NICOLET USERS SOCIETY

PROGRAM LIBRARY CATALOG

APRIL, 1975 EDITION

THE OFFICIAL ORGANIZATION OF NICOLET DATA SYSTEM USERS
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NICOLET USERS SOCIETY

The Nicolet User Society (NUS) is an organization of all Nicolet 1080, NMR-80, MED-80 and NIC-80 system users. It maintains a collection of user-written programs which are available to all 1080 owners free of charge upon request. In addition, application notes describing the use of the 1080 system are distributed from time to time.

Any user who has developed a program which he feels may be of general interest to other users may notify them by submitting a copy of the program to NUS at Nicolet Instrument Corporation in Madison. NUS will duplicate and distribute these programs to all owners who request them. Be sure to include a program submission form with each program. In order that you may be kept up to date on NUS activities, please fill out the registration form and return it to Nicolet Instrument Corporation.

To order NUS programs, please fill out the attached order form. We ask that you limit your orders to five programs per month to allow most rapid service to all NUS members. Listings of NUS programs may be generated from the supplied source tapes, using the Assembler-Editor. Please do not order ASCII (source) tapes unless you plan to make programming modifications.

Nicolet Instrument Corporation neither guarantees the performance of NUS programs nor provides any support for them. It acts merely as a distribution agent for submitted programs. It will distribute user-reported software malfunctions along with the programs and when sufficiently important, may publish them in application notes.

LIST OF NUS PROGRAMS BY CATEGORY

Hardware Test Programs

201 Memory Test
202 1080 Jump Test
203 Operations Test
204 Multiply-Divide Test
238 293 Timer Test
239 293 Digital I/O Test
240 293 DAC Test
241 293 ADC Test
248 Astrotest
513 LPTEST for Centronics Printer

Applications Programs

215 Nmrcal 1085 Overlay
217 Three Point Smooth and Baseline
218 Forward-Inverse Fourier Transform
219 Isometric Plot
222 Normalization Constant
223 Intensity Printout
226 Fixed Integral
227 Variable Scale Integral
229 Block Averaging
230 Fixed Block Size
231 Fast EM
232 Integrate Limits
233 JEOL Pulse 3-Relay 1 Hardware
234 Fast Pass
235 Manual T_1 Measurement
236 Fixed Point Output
242 Spectrum Reverse
250 Phase Correction Using Knobs
301 293 Overlay
302 Zero Beyond Cursor
303 Multiple Pulse Patch for T_2 Meas.
304 Non-Normalized Integral Patch
314 Left & Right Shift
316 KINET-First Order Kinetics
320 DIV32
321 Zero-Set
322 Halt-Quit Patch
323 Peak-to-Peak Cursor Advance
325 1070 Tape Reader
327 Rapid Scan Data Package
328 MOD 2 Patch to FT-Nmr 1972
329 Log of Spectral Region
330 PHFT
331-32 JEOL Plotter Overlays
337 Integration Patch
338 Memory Overflow Protection
339 T_1 Program for BNC-12-Bruker Systems
340 Restore FT after T_1 Program
345 Axis
347 TEMCAL
348 Angle
351-53 1070-NIC-80 Interface Software
354 Line Tilt
355 Nth Order Binomial Smooth
402 Exact SW Patch to BNC-FT
404 Tape Read Patch to FT-Nmr
405 FELIX
406 HSWEEP to FELIX
408 Automatic Shift Patch to FT-Nmr 1972
409 DBLOCK - Disk Block Averaging
410 Normalized Intensity
414 Least Squares T_1 Plot
415 Least Squares Subroutine
423 Differentiation of Display in LAB-80
424-25 FTQUAD
426 Fixed Integral Patch to LAB-80
501 JEOL Expansion Plotting
502 Signal/Noise Calculation
503 Punch Expanded Region for FT74
504 CAT Patch for FT74
505 293 Controller for FT74
506 Magnitude Calculation for FT74
507 RS-232 Input for LAB-80
508 Inverse Fourier Transform

Mathematical Tools

216 MDIAG
243 Astrocal
349 TTI-Calculator
312 Four Operations of Floating Point Arith.
415 Least Squares Subroutine
510 Random Number Subroutines

Utility Programs

205 Desk and Resistance Calculator
206 Nicodupe
207 Nico-Decin
208 Nico-Tab
214 Nico-Page
220 Decimal-Octal Conversion Table
221 Put and Take Program
246 UTIL1
247 UTIL2
309 XAP-Fixed Point Arithmetic Routine
311 Disk View
317 DIRCOP
319 PACK
326 SQUEEZ1
334 Nico-Loadeon for HS Reader
341 Garbage Collection
342 Disk Copy
401 Disk View/II
411 Restore Directory
416 Labeler
418 Octal-Decimal Converter
419 Centronics List
422 Bulletin
509 DIRCPY for DEMON/II

Demonstrations and Games

210 Message
211 Computer Art
213 Times Square
219 Isometric Plot
225 Snoopy
245 Power-of-2
305 Astro-Kaleidoscope
308 Times Square, Version 2
313 Astro-Graph
315 Phychedelic Box Display
324 AC Twinkler
336 Message Writing Program
343 Yin-Yang
346 NIM
356 Reindeer
357 Pong
403 Pong for 293
412 Billiards Game
413 Ping
421 Tic Tac Toe
511 DOG for the TTY
512 PINUP for the TTY

Programming Aids

209 Floating Point, 1972
224 Overlay to Assembler
237 Program Decoder
244 Bugbomb
246 UTIL1
247 UTIL2
306 QED-18B
307 FORCON
310 Disassembler
315 DUMP
333 Octal Debugging Program
335 Patch to Assembler-Editor, 1973
344 Tape Dump
349 Disk Editor
350 Disk Assembler
407 Disk Editor Assembler file Converter
417 Dissassembler Overlay
419 Centronics List

NUS PROGRAM ABSTRACTS

MEMORY TEST (WORST PATTERN GENERATOR) - NUS-201

This test program generates a worst case memory pattern and reads from it repeatedly attempting to induce an error. All errors along with their addresses are then typed out. Source and Binary - Occupies Ø - 571.

1080 JUMP TEST - NUS-202

Direct and indirect jump instructions are executed repeatedly to and from pseudo-random addresses. If a jump fails, the exact location of the failure can be ascertained. Source and Binary - Occupies 300 - 507.

