULES MATCHED WITH COMMON (xxxxxxxx)	Two or more object modules had the same name as common area (xxxxxxxx). The object modules were not moved to the common area. Binding continued on a diagnostic basis unless the LET was exercised.
***LNKERR D02 EXTRN (xxxxxxxx) COULD NOT BE SATISFIED FOR EXECUTION ADDRESS	EXTRN (xxxxxxxx) specified as the program entry point could not be satisfied. Binding continued on a diagnostic basis unless the LET option was exercised, in which event, the program entry point is the first byte of the first module in the root load.
***LNKERR D03 DUPLICATED LOAD NAME (xxxxxxxx) REPLACED WITH (AAAnnn $\Delta\Delta$)	Two or more OVERLAY statements contained a LOADNAME whose first six characters are identical. The Linkage Editor generated unique load names (AAAnnn $\Delta\Delta$) for duplicate symbols. Binding continued on a diagnostic basis unless the LET option was exercised.
***LNKERR D04 COMPUTED PROGRAM LENGTH IS GREATER THAN MAXIMUM SPECIFIED IN 'PROG' CARD	The computed length of the longest path in the program is greater than the maximum length shown on the PROG statement. The computed length was used. This is a warning only.

PRINTOUTS
(Cont'd)

Message	Meaning
***LNKERR D05 SYSTEM MALFUNCTION	An apparent error was detected, during Phase III, in the Module or Entry tables maintained by the Linkage Editor. The routine terminated and a memory dump was taken.
***LNKERR D06 SYSTEM MALFUNCTION	An apparent error was detected, during Phase III, in the VCON or Entry tables maintained by the Linkage Editor. The routine terminated and a memory dump was taken.
***LNKERR D07 SEG TAB LIMIT EXCEEDED	The number of segments in the program exceeded the limit (256) established for programs requiring Automatic Overlay Loading. Binding continued on a diagnostic basis. The number of segments must be reduced to less than 257.
***LNKERR D08 ENTAB LIMITS EXCEEDED	The number of VCON items in segment (xxxxxxx) exceeded the limit (225) established for programs requiring Automatic Overlay Loading. Binding continued on a diagnostic basis. The number of VCON items in the segment must be reduced to less than 226.
*LNKERR D09 EXTRN (xxxxxxx) COULD NOT BE SATISFIED FOR ERREXIT ADDRESS	The entry point specified in the ERREXIT statement was not satisfied in the root load. Binding continued on a diagnostic basis.
***LNKERR E01 SYSTEM MALFUNCTION	An apparent error was detected, during Phase IV, in the Module, VCON, Load, or Entry tables maintained by the Linkage Editor. The routine terminated and a memory dump was taken.
** LNKERR E02 EOT REACHED ON SYSUT2	EOT was sensed on SYSUT2 before current program was completely written. The routine terminated normally. The current program is not on the output tape.

PRINTOUTS
(Cont'd)

Message	Meaning
***PROGRAM (xxxxxxxx) BOUND WITH ERRORS	Program (xxxxxxxx) was bound with the errors listed. The LET option was exercised.
***PROGRAM (xxxxxxxx) NOT BOUND	Program (xxxxxxxx) was not bound due to the errors listed.
***END LNKEDT	The Linkage Editor Routine has been completed.

Note: ♦ A (t) in the message indicates the input source at the time the message was printed.

- When (t) = (P) it was the primary input.
- = (S) it was a secondary input.
- = (L) it was an object module from a secondary input or OML.

TYPEOUTS

Message	Meaning	Action	Response
nΔppppppΔ			
0801 *** LNKERR A01	SYSUT1 did not contain an OMF as specified.	Routine terminates and a memory dump is taken.	None.
0802 *** LNKERR A05	Executive program not on tape specified.	Routine terminates and a memory dump is taken.	None.
0803 *** LNKERR D05	An apparent error was detected, during Phase III, in the Module or Entry tables maintained by the Linkage Editor.	Routine terminates and a memory dump is taken.	None.
0804 *** LNKERR D06	An apparent error was detected, during Phase III, in the VCON or Entry tables maintained by the Linkage Editor.	Routine terminates and a memory dump is taken.	None.
0805 *** LNKERR E01	An apparent error was detected, during Phase IV, in the Module, VCON, Load or Entry tables maintained by the Linkage Editor.	Routine terminates.	None.

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
0806 *** LNKERR E02 EOT REACHED ON SYSUT2	EOT was sensed on SYSUT2 before cur- rent program was completely written.	Routine terminates.	None.
0807A INVALID FORMAT ON (xxxxxxx)	Format on (xxxxxxx) was not recognized.	1. Reassign (xxxxxxx).	1
		2. Bypass assignment. (Further errors may result.)	2 .
0808 *** PROGRAM (xxxxxxxx) BOUND WITH ERRORS	Program (xxxxxxxx) was bound with the errors listed on SYSLST.	None.	None.
0809 *** PROGRAM (xxxxxxxx) NOT BOUND	Program (xxxxxxxx) was not bound due to errors listed on SYSLST.	None.	None.
0810 *** LNKERR A06	An apparent error was detected by the I/O Control section of the Linkage Editor or the Interspersed Executive Overlays could not be located on the device from which they were pre- viously copied.	Routine terminates and a memory dump is taken.	None.
0811A NO OML ON SYSLIB	An OML was not found on SYSLIB.	1. Reassign SYSLIB.	1
		2. Bypass assignment (Further errors may result.)	2
0899 *** END LNKEDT	The Linkage Editor routine has been completed.	None.	None.

**MACRO LIBRARY
UPDATE (MLU)**

◆ The Macro Library Update (MLU) routine is used to create an initial Assembly Macro Library section for a Call Library tape, or to maintain the Assembly Macro section of an existing Call Library tape.

DEVICE ASSIGNMENTS

◆ *Under Executive Control*

SDN	Device Type	Remarks
SYSIPT	Card Reader	Control Statements, updates, etc.
SYSLST	Printer	Listings Output.
SYSOPT	Punch	Punched macros.
INPUT1	Magnetic Tape	TOS Call Library.
INPUT2	Magnetic Tape	TOS Call Library.
INPUT3	Magnetic Tape	TOS Call Library.
INPUT4	Magnetic Tape	TOS Call Library.
OUTPUT	Magnetic Tape	TOS Call Library.
WORK	Magnetic Tape	Work tape.

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
3697	Program was run with errors.	See console log and/or printer.	None.
3698	Abnormal termination. Program not completed.	See console log for fatal error. Correct and rerun.	None.

DEVICE ASSIGNMENTS
(Cont'd)

Under Monitor Control:

Device assignments are the same as above. In addition, magnetic tapes may be substituted for SYSIPT, SYSOPT, and SYSLST.

TYPEOUTS

Message	Meaning	Action	Response
nΔMLUΔΔΔΔ			
3601	<u>FATAL ERROR</u> "ENVIRON" control statement has invalid field.	Program Terminates correct "ENVIRON" card and restart run.	None.
3602	<u>FATAL CONDITION</u> maximum number of control statements exceeded.	File must be created or updated in multiple passes or additional memory allocated.	None.
3603 symbolic device name.	<u>FATAL ERROR</u> End of Tape has been sensed on output tape.	Program terminates. Mount longer output tape, restart run.	None.
3604A symbolic device name.	The file name in the HDR label is not "SYSLIB".	Retry	R
		Terminate	T
		Ignore, continue processing.	I
3605	<u>FATAL CONDITION</u> Assembly macro library was referenced and not found on input tape.	Program Terminates. Correct ENVIRON card or Mount Correct tape and restart run.	None.
3606 library name	Library to be copied is not present.		Processing continues.

**LINKAGE EDITOR
(LNKEDT)**

◆ The Linkage Editor routine is required for the preparation of executable programs for TOS. It creates linkage between modules of a program and converts the card-image format of a language translator output to the TOS Load Library format. Both Program and System Load Libraries can be generated. The routine performs checks on all inputs and prints diagnostic messages to inform the user of errors or possible errors in his program.

**DEVICE
ASSIGNMENTS**

◆ *Under Monitor Control:*

SDN	Device Type	Remarks
SYSIPT	Card reader or magnetic tape.	Parameter input device. Can also be used as primary input device.
SYSLIB	Magnetic tape.	System library tape input.
SYSLST	Printer or magnetic tape.	Diagnostic and listing output device.
SYSUT1	Magnetic tape.	Primary input, if not on SYSIPT, or secondary input device.
SYSUT2	Magnetic tape.	Bound program output device.
SYSUT3	Magnetic tape.	Work tape.

PRINTOUTS

Message	Meaning
***LNKERR A01 SYMBOLIC DEVICE (SYSUT1) DOES NOT CONTAIN AN OMF	SYSUT1 did not contain an OMF as specified. The routine terminated.
*** LNKERR A02 SYMBOLIC DEVICE (xxxxxx) DOES NOT CONTAIN AN OMF OR OML	Device xxxxxx did not contain OMF or OML as specified. Binding continued on a diagnostic basis.
***LNKERR A03 MAXIMUM NUMBER OF ASSIGNED DEVICES EXCEEDED	The number of allowable input devices was exceeded. Binding continued on a diagnostic basis.
***LNKERR A04 FORMAT ERROR	ACTION parameter format error. The parameter was processed up to the point in error. Binding continued.

PRINTOUTS

◆ The messages listed below appear in the ERR FLAGS column of the Macro Corrections Listing, or the ERROR FLAGS column of the Control Statement Listing. Flags appear on the same line as the statement in error.

Code	Meaning	Action Taken
3610	Undefined Parameter	Parameter bypassed. Processing continues.
3611	Invalid Parameter	Same.
3612	Illegal operation for device (i. e. EXTRACT from Merge tape).	Same.
3613	Action required from device not specified.	Same.
3614	Invalid required field in parameter.	Same.
3615	Invalid optional field in parameter.	Option is ignored, processing continues.
3616	Invalid operand in CDELET.	Parameter bypassed, processing continues.
3617	Statement being inserted or cataloged by a STARTC or CATALS is out of sequence.	Statement is inserted. Processing continues. (See note)

Note:

Correct condition by another update.

PRINTOUTS
(Cont'd)

Code	Meaning	Action Taken
3618	The MACRO statement is not the first statement of the macro.	Program generates a MACRO statement. Processing continues. (See note)
3619	The Macro name on the output library does not agree with the name in the prototype statement.	Processing continues. (See note)
3620	Macro does not end with a MEND statement.	Program generates a MEND statement. Processing continues.
3621	SAVE was specified in STARTC or CATALS parameter and a MACRO statement has a blank sequence field.	PROGRAM inserts ΔΔΔΔΔΔ A in the sequence field. Processing continues.

Note:

Correct condition by another update.

**COBOL
LIBRARY UPDATE
(CLU)**

**GENERAL
DESCRIPTION**

◆ The COBOL Library Update (CLU) routine is used to create and maintain a COBOL Source Program Library. This library may appear on a Call Library Tape along with the Assembly Macro, Object Module, and Executive libraries, or it may appear as the only library on a CLT.

Each "entry" contained in the COBOL Library consists of a name followed by one or more COBOL source statements. Entries may be defined for each of the four sections in the library. These sections, any one of which may or may not be present, appear in the following order:

ENVIRONMENT DIVISION
DATA DIVISION
PROCEDURE DIVISION
SOURCE PROGRAMS

Entries within each section are arranged in alphanumeric sequence by entry name.

**DEVICE
ASSIGNMENTS**

◆ *Under Executive Control or Under Monitor Control:*

SDN	Device Type	Remarks
SYSIPT	Card reader or magnetic tape.	For input parameters, source cards, and corrections.
SYSLST	Printer or magnetic tape.	Listing device.
SYSOPT	Card punch or magnetic tape.	Output device.
SYSUT2	Magnetic tape.	Output Library tape.
SYSUT3	Magnetic tape.	Work tape (required if a directory is to be printed in addition to COBOL entries).

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
5600 (parameter)	Invalid operation field in control parameter.	Parameter is bypassed; next parameter is read.	None.
5601 (parameter)	Optional field in STARTC or CATALS parameter card not SAVE, DSPLY, PUNCH, DSPCH or SEQNCE.	Parameter is bypassed; next parameter is read.	None.
5602	Invalid CATALS or STARTC parameter because COPY pa- rameter was not used to signify output.	Parameter is bypassed; next parameter is read.	None.
5603	Invalid STARTC pa- rameter because COBOL input was not specified with the COPY parameter.	Parameter is bypassed; next parameter is read.	None.
5604	SEQNCE has been recognized on a STARTC parameter and is invalid for this parameter. SEQNCE is ignored.	The rest of the param- eter is bypassed if no other errors occur.	None.

