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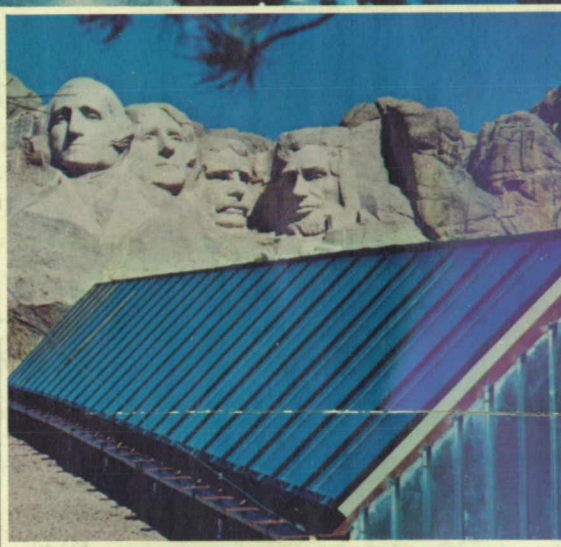
SP-5021 (20)

NASA Tech Briefs Index 1978

National Aeronautics and Space Administration



Vol. 3 (Nos. 1-4) 1978

SP-5021 (20)

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INTRODUCTION

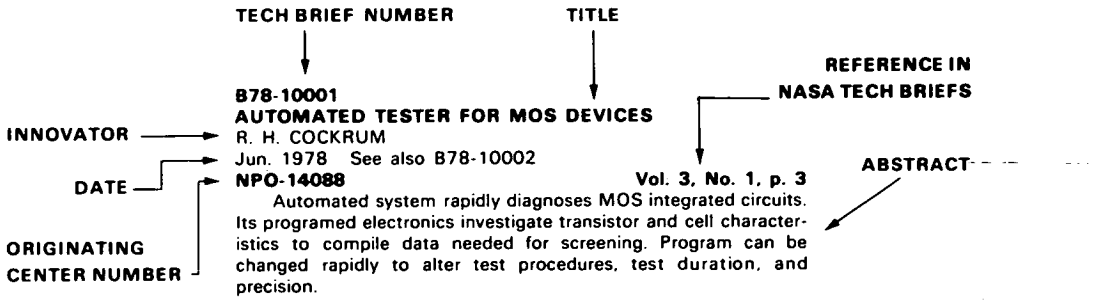
Tech Briefs are short announcements of new technology derived from the research and development activities of the National Aeronautics and Space Administration. These briefs emphasize information considered likely to be transferrable across industrial, regional, or disciplinary lines and are issued to encourage commercial application.

This *Index to NASA Tech Briefs* contains abstracts and four indexes -- subject, personal author, originating Center, and Tech Brief number -- for 1978 Tech Briefs.

Abstract Section

The abstract section is divided into nine categories: Electronic Components and Circuits; Electronic Systems; Physical Sciences; Materials; Life Sciences; Mechanics; Machinery; Fabrication Technology; and Mathematics and Information Sciences. Within each category, abstracts are arranged sequentially by Tech Brief number.

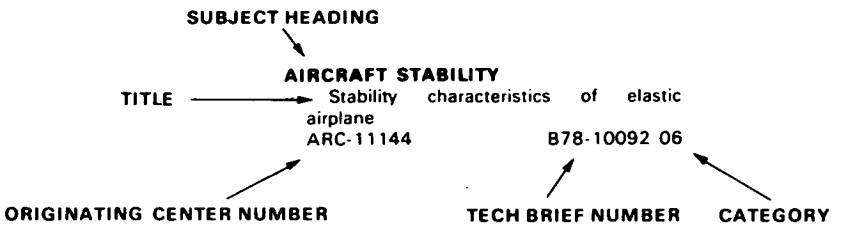
A typical abstract entry has these elements:



The originating Center number in each entry includes an alphabetical prefix that identifies the NASA Center where the Tech Brief originated. A list of prefixes and the corresponding Center names are given on page iii.

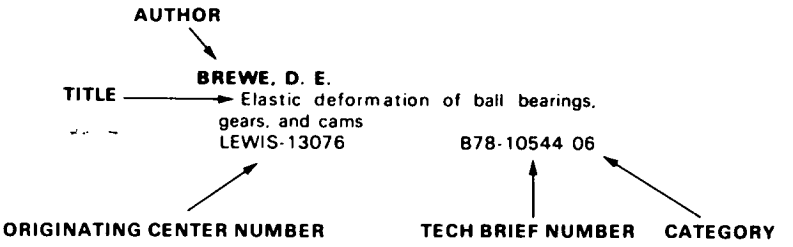
Indexes

Four indexes are provided. The first is a subject index, arranged alphabetically by subject heading. Each entry in the subject index includes a Tech Brief number and a category number to aid the user in locating pertinent entries in the abstract section.

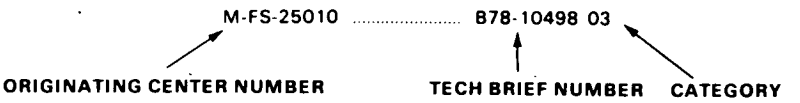


The January 1976 edition of the *NASA Thesaurus* (NASA SP-7050) is used as the authority for the indexing vocabulary that appears in the subject index. The *NASA Thesaurus* should be consulted in examining the current indexing vocabulary, including associated cross-reference structure. Only the subject terms that have been selected to describe the documents abstracted in this issue appear in the subject index. Copies of the *NASA Thesaurus* may be obtained from the National Technical Information Service at $23.50 for the two-volume set.

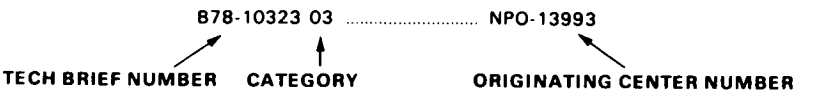
The second index is a personal author index. Entries in this index are arranged alphabetically by author's name. Tech Brief and category numbers are supplied to help the user find the appropriate entries in the abstract section.



The third index relates each originating Center number to the corresponding Tech Brief number and category. Entries in this index are arranged in alphanumeric order by Center number.



The fourth index relates each Tech Brief number to its originating Center number. Entries are arranged in ascending Tech Brief number order.



Originating Center Prefixes

ARC	Ames Research Center
GSFC	Goddard Space Flight Center
HQ	NASA Headquarters
KSC	Kennedy Space Center
LANGLEY	Langley Research Center
LEWIS	Lewis Research Center
M-FS	Marshall Space Flight Center
MSC	Johnson Space Center (formerly Manned Spacecraft Center)
NPO	Jet Propulsion Laboratory/NASA Pasadena Office

Availability of NASA Tech Briefs

Distribution of *NASA Tech Briefs*, a quarterly publication, is limited to managers and engineers in U.S. Industry and to other qualified technology transfer agents, such as; members of the media, teachers, librarians, and professionals supporting domestic commerce and industry.