1080 OPERATIONS TEST - NUS-203

All GROUP I instructions are executed repeatedly in an attempt to induce equipment failure. If failure does occur, it is possible to localize the hardware trouble. Source and Binary - Occupies Ø - 302.

HARDWARE MULTIPLY-DIVIDE TEST - NUS-204

This program starts at location zero and types out sequentially the results of hardware and software controlled multiplication, division and bit inversion if they differ. If they agree, the messages MULTIPLY OK, DIVIDE OK, and BIT INVERT OK are typed. Binary - Occupies Ø - 667.

DESK AND RESISTANCE CALCULATOR - NUS-205

NICALC performs floating point addition, subtraction, multiplication, division, square root, log, and exponentiation functions. Furthermore, it can solve normal voltage divider equations, calculate the effective resistance of two parallel resistors, and determine the decibel relationship between two numbers. Utilizes FPP-1972. Source and Binary - Occupies Ø - 736.

NICODUPE - NUS-206

This program will duplicate tapes, make additional copies and verify binary tapes with a standard (200) leader and checksum parity. In addition, NICO-LOADEON, which has a non-standard (000) leader and in part no checksum, may be duplicated, copied and verified. Source and Binary - Occupies Ø - 724.

NICO-DECIN - NUS-207

When called, this program will accept decimal input from the Teletype. Overflow and invalid characters are automatically checked for within the program. Source and Binary - Occupies Ø - 111.

NICO-TAB - NUS-208

Gives the equivalent of a tabulate instruction to the Teletype, thus allowing neat columns to be easily typed. Source and Binary.

FLOATING POINT PACKAGE 1972 - NUS-209

Now part of the standard Software Package. Source available from NUS.

MESSAGE - NUS-210

This program allows an output of alphabetic characters along a paper tape. It is an ideal program for permanently labeling paper tapes. Source and Binary - Occupies 41 - 311 and 400 - 432.

COMPUTER ART - NUS-211

This program generates exponentially decaying Lissajous figures and normalizes the result to drive an x-y plotter. Fascinating moire patterns can be produced, where several constants can be controlled by the artist. Source and Binary - Occupies Ø - 357. Requires FPP, 1972.

TIMES SQUARE - NUS-212

This program displays the typed text on the scope in a rotating fashion similar to the news signs in Times Square. Source and Binary - Occupies 400 - 553 and 41 - 311.

DICE GAME - NUS-213

Displays two dice on the scope and "rolls" them on Teletype command. Source and Binary - Occupies Ø - 270.

NICO-PAGE - NUS-214

Any tape may be converted into a page by page listing. Source and Binary - Occupies Ø - 112.

NMRCAL 1085 OVERLAY - NUS-215

This overlay causes an entire 4K section to be used for the stick display and another 4K to be used for the Lorentzian display. Requires a 1085 (20K) or larger system. Source and Binary - Occupies no new space.

MDIAG - NUS-216

This matrix diagonalization routine operates on a packed upper triangular matrix stored in data memory, and produces an N x N matrix of eigenvectors and a diagonalized matrix, where the eigenvalues are contained in the diagonal. It operates in conjunction with Floating Point, 1971. The program also contains useful two dimensional array to single-dimensional array conversion routines and Floating Point Skip subroutines. Source only. Utilized FPP-1971 and Occupies 700 - 1760.

THREE POINT SMOOTH AND BASELINE SMOOTH - NUS-217

Overlay to FT-Nmr 1972. Upon command SM performs a three point smooth on all displayed data. Upon command BS it picks out major peaks and performs a three point smooth on the baseline between them. The scientific validity of this latter command is roughly equivalent to the initials of the command. Source and Binary - Occupies 5213 - 5312 and 106 - 111.

FORWARD AND INVERSE COMPLEX FOURIER TRANSFORM - NUS-218

This is the classical Fast Fourier Transform method and will accept both real and imaginary data. The inverse transform can also be taken via this program. Source and Binary - Occupies 600 - 1015 and 1055 - 1161. Overlays FT-Nmr 1972.

ISOMETRIC PLOT - NUS-219

ISOPLOT produces a two dimensional projection of the three dimensional plot of real data vs. imaginary vs. frequency as viewed at a 45° angle down the frequency axis. It operates as an overlay to the FT-Nmr Program. ISOPLOT operates with an x-y plotter only. Source and Binary - Occupies 5213 - 5400 and 172 - 173.

DECIMAL-OCTAL CONVERSION TABLE - NUS-220

This program types out a decimal-octal conversion table on the Teletype, modulo 4096. The formatting can be changed to produce more or less significant figures by modifying the source code. Source and Binary - Occupies Ø - 156.

PUT AND TAKE PROGRAM - NUS-221

This program occupies locations 7600 - 7631 in place of Swap. It copies the 4K area selected by the Readout Buttons into the second 4K of program memory. Upon starting at a second address, it copies the contents of the second 4K of program memory into the area selected by the Readout Buttons. This program requires two stacks of program memory. Source and Binary.

NORMALIZATION CONSTANT OVERLAY TO FT-NMR 1972 - NUS-222

This patch allows the user to access the Normalization Constant used in scaling the FT data upon typing the command NC. This is useful in comparing the relative amplitudes of different transformed spectra. Source and Binary - Occupies 5401 - 5410 and 112 - 113.

INTENSITY PRINTOUT OVERLAY TO FT-NMR 1972 - NUS-223

This patch to FT-Nmr 1972 allows the Peak Printout routine (PP) to list out a fifth column: the intensity of the highest data point in the spectrum. In cases where intensity is more important than integral, this information can be useful. Source and Binary - Occupies 5374 - 5400.

OVERLAY TO ASSEMBLER - NUS-224

This patch causes the Assembler program to fill the last page of a listing with line feeds to the standard 11 inch length and to punch a Rubout in the trailer section of binary and source tapes. Source and Binary.

SNOOPY - NUS-225

All the fun of Schulz's character in digital form. Snoopy occupies 1K of data memory and can be Fourier transformed and restored using the inverse transform program in NUS-80/U-7218. Imagine the surprise of your students when the transform of "garbage" produces an old doggy friend. Binary only. Occupies 100000 - 101777.

FIXED INTEGRAL PATCH TO FT-Nmr 1972 - NUS-226

The P subcommand under ID (Integrate Display) is replaced with the Command F which fixes the integral in memory. Plotting can then be accomplished with the standard PL routine. Source and Binary. Uses no new memory.