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
5605	An optional field on a COPY parameter cannot be identified.	Routine terminates.	None.
5606	A COPY parameter is not the first parameter.	Routine terminates.	None.
5607	A comma is missing between optional fields in a COPY parameter.	Processing is continued, if possible, starting with the column that should have contained the comma.	None.
5608ASΔname	A DSPLY request has been read and ignored because a directory is being written to the printer and the CS option was not used in a prior DSPLY parameter.	Parameter is bypassed; next parameter is read.	None.
5609	A request to display a directory has been read after a parameter other than COPY.	Parameter is bypassed; next parameter is read.	None.
5610 (parameter)	A character other than a space or comma has been encountered following a CD (Directory) field on a DSPLY.	Parameter is processed and a work tape is used to receive directory while entries are being printed.	None.
5611	A DSPCH request has been read after the routine has been informed to write a directory to the printer.	Display of the entry is ignored, but the punch request is honored.	None.
5612	A DELETS parameter has been read and considered invalid because a COPY parameter was not used to signify COBOL Library input.	Parameter is bypassed; next parameter is read.	None.

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
5613 (parameter)	The section number and name on a CATALS or STARTC parameter is not equal to or greater than specified on a previous parameter.	Parameter is bypassed; and parameters are read until a control parameter other than CDELET is recognized.	None.
5614 (parameter)	The entry name on the specified parameter is not greater than the previous name.	Same as 5613.	None.
5615 (parameter)	The section number specified on the parameter is not equal to or greater than the previous parameter.	Same as 5613.	None.
5617 (parameter)	The first character of name on specified parameter is a space or comma.	Same as 5613.	None.
5618 (parameter)	The name on the specified parameter exceeds 8 characters.	Same as 5613.	None.
5619 (parameter)	The section number in the specified parameter is not 1, 2, 3, or 4.	Same as 5613.	None.
5620 Δ (Section number) Δ (name)	The designated section and name was not found on the input tape.	Same as 5613.	None.
5621 Δ (section number)	The designated section was not found on the input tape.	Same as 5613.	None.
5622 Δ (section number) Δ (name) PREV (Seq. No.) CUR (Seq. No.)	Requested sequence check of specified entry on input tape has encountered an out-of-sequence condition.	Sequence checking is terminated; processing continues.	None.

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
5623 Δ (sec- tion number) Δ (name)	Source statement to be deleted from the specified entry name could not be found.	All corrective actions for the entry ceases; processing continues.	None.
5624	End of tape (ET) has been sensed on SYSUT2 (output library tape).	Routine terminates.	None.
5625	Macro Library (AL) not found on input tape.	Processing continues.	None.
5626	COBOL Library (CL) not found on input tape.	Processing continues.	None.
5627	Executive Library (EL) not found on input tape.	Processing continues.	None.
5628	Object Module Library (OL) not found on input tape.	Processing continues.	None.
5629	Macro Library on input tape is not terminated by a tape mark.	Routine terminates.	None.
5630	COBOL Library on input tape is not terminated by a tape mark.	Routine terminates.	None.
5631	Executive Library on input tape is not terminated by a tape mark.	Routine terminates.	None.
5632	Object Module Library on input tape is not terminated by a tape mark.	Routine terminates.	None.

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
5633	End of tape (ET) has been sensed on SYSUT3 (directory tape).	Writing to SYSUT3 (directory tape) discontinued. At end of job, the tape is rewound and a partial directory is printed.	None.
5634 (parameter)	A comma is missing between section and name on the specified parameter.	Processing is continued, if possible, starting with the column that should have contained the comma.	None.
5698	Previous error messages have occurred in this run. Refer to these errors for type of error and action taken.	None.	None.

**TAPE FILE
MAINTENANCE
(TPMAIN)**

**DEVICE
ASSIGNMENTS**

◆ The Tape File Maintenance routine can be used to maintain card or tape input files by updating these files as specified by input parameters. Data can be changed, added, or deleted.

◆ *Under Executive Control:*

SDN	Device Type	Remarks
TFMRDR	Card reader.	Parameter input. Can also be used for file input.
TFMLST	Printer.	Output device.
TFMOPT	Card punch.	Output device.
TFMnnn	Any.	Additional input and output devices.

◆ *Under Monitor Control:*

SDN	Device Type	Remarks
SYSIPT	Card reader.	Parameter input. Can also be used for file input.
SYSLST	Printer.	Output device.
SYSOPT	Card punch.	Output device.
TFMnnn	Other device.	Additional input and output devices.

TYPEOUTS

Message	Meaning	Action	Response
nΔppppppΔ			
3401A Pnn; (See note 1 below)	Invalid card	1. Read next card.	1
		2. Read new set of parameters.	3
		3. Ignore this card and accept correct card from typewriter. (Routine will issue request that operator type in correct card.)	8
		4. Reprocess this card after operator has entered new card from typewriter. (Routine will issue request that operator type in new parameter card. The card that caused the 3401A typeout will then be processed.)	9
		5. Terminate.	T
3401A TYPE CARD	A response of 8 or 9 was given for typeout 3401A.	Type in correct parameter.	
3402A Pnn; (See note 2 below.)	Invalid field.	1. Ignore field.	1
		2. Read next card.	2
		3. Read new set of parameters.	3
		4. Ignore this card and accept correct card from typewriter. (Routine will issue request that operator type in correct card.)	8
		5. Terminate.	T

Note 1: Pnn indicates the field in error. When nn=00, it indicates the parameter identifier. When nn=01, it indicates the first operand. Each additional comma increases the field count by one.

Note 2: Pnn indicates the field in error. When nn=01, it indicates the parameter identifier. When nn=02, it indicates the first operand. Each additional comma increases the field count by one.

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
3402A TYPE CARD	A response of 8 was given for typeout 3402A.	Type in correct parameter.	
3403	No input device specified.	Routine terminates.	None
3404A	FL or FP entry in SEQ parameter incorrect.	Type in correct operand. Note: G = generate operand; U = update operand; C = check operand.	7ΔGFLxx 7ΔGFPxxx 7ΔUFLxx 7ΔUFPxx 7ΔCFLxx 7ΔCFPxxx
		Terminate.	T
3405A	FL is not equal to length of FB, or length of FI is greater than FL.	Terminate.	T
3406A	Input record out of sequence.	1. Ignore sequence number error and continue sequence checking.	1
		2. Continue but stop sequence check.	2
		3. Type in correct sequence field when requested.	7
		4. Terminate.	T
3406A TYPE ERROR FIELD	A response of 7 was given for typeout 3406A.	Type in correct sequence number.	
3407 IN- VALID POSI FIELD- (field)	The field that is displayed is invalid.	Type in correct field.	
3408	More than five input devices specified.	Routine terminates.	None
3409 EP BEFORE SP	The end point was found before starting point.	Routine terminates.	None

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
3410A (parameter)	Too many cards in a set of parameters (more than 15). The 16th parameter is displayed.	1. Read new set of parameters.	3
		2. Accept first 15 parameters; type in THEN or STOP operand for 15th parameter when requested.	7
		3. Terminate.	T
3410A TYPE ERROR FIELD	A response of 7 was given for typeout 3410A.	1. Process this set of parameters, then read next set.	THEN
		2. Process this set of parameters, then terminate routine.	STOP
3411 SP	The input is already positioned past the starting point.	Routine terminates.	None.
3412 EP	The input is already positioned past the end point.	Routine terminates.	None.
3413A ACTUAL (data)	The data displayed did not agree with the Replace parameter data.	1. Do not make replacement.	1
		2. Make replacement.	2
		3. Terminate.	T
3414A	Input block size shown in this parameter is larger than block size specified in first parameter.	1. Continue, using block size specified in first parameter.	1
		2. Terminate.	T
3415	Double tape mark found before end point was reached.	Routine terminates.	None.
3416	Double tape mark found before starting point was reached.	Routine terminates.	None.

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
3417A DEVICE NO. nnn INVALID. TYPE IN CORRECT NO.	Invalid device as- signment.	Type in last three characters of symbolic for correct device.	nnn
3418 IP REC FLUSHED	Input block was larger than specified maximum block size. Block is not written to output.	Processing continues.	None
3419 nnn AT BT	Device TFMnnn positioned at begin- ning of tape.	Processing continues.	None
3420	Not enough memory assigned for routine.	Reload routine and re- quest more memory.	None
3430A END OF TAPE FOUND ON TFM nnn	End of tape has been sensed on output tape TFM nnn.	1. Continue	C
		2. Terminate. The tape is closed with two tape marks and rewound.	T
		3. Display first 37 bytes of last record written.	D
3440A REPLY NOT C, T, OR D RE- PLY AGAIN	Incorrect reply made to 3430A.	Same as 3430A.	
3450 LAST RECORD WRITTEN xxx....xxx	The first 37 bytes of the last record written are xxx...xxx.	Message 3430A will be repeated.	None.
3477A	Incorrect reply to preceding message.	Type in correct reply.	

**RANDOM ACCESS
STORAGE
ALLOCATOR
(RAALLR)**

◆ The Random Access Storage Allocator (RAALLR) reserves storage for a file on a random access volume by entering the name and limits of the file in the Volume Table of Contents (VTOC). This routine must be run before any file data can be loaded. Storage may be allocated for any file which is accessed by the serial, direct, or indexed-sequential methods.

The On-Line Catalog console routine must be run prior to running the Allocator.

DEVICE ASSIGNMENTS

◆ *Under Monitor Control:*

SDN	Device Type	Remarks
SYSIPT	Card Reader	Parameter input
SYSLST	Printer or magnetic tape.	Output listing

Under Executive Control:

SDN	Device Type	Remarks
SYSRDR	Card Reader	Parameter input
SYSPRT	Printer	*Output listing

*If no logging of parameters or error messages are desired, operator may respond with NO instead of a device assignment.

PRINTOUTS
(Cont'd)

Message	Meaning	Action
3108	Volume sequence number is more than 4 digits or non-numeric.	Last volume sequence number will be incremented by 1. First sequence number will be zero.
3109	Invalid ALLOC entry: A is not 0 or 1. B is not 4 digits. D more than 8 digits. O more than 8 digits. T is not 0, 1, or 2. Initial is not A, B, D, I, O, T.	Parameter is rejected.
3110	Invalid volume serial number on XTENT card.	Parameter is rejected.
3111	Required file is not on volume.	No action will be taken on this volume; any other volume serial numbers will be acted upon.
3112	Invalid extent type specified.	A data extent is allocated.
3113	Invalid extent specified.	No action will be taken on this extent; any other extents will be acted upon.
3114	Track allocation on Indexed-Sequential file.	Same as 3113.
3115	Partial cylinders requested in same extent as full cylinders; a partial cylinder must be requested separately.	Same as 3113.
3116	Duplicate file names on a volume.	No action will be taken on this volume; any other volume serial numbers will be acted upon.
3117	Invalid DEPUR operand.	No action will be performed on this operand.
3118	Invalid unused record count in Format 4 label.	No more records written to VTOC.
3119	VTOC address violates device characteristics.*	Allocator is terminated.

*May be caused by improper initialization or accidental destruction of VTOC; volume probably needs reinitialization.

*Random Access Storage
Allocator (RAALLR)*

PRINTOUTS
(Cont'd)

Message	Meaning	Action
3120	Extent not found.	No action will be taken on this extent; any other extents will be acted upon.
3121	Insufficient area in VTOC.	File is not updated.
3122	Volume in XTENT parameter not specified in UNITS parameter.	No action will be taken on this volume; any other valid serial numbers will be acted upon.
3123	Insufficient area for allocation in volumes assigned to file.	Allocation halted for that file.
3124	A mass storage indexed-sequential file has expired.	No action is taken. Deallocation should be requested with all required volumes on line.
3125	Records are remaining in Format C label, and there is no disc or drum area remaining on required volume.	Format C is not written.
3126	There are no indexed-sequential files on requested mass storage indexed-sequential volume.	No action is taken on this volume; any other valid serial numbers will be acted upon.
3127	Index-sequential volume found during non-indexed-sequential processing on mass storage.	Same as 3126.
3128	First volume in UNITS parameter for mass storage indexed-sequential file not a disc or drum.	Same as 3126.
3129	Band not correct for volume.	Same as 3126.
3130	Invalid band specification.	Entire card is allocated as the band.
3131	More than one volume of a file has a Format C label.	Format C is ignored.

PRINTOUTS
(Cont'd)

Message	Meaning	Action
3132	No Format C on first volume of a mass storage indexed-sequential file.	No action is taken on this volume, any other valid serial numbers will be acted upon.
3133	Not all volumes of file are included in the UNITS parameters.	Area is not returned to the Format B of omitted volumes.
3134	Invalid operand in DTFIS.	Operand is ignored.
3135	CYLOF operand exceeds limits.	Entire DTFIS parameter is ignored.
3136	KEYLEN operand is invalid.	Entire DTFIS parameter is ignored.
3137	BNDSize operand is too small.	Entire DTFIS parameter is ignored.
3138	RECSIZE operand is invalid.	Entire DTFIS parameter is ignored.
3139	BLKSIZE operand is invalid.	Entire DTFIS parameter is ignored.
3140	FILSIZE operand is invalid.	Entire DTFIS parameter is ignored.
3141	PRINDEX operand is invalid.	Entire DTFIS parameter is ignored.
3198	Extents exceed the capacity of the allocator: Format 5 - 83 per volume. Formats 1 and 3 - 83 per volume. Format B - 249 per volume. Format C - 76 per file.	Allocator is terminated.
3199	Unrecoverable I/O error.	Allocator is terminated.

