

```

CCCCCCCCCC      MMMM      MMMM      SSSSSSSSSSSSSSSSSSS
CCCCCCCCCCCCCC  MMMMMM      MMMMMM      SSSSSSSSSSSSSSSSSSS
CCCCC      CCCC  MMMMMMMMM  MMMMMMMMM  SSSSSS
CCCCC      C      MMMMMMMMMM  MMMMMMMMMM  SSSSS
CCCCC      MMMMM  MMMMM  MMMMM  MMMMM  SSSSS
CCCCC      MMMMMM  MMMMMMMMM  MMMMMM  SSSSS
CCCCC      CCCCMMM  MMMMMM  MMMSSSS  SSSSS
CCCCCCCCCCCCMMM  MMMMM  MMMSSSSSSSSSS
CCCCCCCCCC      MMM      SSSSSSSSS

```

COMPUTER MANAGEMENT SYSTEM

```

BBBBBBBBBBBBBBBB  99999999  000000
BBBB      BBBB  999999999999  0000000000
BBBB      BBBB  99999  99999  00000  00000
BBBB      BBBB  99999  99999  00000  00000
BURROUGHSBBBBBBBBBBBB  999999999999  00000  00000
BBBBBBBBBBBBBBBBBBBBBBBB  999999999999  00000  00000
BBBB      BBBB  99999  00000  00000
BBBB      BBBB  99999  00000  00000
BBBB      BBBB  99999  0000000000
BBBBBBBBBBBBBBBBBBBB  999999  000000

```

```

3333333333333333  000000  44444
333333333333333  0000000000  44444
      33333  00000  00000  44444
      33333  00000  00000  44444
      33333  00000  00000  44444  4444
      33333  00000  00000  44444  4444
3333  33333  00000  00000  4444444444444444
3333  33333  00000  00000  4444444444444444
      333333333  0000  0000000000  4444
      33333333  0000  000000  4444

```

* BURROUGHS BELIEVES THAT THE INFORMATION IN THIS DOCUMENT IS *
 * ACCURATE AND RELIABLE, AND MUCH CARE HAS BEEN TAKEN IN ITS *
 * PREPARATION. HOWEVER, NO RESPONSIBILITY, FINANCIAL OR OTHERWISE, *
 * CAN BE ACCEPTED FOR ANY CONSEQUENCES ARISING OUT OF THE USE OF *
 * THIS MATERIAL, INCLUDING THE LOSS OF PROFIT, INDIRECT, SPECIAL, OR *
 * CONSEQUENTIAL DAMAGES. *
 * THE CUSTOMER SHOULD EXERCISE CARE TO ASSURE THAT THE USE OF *
 * THE SOFTWARE DESCRIBED WILL BE IN FULL COMPLIANCE WITH THE LAWS, *
 * RULES, AND REGULATIONS OF THE JURISDICTIONS WITH RESPECT TO WHICH *
 * IT IS USED. *
 * THE INFORMATION CONTAINED HEREIN IS SUBJECT TO CHANGE. *
 * REVISIONS MAY BE ISSUED FROM TIME TO TIME TO ADVISE OF CHANGES *
 * AND/OR ADDITIONS. *
 *

1 OVERVIEW

=====

THE B90 CMS SYSTEM SOFTWARE RELEASE LEVEL 3.04 IS A FULL SYSTEM SOFTWARE RELEASE FOR B90 SYSTEMS CONFIGURED WITH THE MINIMUM MEMORY SIZES SPECIFIED IN SECTION 6 (PERFORMANCE CONSIDERATIONS) OF THE SYSTEM AND MCP DOCUMENTATION FILE (SYS.NOTES) - SEE ALSO SECTION 6 POINT 1 OF THIS INTRODUCTION.

THIS RELEASE SUPPORTS THE NEW B96 SERIES OF PRODUCTS.

THIS RELEASE ALSO SUPPORTS THE B81 SERIES.

THIS DOCUMENT PRESENTS A SUMMARY OF THE MAJOR NEW FEATURES, LIMITATIONS AND RESTRICTIONS CONTAINED IN THE B90 CMS 3.04 RELEASE.

2 THE B96 SYSTEM

=====

THE B90 RANGE OF SYSTEMS HAS BEEN EXPANDED TO INCLUDE THE B96 SERIES. THIS SYSTEM CONSISTS OF A 4MHZ PROCESSOR WITH OPTIONAL INBUILT 1MB BSM DISK OR FREE-STANDING MAGNETIC TAPE STREAMER AS A LOAD/DUMP DEVICE. THE B96 SYSTEM SUPPORTS THE FULL RANGE OF PERIPHERALS SUPPORTED BY THE B90 SERIES SYSTEMS.