VARIABLE SCALE INTEGRAL PATCH TO FT-Nmr 1972 - NUS-227

Withdrawn. Is part of FT-Nmr 1972 Revision I.

FULL SCALE DIGITAL PLOT PATCH TO FT-Nmr 1972 - NUS-228

Withdrawn.

BLOCK AVERAGING PATCH TO FT-NMR 1972 - NUS-229

The "Block Averaging" Technique is utilized for signal averaging in the frequency domain. This technique is useful when it is desirable to signal average data having a huge dynamic range, such as when one or more strong solvent lines are present. Data are acquired in the time domain until the strong signals almost overflow memory. The resulting sum is processed and transformed and added to a second block of data memory. The first block can then be zeroed and new time domain data taken until memory is again almost full. The result of this process is that only the strong line will overflow memory in the frequency domain and that a very large dynamic range can be handled efficiently. Source and Binary - Occupies 142 - 143, 74 - 77.

FIXED BLOCK SIZE FOR MC, PC and AP - NUS-230

Withdrawn - Part of FT-Nmr 1972 Revision I.

FAST EM FOR FT Nmr - NUS-231

This patch uses an approximation to produce an exponential window in only 1 second per 4K data block. The accuracy is somewhat less than the standard EM near the tail of the exponential. Binary only - Occupies 4714 - 4775.

INTEGRATE LIMITS PATCH TO FT-Nmr - NUS-232

The new subcommand I under the IR command causes the integral of the intensified (or expanded) region to be printed out in digital form. Occupies 5213 - 5244.

OVERLAY TO DRIVE JEOL PULSE 3 - RELAY 1 HARDWARE - NUS-233

This patch drives the Nicolet modification to the 1080 which steps JEOL 5400 step recorders. The pen lift is automatically actuated using RELAY 1 and the hardware division network divides the 16,384 pulses into 5400 steps. Source and Binary - Occupies no new space.

FAST PASS - NUS-234

This program can be used to cross correlate the response of a rapidly scanned cw-nmr spectrum with the response of an (a) theoretical or (b) experimental reference line. The program is written to utilize the method described by J. Dakok et. al. at the 13th Experimental Nmr Conference. Source and Binary.

MANUAL T_1 MEASUREMENT USING THE JEOL PULSE PROGRAMMER - NUS-235

This patch allows the setting of the interval between the 180° and 90° pulses using the command IN. This sets and resets the interval counter in the JEOL pulse programmer T_1 plug-in. Overlays FT-Nmr 1972. Occupies 5213 - 5337, and 106 - 113.

FIXED POINT OUTPUT FOR FT-Nmr - NUS-236

Withdrawn - Part of Ft-Nmr 1972 Revision I.

PROGRAM DECODER - NUS-237

This program is a classical "disassembler," which, given an initial and final memory address, causes the printing of the specified region in either octal or assembler instructions. This has the advantage that unknown pices of code can be decoded during a dump for later analysis. Binary only - Occupies Ø - 1177.

NIC-293 TIMER TEST - NUS-238

The duration of the 293 Timer may be selected arbitrarily using Teletype input. Source and Binary - Occupies Ø - 265.

NIC-293 DIGITAL I/O TEST - NUS-239

This program allows an easy test to see if the I/O module of the 293 Controller is making errors. A digital ramp is loaded into the output register and read via the sense-contact lines. If what is read back does not agree with what was loaded into the output register, an error message is printed. Source and Binary - Occupies Ø - 117.

NIC-293 DAC TEST - NUS-240

Ramp and square waves may be generated under software control to test the operation of the DAC and allow easy calibration. Source and Binary - Occupies Ø - 150.

NIC-293 ADC TEST - NUS-241

Two alternate inputs are multiplexed under software control, allowing easy calibration of the ADC module. Source and Binary - Occupies Ø - 26.

SPECTRUM REVERSE PATCH TO FT-Nmr 1972 - NUS-242

This causes the left to right reversal of the displayed region upon giving the command SR. This is particularly useful when the rf carrier was placed at the high frequency end of the spectrum instead of the low frequency end. This command is non-destructive of data and can be called twice to restore the spectrum to its original configuration. Source and Binary - Occupies 5213 - 5235 and 174 - 175.

ASTROCAL - NUS-243

ASTROCAL is a sophisticated desk calculator routine, which allows multiple operations in the same expression, transcendental functions, and 100 special storage locations. It operates in either fixed point or floating point mode and utilizes FPP-1972. Occupies location Ø - 536 and 6000 - 7577, leaving pages 2000 and 4000 free for the Assembler-Editor and Nicobug. Source and Binary

BUGBOMB - NUS-244

BUGBOMB is a special tape for reloading the Binary Loader after a program "bombs" if Nicobug is intact. It enters and starts Nico-Loadeon at the Teletype keyboard-reader. Nico-Loadeon is attached and reads in automatically. Finally the Binary Loader is started by overlaying the intermediate loader with a jump to 7777. Binary only.

POWER-OF-2 - NUS-245

POWER-OF-2 utilizes a set of special driver subroutines, UTIL1 and UTIL2 and calculates any positive power of 2 having up to 4096 digits. Uses FPP-72. Occupies Ø - 1777 and 6000 - 7577. Uses first data stack for scratch. Source and Binary. Submitted by J. M. Luce, Med Data, Inc.

UTIL1 - NUS-246

UTIL1 is a series of source subroutines for message and text handling. They include:

ASFPM - prints a message, gets a floating point number and stores it
ASKFXM - prints a message gets a number, fixes it and stores it
PRINTM - prints an in-line string of characters
PRNTMS - prints a message
DOLOOP - sets up a do loop
NOLOOP - terminate a do loop
TSTACC - sign test on AC
TSTFAC - sign test on FAC
CMPFX - arithmetic comparison of two integers
CMPFP - arithmetic comparison of two floating point numbers
SHIFTN - variable length shift routine

Source only. Submitted by J. M. Luce, Med Data, Inc.

UTIL2 - NUS-247

UTIL2 is a series of source subroutines for array handling. They are:

ARYDIM - "Dimensions" an array by making a table entry
ARYSET - Sets each work of an array to a given integer
SUB1 - singly subscripted array handling
SUB2 - doubly subscripted array handling
ARYLKP - looks up the table entry for an array

Source only. Submitted by J. M. Luce, Med Data, Inc.