*Random Access Storage
Allocator (RAALLR)*

TYPEOUTS

Message	Meaning	Action	Response
RUN OLC	A volume indicated in parameter is not in the on line catalog.	Run On-line Catalog console routine. When routine is ended, reply to continue Allocator: Any other response will terminate the Allocator.	C
3151A MOUNT ssssss	The volume ssssss is not on line.	Mount the volume indicated and reply.	YES
3152A BAD CARD ssssss cccc	The purging of card cccc on magazine ssssss caused an unrecoverable write error.	1. Ignore error and start purging with next card.	1. SKIP
		2. Retry purging the indicated card.	2. R
3153 ERRORS	Errors encountered during allocation are listed on the printer.	None.	None.

PRINTOUTS

Message	Meaning	Action
3101	Invalid parameter set.	Read next parameter set.
3102	Invalid DLAB parameter.	Search for next DLAB or END parameter.
3103	Filename in DLAB is more than 44 bytes.	Filename is truncated at 44 bytes.
3104	File serial number is more than 6 bytes or is missing.	Search for next DLAB or END parameter.
3105	Day entry is greater than 8 digits or is non-numeric.	File is created with today's date as expiration date.
3106	Volume serial number more than 6 characters.	No action will be taken on this volume; any other valid serial numbers will be acted upon.
3107	More than 256 units in one file.	Search for next DLAB or END parameter.

**RANDOM ACCESS
INDEX EDIT
(RAINDX)**

◆ The Random Access Index Edit (RAINDX) routine provides an index of the files and labels on a random access volume. This edit includes:

1. Standard volume label - serial number and owner identification code.
2. Address limits of the VTOC table.
3. Unused area remaining in the VTOC table for additional file labels and extend entries.
4. Unused areas (extents) available on the volume.
5. Listing of the names of all files stored on the volume and the areas assigned to these files.

**DEVICE
ASSIGNMENTS**

◆ *Under Executive Control :*

SDN	Device Type	Remarks
PRMDVC	Card reader.	Parameter input.
OUTDVC	Printer or magnetic tape.	Output listings.
RDMVDC	Random access volume.	Required if assign option has been specified in VOLM parameter.

Under Monitor Control :

SDN	Device Type	Remarks
SYSIPT	Card reader.	Parameter input.
SYSLST	Printer or magnetic tape.	Output listings.
RDMDVC	Random access volume.	Required if ASSIGN option has been specified in VOLM parameter.

TYPEOUTS

Message	Meaning	Action	Response
nΔppppppΔ			
49PDA ENTER PARAM DEVICE	Request for parameter input device.	1. Console typewriter 2. Card reader.	T C
49PRA ENTER INDXEDT PRAM	Request for a parameter.	See TOS Utility Manual for parameter format.**	
4901A INVALID PRAM	Parameter is incorrect	1. Read next parameter.*	C
		2. Terminate routine.	T
4902	Invalid reply on typewriter.	None. Request will be reissued.	None.
4908A	Output tape has reached EOT.	1. Terminate routine.	T
		2. Mount new reel and continue.	C
4920 VOL xxxxxx NOT IN CATALOG	The requested volume (xxxxxx) is not in the system's on-line catalog.	None. Routine ignores parameter and reads the next parameter.	None.

*If typewriter input, the request is reissued. If card input, a card read is issued. An valid card may be corrected and inserted in the reader or skipped by not altering the input deck.

**When parameters are entered from the console typewriter the leading space is not used.

SOURCE LIBRARY
UPDATE(SLU)

GENERAL DESCRIPTION

◆ The Source Library Update (SLU) routine is used to maintain or display programs stored on source library tapes created by the TOS Assembler or the SLU routine. These tapes contain Assembly source language statements.

Source programs may be reordered, renamed, added, deleted, printed, punched, or simply copied to an output library. Individual statements within source programs may be resequenced, added, deleted, or replaced. Also, portions of individual statements may be replaced.

DEVICE ASSIGNMENTS

◆ *Under Executive or Monitor Control*

SDN	Device Type	Remarks
SYSIPT	Card reader (see note).	Parameter and source statement input.
MERGE1 to MERGE8	Magnetic tape.	Source Library input for Copy or Merge functions. The highest numbered input has the highest priority in the case of duplicate program names.
XTAPE1 to XTAPE8	Magnetic tape.	Source Library input for Extract functions. The highest numbered input has the highest priority in the case of duplicate program names. Extract tapes have a higher priority than Merge tapes.
SYSUT5	Magnetic tape.	Source Library output.
OPTOUT	Magnetic tape.	Optional Source Library output.
SYSOPT	Card punch (see note).	Source program card output.
SYSLST	Printer (see note).	Listing output.

Note

◆ When running under Monitor, magnetic tape may be substituted for SYSIPT, SYSOPT, and SYSLST.

PRINTOUTS

◆ The messages listed below appear in the remarks column of the Source Program and Corrections listing.

Message	Meaning
6126	Sequence number operand (F=) in STARTC parameter is invalid. An eight byte sequence number was assumed.
6127	Invalid operand in STARTC parameter. Routine continued to next valid operand or next card.
6128	Invalid R = operand. Operand was ignored.
6130	Invalid L = operand. Operand was ignored.
6131	An operand is incomplete in the STARTC parameter. Operand was ignored.
6132	Invalid A = operand. Operand was ignored.
6133	Invalid S = operand. Operand was ignored.
6134	Invalid G = operand. Operand was ignored.
6135	Invalid V = operand. Operand was ignored.
6138	Invalid DELETE parameter. Parameter was ignored.
6140	End of source program reached before delete action was completed. Delete action was terminated.
6141	Stop sequence number in DELETE parameter is less than first sequence number in source program. Delete action was ignored.
6151	Format error in source program TITLE card. Card is ignored.
6153	Format error in source program ICTL card. Card is ignored.
6154	Format error in source program SPACE card. Card is ignored.
6158	The "ENVIRON" control statement did not contain the operand "T=C" and a card appeared after "END" card of program. Check listing.
6159	The "ENVIRON" control statement did not contain the operand "T=C" and the "END" card was not sensed. "END" card was generated to SYSUT5 output.
6160	Program name missing from STARTC parameter. Routine bypassed cards until next *STARTC, *END, or // Monitor parameter.
6161	Invalid P = operand. Operand was ignored.
6162	Invalid card. Card is ignored.

PRINTOUTS
(Cont'd)

Message	Meaning
6163 SEQ GEN START NO n NO OF BYTES (F=) x	Start sequence number n length is not equal to length x given in F = operand. Sequence numbers were not generated.
6164	Invalid column number or limits in *COL parameter. Parameter is ignored.
6166	Sequence number in *COL parameter did not match sequence number in source program. Parameter is ignored.

TYPEOUTS

Message	Meaning	Action	Response
n Δ pppppp Δ			
6101 (parameter)	Invalid operand in ENVIRON parameter.	Program terminates.	None.
6102 ddddd pppppp (card image)	Program pppppp from device ddddd did not begin with a STARTC card.	Input program is bypassed.	None.
6103 (parameter)	Parameter was not recognized.	Program terminates.	None.
6104 (parameter)	Program or device name missing in parameter.	Parameter is bypassed.	None.
6105 (parameter)	An action for a device not in the ENVIRON parameter or an illegal action was requested.	Parameter is bypassed.	None.
6106 (parameter)	Parameter exceeded program table storage area.	Program terminates. (Reload program requesting additional memory. Refer to Appendix D, TOS Utility Routine Manual.	None.

TYPEOUTS
 (Cont'd)

Message nΔpppppΔ	Meaning	Action	Response
6107 dddddd	Reorder request for device ddddddd which was not in the ENVIRON parameter.	Request is bypassed.	None.
6108 (parameter)	RENAME parameter does not contain new program name.	Parameter is bypassed.	None.
6109 (parameter)	Invalid SAVE field in RENAME parameter.	SAVE option is assumed.	None.
6110 (parameter)	New program name in RENAME parameter is the same as previous new program name.	Only the first rename is accepted.	None.
6111A (header label)	File name of input is not SYSUT5 or SOURCE LIB.	1. Accept.	Y
		2. Terminate.	N
6112 dddddd	More than 399 programs on device ddddddd to be re-ordered.	Program terminates. Input file must be divided.	None.
6113 *ENVIRON	More than one input tape when non-sequenced mode (S=N) is specified.	Program terminates.	None.
6114 (parameter)	The SLU assumed the source program name to be spaces.	Action is taken on a program name of spaces.	None.
6115 *ENVIRON	More than eight input tapes.	Program terminates.	None.
6129 mn pppppp	EOT was sensed on OPTOUT while program pppppp was being processed.	Program terminates. OPTOUT is rewound to last complete program written. A double TM is written and termination occurs. This will create a usable output tape upon termination.	None.

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
6157 (parameter)	An out of sequence STARTC parameter is encountered on SYSIPT when processing in a sequenced mode.	Cards are by-passed until next *STARTC, *END, or // Monitor parameter.	None.
6165 dddddd pppppp	Program pppppp is in invalid compressed format on device ddddd.	Program terminates.	None.

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
6139 pppppp	An illogical condition has occurred internal to SLU operation. Program pppppp to be written to SYSUT5 is out of sequence.	Program terminates and dumps memory. The output tape is rewound to the last complete program written. A double TM is written and termination occurs. This will create a usable output tape upon termination.	None.
6142 dddddd (current program) (previous program)	Programs are out of sequence on device ddddd in a sequenced mode.	The (current program) is bypassed.	None.
6155	An illogical condition has occurred internal to SLU operation (invalid spec. packet).	Program terminates.	None.
6156 mn pppppp	EOT has been sensed on device mn while program pppppp was being processed.	Run terminates. If the device is SYSUT5 or OPTOUT, the tape is rewound to the last complete program written. A double TM is written and termination occurs. This will create a usable output tape upon termination.	None.

TYPEOUTS
 (Cont'd)

Message nΔpppppΔ	Meaning	Action	Response
61V3ΔTK #mn- BYTES WRITTEN xxxxxxxxxxxx read- xxxxxxxxxxxx 61V3ΔTK #mn BLOCKS WRITTEN xxxxxxxxxxxx Read- xxxxxxxxxxxx 61V3ΔTK# mn-MARKS WRITTEN xxxxxxxxxxxx- read xxxxxxxxxxxx	Output device did not validate as written. Differences of bytes written and read are noted in message. Output device assigned to a seven level tape device with pack/unpack option, validates against blocks read vs written or by position of tape after validation. Bytes written will always ap- pear as a zero amount.	Program con- tinues. The device re- wound to BT. This is a pos- sible hardware problem. Rerun SLU to produce new output tape.	None.
61V4ΔTK #mn-TAPE NOT POSITIONED AT BEGIN- NING OF DATA	Output tape was not positioned at the first record following the label set at completion of validation.	Program con- tinues. This is a possible hard- ware problem. Rerun SLU to produce new output tape.	None.
61V5 PROGRAM NAME MM DAY YR VERSION #	Program will not fit in program directory.	None Program Continues.	None.

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
6167 pppppp	Invalid block on tape input. If fixed format, the block was not a multiple of 80 or was greater than 400 bytes. If compressed format, the block was greater than 480 bytes.	The output tape is rewound to the last complete program written. A double TM is written and termination occurs. This will create a usable output tape upon termination.	None.
6168	Illegal use of D = option in ENVIRON parameter.	Request is bypassed.	None.
6169 pppppp	Action(s) requested for a program that was renamed. Actions against the old name are illegal.	Actions are bypassed.	None.
6197	Program was run with errors.	Refer to console sheet or listing.	None.
6198	Program terminated abnormally.	Refer to console sheet.	None.
61V1ΔTK #mn-DEVICE NOT DE- FINED	Possible Program or hardware problem.	None. Program continues.	None.
61V2ΔTK #mn-OUT- PUT NOT VALID AS WRITTEN	An unrecoverable read error during validation, or block(s) lost during generation of output tape. Output tape considered as invalid.	Program continues. The device rewound to dismount point. This is a possible hardware problem. Rerun SLU to produce new output tape.	None.

**70/568 SERVICE
PROGRAM
(RAMSUP)**

GENERAL DESCRIPTION

◆ The 70/568 Service Program (RAMSUP) provides a number of service functions designed for Spectra 70 systems that utilize the 70/568 Mass Storage Device. The program may be employed to obtain magnetic tape backup for data stored on mass storage devices, to reconstruct data areas of a mass storage device, to duplicate magazines or portions thereof, to initialize or replace individual cards, and to obtain a magazine usage analysis.

DEVICE ASSIGNMENTS

◆ Under Executive or Monitor:

SDN	Device Type	Remarks
SYSIPT	Card reader. (May be magnetic tape under Monitor only.)	Parameter input.
SYSLST	Printer.	Output Listings.
SYS001	Magnetic tape.	Primary input or output, also used as work tape for CPYM function.
SYS002	Magnetic tape.	Alternate input or output.
SYS003	Magnetic tape.	Input or output device used by RELD function when reloading the pool. Assignment of this device is requested only if it is needed.

