ICL

International Computers Limited

User notice

MANUAL (NOTICE NO.)

4310   GEORGE 3 AND 4 OPERATING (7)
4334   GEORGE 3 AND 4 OPERATION MANAGEMENT (2)
4345   OPERATING SYSTEMS GEORGE 3 AND 4 (2)

File one copy of this notice with each of the manuals indicated.

CONTENTS

The information in this User Notice refers to GEORGE 3 Mark 7.

INDEX TO NEW FACILITIES IN GEORGE 3 MARK 7

The index indicates:

1   what new facilities are available

2   extensions or changes in existing facilities.

The titles of manuals given in the documentation references are abbreviated as follows:

G = Operating Systems GEORGE 3 and 4, Fifth edition (TP 4345)

M = GEORGE 3 and 4 Operation Management, Fourth edition (TP 4334)

O = GEORGE 3 and 4 Operating, Third edition (TP 4310), as amended by Amendment List 1, which will be published soon.

Chapters are referenced by numbers suffixed to the letters. Appendix is abbreviated App.; User Notices are referred to as G, M or O User Notice *number*, for example G User Notice 1. For example

     CARTRIDGE command M2, G12, O3, O8

means that descriptions of this command can be found in:

     GEORGE 3 and 4 Operation Management, Chapter 2.
     Operating Systems GEORGE 3 and 4, Chapter 12.
     GEORGE 3 and 4 Operating, Chapters 3 and 8.

Additional information describing 7020 and 7900
Communications systems will be found in the manual
Data Communications and Interrogation, Second edition
(TP 4201).

This index does not reference every mention of a
facility, but merely those thought to be useful for
explaining Mark 7 facilities.

SUMMARY OF NEW FACILITIES IN GEORGE 3 MARK 7

These notes introduce the main new facilities of
GEORGE 3 Mark 7.   They are not specifications in any
sense and the appropriate manual should always be
consulted before using the facility.   The index
included in this notice will help users to find the
description of an item in the relevant manuals.

New Executive interface

GEORGE 3 Mark 7 works to a new interface with Executive.
Five main advantages are derived from the new inter-
face:

1   GEORGE can now deal with more than 64 peripherals
      (including the operator's console).

2   Extracodes are now implemented more efficiently
      by Executive.

3   GEORGE can obtain information about peripherals
      more efficiently.

4   The information needed for timesharing object
      programs is no longer duplicated in GEORGE and
      Executive.

5   Object programs are handled more efficiently.

New and enhanced communication facilities

COMMUNICATION BETWEEN NOMINATED CONSOLES

The new operator command SPEAK (SK) allows communication
between operators' consoles as follows:

1   Central operator to a remote operator

2   Central operator to all remote operators

3   A remote operator to the central operator

4   A remote operator to another remote operator

A specified text is sent to the destinations defined
in routing parameters to the SPEAK command.   The
command should be very helpful when central and cluster
console operators need to communicate with each other.

IMPROVEMENTS TO HANDLING OF 7900 SYSTEMS

Conceptual multiplexers

Conceptual multiplexers can now be defined on 7901/
7903 message buffering systems.   The facilities are
identical to those implemented in Mark 6 for character

buffering devices.

Auto answering with 7903 systems

Auto answering via DATEL-200 modems is now available
on 7903 message buffering systems.

USING 1901A MACHINES AS REMOTE JOB ENTRY TERMINALS

1901A systems may be used as Remote Job Entry terminals
via character and message buffering multiplexers.   In
this role they are analogous to 7020 systems.

ENHANCEMENTS TO MOP FACILITIES

Automatic paper tape readers attached to termiprinters
and some MOP terminals.

The paper tape output at MOP terminals may be re-input
on MOP terminals and termiprinters that are fitted
with automatic tape readers.   The format of the tape
is controlled by including the GIN macro AUTMOP in
the restore pack.   Strictly this macro is only
necessary if 7900 systems are being used; however its
use with character buffering devices will not have
any undesirable effects.

Handling of inoperable MOP lines

If a MOP terminal becomes inoperable any job which is
being run from it is DISCONNECTed and suspended
rather than ABANDONed.   A job in this state is said
to be in *limbo*; it can be resumed by CONNECTing to it
from another MOP terminal.   When a job is in limbo
an L is printed in the MOP? column in the output from
WHATSTATE and WHATJOBS commands.