ASTRO-TEST - NUS-248

Astro-test is a simple minimum length program for testing and diagnosing faults in core memory. Source and Binary - Occupies Ø - 150.

TTI - CALCULATOR - NUS-249

This program converts the 1080 into a simple desk calculator with iterative capabilities. Strings of commands can be entered and run continuously until interrupted. Source and Binary - Occupies Ø - 526 and 6000 - 7577. Submitted by W. Siebert, Transform Technology, Inc.

NICOLET USERS SOCIETY REGISTRATION FORM

Name _____

Title _____

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Complete Mailing Address _____

_____

_____

_____ ZIP _____

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Machine Model _____
Serial Number _____

Instruments to which you plan to connect your 1080:

_____

Principle application or research area:

_____

_____

In order to receive software updates and notification of new NUS programs, please complete this form and return to:

Nicolet Instrument Corporation
Attention: NUS
5225 Verona Road
Madison, Wisconsin 53711

NICOLET USERS SOCIETY

PROGRAM ORDER FORM

NAME _____

ADDRESS _____

_____

_____ Zip _____ Phone _____

Please send the following programs:

Name	Number	Binary	Source
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

NOTE: LIMIT -Five programs per installation per month. Please cooperate to allow most efficient distribution to all NUS members. Please do not order source tapes unless you plan to modify the programs.

1080 OWNER'S SIGNATURE _____

Send Order Form To:

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Madison, Wisconsin 53711

EUROPEAN COUNTRIES

Dr. Peter Langner
Nicolet Instrument GmbH
Goerdeler Strasse 48
D-605 Offenbach am Main
West Germany

NICOLET USERS SOCIETY
PROGRAM SUBMISSION FORM

NUS will duplicate and distribute any program which is submitted after it has been evaluated by our test department, providing the following are included:

(1) a source tape or listing,
(2) a binary tape, and
(3) a set of instructions on the program's use

Please complete the form below, or a facsimile, and submit it with each program.

Program Title: _____

Short Abstract:

Author (s) _____

_____

Address _____

_____

_____

I hereby give NUS and Nicolet Instrument Corporation full permission to utilize and distribute this program in any form they see fit.

_____
Signature

Enclosures:

_____SOURCE TAPE
_____LISTING
_____BINARY TAPE
_____FULL OPERATING INSTRUCTIONS

Core locations Occupied _____
Additional Programs Needed _____
_____
_____

PHASE CORRECTION USING KNOBS - NUS-250

This program replaces the AP command of FT-Nmr 1972 with the PH command which allows adjustment of the phase of the displayed spectrum using two knobs attached to the NIC-293 ADC board channels Ø and 1. A simple schematic for attaching two 10-turn pots to the NIC-293 Controller is provided. Source and Binary - Occupies 5531 - 5655 and 161 - 165. Submitted by W. Siebert, Transform Technology, Inc.

FT-Nmr OVERLAY FOR 293 PULSE CONTROLLER - NUS-301

Introduces the commands, P1, P2, P3, D1, D2 and D3 referring to three pulses and delays whose values can be entered at the Teletype and used with the NIC-293 Controller. The triggering of the pulse sequence as well as turning it on and off are entirely flexible. Occupies 5127 - 5177, 5213, 5366, 136 - 137, 102 - 103. It overlays the entire user's area and the MC command. Source and Binary.

ZERO BEYOND CURSOR FT-Nmr OVERLAY - NUS-302

This program causes all address beyond the entered address to be set to Ø. Source and Binary - Occupies 106 - 107 and 5213 - 5247.

MULTIPLE PULSE PATCH FOR THE MEASUREMENT OF T_2 - NUS-303

This patch, in conjunction with NUS-7301 allows the setting and use of 5 timers to produce the sequence P1 - D1 - $(P2\text{-}D2)_n$ - P3, where n is an entered parameter. The sequence can be used for a Carr-Purcell train, where P1 is the initial 90 and P2 the 180° pulse. P3 can then be used to trigger the onset of data acquisition. Source and Binary - Occupies 3141 - 3200, 142-143, 122-123, 146-147. The punch routine is removed.

NON-NORMALIZED INTEGRAL PATCH TO FT-Nmr - NUS-304

This patch causes the absolute value of the integral to be printed in the PP routine, rather than the normalized integral. The MI command no longer has any effect. Source and Binary - Occupies no new core.

ASTRO-KALEIDOSCOPE - NUS-305

Astro-Kaleidoscope produces interesting, constantly changing patterns on the oscilloscope. A Fibonacci series is involved in the generation of the patterns; however, the user is invited to speculate as to the exact mode of operation, since the code is entirely uncommented and unintelligible. Source and Binary - Occupies Ø - 76.

QED-18B - NUS-306

QED is a fast, more sophisticated text editor, having a three character search, multiple line deletions, and line modification commands. It stores text in a different fashion than the Assembler-Editior and the code must be punched out and re-read before assembly. With disk systems, FORCON may be used. Binary only - Occupies 2000 - 5777 and utilizes 8K of data memory for text.

FORCON - NUS-307

Withdrawn - obsoleted by disk assembler

TIMES SQUARE - Version 2 - NUS-308

This version of Times Square allows all punctuation as well as all integers and alphabetic characters. It also recognizes the rubout for deletion during message entry. At the end of the text, a FORM (CONTROL/L) begins the circulating display. Source and binary - occupies 0-464 and utilizes 1K of data memory for each 17 characters. Submitted by David Dalrymple, University of Delaware.

XAP - FIXED POINT ARITHMETIC ROUTINES - NUS-309

This is a signed multiply-divided, square and square root routine package which assumes that the binary point lies between bits 18 and 19. Source only - Occupies 113 locations.

DISASSEMBLER - NUS-310

This program decodes binary instructions stored in memory and prints out an assembly language listing. It recognizes pointers, starts of subroutines and constants as well as all mnemonics. Source and binary - occupies 0-3050. Submitted by W. Kreysch, Institut fur Biophysik der Ruhr-Universitat, Bochum, West Germany.

DISK VIEW - NUS-311

Disk View operates in Conjunction with DEMON Revision I, to produce a CRT display of 4K of data starting at track 20. The size can easily be changed to 8 or 16K, and the place in core selected using the Readout pushbuttons. This program allows the user to step through the disk in 1 of N track increments, where N is selectable, viewing the contents of the disk. By jumping back to the monitor the user can easily restore a crashed disk. Source and binary.