TYPEOUTS

Message	Meaning	Action	Response
6800A	Invalid parameter identifier.	1. Ignore and read the next parameter.	I
		2. Terminate.	T
6801A	Duplicate entries in parameter card.	Same as 6800A	
6802A	Serial numbers (M= or O= entry) more than 6 bytes.	Same as 6800A	

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
6803A	Missing or invalid M= or O= entry.	Same as 6800A	
6804	C= specifies more than 15 cards. First 15 cards only will be processed.	None.	None.
6805A	Card number, cylinder number, or M=entry is missing or invalid.	Same as 6800A	
6806A	B=entry is invalid.	Same as 6800A	
6807A	Duplicate card number in parameter.	Same as 6800A	
6808A	Magazine serial number does not agree with M= or O= entry or is not in the On-Line Catalog.	Same as 6800A or run the On-Line Catalog routine (EΔOLC) before next parameter is read.	
6809A	Extraneous or invalid entries in parameter.	Same as 6800A	
6810A	Insufficient entries in parameter	Same as 6800A	
6811A	Tape capacity insufficient for RPLC function.	1. Mount new tape, routine will continue.	R
		2. Ignore and read next parameter.	I
		3. Terminate.	T
6812A	Parameter is missing a field separator (comma, space, or right parenthesis).	1. Ignore and read next parameter.	I
		2. Terminate.	T
6813A	Left parenthesis missing from parameter.	Same as 6812A	
6814A	Card number or cylinder number is invalid.	Same as 6812A	
6815A	Value of S=entry is greater than that of associated E=entry.	Same as 6812A	

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
6816A	Attempting to reload pool cards and data card in same run; or attempting to reload pool to a different magazine.	Same as 6812A	
6817A	D=(dd,n) entry is invalid.	Same as 6812A	
6818A	Unable to read Format 4 VTOC to obtain address of alternate track pool. Address must be supplied through the console.	1. Terminate.	T
		2. Type in LHE & RHE address of pool area. ccc = card number (000-255) yy = cylinder number (00-15) t = track number (0-7)	cccyyt, cccyyt
6819A	Routine cannot locate Format 4 VTOC record.	1. Retry.	R
		2. Ignore and continue program. Message 6818A will be typed.	I
		3. Terminate.	T
6820A	Device error on 70/568 while attempting to read standard volume label.	1. Retry.	R
		2. Terminate.	T
		3. Ignore error and continue processing. Serial number in parameter will not be verified against magazine.	I
6821A	Routine has attempted to extract a card from an empty bin.	1. Retry	R
		2. Terminate.	T
6822A	Routine is attempting to load data from one part of a magazine to another part of the same magazine and the areas overlap.	1. Terminate.	T
		2. Ignore and read next parameter.	I
6823A	No alternate track area in VTOC and function is <u>not</u> CINT.	Same as 6822A.	

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
6830 mn b nnn cc t ssssss	The track indicated is a defective track. Home Address and R0 have been written. mn = device mnemonic b = magazine nnn = card cc = cylinder t = track ssssss = volume serial number.	None; processing continues.	
6831 mn b nnn cc t ssssss	The card indicated is bad and should be replaced. HA & R0 for track indicated could not be written. See 6830 for typeout explanation.	None; processing continues.	
6832 mn b nnn cc t ssssss	R0 of indicated track could not be read from alternate track area. See 6830 for typeout explanation.	None; processing continues.	
6833 mn b nnn cc t ssssss	While attempting to delete an entry from the alternate track area, the HA of the indicated track could not be written. The prime data track is good but reverse linkage still exists from alternate track area. See 6830 for typeout explanation.	None; Program continues.	
6840A SET TALLY SWITCH TO WRITE AND RE- PLACE CARD NRS xxx,xxx	Self-explanatory.	Continue after action has been taken.	0
6841A SET TALLY SWITCH TO WRITE FOR CINT	Self-explanatory.	Continue after action has been taken.	0

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
6842 FILE IDENT IS XXXXXXXXXX TP VOL SER NO. XXXXXX 1ST CARD & CYL xxx xx LST CRD & CYL xxx xx OF MAG SER NR XXXXXX	Information typeout. Identifies tape file created.	None.	None.
6843A SET TALLY SWITCH TO TALLY	Self-explanatory.	Continue after action has been taken.	0
6844A REPLY WHEN TAPE IS READY	No alternate tape available. New tape must be mounted on SYS001.	Continue after new tape is mounted on SYS001.	0
6850A ffffff	Filename entry (ffffff) in VOL card is not ITUTAPE.	1. Skip this runtime parameter and read the next one.	S
		2. Terminate.	T
		3. Ignore parameter difference and use this RTP to process.	I
6851A	During open of a multi-file volume, the end of the last file is not in recognizable format. Routine terminates.	1. Terminate.	T
		2. If there is no alternate tape drive, change tapes; otherwise routine will swap tapes (SYS002 for SYS001 or vice versa), and retry the open.	R
6852A File id	End of volume encountered while attempting to open an output file.	Same as 6851A.	
6853A	Routine attempted to open an multfile tape not recognizable to this routine (No. VSN record).	Same as 6851A.	

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
6854A	User-supplied tape file serial number (from run-time parameter) does not match serial number of tape.	1. Terminate	T
		2. Ignore parameter and use the serial number on tape.	I
		3. Retry after mounting correct tape.	R
6855A mn b nnn cc t	<p>An unreadable track encountered while attempting to copy the alternate track area.</p> <p>mn = device mnemonic b = magazine nnn = card cc = cylinder t = track</p> <p>The word "TAPE" in place of "mn b" in above message indicates that card, cylinder, & track displayed refer to the image on tape, not the destination on the magazine.</p>	1. Terminate.	T
		2. Ignore the flaw build a dummy Home Address and Record 0 on the tape, and continue.	I
		3. Attempt to reread the track 99 times. If successful, routine continues; if not, message is repeated.	R
6856A mn b nnn cc t	Reverse linkage from an alternate track is incorrect. See 6855A for typeout explanation.	1. Terminate.	T
		2. Ignore difference and write alternate to tape.	I
		3. Search alternate track area for an alternate with correct reverse linkage. If found, write correct alternate to tape; of not, message 6859A displayed.	P

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
685CA mn b nnn cc t	Prime data track could not be read; HA did not indicate it was a defective track. See 6855A for type-out explanation.	1. Terminate.	T
		2. Ignore the error; build a dummy HA and R0 on tape; and continue.	I
		3. Retry.	R
		4. Search pool for alternate track.	P
685DA mn b nnn cc t	HA of track just read did not agree with seek address used to read the track. See 6855A for type-out explanation.	1. Terminate	T
		2. Terminate and dump.	D
		3. Retry.	R

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
6857A mn b nnn cc t	Attempted to read a bad alternate track. See 6855A for typeout explanation.	1. Terminate	T
		2. Ignore the error; build a dummy HA and R0 on tape; and continue.	I
		3. Attempt to reread the track 99 times. If successful, routine continues; if not, message is repeated.	R
		4. Search the alternate track area again for an alternate with correct reverse linkage. If found, correct alternate is written to tape; if not, message 6859A is displayed.	P
6858A mn b nnn cc t	An R0 has incorrect format or a variable length R0 is followed by an R1 record. See 6855A for typeout explanation.	1. Terminate.	T
		2. Ignore error; build a dummy R0 on tape; and continue.	I
		3. Retry.	R
		4. Terminate and dump.	D
6859A mn b nnn cc t	Prime data track could not be read; no alternate track assignment is present; alternate track area was searched and no alternate could be found. See 6855A for typeout explanation.	1. Terminate.	T
		2. Ignore error; build dummy R0 and HA for prime track on tape; and continue.	I
		3. Attempt to reread the track 99 times. If successful, routine continues; if not, message is repeated.	R
		4. Search the alternate track area again. If successful, routine continues; if not, message is repeated.	P

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Resp
6860A file id	Double tape mark sensed before file located.	1. Terminate.	T
		2. Swap tapes (SYS002 for SYS001 or vice versa) and retry.	R
6861A file id	On RELD function, the first header label does not match the standard label on the run-time parameter, and MFV was not specified.	1. Terminate.	T
		2. Mount correct tape and retry open.	R
		3. Ignore difference and check VSN record. Message repeated if it doesn't check.	I
		4. If tape is a multifile volume set MFV switch and search all header labels for a match.	S
6862	Unrecoverable I/O error on tape; routine terminates.	None.	None.
6863A ssssss	ssssss = Volume serial number in tape VSN record. The volume serial number in the VSN record on tape does not match the parameter serial number and MFV was not specified.	1. Terminate.	T
		2. Mount correct tape and retry open.	R
		3. Set MFV switch and search all header labels for a match.	S
6864A ssssss	ssssss = Volume serial number in tape VSN record. Requested data to be reloaded does not match data indicated in VSN record and MFV is not specified.	Same as 6863A	
6865A	End of Volume reached on tape, and card to be reloaded not found; tape is rewound to BT.	1. Terminate.	T
		2. Swap tapes (SYS001 for SYS002 or vice versa) and retry.	R

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
6866A TAPE nnn cc t	Track indicated could not be found on tape. nnn = card cc = cylinder t = track	1. Terminate.	T
		2. Skip this track and continue.	S
		3. Skip this track; routine continues. If this condition occurs again; routine will automatically skip and continue.	I
6867A TAPE nnn cc t	Track indicated encountered more than once on tape. See 6866A for typeout explanation.	1. Terminate.	T
		2. Skip this track and continue.	S
		3. Use last track encountered; routine continues. If this condition occurs again, routine will automatically take the last track encountered.	I
6868A	Unsuccessful tape read.	1. Terminate.	T
		2. Retry read.	R
		3. Skip this block and continue.	S
6869A mn b nnn cc t	In reloading a track from tape, after writing an alternate (due to a flaw in prime track) the HA & R0 Linkage could not be written to the prime track. (Alternate will be maintained in the pool.) See 6830 for typeout explanation.	1. Terminate.	T
		2. Retry to write linkage.	R
		3. Ignore and continue.	I
686CA	Format of HA & R0 are incorrect on tape record. (Tape has been mispositioned)	1. Terminate.	T
		2. Restart reload function.	

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
6870A	The alternate track area is full.	1. Terminate.	T
		2. Research the area for alternates.	R
6871A	End of tape has been sensed on SYS003.	1. Terminate.	T
		2. Continue to end of tape.	I
		3. Deallocate SYS003; restart.	R
6872A	After closing and re-opening SYS003, header or format is incorrect.	1. Terminate.	T
		2. Restart the reload pool function.	R
6873A	In reloading SYS003, unable to read the prime track R0 record to allow reverse linkage check.	1. Terminate.	T
		2. Ignore error condition and set linkage for the alternate written to the pool.	I
		3. Retry the read.	R
		4. Skip this record and erase the alternate from the pool.	S
6874A mn b nnn cc t	*In reloading SYS003, defective track flag is not on prime track indicating no alternate assigned. mn = device mnemonic b = magazine nnn = card cc = cylinder t = track Represents address in R0 data field of prime track.	1. Terminate.	T
		2. Skip this record.	S
		3. Retry the read.	R
		4. Ignore problem and check prime track R0 data field for alternate.	I
6875A mn b nnn cc t	*In reloading SYS003, prime track R0 data field has same address as its HA, implying no alternate assigned. See 6874A for typeout explanation.	1. Terminate.	T
		2. Skip this track.	S
		3. Ignore condition and set linkage for alternate written to pool.	I

*These errors represent discrepancies between prime and pool information. It is recommended that the relevant areas be edited and appropriate action taken.

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
6876A mn b nnn cc t	*In reloading SYS003, prime track R0 data field does not point to the alter- nate written to the pool from SYS003. (Implies there is an alternate but this isn't it.) (See 6874A for typeout explanation.)	1. Terminate.	T
		2. Skip this track.	S
		3. Ignore condition and set linkage for the alternate writ- ten to pool.	I
6890 (para- meter)	Input parameter.	None.	None.
6891	Using TANK option, the parameter storage area has been filled and there are more parameters in SYSIPT. SYSIPT is deallocated and processing is begun. Assignment for SYSIPT may be re- quested later.	None.	None.
6892	TANK has been re- quested, and there is no area for storing parameters. This parameter is ignored and processing con- tinues without tanking.	None.	None.

*These errors represent discrepancies between prime and pool information. It is recommended that the relevant areas be edited and appropriate action taken.

**DISC/DRUM DUMP
AND RELOAD
(DDRL)**

**GENERAL
DISCRIPTION**

◆ The Disc/Drum Dump and Reload routine provides backup of a disc or drum at the device or volume level. It dumps from disc or drum to magnetic tape and reloads from this tape. Unless otherwise specified, the entire device is dumped to magnetic tape. It also provides for support of a testing environment by permitting the reloading of the contents of a DDRL produced DUMP tape to a work device and then begin testing immediately.