RESET command

The RESET WIDTH command is introduced to allow users
to define the number of print positions available on a
MOP terminal.   This will be very useful where new
devices which have more print positions than the standard
7071 MOP terminal are introduced, for example termi-
printers.

Job handling

CORE ALLOCATION SYSTEM

An enhanced core allocation system is introduced.   This
will allow real time programs to be sited more efficiently
and permit object program core utilisation to approach

the value defined by the installation parameter
OBJECTQUOTA.

THE HIGH LEVEL SCHEDULER

The high level scheduler issued with Mark 7 is basic-
ally similar to that used under Mark 6 although there
are several changes.

It is possible for an installation to reduce the over-
head associated with the HLS by using it in a 'reduced
facility' mode.   Dictionary checking and the saving
of tentatively started background jobs may be dispensed
with.   They are turned on and off with new parameters
to the EXPRESS command.   The state of job saving and
Dictionary checking is remembered across HLS switches.
This new facility allows users to trade off flexibility
against overhead.

The EXPRESS command now overrides earliest start dates
and times given via a JOBDATA command.   EXPRESSed jobs
are given URGENCY A without the user's budgets being
checked when the job becomes fully started.

Any job which tries to LOAD a core image which is
larger than (OBJECTQUOTA - size of HLS) is given a
Computing Power Index of zero.   Finally, jobs are not
made fully started after a FINISH command has been
issued.

HIGH PRIORITY PROGRAMS

Program members can be run at a priority which is
higher than that of GEORGE.   Normally these members
will be controlling real time programs.   A job will
use a REALTIME ON, PRIORITY command to specify which
members of a program are to have high priority status.
Normally a program should not have more than one high
priority member.

IF ELSE command

An IF $condition,(command_1)$ ELSE $(command_2)$ format is
introduced.   The commands may be nested to produce
very powerful expressions.

INTER PROGRAM COMMUNICATION

Inter-Program Communication (IPC) permits one program
to transmit data to another program using a type 28 I/O
channel.   The transmitting and receiving programs may
be in the same machine which is called Within Machine
Communication (WMC); or they may be in different
machines connected by a 7210/1 IPB when they are using
Inter Machine Communication (IMC).   The connections
are called IPC links and they are always simplex.

There may be any number of IPC links open at any one
time, and any number of links open through an IPB.
The number of links may be controlled by the Installation
manager with the IPCLIM GIN macro.

The IMC facility allows flexible multi-machine 1900
configurations to be created.

Two 1900 processors can be connected even if one is
not running under GEORGE since the IPC facility provided
by GEORGE is compatible with that provided by operator's
Executive.

LISTFILE command

Several small changes are made in Mark 7.   These are
described below.

Listing serial files

Any serial file may be listed on any output peripheral.
An attempt to LISTFILE certain system files or indexed
serial files (all directories, :MASTER.DICTIONARY,
:SYSTEM.OUTPUT and :SYSTEM.SERIAL) will generate a
command error.   When a file containing shift data is
printed the data is converted to GRAPHIC form unless
SPECIAL was supplied as a parameter to the LISTFILE
command.   In this case the data is printed in its full
three shift internal format.

Long records

When a record which contains more characters than
there are available print positions is listed on a
line printer then the current line is truncated and
the last four characters are a continuation mark:
$\triangledown\triangledown-\triangledown$.   The rest of the record is printed on subsequent
lines, each of which is indented by four characters
relative to the start of the first line.   Records of
more than 128 characters are not truncated when they
are LISTFILEd to a paper tape punch.

Peripheral interrupts

When the HOLD button, or the STOP button (other than
the STOP button on a remote printer) is pressed or
'paper-low' is detected GEORGE outputs a 'PLEASE
ENGAGE....' message.   If the device is engaged the
listing continues from the current line.   If a CANTDO
reply is given the listing is abandoned on the current
device, and GEORGE attempts to output it later.   When
the PAGE restart option is specified in the LISTFILE
command 'PLEASE GIVE PAGES.....' message is output.
The reply is used to calculate a suitable starting
line when another attempt is made to list the file.