FOUR OPERATIONS OF FLOATING POINT ARITHMETIC - NUS-312

This is a collection of routines which simplify the use of the Floating Point Package by allowing the user to perform addition, subtraction, multiplication and division sequentially using successive core locations as pointers. Occupies 5366-5776. Submitted by J. Puskar and Vaige Salem, Institute of Cybernetics of the Estonian Academy of Sciences, Talinn, USSR. Source and binary.

ASTROGRAPH - NUS-313

Astrograph solves a 4th order polynomial and displays it on the CRT. An intensified point will roll around on the curve, bouncing off the edges of the scope and appearing to operate under the influence of gravity and a variable viscosity term. Submitted by J. Kisslinger, Astro-Digit, Inc. Source and binary.

LEFT AND RIGHT SHIFT PATCHES TO FT-Nmr 1972 - NUS-314

These programs allow the user to shift the displayed area to the left or the right by a preselected number of points. The end is filled with zeroes. This can be used for aligning spectra or for shifting pulse feed-through off the end of the free-induction decay. Source and Binary - Occupies 5245 - 5325 and 114 - 117.

PSCHEDELIC BOX DISPLAY - NUS-315

A small box is displayed which grows in diameter rapidly. When it fills the screen, it disappears. A new small box begins immediately, producing the illusion that boxes are being thrown at you. Great for parties and dull meetings. Source and Binary - Occupies Ø - 74.

KINET - NUS-316

KINET simulates complex first order kinetic reaction systems of two to four compounds, related by any combination of reversible or irreversible, simple, competitive or consecutive reaction pathways. Binary Only - Occupies Ø - 1245. Requires FPP - 1972. Submitted by D. Dalrymple, University of Delaware.

DIRCOP - NUS-317

DIRCOP is a patch to DEMON Revision I which adds the command COP for making a spare copy of the disk directory on track 17, in case the copy on track 3 is lost. Binary only - Occupies 6060 - 6061, and 7121 - 7135. Submitted by D. Dalrymple, University of Delaware.

DUMP - NUS-318

DUMP overwrites the Save and Dump routine of Nicobug II and is used to dump only those memory locations which have changed contents. It saves time in debugging long programs by eliminating both the tedious search of memory for the source of error and the necessity of rereading long binary tapes after a program fails. Source and Binary - Occupies 4636 - 4667, 4602 - 4620. Submitted by David A. Wright, Michigan State University.

PACK - NUS-319

PACK is a patch to DEMON Revision I to pack (sweep) the contents of a disk, deleting empty files and other unused but inaccessible tracks from the directory and disk. Both the directory and the disk tracks are shuffled to accomplish this. Binary only - Occupies 6056 - 6057 and 7102 - 7120 of DEMON Revision I. Submitted by D. Dalyrymple, University of Delaware.

DIV32 - PATCH TO FT-Nmr 1972 - NUS-320

DIV32 patches FT-Nmr 1972 to scale transformed spectra such that the largest peak will be on scale with a vertical display scale setting of 2K rather tha 65K. Source and Binary - Occupies 1147 - 1154. Submitted by D. Dalrymple, University of Delaware.

ZERO-SET - PATCH TO FT-Nmr 1972 - NUS-321

ZERO-SET patches FT-Nmr, 1972 to allow setting the x-offset of the x-y recorder used for plotting spectra, such that a particular peak will come at a desired location on the chart paper (e.g., TMS at Ø Hz). Source and Binary - Occupies 5213 - 5242. Submitted by D. Dalrymple, University of Delaware.

HALT-QUIT PATCH TO FT-Nmr 1972 - NUS-322

This patches FT-Nmr 1972 for temporarily halting or completely aborting a PP or PL operation while in progress. Source and Binary - Occupies 5350 - 5400. Submitted by D. Dalrymple, University of Delaware.

PEAK-TO-PEAK CURSOR ADVANCE PATCH TO FT-Nmr 1972 - NUS-323

A patch to FT-Nmr 1972 to print out the address of each peak in a spectrum and simultaneously display the spectrum with the cursor (intensified dot) on each of the peaks in turn. Source and Binary - Occupies 5313 - 5342. Submitted by D. Dalrymple, University of Delaware.

AC TWINKLER - NUS-324

This program randomly generates and bit inverts two bits in the AC at a slow enough rate for the eye to follow. The results are entertaining if not mesmerizing. Source and Binary - Occupies 1000 - 1024. Submitted by J. M. Luce, Med Data, Inc.

1070 TAPE READER PATCH TO FT-Nmr 1972 - NUS-325

This patch introduces the command RD, which reads in a paper tape punched out by a 1070 paper tape punch. It is read into the memory block selected by the Readout starting button. Source and Binary - Occupies 3141 - 3217 and 146 - 147. Replaces the PU command.

SQUEEZ1 - NUS-326

SQUEEZ1 reads in ASCII paper tapes and deletes excess leading spaces in the copy it punches out. This decreases the text storage requirements for assembly. Source and Binary. Submitted by J. M. Luce, Med Data, Inc.

RAPID SCAN DATA PACKAGE - NUS-327

The Rapid Scan Data Package allows the user to easily acquire and manipulate data from a NORCON rapid scan optical spectrometer.

This spectrometer presents two trigger locked time signals with a one to one correspondence between time and wavelength. The resulting spectrum is that of the light source which was incident on the input of the spectrometer, divided into two subspectra. The characteristics of these two spectra are that they have some wavelength overlap and that each one has an end region where low sensitivity yields unpredictable data. Further, the sensitivity of the two halves from two separate detectors may not be exactly equal.

The Rapid Scan Package accomplishes the following:

1) The spectral wavelengths can be easily established from a known standard source. For instance, a mercury lamp with known peaks can be used to accurately establish the wavelength to time relationship in the visible region. This calibration need only be done once if the experimental parameters remain unchanged.

2) Unequal sensitivities between the two sensors are automatically compensated for.

3) A final spectrum is calculated where the overlap is removed and the bad end regions are deleted. This yields a continuous spectrum over only the valid data regions.

4) For a light source in the visible region, the tristimulus coordinates are calculated.

5) The final spectrum which contains only relative numbers may be easily converted to absolute terms by typing in the average luminous power of the source.

6) A plot routine enables the user to obtain calibrated plots of the final spectra easily.