FOR SYSTEMS EQUIPPED WITH ONLY 1MB BSM DISK AS REMOVABLE MEDIA, A MAXIMUM OF 512KB OF RANDOM ACCESS MEMORY CAN BE CONFIGURED. THIS LIMITATION IS SCHEDULED TO BE REMOVED ON THE NEXT MAJOR SOFTWARE RELEASE. FOR SYSTEMS EQUIPPED WITH OTHER REMOVABLE DISKS (2.3MB OR 4.6MB CARTRIDGE OR 3MB BSMII REMOVABLE DISKS) OR MAGNETIC TAPE STREAMER, A MAXIMUM OF 1.5MB OF RANDOM ACCESS MEMORY CAN BE CONFIGURED.

THE SYSTEM IS CONFIGURED WITH A MINIMUM OF 1 DATA COMMUNICATIONS POWER PAK USING TDI INTERFACE AND CAN SUPPORT A MAXIMUM OF FOUR CHANNELS OF DATACOMM WITH A TOTAL BANDWIDTH CAPABILITY OF UP TO 60K BITS PER SECOND.

GENERAL INTRODUCTION TO 3.04

3 OPERATING SYSTEM INCLUDING DATACOMM
=====

FULL DETAILS OF THESE FEATURES ARE CONTAINED IN THE PRINTOUT OBTAINED FROM THE DOCUMENTATION FILES `SYS.NOTES` AND `DC.SYS.NOTES`. FOR SOFTWARE INSTALLATION, REFER TO THE PRINTOUT OBTAINED FROM THE DOCUMENTATION FILE `B90.INST`.

THE MAJOR NEW FEATURES OF THE MASTER CONTROL PROGRAM (MCP) INCLUDING DATA COMMUNICATIONS, ARE:

1. THE NEW MAGNETIC TAPE STREAMER IS SUPPORTED. THIS DEVICE OFFERS FAST BACKUP OF DATA. UNDER CERTAIN CONDITIONS, IT CAN RUN AT 100 INCHES PER SECOND ON A B94 AND B96, OFFERING A DATA TRANSFER RATE OF UP TO 160 THOUSAND CHARACTERS PER SECOND. ON B92 AND B93 SYSTEMS (AND B94 AND B96 SYSTEMS WHEN SYSTEM USAGE IS HIGH) THE DEVICE RUNS AT 25 INCHES PER SECOND WHICH GIVES A TRANSFER RATE OF UP TO 40 THOUSAND CHARACTERS PER SECOND.

THE TAPE STREAMER IS NOT SUPPORTED ON THE B91 SYSTEM.

2. THE NUMBER OF USER TASKS WHICH MAY BE RUN CONCURRENTLY HAS BEEN INCREASED FROM 8 TO 23. ALTHOUGH THIS FACILITY DOES NOT DIRECTLY INCREASE THE PROCESSING POWER OF THE B90 SERIES, IT ALLOWS DORMANT TASKS TO REMAIN IN THE MIX WITHOUT FILLING ALL AVAILABLE MIX SLOTS.
3. IT IS NOW POSSIBLE TO OVERRIDE THE NAME OF A FILE AT TASK EXECUTION TIME BY SPECIFYING THE NEW FILE NAME IN THE TASK EXECUTION MESSAGE.
4. PRINTER OUTPUT MAY NOW BE DIRECTED TO DISK IF A PRINTER IS NOT AVAILABLE. PRINTER BACKUP IS A USER-SELECTABLE OPTION.
5. IT IS NOW POSSIBLE FOR THE USER TO SPECIFY CHARACTER TRANSLATION FOR CERTAIN PERIPHERALS. THE CRT/SELF-SCAN DISPLAY, LINE PRINTER, SERIAL PRINTER AND CONSOLE KEYBOARD CAN ALL HAVE CHARACTER TRANSLATION SPECIFIED.
6. SYSTEM MESSAGE AND MAINTENANCE MESSAGE LOGGING HAS BEEN IMPROVED.
7. IT IS NOW POSSIBLE TO ACCESS BOTH INDEXED AND SEQUENTIAL FILES BY MULTIPLE CONCURRENT USERS.
8. IT IS NOW POSSIBLE FOR A SHARED FILE USER TO DETECT THAT A BLOCK IN A FILE IS IN USE AND LOCKED BY ANOTHER USER OF THE

FILE.

9. INTER-PROCESS COMMUNICATION (IPC) NOW ONLY REQUIRES MESSAGE CONTROL SYSTEM (MCS) PARTICIPATION FOR THE INITIAL ATTACHMENT OF COMMUNICATING TASKS. NORMAL IPC MESSAGE TRAFFIC IS HANDLED SOLELY BY THE MCP WITHOUT MCS INTERVENTION.
10. TASK SCHEDULING HAS BEEN IMPROVED. THIS MEANS THAT DATACOMM APPLICATIONS SHARE THE PROCESSOR MORE EVENLY.
11. DATACOMM TASKS MAY NOW SPECIFY A WAIT ON A LIST OF EVENTS (COMPLEX WAIT).
12. SIMULTANEOUS TWO-WAY (FULL DUPLEX) DATACOMM OPERATION IS NOW POSSIBLE.
13. ALL SYSTEM OUTPUT MESSAGES CAN NOW BE TRANSLATED INTO THE LOCAL LANGUAGE BY REFERENCE TO THE LOCAL BURROUGHS OFFICE.