The TERMINATE command

When a LISTFILE is terminated during the listing of
headings it will be repeated later.   If a SETUP file
is TERMINATEd GEORGE assumes that the paper is
correctly aligned and if it is an ONLINE request gives
the device to the object program; if it is a LISTFILE
request the main file is listed.

FINISH command

When FINISH NOW is typed any listing in progress is
terminated and 'saved' for printing next time GEORGE
is loaded.   When FINISH 'time up' occurs no more new
listings are initiated but current listings are
completed.   After all user jobs are complete any
LISTFILEs outstanding for system issued jobs, for
example dumper, are output if suitable devices are
available.   Any remaining listings are 'saved' until
the next time GEORGE is loaded.

LOAD command

In GEORGE 3 Mark 6 object programs occupy backing store
and core store during the interval between a LOAD
command and the first entry to the program.   In Mark 7
the LOAD command will check the program's request slip.
Core and backing store will not normally be reserved
until the program is run by, for example, ENTER or
RESUME.   Any command which reads from or writes to
the core image (for example PRINT, SAVE, ON, OFF, ALTER,
CORE etc.) causes the LOADing process to be completed.
This enhancement increases the efficiency of backing
store and core use.

PRINT to file command

The PRINT command is enhanced to allow one or more
regions of the current core image to be written to a
named serial file.   This may be created, overwritten
or appended to by the user when the command is issued.
The file can be a multifile.   The file may be LISTFILEd
subsequently.   The facility will be very useful when
object program postmortems are to be preserved for later
analysis.   Large programs can be printed without
filling up the job's monitoring file.

SAVE command

The SAVE command is changed to allow core images to be
saved in a direct access file.   Programs are loaded
more efficiently from direct access files than from
serial files.   An optional second parameter to the
command is introduced which defines the type of file to
be used; it may be *DA, *ED, *FD or *CP.   If *DA, *ED

or *FD is specified or the parameter is omitted a
direct access file is used.   If *CP is specified a
serial file is used.

SETPARAM CORE command

A SETPARAM CORE command is introduced.   This allows
user jobs to determine the size of their current core
image in words.

THE SYSTEM JOURNAL

The System Journal is a series of basic serial file-
store files in which GEORGE stores information about
what happens while it is running.   Data is sent to
the Journal in messages which can also go to several
other places including a job's monitoring file, MOP
terminals or the operator's console.   The installation
manager has some control over the destination of
messages by using the GIN macro CATEGORISE.   He can
also vary their content with the GIN macro NEWMESS.

The messages contain various types of information
(such as machine usage, accounting and engineers'
data), in a form which is readily processable by
subject programs.   Information is stored in the
Journal whenever a program alters its core size or a
job changes its urgency or releases a peripheral.   The
data includes jobs' milltime, programs' clocked time,
counts of transfers, fails and repeats for all attached
peripherals and details of lines, pages and properties
for each job's LISTFILES.   It can be analysed by users'
subject programs for a variety of purposes such as
accounting, analysis of machine usage, and engineering
reports.

The flexibility of the message system is further
increased by the provision of a new command SJMESS
(and two equivalent extracodes) which will write
messages specified by privileged users into the
Journal.   The command can be issued from the operator's
console, MOP terminals or background jobs.   The extra-
codes will send messages from users' object programs.

The main use of the System Journal by ICL in Mark 7 is
to provide flexible, efficient accounting.   This is
accomplished by the Journal Accounting Program (JAP),
a processing program which is run at system-determined
intervals to analyse Journal files, produce accounting
data, update budgets in the Dictionary and print
invoices.   System Journal accounting is initiated
by including the GIN macro BILA SJ in GEORGE's restore
pack.   This switches off built-in and built-out log
analysis and permits all charges to be calculated by the
Journal Accounting Program from its log analysis.   In
its issued form the JAP uses the same algorithms as the
existing built-out log analysis program #XK7F, but
provision is made for user alteration of charging

co-efficients.

The Journal Accounting Program is run as an ordinary
job under :JOURNAL.   Every time the JAP updates the
Dictionary it inserts an 'update record' in the
Dictionary.   This contains all the information
necessary to restart the program at the right place in
the System Journal, so the JAP can determine how much
of the Journal it has already processed.   This prevents
jobs being accounted for twice and provides protection
against breakdowns or the JAP being abandoned.