**DEVICE
ASSIGNMENTS**

◆ Under Monitor or Executive:

SDN	Device Type	Remarks
SYSIPT	Card Reader. May be magnetic tape under Monitor only.	Parameter Input.
SYSLST	Monitor device only.	For Monitor only.
SYS001	Magnetic tape.	Alternate input or output.
nnnnnn	Disc or drum, nnnnnn = name specified in parameter card.	Input or output.

TYPEOUTS

Message	Meaning	Action	Response
3700A	Cannot recognize operation desired.	1. Terminate.	T
		2. Discontinue processing and re-request the next parameter.	N
		3. Request the next parameter through console, instead of SYSIPT.	C
3701A	Duplicate keys in parameters.	Same as 3700A	
3702A	Disk function and program cannot handle the device type assigned.	Same as 3700A	

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
3703A	Drum function and program cannot handle the device type assigned.	Same as 3700A	
3704A	"D=" Key is incomplete or missing.	Same as 3700A	
3705A	There is an illegal character in the "D=", "DI=" or "DO=" key.	Same as 3700A	
3709A	Extraneous or invalid key(s) in parameter. Note: When a comma, used as a field separator, is followed by a blank column, this message is displayed.	Same as 3700A	
3710A	Parameter contains insufficient keys.	Same as 3700A	
3712A	Missing key or field separator (comma).	Same as 3700A	
3714A	Cylinder/Track number is invalid.	Same as 3700A	
3715A	The value of an "S-" entry is greater than that of the associated "E-" entry.	Same as 3700A	
3720A	Read error on disc or drum while attempting to read a Standard Volume Label.	1. Terminate.	T
		2. Discontinue processing parameter and request the next parameter.	N
		3. DUMP function: set control block to show Non-standard Labels and continue processing. RELOAD function: continue processing without further checking of RA device.	C

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
		4. Retry the I/O	R
3721A vvvvvv	Where vvvvvv is the Volume Serial Number from the disc or drum. The program cannot find a Format Four VTOC record on disc or drum.	1. Terminate.	T
		2. Discontinue processing parameter and request the next parameter.	N
		3. DUMP function; set control Block to show no VTOC and no known alternate track extents.	C
		4. Retry the I/O.	R
3722A vvvvvv EXECU- TIVE RESIDENT or PROGRAM RESIDENT	Where vvvvvv is the Volume Serial Number from the disc or drum. The Executive or Program Library resides on the disc or drum to be reloaded.	1. Terminate	T
		2. Discontinue processing parameter and request the next parameter.	N
		3. Continue processing without further checking of the RA Device.	C
		4. Retry the I/O.	R
3723A vvvvvv file id	Where vvvvvv is the Volume Serial Number from the disk or drum and file id is the File ID of the first file located in the VTOC (if no Exec or Program Library was present) or the disc or drum to be reloaded.	Same as 3722A	
3731A fffff	Where fffff is not DTF name on the // VOL card. The DTF name is not "ITUTAPE".	1. Terminate.	T
		2. Discontinue processing of this parameter and request next parameter.	N
		3. Skip this parameter and get the next runtime parameter, if any;	S

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
		otherwise use DDRL standard labels.	
		4. Ignore the difference and use the parameter.	I
3732A nnnnnn	Where nnnnn is the tape volume serial number from the run-time parameters. The serial number does not match the number in the tape VOL label.	1. Terminate.	T
		2. Discontinue processing of this parameter and request next parameter.	N
		3. Ignore the difference and use the tape.	I
		4. Swap tapes (SYS001) for SYS002 or SYS002 for SYS001); or change tapes (if NALT), and reenter housekeeping.	R
3733A File id (NOTE: 17 character header label)	Where the 17 character text is the file ID. End-of-volume was encountered while attempting to open an output file.	1. Terminate.	T
		2. Discontinue processing of this parameter and request next parameter.	N
		3. Swap tapes (SYS001 for SYS002 or SYS002 for SYS001); or change tapes (if NALT), and reenter housekeeping.	R
3734A	On a tape input file the header label or the "VSN" record is missing.	Same as 3733A	

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
3735A File id (NOTE: 17 character header label)	Where the 17 character text is the file ID. The user supplied label or the standard label does not match the label encountered on an input file.	1. Terminate.	T
		2. Discontinue processing of this parameter and request next parameter.	N
		3. Ignore the difference and use the tape.	I
		4. Swap tapes (SYS001) for SYS002 or SYS002 for SYS001); or change tapes (if NALT), and re-enter housekeeping.	R
3736A aaaa bbbb	aaaa = the volume sequence number required by the program on an input file. bbbb = the volume sequence number from the header label.	Same as 3735A	
3737A	The random access device assigned is not the same type as that dumped to tape (determined from the "VSN" record).	Same as 3733A	
3738A File id (NOTE: 17 character header label)	Where the 17 character text is the file ID. The "EOF" or "EOV" label is missing.	1. Terminate	T
		2. Discontinue processing of this parameter and request next parameter.	N
		3. Treat as an end-of-file condition.	F
		4. Treat this as an end-of-volume condition.	V

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
3739A File id mn aaaaaa bbbbbb	aaaaaa = the block count as accumulated by the ITURWR module. bbbbbb = the block count taken from the trailer label. The counts do not match. File id = the 17 character file ID. mn = the symbolic physical device name.	1. Terminate.	T
		2. Discontinue processing of this parameter and request next parameter.	N
		3. Ignore the difference and continue closing file.	I
3740A mn B NNN ccc t (See Legend)	In the DUMP function, the Home Address read does not match the address specified in the Seek command.	1. Terminate.	T
		2. Discontinue processing of this parameter and request next parameter.	N
		3. Retry the read 25 times.	R
		4. Skip this track.	S
		5. Ignore the difference and build a "dummy record".	I
		6. Terminate the program and dump it.	D
3741A mn B NNN ccc t (See Legend)	Home Address or Track Descriptor Record could not be read successfully from a prime data track; or the Track Descriptor Record on a defective track did not point to an alternate track.	1. Terminate.	T
		2. Discontinue processing of this parameter and request next parameter.	N
		3. Skip this track and read the next one, if any.	R

Legend: mn = installation mnemonic
 B = reserved for future use.
 NNN = reserved for future use.
 ccc = cylinder number.
 t = track number.
 xxx = record number of last successfully read record
 (where applicable)

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
		4. Retry the read 25 times.	
		5. Ignore the error and build a "dummy record" to write to tape.	I
3742A mn B NNN ccc t (See Legend)	Home Address or the Track Descriptor Record could not be read from an alternate track.	Same as 3741A.	
3743A mn B NNN ccc t (See Legend)	Home Address or the Track Descriptor Record could not be read and the track is part of an overflow record; program awaits reply.	Same as 3741A.	
3745A mn B NNN ccc t xxx (See Legend)	The record after record number xxx could not be read successfully from the prime data track.	1. Terminate.	T
		2. Discontinue processing this parameter and request next parameter.	N
		3. Skip this track and read the next one, if any.	S
		4. Retry the read 25 times.	R
		5. Ignore and write to tape that part of the track which was successfully read.	I

Legend: mn = installation mnemonic.
 B = reserved for future use.
 NNN = reserved for future use.
 ccc = cylinder number.
 t = track number.
 xxx = record number of last successfully read record
 (where applicable).

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
3746A mn B NNN ccc t xxx (See Legend)	The record number after record xxx could not be read successfully from the alternate track.	Same as 3745A.	
3747A mn B NNN ccc t xxx (See Legend)	The record after record number xxx could not be read successfully, and this record is part of an overflow record.	Same as 3745A.	
3751A mn B NNN ccc t (See Legend)	In initializing the alternate track area on an output disc or drum, Home Address or Track Descriptor Record could not be written on this track.	None.	
3762A mn B NNN ccc t (See Legend)	This prime data track could not be written successfully and it was not marked as defective when it was read from the input RA device.	1. Terminate	T
		2. Discontinue processing this parameter and request next parameter.	N
		3. Go to dynamic alternate track assignment routine.	A
		4. Retry the write 5 more times.	R
		5. Skip this track and get the next input track, if any.	S

Legend:

- mn = installation mnemonic.
- B = reserved for future use.
- NNN = reserved for future use.
- ccc = cylinder number.
- t = track number.
- xxx = record number of last successfully read record (where applicable)

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
3763A mn B NNN ccc t (See Legend)	This prime data track, which is part of an overflow record, could not be written successfully and it was not marked as defective when it was read from the input RA device.	Same as 3762A.	
3766 mn B NNN ccc t (See Legend)	The program is unable to write a defective track to this alternate. The program will attempt to locate another unused alternate for the defective track.	None.	None.
3767A- nnnnn	nnnnn = the tape block number of the block read, whose Home Address and R0 Count Field are in incorrect format (either a bad read or an incorrectly built tape).	1. Terminate.	T
		2. Discontinue processing this parameter and request next parameter.	N
		3. Terminate and dump the program.	D
		4. Skip this block and try the next one.	S
3768A mn B NNN ccc t (See Legend.)	The Home Address or the Track Descriptor Record of a defective track could not be written to the Prime Track (pointer to the alternate cannot be written).	1. Terminate	T
		2. Discontinue processing this parameter and request next parameter.	N
		3. Retry the write 5 5 more times.	R

Legend: mn = installation mnemonic.
 B = reserved for future use.
 NNN = reserved for future use.
 ccc = cylinder number.
 t = track number.
 xxx = record number of last successfully read record
 (where applicable).

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
		4. Skip this track and get the next input track, if any.	S
3771A	<p>There was no known alternate track area or the alternate track area has been filled.</p> <p>NOTE: If the "D" option is selected, alternate tracks will be written within this extent without checking previous contents of the tracks. Any tracks read from the input device that fall within this extent will not be written to the RA device.</p>	1. Terminate.	T
		2. Discontinue processing this parameter and request next parameter.	N
		3. Skip this track and get the next track from input device.	S
		4. To assign an additional alternate track extent, type in LHE and RHE address of the extent. ccc = cylinder number(000-202) t-track number (0-9)	D, ccct, ccct
3772	<p>A format error was encountered in the "D" response to a 3771A typeout (either not in ccct, ccct format; no commas; ccct non-numeric; the cylinder number or track number do not exist on this device; or the start address of the extent is higher than the end address);</p>	None.	None.

Legend: mn = installation mnemonic.
 B = reserved for future use.
 NNN = reserved for future use.
 ccc = cylinder number.
 t = track number.
 xxx = record number of last successfully read record
 (where applicable)

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
	program continues and returns to the 3771A typeout.		
3773 mn B NNN ccc t (See Legend)	This track is the LHE of the existing alternate track area. If typeouts occur from a "D" response to a 3771A typeout, the extents specified in the response overlap the existing alternate track area. Program goes to a 3774 typeout.	None.	None.
3774 mn B NNN ccc t (See Legend)	This track is the RHE of the existing alternate track area; program goes to a 3771A typeout.	None.	None.
3775 NO ALT EXTENT	There is no known alternate track area assigned on this device. Program goes to a 3771A typeout.	None.	None.
3776A	This typeout occurs when the one additional alternate track area assigned in response to a 3771A typeout has been filled.	1. Terminate.	T
		2. Discontinue processing this parameter and request next parameter.	N
		3. Skip this track and try to read the next one.	S

Legend: mn = installation mnemonic.
 B = reserved for future use.
 NNN = reserved for future use.
 ccc = cylinder number
 t = track number.
 xxx = record number of last successfully read record
 (where applicable)

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
3785 BUFFER AREA TOO SMALL	Not enough memory has been assigned to DDRL to permit I/O processing for DUMP function with non-564 disc storage unit.	The program terminates.	Same as 3784.
3786 BUFFER AREA TOO SMALL	Not enough memory has been assigned to DDRL to permit I/O processing for RELOAD function with non-564 disc storage unit.	The program terminates.	Same as 3784.
3787 DUPLI- CATE SYMBOLIC NAMES FOR RA DEVICES	For a COPY function "DI=" and "DO=" keys have the same symbolic device name.	The program terminates.	None.
3790A PARAM- ETER DEVICE	Request for parameter device.	1. Console type- writer.	T
		2. Card reader	C
3791A SUPPLY PARAM- ETER	Self-explanatory.	Type of parameter.	
3792 fff... fff	fff...fff is a one to eighty character logged copy of the parameter card as read through SYSIPT with the leading and trailing spaces deleted.	None.	None.

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
3780A nnnnnn	Where nnnnnn is the tape block count. This typeout follows an "X 1" response to an Exec error typeout for the tape.	1. Terminate.	T
		2. Discontinue processing this parameter and request next parameter.	N
		3. Skip this track and try to read the next one.	S
		4. Retry the read of this track.	R
3781A nnnnnn	Where nnnnnn is the tape block count. Check of key lengths and data lengths of the records read in from tape do not agree with overall length of block read from tape (bad block from tape).	Same as 3780A	
3782A nnnnnn	Where nnnnnn is the tape block count. Length of block read does not agree with length of block as shown in the block count at the beginning of the tape block.	Same as 3780A	
3783	The random access input and output devices are not the same type.	The program terminates.	None.
3784 BUFFER AREA TOO SMALL	Not enough memory has been assigned to DDRL to permit I/O processing for COPY function with non-564 disc storage unit.	The program terminates.	Reload DDRL. Requesting additional memory.