4 SYSTEM UTILITIES

FULL DETAILS OF THESE FEATURES ARE CONTAINED IN THE PRINTOUT PRODUCED BY THE DOCUMENTATION FILES UTIL.NOTES1 AND UTIL.NOTES2.

NEW FEATURES AND NEW UTILITIES INCLUDED IN THIS RELEASE ARE AS FOLLOWS:

1. CARTRIDGES, BSM DISKS AND 2011 FIXED DISKS CAN NOW BE INITIALISED UNDER MCP CONTROL.
2. THE BOOTSTRAP AREA ON A DISK CAN NOW BE UPDATED WITHOUT DESTROYING THE DATA ON THE DISK, THAT IS WITHOUT RE-INITIALISING OR REFORMATTING.
3. IT IS NOW POSSIBLE TO BACKUP TO TAPE OR DISK ONLY THOSE FILES WHICH HAVE BEEN UPDATED SINCE THE LAST BACKUP.
4. IT IS NOW POSSIBLE TO OBTAIN A DUMP OF A COBOL OR RPG PROGRAM WHICH RELATES DIRECTLY TO THE DATA-NAMES USED IN THE ORIGINAL PROGRAM SOURCE.
5. THE STAND-ALONE UTILITIES CAN NOW BE RUN ON A SYSTEM WHICH DOES NOT HAVE A CONSOLE (B93, B94 AND B96). THIS IS DONE BY MEANS OF A DATACOMM INTERFACE. THE SAU COPY FUNCTION NOW PERFORMS A READ-AFTER-WRITE WHEN A 3MB BSMII IS BEING USED AS AN OUTPUT DISK.
6. FILEUTL IS A COMPLETELY NEW UTILITY WHICH ALLOWS CREATION, DISPLAY AND MODIFICATION OF ANY USER DATA FILE. FILEUTL USES A DATACOMM INTERFACE AND IS DRIVEN BY MEANS OF SIMPLE TO USE MENU SCREENS.
7. A NEW FACILITY CALLED COLDSTART HAS BEEN INTRODUCED TO ENABLE SYSTEM SOFTWARE TO BE INSTALLED ON A B96 SYSTEM.

5 PROGRAMMING LANGUAGES5.1 COBOL

FULL DETAILS OF THESE FEATURES ARE CONTAINED IN THE PRINTOUT PRODUCED FROM THE DOCUMENTATION FILE COBOL.NOTES.

THE FOLLOWING NEW FEATURES HAVE BEEN INCLUDED IN THE COBOL LANGUAGE:

1. THE NUMBER OF ALLOWABLE DATA-NAMES HAS BEEN INCREASED FROM APPROXIMATELY 3700 TO 6300.
2. A NEW DOLLAR OPTION HAS BEEN INTRODUCED TO PROVIDE SOURCE-RELATED DUMP INFORMATION.
3. PRINTER BACKUP FILE ATTRIBUTES CAN NOW BE SPECIFIED.
4. THE CONSTRUCT ON EXCEPTION ALLOWS DETECTION OF LOCKED BLOCKS WHEN USING SHARED FILES. THE VERB FREE ALLOWS A BLOCK LOCK TO BE RELEASED WITHOUT PERFORMING UNNECESSARY I/O.
5. THE WITH IOCOMPLETE CONSTRUCT FORCES I/O TO BE COMPLETED BEFORE TASK EXECUTION CAN CONTINUE.
6. IT IS NOW POSSIBLE TO SPECIFY A PROGRAM VERSION NUMBER. THIS NUMBER IS STORED IN THE CODE-FILE AND IS PRINTED BY THE DIRECTORY LIST (LR) PROGRAM.

5.2 MPLII

FULL DETAILS OF THESE FEATURES ARE CONTAINED IN THE PRINTOUT PRODUCED BY THE DOCUMENTATION FILE MPL.NOTES.