GEORGE also has special mechanisms which protect the
Journal files against system breaks.   Mark 7 allows
parallel running of existing built-in or built-out
log analysis systems and System Journal accounting.
This simplifies the validation of the new accounting
methods when they are adopted by each installation.

Enhancements to the filestore

ARCHIVE COMMAND

This new command can be used to indicate that a file
may be thrown offline by the Backing Store Unjammer.
The command is 'permanent' so a CANCEL ARCHIVE command
is provided to de-ARCHIVE the file.   A NOTOWNER
privilege is introduced.   Users possessing this
privilege may ARCHIVE files belonging to other users.
For instance, the installation manager can ARCHIVE
files that he considers should be removed immediately
a Backing Store Jam occurs.   Files which are defined
in an ARCHIVE command have indicator bits set in their
directory.   This allows user accounting systems to
charge separately for these files.

AUTOWRITE OUTPUT TO OFFLINE *LP FILES

The filestore line printer file handling routines
are enhanced to accept object program line printer
output in Autowrite format.   The offline files
produced in this way are then LISTFILEd producing the
same effect as using Autowrite mode and an ONLINE
buffered line printer, although the LISTFILE routines
themselves do not use Autowrite transfers.   The ASSIGN
command for the line printer file must have an AUTO
qualifier.

BASIC FILES

In GEORGE 3 Mark 6 there can be as many basic serial
file types in the filestore as there are basic
peripheral types.   The type of the file corresponds
to the peripheral from which it was INPUT or the
offline basic peripheral channel on which it was out-
put.   Hence the filestore can contain card reader

files, card punch files, tape reader files, tape punch
files and line printer files.   The handling of basic
files is simplified and rationalised in Mark 7.

Information handled via basic peripherals is called
basic data; it consists of a sequence of records each
of which is a string of characters.   There are three
types of basic data, GRAPHIC, NORMAL and ALLCHAR.
GRAPHIC data is composed of the standard ICL 1900
series 64 character set, NORMAL and ALLCHAR data is
composed of the 1900 series shift character set which
includes upper and lower case letters and various
control characters.

ALLCHAR data includes the entire 128 character set
whereas the NORMAL set excludes runout and delete
characters.   Note that these data types describe the
external character set and not the way any given type
of data is represented on a particular medium or
internally by GEORGE.

There are only three types of basic files, GRAPHIC,
NORMAL and ALLCHAR which correspond to the three types
of data already described.   In contrast to Mark 6 a
file's type is determined by the type of data it
contains and not by the device or channel originally
associated with it.   Much data is GRAPHIC and users
are recommended to use this type of file wherever
practicable because it employs a less complex internal
representation than the others, and can be manipulated
more readily.

The file type qualifier

A file's type may be explicitly declared with a
qualifier to the filename specified in an INPUT
command.   This qualifier can be GRAPHIC, NORMAL or
ALLCHAR, for example:

       IN   :MG,ABC(GRAPHIC)

If the qualifier is omitted the file will be of
GRAPHIC type by default.   A similar qualifier may
also be used when offline basic output files are
ASSIGNed for writing.

CHANGES TO FILE TRAPS

An ERASE trap is introduced.   The ERASE and RENAME
commands check this trap; the ERASE command no
longer checks for ownership except when attempting to
ERASE a directory.   If the trap is not open a command
error is generated.   A user can now allow other users
to ERASE his terminal files; this facility is entirely
separate from that of allowing other users to write
to them.

When a file other than a directory is created all
traps are initially left open to the owner of the file.
In contrast, under Mark 6 the READ, APPEND and EXECUTE
traps are initially left open and the WRITE trap is
closed.   Treatment of directories, however, is
unchanged from Mark 6.   A TRAPSTOP qualifier is
introduced for relevant commands to allow users
conveniently to reset the default traps.

The first change will increase the security of files
by making it more difficult for users to accidentally
ERASE their files, for example by typing ER *filename*
instead of ED *filename* during a MOP job.   The second
change will slightly reduce the security of a newly-
created file.   However there is likely to be a
reduction in the number of jobs which fail because the
user has forgotten to open a file trap, whilst the
TRAPSTOP qualifier allows users readily to define the
initial level of security that they need.