Requests for individual Tech Briefs or for copies of the quarterly publication should be addressed to the Director, Technology Transfer Division, P.O. Box 8757, Baltimore/Washington International Airport, Maryland 21240.

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Index to NASA Tech Briefs

February 1979

Abstract Section

01 ELECTRONIC COMPONENTS AND CIRCUITS

B78-10001
AUTOMATED TESTER FOR MOS DEVICES
R. H. COCKRUM
Jun. 1978 See also B78-10002
NPO-14088 **Vol. 3, No. 1, p. 3**

Automated system rapidly diagnoses MOS integrated circuits. Its programed electronics investigate transistor and cell characteristics to compile data needed for screening. Program can be changed rapidly to alter test procedures, test duration, and precision.

B78-10002
MEASURING OXIDE TRAPPING PARAMETERS IN MOS STRUCTURE
J. MASERJIAN
Jun. 1978 See also B78-10001
NPO-14120 **Vol. 3, No. 1, p. 4**

System for controlled injection of electrons or holes into oxide layer of MOS capacitor can be used to measure oxide trapping parameters. Since trapping mechanisms can cause degradation and ultimate failure of MOS elements exposed to ionizing radiation, system can be helpful in predicting device tolerance.

B78-10003
NYLON SCREWS MAKE INEXPENSIVE COIL FORMS
G. AUCOIN (TRW, Inc.) and C. ROSENTHAL (TRW, Inc.)
Jun. 1978
MSC-16912 **Vol. 3, No. 1, p. 5**

Standard nylon screws act as coil form copper wire laid down in spiral thread. Completed coil may be bonded to printed-circuit board. However, it is impossible to tune coil by adjusting spacing between windings, technique sometimes used with air-core coils.

B78-10004
GATE-ASSISTED TURN-OFF THYRISTOR
L. R. LOWRY (Westinghouse Electric Corp.), D. J. PAGE (Westinghouse Electric Corp.), and E. S. SCHLEGEL (Westinghouse Electric Corp.)
Jun. 1978 See also NASA CR-134951 (N77-31405)
LEWIS-12535 **Vol. 3, No. 1, p. 6**

1,000-volt, 200-ampere gate-assisted turn-off thyristor has been developed for power circuits requiring high efficiency, small size, and low weight. Design features include shunted cathode for high dV/dt capability. Cathode in interdigitated with dynamic gate for fast, low-loss switching. Operating frequency exceeds 20 kHz with overall energy dissipation of less than 12 mJ per pulse for typical 20-microsecond half-sine waveform. Device has turn-on time of 2 microseconds and turn-off time as short as 3 microseconds with only 2 amperes of gate drive.

B78-10005
S-BAND COMPLEX-WEIGHT MODULE FOR ADAPTIVE PROCESSING
A. J. GIANATASIO (Harris Corp.), J. B. SCHAPPACHER (Harris Corp.), D. G. SCOTT (Harris Corp.), and M. R. WILLIAMS (Harris Corp.)
Jun. 1978
LANGLEY-12197 **Vol. 3, No. 1, p. 7**

S-band complex weight for adaptive processing is fabricated as microwave integrated circuit. When interfaced with suitable control component, it is potentially capable of producing 25 dB rejection of interface with bandwidth of 500 MHz. Performance inproves with decreased bandwidth. Versatility stems from numerous control methods available in broadening field of adaptive processing.

B78-10006
ADAPTIVE POLARIZATION SEPARATION EXPERIMENTS
C. A. BAIRD (Harris Corp.), A. J. GIANATASIO (Harris Corp.), G. M. PELCHAT (Harris, Corp.), G. G. RASSWEILER (Harris Corp.), D. G. SCOTT (Harris Corp.), R. F. VARLEY (Harris Corp.), and L. R. YOUNG (Harris Corp.)
Jun. 1978
LANGLEY-12196 **Vol. 3, No. 1, p. 8**

Network approach lends itself to simple, direct, analog adaptive control. System constructed and tested successfully with adaptive control yielding residual cross polarization below main channel level for input cross polarization. Canellation network significantly cancels polarization over very wide bandwidths and is adaptively controlled.

B78-10007
CURVE TRACER CHECKS CMOS IC'S
F. KIZER
Jun. 1978
GSFC-12209 **Vol. 3, No. 1, p. 9**

Conventional transistor curve tracer can speed up failure analysis of CMOS integrated circuits by displaying transfer characteristics while device is subjected to vibration or environmental testing. Failures that show up as change in threshold voltage or transfer characteristics are quickly detected.

B78-10008
PORTABLE SPARK-GAP ARC GENERATOR
L. R. IGNACZAK
Jun. 1978
LEWIS-12886 **Vol. 3, No. 1, p. 10**

Self-contained spark generator that simulates electrical noise caused by discharge of static charge is useful tool when checking sensitive component and equipment. In test set-up, device introduces repeatable noise pulses as behavior of components is monitored. Generator uses only standard commercial parts

and weighs only 4 pounds; portable dc power supply is used. Two configurations of generator have been developed: one is free-running arc source, and one delivers spark in response to triggering pulse.

B78-10009
COAXIAL ISOLATOR HAS VERSATILE INTERFACE
D. L. OLSSON (TRW, Inc.)
Jun. 1978
MSC-16908 **Vol. 3, No. 1, p. 11**

Approach increases system-packaging flexibility. Isolators are constructed with removable connectors that can be changed to meet user's requirements. Technique reduces development scheduling problems. Isolators can be procured before package design is firm and then readily reconfigured to meet final design requirements. Changes to existing designs to incorporate removable connectors are minimal. Small adapter plates increase size modestly; weight increase is negligible.

B78-10010
SIMPLE TOOL REMOVES IC FLAT PACKS
J. EGGEBEEN (Sperry Rand Corp.)
Jun. 1978
MSC-16058 **Vol. 3, No. 1, p. 12**

Handtool has bifurcated handle that can be tightened so that clamping head grips pack securely. Tool easily removes hybrid integrated-ciruit flat packs from printed-wiring boards. It does not damage circuit or board; thus, board can be reused with replacement circuit, and old circuit can be analyzed for faults and, if possible, repaired.

B78-10011
DIGITAL PHASE SHIFTER SYNCHRONIZES LOCAL OSCILLATORS
S. M. ALI (Rockwell International Corp.)
Jun. 1978
MSC-16695 **Vol. 3, No. 1, p. 12**

Digital phase-shifting network is used as synchronous frequency multiplier for applications such as phase-locking two signals that may differ in frequency. Circuit has various phase-shift capability. Possible applications include data-communication systems and hybrid digital/analog phase-locked loops.

B78-10012
EFFICIENT DC-TO-DC CONVERTER
J. M. BLACK
Jun. 1978
FRC-11014 **Vol. 3, No. 1, p. 14**

Circuit consists of chopper section which converts input dc to square wave, followed by bridge-rectifier stage. Chopper gives nearly-ideal switching characteristics, and bridge uses series of full-wave stages rather than less-efficient half-wave rectifiers found in previous circuits. Special features of full-wave circuit allow redundant components to be eliminated, lowering parts count. Circuit can also be adapted for use as dc-to-dc converter or as combination dc-and-ac source.