7) Print and dump routines also produce numerical output.

Binary Only - Occupies Ø - 7577 and stores standard curves in 104000 - 107777.

MOD 2 PATCH TO FT-Nmr 1972 - NUS-328

This program introduces a total acquisition time printout to the SW command, and prints out the digital resolution in Hz. After the TC constant has been entered the total broadening in Hz is printed. The F1 and F2 commands have been modified to print out the address followed by the frequency and value in ppm. A DD (Data Dump) command causes the printing of the digital contents of addresses between F1 and F2. A threshold has been added to the PP command which inhibits peak printout of peaks having an intensity below the threshold. This tape also contains versions of Normalization Constant Overlay (NUS-7222), Intensity Printout (NUS-7223), Fixed Integration Patch (NUS-7226), Integrate Limits (NUS-7232), Spectrum Reverse (NUS-7242) and Non-normalized Integral Patch (7304). Binary Only. Replaced DW, MC, PU, CC and AP and fills the entire user's area. Submitted by Dr. Robert A. Craig, Indiana University.

LOG OF SPECTRAL REGION - NUS-329

Patch to FT-Nmr, 1972 to take log of spectral region using command LD and restore using EX for exponentiate. Assumes positive data. Occupies 5213-5251 and 106-111. Source and Binary.

PHASE CORRECTION AND FT-PHFT - NUS-330

This stand alone program takes the Fourier transform of the displayed block and then allows region expansion and real time knob interactive phase correction using the 293 or NIC-80 knobs. When the zero order correction is completed, the first order correction can be done while holding one peak constant in phase. Occupies 0 - 3000. Source and Binary.

JEOL PLOTTER OVERLAY TO FT-NMR REVISION II - NUS-331

Overlays FT-Nmr Rev. II with device codes for JEOL plotter pulse stretcher box.

JEOL PLOTTER OVERLAY TO T1PRGM - NUS-332

Overlays T1PRGM plot routine for JEOL pulse stretcher box.

OCTAL DEBUGGING PROGRAM - NUS-333

This is a re-written version of Nicobug, which in addition to the usual commands, includes exclusive dump of locations not equal to number added with mask, ability to write all locations between limits equal to a number, copy of locations between F and T into new region, and comparison of two blocks of memory. Occupies 4700 - 5457. Source and Binary. Submitted by A. Heiss, Bruker Physik, A.G.

NICO-LOADEON FOR HIGH SPEED READER - NUS-334

This version of Nico-Loadeon uses the High speed reader. Two differences exist in the numbers toggles in, as well. Binary Only. Submitted by A. Heiss, Bruker Physik, A.G.

PATCH TO ASSEMBLER-EDITOR, 1973 - NUS-335

This patch causes the line counter to be incremented by the N command. In octal mode all non-executable statements are ignored. The # command prints out the current line number. CTRL/T prints the absolute line number of the last line of the text followed by the last allowed address for text storage. Source and Binary. Submitted by A. Heiss, Bruker Physik, A.G.

YIN-YANG - NUS-343

This program draws the familiar Yang and Yin symbols on the scope. Occupies 0-223 and uses FPP72. Submitted by William Cunningham, University of Alabama Medical Center. Source and Binary.

TAPE DUMP - NUS-344

Prints out the contents of a binary tape in octal as it reads it. Source and Binary. Occupies 0-347. Submitted by B. Bangerter, University of Illinois-Chicago Circle.

AXIS - NUS-345

This patch to FT-Nmr 1972 draws a horizontal axis on a plotted spectrum with vertical hatch marks at each ppm (adjustable to other spacings). Occupies 146-147, 1317-1364 and 3141-3221. Destroys PU, AP and CC but not PH, PS or any other patch in the user's area. Source and Binary. Submitted by D. Dalrymple, University of Delaware.

NIM - NUS-346

Test your mathematical agility by playing this time honoured game. The object of the game is to be the last to remove a number from three columns of numbers. Sounds easy? You'd be surprised. Source and Binary. Occupies 0-655. Submitted by J. E. Pearson, Roche Products Ltd., England

TEMCAL - NUS-347

This program calculates chemical shift for methanol or ethylene glycol at any temperature, and vice-versa. Source and Binary. Occupies 0-636. Submitted by Leon Huang, University of Chicago.

ANGLE - NUS-348

Angle calculates alpha=arccos $(e^{-T/T1})$. Source and Binary. Occupies 0 - 137. Submitted by Leon Huang, University of Chicago.

Disk Editor - NUS-349

This disk based text editor operates in conjunction with DEMON/II and allows manipulation of files of virtually "infinite" length stored on disk. The features include multiple line deletions, 72-character string searches, text moves file extractions and recombinations, current line number and jumps by an entered number of lines commands. Binary Only. Ocuppies 0-3777.

NUS PROGRAM ABSTRACTS

DASM - Disk Assembler - NUS-350

Withdrawn - obsoleted by IMP disk assembler.

1070-NIC-80 Interface Software - NUS-351 - 353

This group of programs consists of a Teletype controlled executive which allows the user to initiate a number of routines. Included are 1, 2 and 4-input variance, Fourier transforms and auto and cross-correlation, as well as display and cursor manipulation. A 1070-NIC-80 interface board is required to execute these programs. Specify only those programs needed. Binary only.

NUS-351 - 1070 - 1080 Single Input
352 - 1070 - NIC-80 Dual Input
353 - 1070 - NIC-80 Four Inputs

LINE TILT PATCH TO LAB-80 PROGRAM - NUS-354

This program is a patch to the LAB-80 package which moves data up and down and rotates and bends it according to parameters, which can be entered at the Teletype. Occupies 4000-4300. Source and binary. Submitted by Don Ware, Bruker Magnetics, Inc.

Nth ORDER BINOMIAL SMOOTH - NUS-355

This patch to FT-Nmr 1972 allows a 1, 3, 5, 7... n point binomial smooth of data points. Overlays IR. Occupies 3420-3461. Submitted by Clark Thompson, Nicolet Technology, Inc.

REINDEER - NUS-356

This program punches out an endless string of reindeer on the low speed punch. Use the red tape at the end of rolls for added jollity at holiday time. Source and binary. Occupies 0-150.

PING-PONG - NUS-357

Ping Pong for NMR-80 or BNC-12 computers with phase knobs. First person to reach 15 and be two points ahead, is the winner. Source and binary. Occupies 0-622. Submitted by Clark Thompson, Nicolet Technology, Inc.