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
3795A TYPE C WHEN TAPE mn IS READY	Where mn is the installation mnemonic of the tape unit assigned to SYS001. Typeout occurs after the first time a "NALT" function has been specified.	Reply when tape is ready.	C
3796A TOTAL KL & DL TOO BIG	A track has been read in which the cumulative total of the KI and DL fields of the component records exceeds the track capacity; program terminates and dumps.	None.	None.

**LOAD LIBRARY
TO TAPE (LLT)**

**GENERAL
DISCRIPTION**

◆ The Load Library to Tape routine provides a backup, on tape, for all or selected programs from a disc or drum program library. The tape is transcribed back to disc or drum using the Program Library Transcriber (PRG TRN) routine.

**DEVICE
ASSIGNMENTS**

◆ Under Executive and Monitor Control:

SDN	Device Type	Remarks
SYSIPT	Card reader or magnetic tape.	Parameter input.
SYSLST	Printer or magnetic tape.	Output device.
SYSUT2	Magnetic tape.	Output device.
RADEV	Disc or drum.	Input device.

TYPEOUTS

Message n Δpppppp	Meaning	Action	Response
4002	Unrecoverable error on disc or drum.	Program terminates.	None.
4003	Illogical error.	Dump program.	None.
4005	First parameter was not ΔUNS Δ..	Program terminates. Correct parameters and restart.	None.
4010	Invalid reply to previous message.	Repeat reply.	
4011	Invalid parameter.	Parameter is ignored. Next one is read.	None.
4012	Operand in Delete parameter is too large.	Operand is ignored.	None.
4013	Parameter exceeds col. 71.	Information past col. 71 is ignored.	None.
4014	Delete table has overflowed.	No further delete actions will be processed.	None.

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
n \pppppp			
4016	Program to be deleted was not found.	Processing continues	None.
4017	File ID specified was not found.	Program terminates.	None.
4018	No Volume label on RADEV.	Program terminates.	None.
4019	Volume serial number in parameter does not agree with Volume label on RADEV.	Program terminates.	None.
4020	Invalid operand in UNS parameter.	Program terminates.	None.
4021	Invalid Keyword in DEL parameter.	Parameter is bypassed.	None.
4022	File ID in DEL parameter is not equal to File ID in UNS parameter.	Parameter is bypassed.	None.
4023	Volume serial number in DEL parameter is not equal to Volume serial number in UNS parameter.	Parameter is bypassed.	None.
4068	End of Job. The routine did not complete all requested actions.	None.	None.

10. SORT/MERGE GENERATOR (SRTGEN)

- ◆ The TOS Sort/Merge System sorts a file of randomly-sequenced records or merges up to eight files of sequenced records.

The system consists of a Generator (a subprocessor on the system resident tape), and a library of object modules on the system library tape. Object programs are generated based on user-supplied control information. Parameters can be prestored during generation or entered at object time.

To generate a program, the Generator and Linkage Editor are required job steps in a Monitor session. The object program can be executed under control of Monitor or the Executive.

DEVICE ASSIGNMENTS

- ◆ Generation/Linkedit Under Monitor Control:

SDN	Device Type	Remarks
SYSIPT	Card reader or magnetic tape.	Monitor input.
SYSLST	Printer or magnetic tape.	Receives PARAM listing and LNKEDT program map.
SYSUT1	Magnetic tape.	Generator output; input to LNKEDT.
SYSUT2	Magnetic tape.	LNKEDT output (bound generated program).
SYSUT3	Magnetic tape.	LNKEDT work tape.
SYSLIB	Magnetic tape.	Sort/merge object modules (input to LNKEDT).
SYSUT4	Magnetic tape.	Optional-user modules not on SYSIPT (input to LNKEDT).

TYPEOUTS

- ◆ A generated Sort or Merge (if run under Monitor control) and the Sort/Merge Generator write all control statements to SYSLST if the // PARAM Monitor control statement specified LIST = YES. All control statements containing punctuation errors (message number 0701) and all error messages pertaining to control statements (message numbers 0702 and 0703) always are written to SYSLST.

A generated Sort or Merge executed directly under the Executive writes all control statements containing punctuation errors (message number 0701) and all error messages pertaining to control statements (message number 0702) to the console typewriter.

All other messages occurring during the execution of a generated Sort or Merge program (message numbers 0714 to 0784) are written to the console typewriter.

**GENERATOR OR
OBJECT PROGRAMS**

Message	Meaning	Action	Response
nΔppppppΔ			
0700	Punctuation error in a control statement. Additional message describes details.	None. After all statements are checked program terminates.	None.
0701	Incorrect entry in a control statement. Additional message describes details.	None. After all statements are checked program terminates.	None.
0702	Incompatible information between control statements. Additional message describes details.	None. After all statements are checked program terminates.	None.

GENERATOR

Message	Meaning	Action	Response
nΔppppppΔ			
0703 INVALID STATEMENT	Invalid LNKEDT card read before processing SRTMRG statement.	None. Statement is ignored.	None.
0703 DUPLICATE STATEMENT	Duplicate LNKEDT statements read.	None. First duplicate is processed; others are ignored.	None.
0703 MISSING OM OR SEQ	Object module not on SYSIPT as specified or not in proper sequence.	None. After all statements are checked generator terminates.	None.
0703 MISSING ESD CARDS	Object module on SYSIPT is in improper format.	None. After all statements are checked generator terminates.	None.
0706A Insufficient Disc Work Area	Insufficient disc work area allocated to the sort. According to calculations made in Phase 0.	Continue. (Sort may not be able to process all data records.) Review formula calculation for disc sort work area.	C
		Terminate.	T

OBJECT PROGRAMS
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΛ			
0711A SORTIN ELK XXXXXX DU mn	A wrong length input block has caused an abnormal termination. All wrong length blocks on the input files may be bypassed, and the program continued. The program may be terminated, or the input blocks accepted and processed. A variable sort cannot process wrong length blocks.	Accept error block and continue processing (fixed sort only).	C
		Bypass wrong length blocks and continue processing.	B
		Terminate.	T
0712 CYCLE n INPUT RECORD COUNT xxxxxxxx	The number of records sorted in phase 1 of cycle n is xxxxxxxx.	None.	None.
0713 TOTAL INPUT REC- ORD COUNT xxxxxxxx	The number of records sorted in phase 1 is xxxxxxxx.	None.	None.
0714 SORTIN BLK xxxxxx TU mn	An unrecoverable read error has occurred in a block of the sort input. The error block has been bypassed, because the BYPASS option was specified, and the program is continuing operation (xxxxxx is the block number on the current input tape volume and mn is the tape unit on which the error occurred).	None.	None.

OBJECT PROGRAMS

Message	Meaning	Action	Response
n△pppppp△			
0710 ETW TU mn	The volume limit of the current cycle has been exceeded due to either a short tape volume or an excessive number of write errors on tape unit mn.	Program terminates. Program may be re-started from last checkpoint if CKPT option was specified. Full-length work tape volumes are required. If condition occurs with full-length work tape volumes, tape unit mn should be checked.	None.
0710 WRITE ERROR DU mn	An abnormal I/O write condition has occurred on a write to disc unit mn. Hardware malfunction is suspected.	Restart sort.	None.
0711 READ ERROR TU mn	An abnormal termination occurred during a read from tape unit mn.	Take a memory dump and examine byte 32 of the CCB to determine the problem.	None. Program terminates.
0711A SORTIN BLK XXXXXX TU mn	A wrong length input block has caused an abnormal termination. All wrong length blocks on the input files may be bypassed, and the program continued. The program may be terminated, or the input blocks accepted and processed. A variable sort cannot process wrong length blocks.	Accept error block and continue processing (fixed sort only.)	C
		Bypass wrong length blocks and continue processing.	B
		Terminate.	T

OBJECT PROGRAMS
(Cont'd)

Message	Meaning	Action	Response
nΔpppppΔ			
0714A SORTIN BLK xxxxxx DU mn	An unrecoverable read error has occurred in a block of the disc sort input. The <u>bypass</u> option was not specified. The error block may be bypassed and the program continued, or the program may be terminated. <u>xxxxxx</u> is the block number of the current input disc volume and <u>mn</u> is the disc unit in which the error occurred. (Phase 1)	1. Bypass the block and continue program. 2. Terminate.	C Use a console routine, e.g., E HLT n.
0715 MOUNT NEXT SERIAL INPUT REEL ON TU mn if re- quired	The input reel on TU mn was replaced by a work reel for a multi cycle sort. If additional input reels are to be processed, the next input reel should be mounted on this alternate input drive.	Mount tape if additional input is to be processed.	None.
0715A REMOUNT INPUT ON TU mn	The previously dis-mounted input tape volume must be re-mounted before continuing the program.	Continue the program after the input tape volume has been re-mounted on tape unit mn.	C
0716 INSUFFI- CIENT DISC WORK AREA	The Disc Work Area allocated to the program is insufficient to continue sorting the data. (Phase 1)	Program is terminated.	None.

OBJECT PROGRAMS
(Cont'd)

Message	Meaning	Action	Response
nΔpppppΔ			
0716A INSUFFI- CIENT DISC WORK AREA	The disc work area allocated to the program is not sufficient to sort the entire input data set. The user has the option to terminate the sort or continue and process the data that can be sorted with the work area that has been allocated. (Phase 1)	Continue. Terminate.	C T
0717 REPOSI- TIONING COUNTER IS xxxxxx	The multicycle volume limit for the sort has been exceeded or a multicycle sort is required and not possible. A subsequent sort may be initiated to process the balance of the input. Automatic repositioning of the current input volume may be accomplished by including xxxxxx in the SKIPREC operand of the OPTION control statement.	None.	None.
0718 SORTIN ERROR TU mn	A block of the sort input does not conform to the specified format (e.g., truncated record or block variable-length records specified as fixed-length, etc.).	Program terminates. The input tape volume should be examined for conformance to control statements.	None.
0718 SORTIN ERROR DU mn	A block of the disc sort input does not conform to the specified format (e.g., truncated record or block, variable length records specified as fixed length).	Program terminated. The input data should be examined for conformation to control statements.	None.

OBJECT PROGRAMS
(Cont'd)

Message	Meaning	Action	Response
nΔpppppp			
0719 WRITE ERROR TU mn	An abnormal termination occurred during a write from tape unit mn (Phase 1)	Program terminates. Examine sense byte one (byte 32 of CCB) to determine the reason for the abnormal termination.	None.

OBJECT PROGRAMS
 (Cont'd)

Message	Meaning	Action	Response
n\pppppp\			
0714 SORTIN BLK xxxxxx DU mn	An unrecoverable read error has occurred in a block of the disc sort input. The error block has been bypassed, because the bypass option was specified, and the program is continuing operation. <u>xxxxxx</u> is the block number on the current input disc volume and <u>mn</u> is the disc unit on which the error occurred. (Phase 1)	None.	None.
0714A SORTIN BLK xxxxxx TU mn	An unrecoverable read error has occurred in a block of the sort input. The BYPASS option was not specified. The error block may be bypassed and the program continued, or the program may be terminated (xxxxxx is the block number on the current input tape volume and mn is the tape unit on which the error occurred).	1. Bypass the block and continue the program. 2. Terminate.	C Use a console routine, e.g., E HLT n.

OBJECT PROGRAMS
 (Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
0719A MOUNT FIRST VOL OF NEXT FILE ON TU mn	The first volume of the next file must be mounted on tape unit mn before the program may be continued.	Continue after volume is mounted.	C
0720ETW TU mn	The volume limit of the current cycle has been exceeded due to either a short tape volume or an excessive number of write errors on tape unit mn.	Program terminates. Program may be restarted from last checkpoint if CKPT option was specified. Full-length work tape volumes are required. If condition occurs with full-length work tape volumes, tape unit mn should be checked.	None.
0721 READ ERROR TU mn	An abnormal termination occurred during a read from tape unit mn.	Take a memory dump and examine byte 32 of the CCB to determine the problem.	None. Program terminates.
0721 READ ERROR DU mn	Unrecoverable read error on disc unit mn. Hardware error is suspected.	Restart sort.	None.
0722A MOUNT CYCLE OUTPUT 01 ON TU mn, 02 ON TU mn, . . . nn ON TU mn.	The previously dismounted cycle output tape volumes must be remounted on the designated tape units before the program may be continued.	Continue after all cycle output tape volumes have been remounted.	C
0723 DISMOUNT CYCLE OUT- PUT ON TU mn LABEL AS nn, MOUNT WORK	A cycle output tape volume has been created on tape unit mn. When the rewind and unload is completed, the tape volume should be dismounted and physically labeled as CYCLE mn. A work tape volume must be mounted on tape unit mn.	Mount new work tape on tape unit mn as program continues.	None.