B78-10148
SYMMETRIC VOLTAGE-CONTROLLED VARIABLE RESISTANCE
J. C. VANELLI (Lockheed Elec. Co., Inc.)
Oct. 1978
MSC-16685 **Vol. 3, No. 2, p.165**

Feedback network makes resistance of field-effect transistor (FET) same for current flowing in either direction. It combines control voltage with source and load voltages to give symmetric current/voltage characteristics. Since circuit produces same magnitude output voltage for current flowing in either direction, it introduces no offset in presense of altering polarity signals. It is therefore ideal for sensor and effector circuits in servocontrol systems.

B78-10149
FAST DIFFERENTIAL ANALOG-TO-DIGITAL CONVERSION
A. G. BIRCHENOUGH and W. J. RICE
Oct. 1978
LEWIS-12909 **Vol. 3, No. 2, p. 166**

Technique first digitizes difference between input and previous conversion. Digitized difference is added to previous digitized value to yield new digital representation of analog input. Output of analog-to-digital converter is useful as digital derivative of input signal.

B78-10150
IMPROVED SERVOCONTROL SYSTEM
E. C. BUCHANAN
Oct. 1978
M-FS-19358 **Vol. 3, No. 2, p. 167**

System combines error signal with output of deadband circuit, which offsets any decrease in gain of error circuit for rapid changes in input signal.

B78-10151
HIGH-POWER RF SWITCH
E. R. CARO
Oct. 1978
NPO-14229 **Vol. 3, No. 2, p. 168**

Switch designed for vacuum environments can handle 5 kilowatts of microwave power. Arcing between conductors is prevented by filling gaps with Teflon rather than with inert gas as in conventional switches. Thus, switch is not susceptible to gas leakage, problem faced by conventional switches in high-vacuum applications. Compact three-port switch, developed for microwave radar transmitters aboard spacecraft, is operated by depressing spring-mounted insulating pins that can be remotely actuated by relay. When pin is depressed, it routes microwave signals to selected output port.

B78-10152
TEMPERATURE STABILIZATION OF MICROWAVE FERRITE DEVICES
R. KAMINSKY (Cutler Hammer, Inc.) and E. J. WENDT (Cutler Hammer, Inc.)
Oct. 1978
MSC-16833 **Vol. 3, No. 2, p. 169**

Thin-film heating element for strip-line circulator is sandwiched between insulation and copper laminations. Disks conform to shape of circulator ferrite disks and are installed between copper-clad epoxy ground planes. Heater design eliminates external cartridges and reduces weight by approximately one-third.

B78-10153
IC IMPLEMENTATION OF CROSSBAR SWITCHES
T. O. ANDERSON
Oct. 1978
NPO-13837 **Vol. 3, No. 2, p. 170**

Basic switching-element configuration can be expanded to more complex networks by coupling basic building blocks in appropriate way. In all cases, binary addressing of input and output ports is used.

B78-10154
STROBE-MARGIN TEST FOR PLATED MEMORY SYSTEMS
T. E. ANSPACH (Honeywell, Inc.), J. W. CLARKE (Honeywell, Inc.), and R. C. CONSTABLE (Honeywell, Inc.)
Oct. 1978
M-FS-23838 **Vol. 3, No. 2, p. 171**

Technique measures performance of plated-wire memories. Strobe-margin test (SMT) utilizes worst-case testing and automatically gives exact strobe margin. Test is automatic; thus, memory system-level test is superior to tests at component level that use artificial test conditions. Test is significant tool in design and test of plated-wire memory systems. It can rapidly quantify memory-system margin on each production unit and impact of any design changes.

B78-10155
SAFE VENTING FOR ELECTRONIC COMPONENTS
R. CURRIN, JR. (Rockwell Intern. Corp.) and C. W. FISCHER (Rockwell Intern. Corp.)
Oct. 1978
MSC-18007 **Vol. 3, No. 2, p. 171**

Vented enclosure is made from lightweight metal. Printed-circuit boards are attached to bottom and end bulkheads and to top cover. Airflow cools components indirectly through walls of inner compartment. Flammability and smoke tests demonstrate safety of enclosure.

B78-10156
DIRECT-READING GROUP-DELAY MEASUREMENT
D. L. TROWBRIDGE
Oct. 1978
NPO-13909 **Vol. 3, No. 2, p.172**

Technique for measuring modulation signal retardation in microwave components gives direct plot of dependence of delay time on carrier frequency. Recorder sensitivity can be adjusted to give convenient scale factor for group delay. From family of such recordings, it is possible to observe changes in group delay due to temperature, mechanical stress, and other factors.

B78-10157
SYNCHRONOUS TRANSFER CIRCUITS FOR REDUNDANT SYSTEMS
S. NAGANO
Oct. 1978
NPO-14162 **Vol. 3, No. 2, p 173**

Circuit arrangements for flip-flops, counters, and clock drivers in redundant systems ensure that control is synchronously transferred to surviving components when failure occurs. In addition to original application to spacecraft systems, redundant circuits have terrestrial uses in power generators, solar-energy converters, computers, vehicle controllers, and other systems demanding high reliability.

B78-10158
ANALYZING CMOS/SOS FABRICATION FOR LSI ARRAYS
A. C. IPRI (RCA Corp.)
Oct. 1978 See also NASA CR-150213 (N76-78470)
M-FS-23788 **Vol. 3, No. 2, p 174**

Report discusses set of design rules that have been developed as result of work with test arrays. Set of optimum dimensions is given that would maximize process output and would correspondingly minimize costs in fabrication of large-scale integration (LSI) arrays.

B78-10297
AUTOMATIC GAIN-BALANCING CIRCUIT
D. F. EISENHUT (TRW, Inc.)
Jan. 1979 See also NASA CR-145137 (N77-19560)
LANGLEY-12074 **Vol. 3, No. 3, p. 319**

Energy reaching sensor is collected by telescope, modulated by chopper, spectrally filtered, and simultaneously directed onto two detectors. Gains through multiple signal paths are automatically balanced to 1 part in 10,000. Circuit compensates for slow changes in optical and electrical gains common to gas-filter correlation spectrometers.

B78-10298
HIGH-SPEED, HIGH-POWER, SWITCHING TRANSISTOR
D. CARNAHAN (Westinghouse Electric Corp.), C. K. OHU (Westinghouse Electric Corp.), and P. L. HOWER (Westinghouse Electric Corp.)
Jan. 1979 See also NASA CR-135013 (N76-28470)
LEWIS-13021 **Vol. 3, No. 3, p. 320**

Silicon transistor rate for 200 angstroms at 400 to 600 volts combines switching speed of transistors with ruggedness, power capacity of thyristor. Transistor introduces unique combination of increased power-handling capability, unusally low saturation and switching losses, and submicrosecond switching speeds. Potential applications include high power switching regulators, linear amplifiers, chopper controls for high frequency electrical vehicle drives, VLF transmitters, RF induction heaters, kitchen cooking ranges, and electronic scalpels for medical surgery.