GENERAL DESTRUCTIVE READING OF FILES

Files may now be accessed in General Destructive Read
mode.   This means that the records they contain are
destroyed as they are read.   A file may have one
reader, multiple readers, single reader and/or multiple
readers and communal writers using the file in
communication mode.   General Destructive Read can be
used in combination with Direct Response Mode.   A
new qualifier to the ASSIGN command, GDR, is introduced.

GENERAL RESTORE

More informative messages are output if a magnetic
tape fails or a tape format error is found during a
general restore.   Previously tape fails would force
GEORGE to be reloaded and the Early Morning Start
procedure to be repeated.   If a format error occurred
GEORGE would break GEOERR IDFORMAT.   In Mark 7
messages are output giving the last file read, and
stating the type of error.   After an error the
General Restore routines will release all the backing
store already obtained and ask the operator to try
again with a different increment and/or a different
tape deck.

INDEXED SERIAL FILES

In Mark 7 certain commonly used serial files are
indexed.   The index is held in a file's directory
entry and allows records to be accessed directly
rather than serially, reducing the number of backing store
transfers required and hence access times; the format
of the file itself is not altered.   The files may be
processed serially or records can be accessed directly
by calculating the record's position in the file from

a key.   In Mark 7 the following files are indexed:
directories, :MASTER.DICTIONARY, :SYSTEM.OUTPUT and
:SYSTEM.SERIAL.   Although access to these files will
be much faster users are not directly affected except
that any attempt to INPUT, ASSIGN for writing, COPY
to or EDIT an indexed file will result in a command
error, and any programs which access directories using
the File Reader may need modification.

LIMITING ONLINE BACKING STORE

The online backing store of a job is the total amount
of space occupied by files used by the job at any
given time.   Because these files are associated with
a job they cannot be discarded by the Backing Store
Unjammer.   By limiting the maximum online backing
store used by each job the likelihood of severe
backing store jams is reduced.   A new installation
parameter DEFAULTBS is introduced which defines in
K words the maximum amount of backing store allowed
to each job.   If a job exceeds DEFAULTBS the
operators are asked to increase the limit by changing
DEFAULTBS.   If they do this the job will continue or
they may refuse, in which case a command error or
program event occurs.   Alternatively they can decide
to ABANDON the job.

So-called public files are excluded from a job's
online backing store count.   Basic system files
and directories are always public.   Other commonly
used files (for example compilers) may be declared
as public with the ALLOCATE PUBLIC command which can
be issued from the operator's console or by a job
running under :MANAGER.

PAPER TAPE HANDLING

Paper tape input and output is simplified in Mark 7.
The default file type is GRAPHIC, and, if a non-
graphic tape is INPUT, a NORMAL or ALLCHAR entrant
description qualifier must be included in the INPUT
command.

UDAS MODE PERIS TO ACCESS FILESTORE FILES

UDAS facilities are provided for disc type filestore
files.   In Mark 6 UDAS modes are illegal when address-
ing filestore files.   New modes are *1200 (Create
and Open) and *1300 (Close and Delete), whilst meaning-
ful action is implemented for modes *1100, *1400 and
*1500.

UNJAMMING ALL RESIDENCES

When the Backing Store Unjammer is called in it will clear any jammed residences and examine all the unjammed residences. Files are removed from the latter if the residence is nearly jammed, that is, the percentage of used blocks is greater than a threshold value. This is determined by the setting of a new installation parameter BACKTHRESH, and is equal to (BACKJAM - BACKTHRESH). Suppose that BACKJAM = 80% and BACK-THRESH = 10%; then the threshold = 70%. The unjammer will throw files off any residences which are more than 70% used.

Special residences are no longer automatically unjammed. Jams on special residences are considered to be totally undesirable and they should be dealt with directly by the Installation Manager.

Peripheral Handling

ASSOCIATIONS ON LOCAL PERIPHERALS

The Property system is extended to allow Associations to be created for local peripherals. Previously this was not possible. By increasing the flexibility of the property system special applications such as the creation of dedicated local card reader and line printer combinations are possible. When a local card reader or paper tape reader is associated with a line printer or a card or tape punch, jobs initiated from the reader automatically send their LISTFILES to the Associated output device. Hence a 'Cafeteria' service for small jobs using, for example, ICL's FLAIR or BABS software, can be readily devised.