OBJECT PROGRAMS
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
0730 TOTAL OUTPUT RECORD COUNT xxxxxxx	The number of records written to the output file is xxxxxxxx.	None.	None.
0731 READ ERROR TU mn	An abnormal termination occurred during a read from tape unit mn.	Take a memory dump and examine byte 32 of the CCB to determine the problem.	None. Program terminates.
0732A CONTINUE WHEN WORK(S) MOUNTED ON TU(S) mn mm	The sort has been waited to assure that the necessary work, tape volume is mounted on tape unit mn and, if specified, on tape unit mm.	Continue after mounting the necessary work tape volume(s) on tape unit(s) mn (and mm).	C
0733 SEQUENCE ERROR	A sequence error has occurred during phase 3.	None. Program terminates.	None.
0734 TU mn CYCLE OUTPUT PROGRAM NAME IS pppppp	The cycle output tape on tape unit mn was not created by the program being restarted. The tape was created by program pppppp.	Mount the correct tape and restart the program.	None.
0735 MOUNT CYCLE OUT- PUT 01 ON TU mn, 02 ON TU mn, ..., mn ON TU mn	One or more cycle outputs are not mounted on the correct tape units for the program being restarted.	Mount the tapes as indicated and restart the program.	None.
0737 BLOCK SIZE ERROR TU mn	The size of the last block read from tape unit mn by the sort does not agree with size of the same block when previously written to the same tape unit by the sort.	Program terminates. Hardware problem is suspected.	None.

OBJECT PROGRAMS
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
0737 BLOCK SIZE ERROR DU mn	The size of the last block read from disc unit mn by the sort does not agree with the size of the same block when previously written to the same disc unit by the sort. (Phase 3)	Program terminates. Hardware problem is suspected.	None.

OBJECT PROGRAMS
(Cont'd)

Message n^pppppp^	Meaning	Action	Response
0723A DISMOUNT CYCLE OUT- PUT ON TU mn, LABEL as mn, MOUNT WORK	A cycle output tape volume CYCLE nn was previously taken down and replaced with a work tape on tape unit mn. Program is now ready to use new work tape.	Continue.	C
0724 CYCLE n OUTPUT RECORD COUNT xxxxxxxx	The number of records written to the cycle n output tape volume is xxxxxxxx.	None.	None.
0727 BLOCK SIZE ERROR TU mn	The size of the last block read from tape unit mn by the sort does not agree with size or the same block when previously written to the same tape unit by the sort.	Program terminates. Hardware problem is suspected.	None.
0727 BLOCK SIZE ERROR DU mn	The size of the last block read from disc unit mn by the sort does not agree with the size of the same block when previously written to the same disc unit by the sort. (Phase 2)	Program terminates. Hardware problem is suspected.	None.
0728 BLOCK SEQUENCE ERROR TU mn	The block last read from tape unit mn is not the block expected by the sort program.	Program terminates. Hardware problem is suspected.	None.
0728 BLOCK SEQUENCE ERROR DU mn	The block last read from disc unit mn is not the block expected by the sort program. (Phase 2)	Program terminates. Hardware problem is suspected.	None.
0729 WRITE ERROR TU mn	An abnormal termination occurred during a write to tape unit mn. (Phase 2)	Program terminates. Examine sense byte one (byte 32 of the CCB) to determine the reason for the abnormal termination.	None.

OBJECT PROGRAMS
(Cont'd)

Message n^pppppp^	Meaning	Action	Response
0744 MRGIN 0n BLK xxxxxx TU mn	An unrecoverable read error has occurred in a block of the indicated (0n) file merge input file. The error block has been bypassed, because the BYPASS option was specified, and the program is continuing operation (xxxxxx is the block number on the current input volume and mn is the tape unit on which the error occurred).	None.	None.
0744A MRGIN 0n BLK xxxxxx TU mn	An unrecoverable read error has occurred in a block of the indicated (0n) file merge input file. The BYPASS option was not specified. The error block may be bypassed and the program continued, or the program may be terminated (xxxxxx is the block number on the current input volume and mn is the tape unit on which the error occurred).	1. Bypass the block and continue the program. 2. Terminate.	C Use a console routine, e.g., E HLT n.

OBJECT PROGRAMS
 (Cont'd)

Message	Meaning	Action	Response
n^ppppp^			
0738 BLOCK COUNT ERROR TU mn	The block last read from tape unit mn is not the block expected by the sort program.	Program terminates. Hardware problem is suspected.	None.
0738 BLOCK SEQUENCE ERROR DU mn	The block last read from disc unit mn is not the block expected by the sort program. (Phase 3)	Program terminates. Hardware problem is suspected.	None.
0739 WRITE ERROR ON DU yy	Program has received an indication that an abnormal indication has occurred on disc unit yy.	Program terminates.	None.
0740 TOTAL OUTPUT RECORD COUNT xxxxxxx	The number or records written to the output file is xxxxxxxx.	None.	None.
0741A MRGIN On BLK XXXXXX TU mn	A wrong length input block has caused an abnormal termination. All wrong length blocks may be bypassed, and the program continued. The program may be terminated, or the input blocks can be accepted and processed. A variable data cannot process wrong length blocks.	Accept error blocks and continue processing (fixed data only).	C
		Bypass wrong length blocks and continue processing.	B
		Terminate.	T
0743 SEQUENCE ERROR	A sequence error has occurred during phase 3.	None. Program terminates.	None.

OBJECT PROGRAMS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
0769 WRITE ERROR TU mn	An abnormal termination occurred during a write to tape unit mn (Phase 3)	Program terminates. Examine sense byte one (byte 32 of CCB) to determine the reason for the abnormal termination.	None.
0770 INSUFFI- CIENT OUTPUT AREA	The disc area allocated for the output file is not large enough.	None.	None.
0771 WRITE ERROR ON DU yy	An abnormal termination has occurred on disc unit yy when writing a user header or trailer label.	1. Retry the operation.	R
		2. Terminate the program.	T
		3. Bypass writing of user label and continue.	B

OBJECT PROGRAMS
(Cont'd)

Message nAppppppΛ	Meaning	Action	Response
0751 IN-SUFFICIENT MEMORY	Minimum memory required for execution of program was not allocated.	None. Program terminates.	None.
0754 ILLEGAL WORK TAPE UNIT TYPES	Program can not be executed with assigned mixture of tape unit types.	None. Program terminates.	None.
0755 SINGLE CYCLE SORT	Duplication of the final output tape unit with the first work tape unit was specified. The assigned tape units are not physically compatible. A multicycle sort is not possible. The program is continuing as a single cycle sort.	None.	None.
0761 READ ERROR TU mn	An abnormal termination occurred during a read from tape unit mn (Phase 3)	Program terminates. Examine sense byte one (byte 32 of CCB) to determine the reason for the abnormal termination.	None.
0762 MOUNT WORK(S) ON TU(S) mn mm	Tape unit mn is used as an input tape unit and as an output tape unit. If a second tape unit designation (mm) appears in the message, it is used as an alternate input tape unit and an alternate output tape unit.	Dismount the input tape volume(s) from the designated tape unit(s) and mount the necessary work tape volume(s) as program continues.	None.
0766A CONTINUE WHEN WORK MOUNTED ON TU mn	The sort has been waited to assure that a work tape volume is mounted on tape unit mn.	Continue if a work tape volume has been mounted on tape unit mn.	C
0767A MOUNT WORK ON TU mn	Tape unit mn is used as an input tape unit and as a work tape unit.	Dismount the input tape volume from tape unit mn and mount a work tape volume. Continue.	C

11. LIBRARY CONVERSION ROUTINES

EXECUTIVE TRANSCRIBER (LDISK)

◆ The TDOS Executive Transcriber has been deleted from this portion of the manual. Refer to Systems Generation, section 4.

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
nΔppppppΔ			
58A5	An unrecoverable I/O error has occurred while attempting to write an updated key, data record which was originally written in the overflow mode.	Routine terminates.	None.
58A6	An unrecoverable I/O error has occurred while attempting to write an updated key, data record which was originally written in the overflow mode.	Routine terminates.	None.
5800	Cannot recognize parameter.	Routine will read new parameter.	None.
5801	Duplicate keys in parameter.	Routine terminates.	None.
5802	An "I=", or "V=", entry is more than 6 bytes or "A=" entry is more than 44 bytes.	Routine terminates.	None.
5803	An "I=", "V=", "A=", or "P=" entry exceeds limits of the card.	Routine terminates.	None.
5804	Parameter does not contain enough information to process.	Routine terminates.	None.
5805	"N="(missing from Add or Delete parameter.)	Routine terminates.	None.

**PROGRAM LIBRARY
TRANSCRIBER
(PRGTRN)**

◆ The TDOS Program Library Transcriber places programs on disc or drum from a TOS System Load Library Tape or a TOS Program Load Library Tape, in a format acceptable to the TDOS Executive System. The functions performed by the routine are completely dependent on user-supplied parameters.

DEVICE ASSIGNMENTS

◆ Under Executive or Monitor Control:

SDN	Device Type	Remarks
SYSIPT	Card Reader.	Input parameters.
SYSLST	Printer.	Output Listing Device.
xxxxxx	Magnetic Tape.	xxxxxx is the symbolic name assigned to the TOS Load Library to be transcribed.
yyyyyy	Disc. or Drum.	yyyyyy is the volume number of the disc to which the TOS Load Library is to be transcribed.

Note:

Magnetic tape may be assigned for SYSIPT and SYSLST under Monitor control.

TYPEOUTS

Message	Meaning	Action	Response
nΔppppppΔ			
58A1	Unrecoverable I/O error while writing text in normal or special mode.	Routine terminates.	None.
58A2	An unrecoverable I/O error has occurred while attempting to do a normal format write of an updated key data record.	Routine terminates.	None.
58A3	An unrecoverable I/O error has occurred while attempting to write an updated key data record which was originally written in the overflow mode.	Routine terminates.	None.
58A4	An unrecoverable I/O error has occurred while attempting to write an updated key, data record which was originally written in the overflow mode.	Routine terminates.	None.

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
5806	A flaw track exists in the program directory.	Routine terminates.	None.
5807	Unrecoverable I/O error on disc.	Routine terminates.	None.
5808	The volume serial number does not match the "V=" entry on parameter.	Routine terminates.	None.
5809	An "A=" entry in parameter does not exist in VTOC.	Routine terminates.	None.
580A	Duplicate program ID in program directory.	Routine processes next ID. Error ID will be typed and printed.	None.
580B	Cannot find ID to delete.	Same as 580A.	
580C	Cannot find ID on input tape.	Same as 580A.	
580D	Program ID has exceeded end of card.	Routine terminates.	None.
580E	Program ID is over six bytes.	The ID is truncated to six bytes. An attempt will be made to transcribe program. Successful transcription will begin when next comma on parameter card is detected. The six-byte ID will be typed.	None.
580F	An "ADD", "DEL", or "ABS" Function has been requested. However, the program directory has never been initialized.	Routine terminates.	None.
5811	Program will not fit in allocated area.	Routine terminates.	None.

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
5812	Unrecoverable error on tape.	Routine terminates.	None.
5813	An unidentifiable record has been detected on tape.	Routine terminates.	None.
5814	No terminal record for this program.	Routine terminates.	None.
5815	A text block indicates a load point below the actual load address of this load.	Routine terminates.	None.
5816	An attempt to initialize an existing program directory.	Routine terminates.	None.
5817	A P= entry is a non-numeric character (not 0-9 or 0-7 for drum). An L= entry is not followed by PD, or the character following the numeric or PD entry is not a comma or space.	Routine terminates.	None.
5818	No room left in program directory for this program.	Routine terminates.	None.
5819	An ADD function can find no programs on the tape.	Routine processes next card.	None.
581A	An ABS function has been requested. However, there are no entries in the program directory.	Routine goes on to next card.	None.
581B	The number of modifiers in a modifier block on tape and length of the block do not agree.	Routine terminates.	None.

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
5820	Work area overflow during internal processing.	Routine terminates.	None.
5821	Unrecoverable I/O error on disc.	Routine terminates.	None.

**CALL LIBRARY
TRANSCRIBER
(CLTR)**

◆ The Call Library Transcriber transcribes TOS call libraries from magnetic tape to disc or drum in a format suitable for the TDOS System. The functions performed by the routine may be preset, or dependent on optional user-supplied parameters.

**DEVICE
ASSIGNMENTS**

◆ Under Executive or Monitor Control

SDN	Device Type	Remarks
SYSIPT	Card Reader or magnetic tape.	Input parameters.
SYSLST	Printer or magnetic tape.	Output abstract listing.
SYSUT2	Magnetic tape.	Input call library tape. (required when preset transcription is specified.)
SYSnnn or SSSSSS	Magnetic tape.	Alternate input(s) containing libraries to be transcribed.
vvvvvv (RA device volume serial number.)	Disc or drum.	Input and output. The volume serial number of the RA device to which the call library is transcribed to, or from which an abstract is to be obtained.