B78-10299
SIMPLE DIGITAL PULSE-PROGRAMING CIRCUIT
J. L. LANGSTON (Texas Instruments, Inc.)
Jan. 1979
NPO-13747 **Vol. 3, No. 3, p. 321**

Pulse-sequencing circuit uses only shift register and Exclusive-OR gates. Circuit also serves as date-transition edge detector (for rising or falling edges). It is used in sample-and-hold, analog-to-digital conversion sequence control, multiphase clock logic, precise delay control computer control logic, edge detectors, other timing applications, and provides simple means to generate timing and control signals for data transfer, addressing, or mode control in microprocessors and minicomputers.

B78-10300
AUTOMATIC CIRCUIT INTERRUPTER
W. S. DWINELL (Rockwell International Corp.)
Jan. 1979
MSC-16697 **Vol. 3, No. 3, p. 322**

In technique, voice circuits connecting crew's cabin to launch station through umbilical connector disconnect automatically unused, or deadened portion of circuits immediately after vehicle is launched, eliminating possibility that unused wiring interferes with voice communications inside vehicle or need for manual cutoff switch and its associated wiring. Technique is applied to other types of electrical actuation circuits, also launch of mapped vehicles, such as balloons, submarines, test sleds, and test chambers-all requiring assistance of ground crew.

B78-10301
EASILY-WIRED TOGGLE SWITCH
W. T. DEAN (Rockwell International Corp.) and E. J. STRINGER (Rockwell International Corp.)
Jan. 1979
MSC-18102 **Vol. 3, No. 3, p 323**

Crimp-type connectors reduce assembly and disassembly time. With design, no switch preparation is necessary and socket contracts are crimped to wires inserted in module attached to back of toggle switch engaging pins inside module to make electrical connections. Wires are easily removed with standard detachment tool. Design can accommodate wires of any gage and as many terminals can be placed on switch as wire gage and switch dimensions will allow.

B78-10302
AUTOMATIC LOAD SHARING IN INVERTER MODULES
S. NAGANO
Jan. 1979
NPO-14056 **Vol. 3, No. 3, p. 324**

Active feedback loads transistor equally with little power loss. Circuit is suitable for balancing modular inverters in spacecraft, computer power supplies, solar-electric power generators, and electric vehicles. Current-balancing circuit senses differences between collector current for power transistor and average value of load currents for all power transistors. Principle is effective not only in fixed duty-cycle inverters but also in converters operating at variable duty cycles.

B78-10303
HALL DEVICES IMPROVE ELECTRIC MOTOR EFFICIENCY
W. HAEUSSERMANN
Jan. 1979
M-FS-23828 **Vol. 3, No. 3, p. 325**

Efficiency of electric motors and generators is reduced by radial magnetic forces created by symmetric fields within device. Forces are sensed and counteracted by Hall devices on excitation or control windings. Hall generators directly measure and provide compensating control of anu asymmetry, eliminating additional measurements needed for calibration feedback control loop.

B78-10304
IMPROVED DRIVER FOR CAPACITIVE LOADS
R. T. MATSUMOTO (Rockwell Intern. Corp.)
Jan. 1979
LANGLEY-11609 **Vol. 3, No. 3, p. 326**

Bias resistors with large voltage swings are replaced by transistorized current sources and bias currents are reduced to level where beta of devices is accceptable. Innovation has other applications in circuits driving pulsed capacitive loads.

B78-10305
Z-AXIS CONTROL LOOP FOR CATHODE-RAY TUBES
A. J. RAY, JR. (Ball Bros. Res. Corp.)
Jan. 1979
NPO-13775 **Vol. 3, No. 3, p. 324**

Inexpensive PIN diode detector samples screen brightness between camera frames generating error signal for feedback control of intensity. System was tested by taking flat-field exposures at several density levels over 4 hour period. Results showed processed film density levels varied by less than + or - 10 percent usually centering around + or - 8 percent.

B78-10306
THREE-FUNCTION SIGNAL GENERATOR
G. F. KOPP (Honeywell, Inc.)
Jan. 1979
MSC-16672 **Vol. 3, No. 3, p. 328**

Variable-frequency circuit develops sine square and triangular waveforms. Three-function generator used variable-rate integrator to generate triangular wave and zero-crossing detector to develop square wave. Sine wave generator uses diode matrix to operate on triangular wave, thus with design harmonic distortion in output is less then one percent. By changing values of outboard resistors and capacitors, same design can be used at higher frequencies.

B78-10307
POWER-SWITCH DV/DT SENSING
R. L. JONES
Jan. 1979
MSC-16707 **Vol. 3, No. 3, p. 329**

Simple means for controlling voltage risetime and powerline noise used three transistors and capacitive feedback. Rate of change of voltage across load is reduced and controlled by circuit. Circuit is useful in situations where large wire bundles are subject to noise and crosstalk due to rapid current switching.

B78-10308
PHASE-SHIFT ARRAY, ARBITRARY AND CONTINUOUS THROUGH 360 DEG
A. C. DIBBLE, JR. and R. E. GRANDLE
Jan. 1979
LANGLEY-12272 **Vol. 3, No. 3, p. 330**

Langley Research Center's Phase-shift array satisfies requirement to phase shift common source signal into array of branch circuits thus simplifying multiple phase control. With system, wiring and assembly are uncomplicated, requiring no switching networks and system can be operated at any desired frequency. Design provides effective solution to problem of multiple shift control.

B78-10309
IMPLEMENTING OQASK BY USING MSK
M. K. SIMON
Jan. 1979
NPO-13896 **Vol. 3, No. 3, p. 331**

Concept simplifies implementation of offset quadrature amplitude-shift-keyed signal when encoding digital information for transmission. Although originally developed for deep-space radio transmission, concept can find applications in various band-width constrained systems and in digital radio communications. Also is particularly useful in high volume data transmission as means of encoding and decoding.

B78-10310
TERRESTRIAL PHOTOVOLTAIC MEASUREMENTS
H. W. BRANDHORST, JR. and H. B. CURTIS
Jan. 1979 See also NASA CP-2010 (N77-30521);NASA-TM-73788 (N78-14629); NASA-TM-73702 (N77-29603)
LEWIS-13057 **Vol. 3, No. 3, p. 331**

Revised measurement and calibration procedures are available. ERDA workshop utilized experience gained in solar cell research to define and explore additional measurement needs of photovoltaic community. Interim measurement procedures previously established were revised and published in manual in addition to other procedures.

B78-10311
CMOS-ARRAY DESIGN-AUTOMATION TECHNIQUES
A. FELLER (RCA Corp.) and T. LOMBARDT (RCA Corp.)
Jan. 1979 See also NASA-CR-150221 (N77-78784)
M-FS-23762 **Vol. 3, No. 3, p. 322**

Thirty four page report discusses design of 4,096-bit complementary metal oxide semiconductor (CMOS) read-only memory (ROM). CMOSROM is either mask or laser programable. Report is divided into six sections; section one describes background of ROM chips; section two presents design goals for chip; section three discusses chip implementation and chip statistics; conclusions and recommendations are given in sections four thru six.