THE FOLLOWING NEW LANGUAGE FEATURES HAVE BEEN IMPLEMENTED IN MPLII:

1. IT IS NOW POSSIBLE TO SPECIFY A PROGRAM VERSION NUMBER. THIS NUMBER IS STORED IN THE CODE-FILE AND IS PRINTED BY THE DIRECTORY LIST (LR) PROGRAM AND CAN BE ACCESSED PROGRAMATICALLY.
2. A NEW BUILT-IN FUNCTION, TRANSLATE, PROVIDES CHARACTER BY CHARACTER IN-PLACE TRANSLATION USING A PROGRAM SUPPLIED TRANSLATION TABLE. ASCII.TO.EBCDIC AND EBCDIC.TO.ASCII ARE SUPPLIED AS BUILT-IN TABLE NAMES WHICH GIVE ASCII TO EBCDIC AND EBCDIC TO ASCII TRANSLATION RESPECTIVELY.
3. USING THE I/O OPTION, SHARED, IT IS POSSIBLE TO DETECT A LOCKED BLOCK WHEN USING A SHARED FILE.
4. THE FREE_BLOCK FUNCTION ALLOWS A LOCKED BLOCK TO BE RELEASED WITHOUT PERFORMING UNNECESSARY I/O ON A SHARED FILE.
5. THE WAIT FUNCTION CAN NOW SPECIFY A LIST OF EVENTS AS WELL AS A WAIT TIME. THIS ALLOWS THE PROGRAM TO BE "WOKEN UP" BY ONE OF THE LIST OF EVENTS, NOT JUST BY THE TIME BEING EXHAUSTED.
6. MPLII NOW CONTAINS PRINTER BACKUP FILE ATTRIBUTES.
7. A NEW DOLLAR OPTION, XREF, PRODUCES A COMPLETE CROSS-REFERENCE LISTING OF A SYNTACTICALLY CORRECT PROGRAM.

5.3 RPG

FULL DETAILS OF THESE FEATURES ARE CONTAINED IN THE PRINTOUT PRODUCED BY THE DOCUMENTATION FILE RPG.NOTES.

THE FOLLOWING NEW FEATURES HAVE BEEN INCLUDED IN THE RPG LANGUAGE:

1. PRINTER BACKUP CONSTRUCTS HAVE BEEN INCLUDED IN THE LANGUAGE.
2. THE NUMBER OF ALLOWABLE FILES HAS BEEN INCREASED FROM 20 TO 31.
3. IT IS NOW POSSIBLE TO OBTAIN A SOURCE-RELATED DUMP LISTING.
4. A NEW DOLLAR OPTION, XREF, PRODUCES A COMPLETE CROSS-REFERENCE LISTING OF A COMPILATION.

6 LIMITATIONS AND RESTRICTIONS IN 3.04

1. THE RECOMMENDED MINIMUM MEMORY SIZES REQUIRED FOR SYSTEM OPERATION ARE AS FOLLOWS:

192K BYTES FOR A NON-DATACOMM ENVIRONMENT

256K BYTES FOR A DATACOMM ENVIRONMENT WITHOUT TERMINAL SPO

384K BYTES FOR A DATACOMM ENVIRONMENT USING TERMINAL SPO
2. THE 3.04 SPIM (SPO INTERFACE MODULE) PROGRAM MUST BE RUN WITH THE 3.04 SPONDL. THE INTERFACE HAS BEEN CHANGED SINCE THE 3.03 RELEASE AND THE NEW SPIM WILL NOT RUN WITH PRE 3.04 SPONDL PROGRAMS.
3. SIMILARLY, THE 3.04 SPONDL WILL NOT RUN WITH A 3.03 SPIM.
4. COMPLEX WAIT IS ONLY AVAILABLE TO MPLII WRITTEN PROGRAMS.
5. THE MAXIMUM DATACOMM BANDWIDTH FOR B91, B92 AND B93 SYSTEMS USING DATA COMMUNICATIONS POWER PAK CONTROLLERS IS 38.4K BPS.
6. THE MAXIMUM DATACOMM BANDWIDTH FOR B94 AND B96 SYSTEMS IS 60K BPS USING DATA COMMUNICATIONS POWER PAK CONTROLLERS.
7. MAGNETIC TAPE STREAMER, WHEN USED ON B92 AND B93 SYSTEMS, WILL ALWAYS OPERATE AT 25 INCHES PER SECOND.
8. THE STAND-ALONE UTILITIES CANNOT SUPPORT DUAL-PACK FILES WHEN THE TWO HALVES OF THE FILE RESIDE ON DISKS WITH DIFFERENT ALLOCATION UNITS. FOR EXAMPLE, A DUAL PACK FILE WHICH RESIDES ON BOTH 211 DISK AND 3MB DISK, WILL NOT BE HANDLED BY SAU.

TABLE OF CONTENTS.
=====

1	OVERVIEW	1
2	THE B96 SYSTEM	1
3	OPERATING SYSTEM INCLUDING DATACOMM	2
4	SYSTEM UTILITIES	4
5	PROGRAMMING LANGUAGES	5
5.1	COBOL	5
5.2	MPLII	6
5.3	RPG	7
6	LIMITATIONS AND RESTRICTIONS IN 3.04	8