DISK VIEW/II - NUS-401

This version of Disk View operates in conjunction with DEMON/II and allows the restoration of crashed disks by viewing their contents in blocks whose size is selected by the Readout push-buttons. Occupies 0-261. Source and binary.

EXACT SW PATCH TO BNC 1973 FT-NMR PROGRAM - NUS-402

This patch corrects the round-off inaccuracy between the entry of SW and the calculated DW. SW is then recalculated and stored correctly. Occupies 4030-4034. Source and binary.

PONG FOR NIC-293 PHASE KNOBS - NUS-403

This version of PONG operates using the NIC-293 phase knobs rather than those of the NMR-80 or BNC-12, allowing use with 1080 systems. Submitted by Clark Thompson, Nicolet Technology, Occupies 0-650. Binary only.

TAPE READ PATCH TO FT-NMR 1972 - NUS-404

This program allows tape to be read in via the TTY or HSR, replacing bit 8 in even parity tapes if HSR is used; replaces the MC command. Allows manual access to individual memory locations. Occupies 5127-5160 and 6453-6462. Submitted by H.W. Akitt, University of Leeds, Leeds, England. Source and binary.

FELIX - NUS-405

FELIX is a program which solves the Bloch equations by numerical integration. It can be used to simulate the results of pulsed or field-swept cw nmr experiments, generating FID's, absorption signals, etc., as functions of T_1, T_2, H_1 and offset frequency or sweep rate. Submitted by Dr. David Dalrymple, Department of Chemistry, University of Delaware. Occupies 0-1326 plus FPP72. Source and binary.

HSWEEP PATCH TO FELIX - NUS-406

HSWEEP is a patch to FELIX (NUS-405) to convert it to a program to simulate rapid-passage field or frequency-swept cw nmr experiments. The modified program occupies address 0-1326 and requires FPP72 for operation. Submitted by Dr. David Dalrymple, University of Delaware.

DISK EDITOR ASSEMBLER FILE CONVERTER - NUS-407

This program converts files created by DSKED to files which can be read by Assembler-Editor, 1973. Occupies 0-362. Binary only. Submitted by Dr. Peter Bachmann, Spectrospin, A.G.

AUTOMATIC SHIFT PATCH TO FT-Nmr 1972 - NUS-408

This patch can be used to perform frequency domain averaging and features an automatic shift routine to correct for field drift (enabling operation without using an nmr lock). It includes a modified version of the block averaging patch (NUS-229). It was originally written to be used with FT-Nmr Revision II but should also be compatible with Revision I. Submitted by David R. Weiler, Department of Chemistry, University of Saskatchewan, Regina Campus. Source and binary. Occupies 5531-5655, 5672-5700, 5245-5317, 162-5 and 115-123. Overlays AP and CC.

DBLOCK - DISK BLOCK AVERAGER - NUS-409

DBLOCK allows averaging of weak signals in the presence of strong ones to continue beyond the memory overflow point by transforming the data and summing it into a disk file of successive transforms, thus allowing all of memory to be used for signal averaging. This program operates in conjunction with DEMON/II and T1 PROGRAM/II and allows disk based block averaging of data acquired using the NIC-80, BNC-12 or 1080 with or without the NIC-293 Controller. After a specified number of scans, the data are Fourier transformed and phase corrected and added into a frequency domain file accumulating on disk. After the specified number of blocks have been taken, each with the desired number of scans, the file can be further manipulated using the T1 PROGRAM/II. If desired, block averaging can also be performed on a T1 experiment having up to 30 delay values. Source and binary. Occupies 0-1777.

NORMALIZED INTENSITY OVERLAY TO FT-NMR 1972 - NUS-410

This program prints an additional column of peak printout which is the intensity of the peak normalized to 1000. The MI command set minimum intensity instead of minimum integral. Deletes PU, AP and CC. Binary only. Submitted by Gunther Jaeckel, Nicolet GmbH.

RESTORE FOR DEMON/II DIRECTORY - NUS-411

This overlay for DEMON/II's SYSGEN allows a user to retype his directory from the information on a full directory listing in the event of a destroyed directory. Binary only.

BILLIARDS GAME - NUS-412

A simplified version of bank billiards played on the oscilloscope with two balls. Points are scored by banking the cue ball off one or more cushions before striking the target ball. Requires NIC-293 phase knobs. May work with NMR-80 knobs as well. Occupies 0-530. Source and binary. Submitted by Dr. David Dalrymple, University of Delaware.

PING - NUS-413

A patch to PONG (NUS 403) to convert it to a version in which the game is displayed as if viewed from the side of the table instead of from above; i.e., the ball follows parabolic trajectories. Occupies additional addresses 627-637. Source and binary. Submitted by Dr. David Dalrymple, University of Delaware.

LEAST SQUARES PLOT IN T1 PROGRAM/II - NUS-414

A patch to the T1CALC module of T1 PROGRAM/II to generate a plot of the ln $(1-A/A_0)$ vs tau points and the least squares line through them for each peak in the spectrum. Allows deletion of individual points and recalculation of T1. Also includes provision for specifying allowable drift in peak positions. Occupies 3774-5 and 4251-5003 of T1 CALC. Works with xy plotters only. Source and binary. Submitted by David Dalrymple, Department of Chemistry, University of Delaware.

LEAST SQUARES SUBROUTINE - NUS-415

This subroutine performs a linear least squares analysis on two arrays of floating point data. From these blocks of x and y values, the slope and intercept are calculated. If the output switch is set, the x, y, calculated y, the deviation from the computed y and the standard deviation of y are printed. In addition, the slope, intercept and the average standard deviation of y is printed in the least squares summary. Floating point values are used in this subroutine in order to eliminate overflow that would be associated with integer values. Source only. Occupies 516 locations.

LABELER - NUS-416

This program permanently labels and duplicates any source or binary program tape. Any of the Keyboard characters may be used in the labels and the characters are punched right side up. Occupies 2000-3777. Source and binary. Submitted by Larry W. Wilson, University of Oklahoma.

DISASSEMBLER OVERLAY FOR NUS-310 - NUS-417

This program makes an internal correction to the disassembler program so that the response N to the query "TYPE (J,N)" restarts the program. Source and binary. Submitted by Larry W. Wilson, University of Oklahoma.