B78-10448
MULTICHANNEL VCO NEEDS ONLY ONE REFERENCE
R. K. MASSON (Hughes Aircraft Co.) and N. P. MORENC (Hughes Aircraft Co.)
Mar. 1979
MSC-18225 **Vol. 3, No. 4, p. 471**

Frequency stabilizing circuit controls output of multichannel microwave oscillator using passband filters and selector logic to eliminate need for separate crystal diode voltage controlled oscillator (VCO).

B78-10449
ARC DETECTOR USES FIBER OPTICS
E. J. FINNEGAN and R. A. LEECH
Mar. 1979
NPO-13377 **Vol. 3, No. 4, p. 472**

Arc detector for protecting high-power microwave klystron oscillators uses fiber optics connected to remote solid-state light-sensing circuits. Detector is more reliable, smaller, and sensitive than other systems that locate detector in waveguide.

B78-10450
MINIATURE KU-BAND DOWN CONVERTER
D. A. NORBURY (Avantek, Inc.)
Mar. 1979
MSC-18313 **Vol. 3, No. 4, p. 473**

Hybrid circuit serves as receiver front end for 13.75- to 14.0-GHz communications and radar systems. Complete microwave integrated circuit (MIC) assembly is packaged in small hermetically welded, nitrogen-filled aluminum case. Simplicity and size proves useful for lower-frequency wideband applications.

B78-10451
TESTING INTEGRATED CIRCUITS BY PHOTOEXCITATION
J. J. ERICKSON (Hughes Aircraft Co.) and M. E. LEVY (Hughes Aircraft Co.)
Mar. 1979
M-FS-23943 **Vol. 3, No. 4, p. 474**

System for testing integrated circuits uses photoexcitation to determine quality of internal elements inaccessible to electrical tests. Approach prevents direct monitoring of internal operation of circuit by measurements at external terminals and is superior to electron beam scanning due to nondestructiveness.

B78-10452
PRECISE MATCHING OF DIODES
W. T. MCLYMAN
Mar. 1979
NPO-14293 **Vol. 3, No. 4, p. 475**

Two circuit arrangements using ac and dc power source provide low-cost method for matching forward voltage drops of diodes and other semiconductors. Both circuits are simpler and less expensive than conventional, characteristic-curve tracers.

B78-10453
SPLICING SHIELDED CABLES
W. P. LIND (Rockwell Intern. Corp.) and W. R. MCGOUGAN (Rockwell Intern. Corp.)
Mar. 1979
MSC-18297 **Vol. 3, No. 4, p. 476**

B78-10454
MODULAR GROUND-WIRE CONNECTOR
W. T. DEAN (Rockwell Intern. Corp.) and E. J. STRINGER (Rockwell Intern. Corp.)
Mar. 1979
MSC-16633 **Vol. 3, No. 4, p. 477**
Chassis-mounted module makes it easy to remove and attach ground wires. With module, more ground connections are made in smaller area and no terminal lugs, lockwashers, or locknuts are required. Device also reduces holes that are punched or drilled in chassis for ground connections.

B78-10455
ELECTRICAL-GROUND MONITOR
T. D. LYONS (Lockheed Electronics Co.)
Mar. 1979
MSC-18281 **Vol. 3, No. 4, p. 477**
Instrument for detecting short circuits monitors ground connections and sounds alarm if out-of-limits condition occurs. Circuit includes electronics that prevent false triggering by high-resistance or capacitive paths and other noise.

B78-10456
ONE-THIRD SELECTION FOR MATRIX-ADDRESSING FERROELECTRICS
L. E. TANNAS, JR. (Rockwell Intern. Corp.)
Mar. 1979
LANGLEY-11993 **Vol. 3, No. 4, p. 479**
Automatic-gain-control (AGC) circuit regulates gain of intermediate frequency and radio-frequency signals over wide dynamic range with high linearity and very low phase shift. Potential application include radio and television receivers, signal distribution systems, and test and measurement instruments.

B78-10457
SIMPLIFIED PHASE DETECTOR
L. M. HERSHEY
Mar. 1979
NPO-13395 **Vol. 3, No. 4, p. 480**
Tanlick sine-wave phase detector gives dc output voltage nearly proportional to phase difference between oscillator signal and reference signal. Device may be used for systems in which signal-to-noise ratio is high.

B78-10458
DIGITAL CORRELATOR WITH FEWER IC'S
G. G. APPLE (TRW, Inc.) and L. RUBIN (TRW, Inc.)
Mar. 1979
MSC-16743 **Vol. 3, No. 4, p. 481**
Digital correlator requires only few integrated circuits to determine synchronization of two 24-bit digital words. Circuit is easily reduced or expanded to accommodate shorter or longer words and can be utilized in industrial and commercial data processing and telecommunications.

B78-10459
PULSE-WIDTH-MODULATED ATTENUATOR FOR AGC
J. W. MACCONNELL
Mar. 1979
NPO-14127 **Vol. 3, No. 4, p. 483**
Automatic-gain-control (AGC) circuit regulates gain of intermediate-frequency and radio-frequency signals over wide dynamic range with high linearity and very low phase shift. Device has potential uses in radio and television receivers, signal distribution systems, and test and measurement instruments.

B78-10460
OVERLOAD PROTECTION SYSTEM
S. NAGANO
Mar. 1979
NPO-13872 **Vol. 3, No. 4, p. 484**
Overload protection circuit utilizes one circuit for suspending inverter action when load abnormality is detected and second circuit to monitor clearance of abnormality. Device wastes no power during normal operating conditions and responds instantaneously when abnormality is cleared.

B78-10461
LOAD BALANCING MULTIMODULE SWITCHING POWER CONVERTERS
W. T. MCLYMAN and G. W. WESTER
Mar. 1979
NPO-13832 **Vol. 3, No. 4, p. 485**
Regulating system individually adjusts duty cycles of modules so that all share load equally, thus, protects individual modules and their components from overload and increases reliability and life expectancy. Converters are alternative to high-power, single unit systems.

B78-10462
ELIMINATING GOLD MIGRATION IN MICROCIRCUITS
A. DERMARDEROSIAN (Raytheon Co.) and C. R. MURPHY (Rockwell Intern. Corp.)
Mar. 1979
MSC-18213 **Vol. 3, No. 4, p. 486**
Report discusses how effects of moisture and other factors causing bridging between conductors can be prevented. Study details how several factors such as contaminants, large packages, high voltage, narrow conductor spacing and temperature contribute to moisture problems.

02 ELECTRONIC SYSTEMS

B78-10013
VIDEO SCRAMBLER/DESCRAMBLER
P. C. LIPOMA (Lockheed Electronics Co., Inc.) and K. H. VORHABEN (Lockheed Electronics Co., Inc.)
Jun. 1978
MSC-16843 **Vol. 3, No. 1, p. 17**
Video scrambler that operates on baseband signals uses relatively simple delay and inversion circuitry to alter television signal so that is is unrecognizable when picked up on TV monitor. Descrambler that uses essentially same circuit restores signal and allows original video information to be retrieved. Circuits allow only authorized parties to have access to transmitted information.