TYPEOUTS

Message	Meaning	Action	Response
xyyyz \nnnnnn			
5901 MACRO IP TAPE CON- TAINS TM AFTER DIR- ECTORY	Macro library input data format error on tape dddddd.	The transcription of the Macro library from this tape is terminated; processing continues.	None.
5902 ΔΔ dddddd	COBOL library input data format error on tape dddddd.	The transcription of the COBOL library from this tape is terminated; processing continues.	None.
5903 ΔΔ dddddd	Object Module library input data format error on tape dddddd.	The transcription of the OML from this tape is terminated; processing continues.	None.

TYPEOUTS
(Cont'd)

Message xxxxyz\annnnnn	Meaning	Action	Response
5910△△ ddddd	An unrecoverable error has been encountered on tape dddddd. The following message will indicate which library was being transcribed. See 5981 △ , 5982 △ , 5983 △ .	The transcription of the library from device dddddd is terminated; processing continues.	None.
5911△△ ttttt	The extents of a file have been exceeded. The following message indicates which library. See 5981 △ , 5982 △ , 5983 △ .	The transcription of the library to the random access file number ttttt is terminated; processing continues.	None.
5915△△ ttttt	VTOC does not contain correct label for library to be transcribed or abstracted. Following message indicates which library. See 5981 △ , 5982 △ , 5983 △ .	The transcription or abstract is not produced, processing continues.	None.
5920A	End of Tape encountered on SYSLST	Tape will be closed. Mount next tape. No label will be written to this file.	R
5940A △ ttttt	Unrecoverable error on the random access device. If bypassed, the following message will indicate which library. See 5981 △ , 5982 △ , 5983 △ .	Terminate the transcription or abstract of the library; continue processing.	B
		Retry the transcription or abstract of library from the beginning.	R
5941A △	Unrecoverable error while opening the random access device. If function is terminated the following message will indicate which library. See 5981 △ , 5982 △ , 5983 △ .	Terminate function and continue processing.	B
		Retry open, either with the same, or another random access device.	R

TYPEOUTS
(Cont'd)

Message xxyyzΔnnnnnn	Meaning	Action	Response
5942AΔ ttttt	Serial number ttttt on random access device does not match that specified in the parameter.	Typeout parameter which can be bypassed or resubmitted. See 5965A.	B
		Retry after volume with correct serial number is mounted.	R
5945AΔ ttttt (file identification)	The area allocated for the Macor Library Transcription to random access device ttttt already contains the library.	To allow transcription.	B
		To bypass transcription and continue processing.	R
5946AΔ ttttt	The area allocated for the COBOL Library Transcription to random access device ttttt already contains the library.	To allow transcription.	B
		To bypass transcription and continue processing.	R
5947AΔ ttttt	The area allocated for the Object Module Library Transcription to random access device ttttt already contains the library.	To allow transcription.	B
		To bypass transcription and continue processing.	R
5951AΔ dddddd	Error encountered opening tape on device ddddd.	Bypass processing parameter and continue processing next.	B
		Retry opening tape after correct tape is mounted.	R
5952AΔ dddddd	An IDN for the library to be transcribed from ddddd has not been found.	Bypass processing parameter and continue processing the next.	B
		Retry opening tape after correct tape is mounted.	R

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
xyyzΔnnnnnn			
5961AΔ parameter	Invalid parameter type not TRNS or END	Bypass processing parameter and continue process- ing the next.	B
		To resubmit a cor- rected parameter where p is new parameter of up to 70 characters.	RΔp....p
5962AΔ parameter	Invalid parameter; key word not I=; V=; LIB=; CDS; or ABS.	Bypass this para- meter and con- tinue to run.	B
		Resubmit cor- rected parameter where p is the new parameter up to 70 characters.	RΔp....p
5963AΔ parameter	Invalid Library name: not OML; COB; MAC or ALL.	Bypass processing this parameter and continue to run.	B
		Resubmit corrected parameter where p is the new para- meter up to 70 characters.	RΔp....p
5964AΔ parameter	Invalid options used. CDS and ABS may not appear in the same parameter. They are mutually exclusive functions.	Bypass processing this parameter and continue to run.	B
		Resubmit corrected parameter where p is the new parameter up to 70 characters.	RΔp....p
5965AΔ parameter	Serial Number on random access de- vice does not match that specified in the parameter. See message 5942A.	Bypass processing this parameter and continue to run.	B
		Resubmit corrected parameter where p is the new parameter up to 70 characters.	RΔp....p

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
xxyz \nnnnnn			
5981\Δ\ttttt	Macro Library Transcription or Abstract on random access device ttttt has been terminated before completion.	Processing continues.	None.
5982\Δ\ttttt	COBOL Library Transcription or Abstract on random access device ttttt has been terminated before completion.	Processing continues.	None.
5983\Δ\ttttt	The Object Module Library Transcription or Abstract on random access device ttttt has been terminated before completion.	Processing continues.	None.
5984	No MACRO Library found to be extracted.	Processing continues.	None.
5985	No COBOL Library found to be extracted.	Processing continues.	None.
5986	No OML Library found to be extracted.	Processing continues.	None.
5991 \Δ\ttttt\Δccc\lll	Transcription or computing of RA extents has been successfully completed for the M Macro Library on random access device ttttt where ccc\lll-last cylinder and track used.	None.	None.
5992 \Δ\ttttt\Δccc\lll	Transcription or computing of RA extents has been successfully completed for the COBOL Library on random access device ttttt where ccc\lll-last cylinder and track used.	None.	None.
5993 \Δ\ tt\tttt\Δccc\lll	Transcription or computing of RA extents has been successfully completed for the Object Module Library on random access device ttttt where ccc\lll-last cylinder and track used.	None.	None.

12. COMMUNICATIONS ROUTINES

CARD CONVERT (CDCONV)

GENERAL DESCRIPTION

◆ Card Convert accepts graphics input and provides EBCDIC output in proper format to serve as input to TSTCUP.

DEVICE ASSIGNMENTS

◆ Under Executive Control:

SDN	Device Type	Remarks
SYSRDR	Card Reader or Magnetic tape substitute.	Parameter Input.
SYSOPT	Card Punch or Magnetic tape substitute.	Parameter Output.

TYPEOUTS

Message nΔpppppΔ	Meaning	Action	Response
7151 NO FLT CD	First parameter must be //_FLOAT.	Program Terminates.	None.
7152 INVAL PAR	Invalid Parameter	Program Terminates.	None.
7153 CTL SEQ. ERR	Input parameters not in sequence (Col. 76)	Parameters bypassed until a "1" card or new parameter read.	None.
7154 DAT SEQ ERR	Odd number of data cards processed.	Last data card is ignored. Program continues.	None.

**COMMUNICATIONS
TEST PACKAGE
(TSTCUP)**

GENERAL DESCRIPTION

◆ The Communication User Test Program operates in conjunction with an MCP program to perform communications functions as specified on parameters read by TSTCUP.

DEVICE ASSIGNMENTS

◆ Under Executive Control:

SDN	Device Type	Remarks
Reader	Card Reader or Magnetic Tape substitute.	Parameter Input.
SNAPOP	Printer or Magnetic Tape substitute.	SNAPSHOT output.

TYPEOUTS

Message	Meaning	Action	Response
nΔppppppΔ			
7102 NO TERMINAL /* ON PATCH CARD	An object time patch string is not properly identified.	Parameter is ignored and processing continues.	None.
7103 1st COLUMN OF PRE- VIOUS CD GREATER THAN X30 OR NOT MULT4.	Invalid parameter code in column 1.	Parameter is ignored and processing continues.	None.
7104 CCMXX DID NOT LOAD	Program unable to load CCM memory.	Program continues with next parameter.	None.
7105 CCMXX LOADED O. K.	Specified CCM memory load successfully written to CCM.	Program continues with next parameter.	None.

**MCS OFF-LINE
RECOVERY
PROGRAM
(MCSREC)**

DEVICE ASSIGNMENTS

◆ The MCS Off Line Recovery Program can be used to assist MCS users in restarting MCP following system failures or emergency shutdowns. It utilizes information contained in a snapshot and message cells to create a tape that can be used to rebuild message queues.

◆ Under Executive Control

SDN	Device Type	Remarks
MCSRDR	Card Reader or Console Typewriter.	Parameter input. If no assignment is made, parameters are requested and submitted through the console typewriter.
CMSNAP	Disc Storage Unit	Device containing COMSNAP file.
CMDISC	Disc Storage Unit	Device containing COMDISC file (May be same as CMSNAP)
MCSTAP	Magnetic Tape	Output device.

Under Monitor Control

SDN	Device Type	Remarks
SYSIPT	Card Reader or Magnetic Tape.	Parameter input.
CMSNAP	Disc Storage Unit.	Device containing COMSNAP file.
CMDISC	Disc Storage Unit	Device containing COMDISC file (may be same as CMSNAP)
MCSTAP	Magnetic Tape	Output device.

TYPEOUTS

Message	Meaning	Action	Response
nΔpppppΔ			
1511 DEVICE UNRECOVERABLE ERROR	Unrecoverable I/O error on either COMSNAP or COMDISC.	Program is terminated.	None.
1513 INVALID PARAMETERS	One or more parameters in error.	1. If parameters came from SYSIPT or the card reader, the program is terminated.	None.

TYPEOUTS
(Cont'd)

Message nΔppppppΔ	Meaning	Action	Response
		2. If parameters came from the console type-writer.	Resubmit parameters
1515 filename FILE NOT ON DISC	COMSNAP or COMDISC file not on assigned disc.	Program is termi- nated.	None.
1517 SNAP- SHOT ssss NOT FOUND OR NOT COMPLETE	Specific snapshot option ssss ₁₆ can- not be processed.	Program is termi- nated.	None.
1519 NO PARA- METERS	Parameters not in SYSIPT	Program is termi- nated.	None.
1527A ENTER PARA- METERS	Parameters re- quest.	Type in parameter.	PΔΔ MSGΔnnn, [dddd], [uuuu], cccc, xxxx nnnn = decimal number of mes- sage table entries (same as specified in CMMSG) dddd = decimal number of bytes in Com- mon Data Area if present (same as specified in CMMSG) uuuu = decimal number of bytes in User Station Se- quence Number Table if present (Same as specified in CMMSG). cccc = decimal number of bytes in each cell (Same as specified in CMBUF)

TYPEOUTS
(Cont'd)

Message	Meaning	Action	Response
nΔpppppΔ			xxxx = LAST - latest complete snapshot is to be processed. = 1-4 character representation of the hexadecimal number of a specific snapshot to be processed.
1533 MTE xxxx TYPE tt	Due to an unrecoverable disc read error, no cells for Message Table Entry xxxx ₁₆ of type tt could be read from COMDISC. Only the MTE is written to tape.	Processing continues.	None.
1536 MTE xxxx TYPE tt	Same as 1533 however, one or more cells (but not all) could be read from COMDISC and were written to tape.	Processing continues.	None.
1539 LATEST COMPLETE SNAPSHOT IS ssss	Snapshot ssss ₁₆ is to be processed.	None.	None.

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APPENDIX X
PROCEDURE FOR
REPORTING
SUSPECTED
SOFTWARE
PROBLEMS

General

◆ Prior to reporting an error condition, the following criteria should be checked to ascertain that the problem is actually a software error:

1. All input data, parameter messages, device assignments, etc. are properly formatted and sequenced.
2. Software system or program being utilized is the latest RCA version released.
3. Operation of the problem program has been repeated at least twice with identical results.
4. Operation monitored to ensure that the problem is not the result of an operator intervention, program rollback, or erroneous intervention to bypass a hardware error.
5. Operating procedures have been followed using the latest RCA documentation released.
6. Unofficial modifications have not been incorporated in the overall hardware and software system. This does not include own-coding or non-standard label logic which conform to RCA specifications.

If incorrect results or repeated error conditions occur, a Software Error Notification (form #28-02-001) should be prepared, together with appropriate supplementary documentation, and forwarded to the local RCA District Office. This will apprise RCA of the problem and facilitate its evaluation and resolution.

As the processing of the error notification form is part of an automated system, all entries must be complete and printed in a legible manner.

An emergency problem may be communicated to the local RCA District Office by telephone or other expeditious means. Such action must be promptly supplemented, however, with a completed Software Error Notification form and other required documentation.

Required
Supplemental
Material

◆ The following supplemental material, as applicable, must be submitted to the RCA District Office with the five Software Error Notification copies:

1. The appropriate "Result Sheet" properly completed.
2. A printout of the entire memory if the program did not go to "end of run."
3. A copy of the actual input data, source program and parameter messages utilized. If an assembly or RPG program, a copy of the source deck is also required.
4. A detailed description of the functions performed by any own-coding or non-standard logic options used.

**Required
Supplemental
Material**
(Cont'd)

5. The following are also required when production programs are involved:
 - a. A duplicate of the Master Library Tape.
 - b. All listings generated by the assembly or compilation system.
 - c. A copy of installation operating procedures used in conducting computer operations.