OCTAL-DECIMAL CONVERTER - NUS-418

By typing the command OD and then a whole octal number between 0 and 3777777 the program responds by typing out the equivalent decimal number. The decimal point must be typed on all but seven digit numbers. Occupies 0-1003. Binary only. Submitted by Alfred J. Temps, Albert Einstein College of Medicine, Department of Biophysics.

CENTRONICS LIST PROGRAM - NUS-419

This program will list any ASCII file on the Centronics printer and make multiple copies by typing the M option to the DCI. A string of files can be entered for sequential listing as well. Occupies 0-1777. Source and binary.

TIC TAC TOE - NUS-421

The computer plays a game of tic tac toe with the user on the Teletype. The program is useful in demonstrating programmed decision making and can be used as an interesting computer demonstration for "science day," etc. Occupies 0-1432, Source and Binary. Submitted by Larry W. Wilson, Beckman Instruments Inc.

BULLETIN - NUS-422

This program types a changeable bulletin to users of your computer system. The bulletin may be used to provide instructions in the use or certain programs, inform your users of experimental procedures, etc. The program occupies 0-7577 for 96 full lines of type. Source and Binary. Submitted by Larry W. Wilson, Beckman Instruments, Inc.

DIFFERENTIATION OF DISPLAY IN LAB-80 - NUS-423

This routine adds to the LAB-80 signal averaging package the capability to calculate the differential of the displayed area using the Newton-Gregory forward interpolating polynomial. Occupies 4000-4112 and 164-5. Source and Binary.

QUADRATURE DETECTION NMR PROGRAM - NUS-424 and 425

This program is a revision of FT-74 allowing acquisition of data into two inputs which then baseline corrects each of the two free induction decays separately, and performs a complex Fourier transform on them. Commands for entering SW and DW have been modified to calculate the bandwidth available on both sides of the carrier and the dual display is an integral part of the package. Requires a 2-input digitizer in a 1080 or Nmr-80 and phase knobs of a Nmr-80 or a NIC-293. Order NUS-424 for a Nmr-80 or BNC-12 with phase knobs. Order NUS-425 for a 1080 having a NIC-293 with phase knobs. Binary only.

FIXED INTEGRAL PATCH TO LAB-80 - NUS-426

This patch replaces the Plot sub command under integrate with an F command which stores the displayed integral in memory. Source and Binary.

EXPANSION PLOTTING FOR JEOL PLOTTER - NUS-501

This program takes an arbitrary addressable range of data from a 4K block, transferring it to the start of another 4K data block. It then prints the (octal) dwell time setting required to make the JEOL plotter advance by the length of the selected region in the JEOL 250 second record interval. The start of the data in the second data stack is readily synchronized with the start of the JEOL record command. Source and Binary - occupies 0-423, starts at 0. Submitted by A.J. Temps, Jr., Albert Einstein College of Medicine.

SIGNAL TO NOISE RATIO CALCULATION - NUS-502

This program computes and prints the RMS noise level of a block of data such as an NMR spectrum. It will then print the signal to noise ratio of operator-selected peak addresses. The data is displayed showing the chosen address intensified. Requires Floating Point Package, 1972. Source and binary - occupies 0-1031, starts at 0. Submitted by A.J. Temps, Jr., Albert Einstein College of Medicine.

PUNCH EXPANDED REGION PATCH FOR FT74 - NUS-503

This is a patch to the Nicolet FT74 program, NIC-32-40620 which alters the "PU" command to punch the region last specified by "EP". Thus, the same region is referenced as for "PL", etc. Source and binary - occupies 1207 and 1211. Submitted by E.H. Williams, University of Adelaide, Australia.

CAT PATCH FOR FT74 - NUS-504

This patch for FT74 enables the use of a 1973 or later model BNC-12 as a CAT on HX90 series spectrometers. Source and binary - occupies 212-213, 6267-6306. Submitted by E.H. Williams, University of Adelaide, Australia.

293 PULSE CONTROLLER OVERLAY FOR FT74 - NUS-505

This patch provides commands, "P1", "P2", "P3", "D1", "D2", "D3", for the lengths of three pulses and three delays in the 293 controller. Commands "ON" and "OF" are provided to turn the sequence on and off from level LEV5 on pin B6. Source and binary - occupies 6231-6456 and 212-231, overlaying dual display area.

MAGNITUDE CALCULATION FOR FT74 - NUS-506

This patch overlays the imaginary part of a spectrum by the magnitude, defined as the square root of the sum of the squares of the real and imaginary parts. Source and binary - occupies 162-163 and 6132-6342. Original code can be restored using FT74 Restore Patch.

RS-232 INPUT FOR LAB-80 - NUS-507

This patch for the LAB-80 Signal Averaging Package reads signed decimal data in ASCII format from the RS-232 interface and stores it in memory. Source and binary - occupies 166-167 and 5000-5055.

INVERSE HERMITIAN FOURIER TRANSFORM - NUS-508

This subroutine can be patched into FT74 to provide the capability of inverting a complex spectrum (up to 4K total in size) to recover the original FID signal or the time domain equivalent of the current spectrum. Can be reassembled to a different origin. Source and binary - occupies 110000-110500. Submitted by T. Moran, University of Wisconsin.

DIRCPY FOR DEMON/II - NUS-509

This program will copy the DEMON/II directory from track 3 onto track 13 in response to the "C" command, or swap the saved directory on track 13 with a damaged directory on track 3 (the "S" command). Note that this does not back up or restore the programs themselves, only the directory. Source and binary. Occupies 0-173, starts at 0.

RANDOM NUMBER SUBROUTINES - NUS-510

This subroutine package consists of subroutines to generate pseudo-random integers or floating point numbers. Distributions can be uniform, normal (Gaussian), or exponential. Floating point values require the use of Floating Point Package, 1972. Code may be reassembled elsewhere from source tape. Source and binary. Occupies 5000-5213. Unused functions may be deleted.

DOG - NUS-511

This ASCII tape prints a picture of man's best friend shaking his fist at the Red Baron. Source only, no program.

PINUP - NUS-512

This ASCII tape produces a beautifully shaded picture of interest primarily to "M.C.P.'s". Source only, no program.

LPTEST FOR CENTRONICS PRINTER - NUS-513

This program prints sets of 3 pages of character test patterns on the Centronics line printer continually until CTRL-Q is typed on the keyboard. Source and binary. Occupies 0-165, starts at 0.