B78-10014
ACCURATE POSITIONING OF CHARACTERS ON CRT DISPLAYS
J. R. DAMIAN (IBM, Corp.)
Jun. 1978
MSC-16505 **Vol. 3, No. 1, p. 18**
Two systems, one digital and one analog, improve positioning of characters in cathode-ray tube (CRT) display systems. Circuits minimize effects of amplifier settling times--effects that can displace and distort characters in high-speed multiplexed systems.

B78-10015
COMPUTER INTERFACE FOR MECHANICAL ARM
W. L. DEROCHER (Martin Marietta Corp.) and R. O. ZERMUEHLEN (Martin Marietta Corp.)
Jun. 1978
M-FS-23849 **Vol. 3, No. 1, p. 20**
Man/machine interface commands computer-controlled mechanical arm. Remotely-controlled arm has six degrees of freedom and is controlled through 'supervisory-control' mode, in which all motions of arm follow set of preprogramed sequences. For simplicity, few prescribed commands are required to accomplish entire operation. Applications include operating computer-controlled arm to handle radioactive of explosive materials or commanding arm to perform functions in hostile environments. Modified version using displays may be applied in medicine.

B78-10016
CALIBRATION METHOD FOR AN ULTRASONIC GRAY-

SCALE RECORDER
P. E. MOORHEAD
Jun. 1978
LEWIS-12782 **Vol. 3, No.1, p. 20**

Calibrated method for ultrasonic C-scanning is based on direct correlation of gray-scale response to electronic signal used. In procedure, optical density of reference recording is measured to generate curve of reflective intensity versus transmission.

B78-10017
HIGH-RESOLUTION GRAY-SCALE RECORDER
P. E. MOORHEAD, T. M. DAVIS, and R. L. SORG
Jun. 1978
LEWIS-12783 **Vol. 3, No.1, p. 22**

Electronic circuit makes it possible to obtain gray-scale recordings with good contrast and linearity over entire recording density range for ultrasonic testing unit. Electronic circuit produces square wave of constant voltage but of varying width. Frequency of square-wave pulses can be adjusted to determine optimum pulse frequency.

B78-10018
MULTIPLE-INPUT LAND-USE SYSTEM CONCEPT
F. C. BILLINGSLEY, N. A. BRYANT, and A. L. ZOBRIST
Jun. 1978
NPO-13903 **Vol. 3, No. 1, p. 23**

Image based information system would accept data in a variety of formats and convert it to registered raster-scan with single format. Images could then be manipulated by system processor to read out desired information. Existing methods of digital-image processing could be modified to develop necessary software and hardware needed to implement system.

B78-10019
MICROSTRIP BACKFIRE ANTENNA
T. G. CAMPBELL and N. V. COHEN (Old Dominion Univ.)
Jun. 1978
LANGLEY-12172 **Vol. 3, No. 1, p. 24**

Microstrip resonator is improvement over dipole-fed waveguide-fed backfire designs. Advantages include simpler construction with reduction in weight and size over other backfire designs. Microstrip backfire concept has potential in dual-polarization antenna systems, array-thinning designs, and feed designs for larger parabolic reflectors.

B78-10020
TEST-VEHICLE CYCLE PROGRAMMER
D. J. LESCO and R. F. SOLTIS
Jun. 1978
LEWIS-12977 **Vol. 3, No. 1, p. 24**

Instrument reduces manpower needed for testing electric powered vehicles. Device has dual scale that allows operator to compare actual speed with preprogrammed test speed. Features include large meter, buzzer, packaging to allow ready interchange of memories with different profiles, small size, minimal current drain, and reverse supply voltage protection.

B78-10021
OPTICAL TRAFFIC-SENSING CONCEPT
A. R. JOHNSTON and K. SHIMADA
Jun. 1978
NPO-13603 **Vol. 3, No. 1, p. 26**

Scaled-up optical proximity detector is versatile traffic sensor that replaces or augments existing systems such as inductive loops. Photosensor which does not depend on ambient light has several features that protect it against spurious or ambiguous inputs. It could be implemented in several forms to cope with different roadway conditions.

B78-10022
VOICE-OUTPUT SOLAR ENERGY REPORTER
B. L. DETTERMAN and R. L. MILLER
Jun. 1978
LEWIS-12947 **Vol. 3, No. 1, p. 27**

Reporter combines commercially available equipment to sense solar energy and measure instantaneous intensity and accumulated energy at remote site. Data are encoded in voice form and stored for retrieval at any time by commercial telephone.

B78-10023
SIMPLIFIED DATA COMPRESSOR
R. F. RICE, V. C. TYREE, and C. WU
Jun. 1978
NPO-14041 **Vol. 3, No. 1, p. 28**

Image data are compressed for transmission by simple, economical circuitry. Compressor handles data in blocks of 64 samples. Mean from previous line is subtracted, and pseudo-random sequence of positive and negative 1's multiplies samples of each block. Hadamard transform applied to blocks yields 64 transform coefficients. Each coefficient is compared with approximation to corresponding coefficient of previous line, and difference is quantized. Values are transmitted or stored. Procedure is reversed to reproduce image.

B78-10024
PREVENTING RADIO-PAGING SYSTEM TIEUP
J. P. JASMIN (Rockwell International Corp.)
Jun. 1978
MSC-19696 **Vol. 3, No. 1, p. 29**

Time-delay relay limits message time of emergency radio-paging system, thereby preventing inadvertent tieup. Relay is connected with telephone circuit and permits adjustable message time between 30 and 55 seconds. After that time interval, relay opens, making line free for another paging regardless of what previous caller did with his telephone.

B78-10025
HYBRID RANDOM-SOUND TEST-CONTROL SYSTEM
R. C. WOODBURY
Jun. 1978
NPO-13900 **Vol. 3, No. 1, p. 30**

Controller develops gain-control signals by comparing detected sound levels in each band with reference set levels. By eliminating multiplexing network and single clock used in digital system, design allows servocontrol rate for each band to be adjusted independently.

B78-10026
SELF-NAVIGATING ROBOT
A. M. THOMPSON
Jun. 1978
NPO-14190 **Vol. 3, No. 1, p. 31**

Rangefinding equipment and onboard navigation system determine best route from point to point. Research robot has two TV cameras and laser for scanning and mapping its environment. Path planner finds most direct, unobstructed route that requires minimum expenditure of energy. Distance is used as measure of energy expense, although other measures such as time or power consumption (which would depend on the topography of the path) may be used.

B78-10159
FINDING RADIANT-ENERGY SOURCES
G. J. SCHAFFER (Hughes Aircraft Co.)
Oct. 1978 See also B77-10264
GSFC-12147 **Vol. 3, No. 2, p. 177**

Antenna is scanned in orthogonal directions to pinpoint interfering sources. Satellite system locates ground-based microwave transmitter to accuracy of about 100 miles. When data on misalinement of satellite antenna boresight are used to correct antenna pointing, accuracy is improved to better than 70 miles.