DIRECT RESPONSE MODE

In Mark 7 Direct Response Mode peripheral handling is made available for ONLINE exofiles and basic peripherals.

EXCHANGING FILESTORE CARTRIDGES

The CARTRIDGE (CG) command eliminates the need to break GEORGE when an EDS spindle holding a filestore or swap residence fails and it is necessary to transfer the cartridge on that spindle to another spindle. The operator types

        CARTRIDGE Un_1, Un_2

here Un_1 and Un_2 are the operator's unit numbers of the failed spindle and the new spindle. The order of the parameters is immaterial. The two units are disengaged and the operator can transfer the cartridge from the failed spindle.

REVISED GENERATION NUMBER WHEN ONLINING EXOFILES FOR
OUTPUT

A new qualifier to the exofile name, REVGEN, is
available when a UDAS device is ONLINEd for writing.
The REVGEN qualifier allows the generation number of
the output file to be revised, providing that the
new number is <4096.   The action of the ONLINE
command and its equivalent open mode (#300) PERI
instruction is now compatible.

UNLOADING MAGNETIC TAPES

After the system has finished using a tape the
tape is rewound, the deck becomes inoperable and the
deck address light goes out, indicating that the deck
is not available to GEORGE.   The behaviour of 1974
decks is not altered.

MT LIBRARIAN PROPERTIES

Magnetic tapes and decks can be described properties.
These are:

1   Tape characteristic which is the recording method
      used to write a tape, for example seven track,
      nine track and/or phase encoded or NRZI.

2   MODE which describes the parity, gap and recording
      density used to record data on a 7 track tape.

3   Peripheral properties, encompassing the tape
      characteristic, speed properties and MODE.

The properties are specified in peripheral property
parameters or qualifiers, or entrant property qualifiers,
depending upon the context.   This enhancement will
allow the user and operators to have more control over
the use of the available transports in installations
with more than one type of tape transport.   Enhancements
are introduced to GEORGE requests for magnetic tapes,
the UNLOAD, TRANSPORTS, GETONLINE, ONLINE, NEW and
GET commands and unanticipated open mode PERI program
instructions.

Operators' facilities

THE GERONIMO SYSTEM

The GERONIMO system allows some operator information
(for example details of jobs currently running, files
to be listed, etc.) to be output on one or more Mark II
local alphanumeric visual display units (AVDU).   The
system comprises a command language macro, VIDEO, and
a small realtime subject program which controls the
AVDUs.   The operator information is output in response
to commands to GERONIMO input via the AVDU.   Some

commands include an AUTO facility which causes the
displayed information to be updated and refreshed
periodically. Operators can also input and run small
background jobs from the AVDU unit. A Master AVDU
may be nominated in a configuration which has two or
more AVDUs, (up to a maximum of six). The Master
AVDU is provided with an extended repertoire of
instructions to control the complete GERONIMO system.

A GEORGE 3 user may run GERONIMO if he has Mark II
visual display equipment available, that is 7181/4
terminals connected via a 7180/2 cluster control unit.

MOP ON OPERATORS' CONSOLES

MOP facilities are provided on central and cluster
operators' consoles. A small subject program,
#XKLY, uses an online Command Issuer channel to set
up and drive a MOP job and internally issued DISPLAYs
and QUESTIONs to output data to, and read commands from,
the operator's console. Break-in facilities are
provided by a second system job which controls another
subject program #XKLZ. This also uses a Command
Issuer channel to CONNECT to the first job and to cause
it to issue a Command Issuer break-in.

The facility will be especially useful to installations
or remote clusters which do not have MOP terminals.
For example, an operator can CONNECT a background job
which is thought to be looping and PRINT an object
program to the job's monitoring file rather than just
ABANDONing it, leaving the user with no diagnostic
information.

PMPRINT COMMAND MACRO

Post mortems are now dumped to magnetic tape in
compressed line printer image format. The PMPRINT
command macro, in conjunction with program #XK65,
provides a simple method of listing these postmortems
to a line printer or a line printer file. The command
is issued from the operator's console.