B78-10160
NOISE TOLERANT COMPUTER LINK
M. W. SIEVERS
Oct. 1978
NPO-14152 **Vol. 3, No. 2, p. 178**

Inexpensive computer-to-computer link facilitates data communication in electrically noisy environments. Link can connect process-control computers while reducing errors from electrical noise of manufacturing operations.

B78-10161
HUMAN ARM MAY ACT AS ANTENNA
J. C. GADDIE (Stanford Res. Inst.) and R. T. WOLFRAM (Stanford Res. Inst.)
Oct. 1978
ARC-11195 **Vol. 3, No. 2, p. 178**

Wrist strap with copper strips is used as coupler of radio-frequency energy. Wires at midpoints of strips lead to radio-frequency device that acts as transmitter or receiver. Varying widths of copper strips produces somewhat different characteristics.

B78-10162
FEMTOSECOND TIME-DOMAIN PHASE COMPARATOR
T. DONAHOE and V. REINHARDT
Oct. 1978
GSFC-12228 **Vol. 3, No. 2, p. 180**

Phase shift in test device is measured by summing output of mixer with ramp voltage and comparing time interval between zero crossings of summed signal and ramp reference frequency. Circuit can be used to test devices at other frequencies by changing only signal source, phase splitter, and mixer; divider and time-interval counter need not be driven by oscillator.

B78-10163
CHOPPER-STABILIZED PHASE DETECTOR
P. M. HOPKINS (Lockheed Elec. Co.)
Oct. 1978
MSC-16461 **Vol. 3, No. 2, p. 181**

Phase-detector circuit for binary-tracking loops and other binary-data acquisition systems minimizes effects of drift, gain imbalance, and voltage offset in detector circuitry. Input signal passes simultaneously through two channels where it is mixed with early and late codes that are alternately switched between channels. Code switching is synchronized with polarity switching of detector output of each channel so that each channel uses each detector for half time. Net result is that dc offset errors are canceled, and effect of gain imbalance is simply change in sensitivity.

B78-10164
BIT-SYNCHRONIZER LOCK DETECTOR
D. C. HUEY (TRW, Inc.) and B. A. ITRI (TRW, Inc.)
Oct. 1978
MSC-16744 **Vol. 3, No. 2, p. 182**

Circuit measures phase error that exists in phase-locked loop between clock signal recorded in data on magnetic tape and reconstructed clock signal. Circuit presents error as digital word that can be compared with predetermined threshold to indicate lock status. With simple alterations, circuit can also be used as phase detector.

B78-10165
AUTOMATIC RADIO-TRANSMISSION MONITOR
A. J. BERNSTEIN
Oct. 1978
NPO-13941 **Vol. 3, No. 2, p. 183**

System continuously monitors radio transmissions stored in memory. If spectrum deviates beyond present limits, alarm is tripped and spectrum is transferred to long-term storage for later analysis. Monitor can be useful in ensuring proper power level and spectral quality and in finding cause of failure. It might also be used to monitor radio-frequency interference or power levels of citizen's-band transmitters.

B78-10166
CONTROL OF SMALL PHASED-ARRAY ANTENNAS
G. D. DOLAND (Lockheed Elec. Co.)
Oct. 1978
MSC-14938 **Vol. 3, No. 2, p. 184**

Series of reports, patent descriptions, calculator programs, and other literature describes antenna control and steering apparatus for seven-element phased array. Though series contains information specific to particular system, it illustrates methods that can be applied to antennas with greater or fewer numbers of elements. Included are programs for calculating beam parameters and design functions and information to interfacing digital controller to beam-steering apparatus.

B78-10312
AUTOMATIC ACQUISITION AND RANGING SYSTEM
R. M. GOLDSTEIN, W. P. HUBBARD, J. W. LAYLAND, W. L. MARTIN, and A. I. ZYGIELBAUM
Jan. 1979
NPO-13982 **Vol. 3, No. 3, p. 335**

Digital circuitry automatically demodulates received radio-frequency ranging signals for phase comparison with transmitted signal. All digital circuitry makes system more stable than analog predecessor and makes automatic operation easier and simpler.

B78-10313
AIR-TRAFFIC SURVEILLANCE SYSTEMS
P. F. MACDORAN
Jan. 1979
NPO-14173 **Vol. 3, No. 3, p. 336**

Passive ground-based radio-interferometry systems (RILS) monitor local air traffic by determining aircraft position in planes defined by surveillance area. Similar RILS arrangements are used to determine aircraft positions in three dimensions when combined with azimuth and range information obtained by radar. Information helps determine three-dimensional aircraft position without expensive encoding altimeters.

B78-10314
OPTIMIZING MULTISLOT FEEDS FOR REFLECTING ANTENNAS
D. K. WAINEO (Rockwell Intern. Corp.)
Jan. 1979
NPO-14064 **Vol. 3, No. 3, p. 337**

Multislot feed corrects phase errors in reflecting antennas. Variables are reduced by considering symmetry and corrective effect of each phase mode. Overall computation concerning calculation of correct phase angles while optimizing main beam efficiency is simplified by analysis used parabolic torus reflector aboard Space Shuttle.

B78-10315
28-BIT SERIAL WORD SIMULATOR/MONITOR
J. W. DURBIN (Rockwell Intern. Corp.)
Jan. 1979
MSC-16418 **Vol. 3, No. 3, p. 338**

Modular interface unit transfers data at high speeds along four channels. Device expedites variable-word-length communication between computers. Operation eases exchange of bit information by automatically reformatting coded input data and status information to match requirements of output.

B78-10316
PORTABLE DATA SYSTEM
M. DIX
Jan. 1979
ARC-11136 **Vol. 3, No. 3, p. 339**

Compact system for data recording, manipulation, and transmission uses readily available components. Data system originally designed for high-altitude research is used with appropriate sensors to monitor transportation systems, biomedical data, weather stations, mineral exploration equipment, and various other tasks.

B78-10317
MICROWAVE-BEAM SAFETY SUBSYSTEM
R. M. DICKINSON
Jan. 1979
NPO-14224 **Vol. 3, No. 3, p. 340**

Airspace between high-power microwave transmitters and receivers is dangerous to people, equipment, or birds flying in area. Hazard is reduced or eliminated by subsystem that monitors area and interrupts or alters microwave transmission during accidental intrusions.

B78-10463
NARROW-BANDWIDTH RECEIVER

E. A. MANUS (Virginia Polytechnic Institute and State University) and P. H. WILEY (Virginia Polytechnic Institute and State University)
Mar. 1979
GSFC-12142 **Vol. 3, No. 4, p. 489**

Synchronous switching circuit reduces bandwidth and improves sensitivity of communications receiver. With modified receiver, signals 35 db below level can be detected.

B78-10464
MEASURING RADIO-SIGNAL POWER ACCURATELY
R. M. GOLDSTEIN, J. W. NEWTON, and R. A. WINKELSTEIN
Mar. 1979
NPO-13373 **Vol. 3, No. 4, p. 490**

Absolute value of signal power in weak radio signals is determined by computer-aided measurements. Equipment operates by averaging received signal over several-minute period and comparing average value with noise level of receiver previously calibrated.

B78-10465
DETERMINING THE RESPONSE OF AN FM RECEIVER
J. C. PERRY (Lockheed Electronics Co.)
Mar. 1979
MSC-16751 **Vol. 3, No. 4, p. 491**

Frequency response to frequency-modulation (FM) receiver is measured with aid of phase-modulation (PM) transmitter by applying correction to output power level. As modulating frequency is increased, output level obtained in response to PM input is reduced by 6 db per octane.

B78-10466
MORE EFFICIENT MICROWAVE-POWER TRANSMISSION
R. M. DICKINSON and W. T. BROWN (Raytheon Co.)
Mar. 1979
NPO-13885 **Vol. 3, No. 4, p. 492**

Small improvements in magnetron, receiving diodes, radiating antennas, and circulator sections of components add sizable improvement in microwave system efficiency. Further improvements in future are possible by adding new materials and designs to RF-to-dc converter-or removal of circulator, power supply and redesigning of magnetron to tolerate low or high power levels.

B78-10467
EFFICIENT DIGITAL ENCODING SCHEME
D. E. OBRIEN, III
Mar. 1979
MSC-18267 **Vol. 3, No. 4, p. 493**

Modified NRZ (non-return-to-zero) code immunizes record and playback systems against dc drift and bit slippage. In order to maximize bit packing density improved code called J-NRZ gives 100 percent NRZ efficiently and solves DC drift problem by adding check bits in specified format when long string is encountered. Remainder of data stream is encoded in NRZ format.

B78-10468
WIDEBAND DIGITAL SPECTRUM ANALYZER
G. A. MORRIS, JR. and H. C. WILCK
Mar. 1979
NPO-14394 **Vol. 3, No. 4, p. 494**

Modular spectrum analyzer consisting of RF receiver, fast fourier transform spectrum analyzer, and data processor samples stochastic signals in 220 channels. Construction reduces design and fabrication costs of assembled unit.

B78-10469
ELIMINATING AMBIGUITY IN DIGITAL SIGNALS
W. J. WEBER, III
Mar. 1979
NPO-14289 **Vol. 3, No. 4, p. 495**

Multiamplitude minimum shift keying (mamsk) transmission system, method of differential encoding overcomes problem of ambiguity associated with advanced digital-transmission techniques with little or no penalty in transmission rate, error rate, or system complexity. Principle of method states, if signal points are properly encoded and decoded, bits are detected correctly, regardless of phase ambiguities.

B78-10470
DATA REFORMATTING WITH LESS HARDWARE
A. ENGEL and L. R. SPRINGER
Mar. 1979
NPO-13676 **Vol. 3, No. 4, p. 496**

Dual-function integrated circuits use one shift register array instead of two to feed video data to seven tape channels thereby making system more reliable and less expensive than predecessor. Basic principle of reformatter is also applicable to multiplexing and frequency conversion circuits.

B78-10471
EFFICIENT RECTIFYING ANTENNA
R. M. DICKINSON and W. C. BROWN (Raytheon Co.)
Mar. 1979
NPO-13884 **Vol. 3, No. 4, p. 497**

Rectifying antenna comprised of 17 subarrays positioned closely together to intercept microwave beam features low cost, high conversion efficiency, and high power handling capability. Tests demonstrate efficiency level of 82 percent in converting RF to dc.

B78-10472
LIGHTWEIGHT CONICAL ANTENNA REFLECTOR
D. M. MOORE
Mar. 1979
NPO-13552 **Vol. 3, No. 4, p. 499**

Conical antenna reflectors using knitted mesh materials for aluminized film eliminate problem areas in thermal distortion and long term stability when film is subjected to ultraviolet radiation. Meshes may be selected from wide selection of yarns to form mesh membrane.

B78-10473
COMPACT ANTENNA HAS SYMMETRICAL RADIATION PATTERN
E. A. KUHLMAN (McDonnell-Douglas Corp.) and E. D. MCKEE (McDonnell-Douglas Corp.)
Mar. 1979
ARC-11189 **Vol. 3, No. 4, p. 500**

Compact quadrifilar-helix antenna has exceptionally uniform and axially symmetric radiation pattern. It resists shock and vibration and gives excellent radiation characteristics which make it potentially useful for mobile citizenband radios and other terrestrial communications sytems.

B78-10474
MULTIPLEXED BATTERY-BYPASS CONTROL SYSTEM
J. C. BENNETT, H. A. FRANK, J. LEPISTO, and A. P. WAGNER
Mar. 1979 See also NASA-CR-155271 (N78-12317)
NPO-14414 **Vol. 3, No. 4, p. 501**

Cell-bypass control system senses low capacity cells before they overcharge or discharge. Relay automatically removes defective cell (when it is detected) from battery circuit. System shows promise for improving batteries in computer standby power systems, electric vehicles, and energy storage systems.

B78-10475
SYSTEM FOR MONITORING LIGHTNING STRIKES
J. C. FUCAS and R. J. WOJTASTNSKI
Mar. 1979
KSC-11018 **Vol. 3, No. 4, p. 502**

System for monitoring lightning strikes utilizes optical data link between lightning sensor and recording instruments thus making data link immune to electrical interference induced in wires by huge burst of energy in lightning strikes. It also protects people and equipment at data receiving end from electrical shock.

B78-10476
TELECOMMUNICATIONS NETWORK OPTIMIZATION
J. LEE
Mar. 1979
NPO-14486 **Vol. 3, No. 4, p. 504**

Analysis discusses STACOM (state criminal justic communication) network topology program used to design and evaluate digital telecommunications networks STACOM employs ESAU-

WILLIAMS technique to search for direct links between system terminations and regional switching center. Inputs include traffic data, terminal locations, and functional requirements.

03 PHYSICAL SCIENCES

B78-10027
IMPROVED OPTICAL FILTER
A. M. TITLE (Lockheed Missiles & Space Co., Inc.)
Jun. 1978
GSFC-12225 **Vol. 3, No. 1, p. 35**

Filter includes partial polarizer between birefrigent elements. Plastic film on partial polarizer compensates for any polarization rotation by partial polarizer. Two quarter-wave plates change incident, linearly polarized light into elliptically polarized light.

B78-10028
HOUSING PROTECTS LASER IN VACUUM
V. G. CANALI
Jun. 1978
GSFC-12241 **Vol. 3, No. 1, p. 36**

Airtight housing encloses laser for easy alinement and operation in high-vacuum chamber. Beam is transmitted through window into vacuum chamber. Flexible line runs through vacuum chamber to outside, maintaining laser enclosure at atmospheric pressure.

B78-10029
DIRECTIONAL LASER VELOCIMETER WITH DOPPLER VELOCITY SIMULATOR
J. M. FRANKE
Jun. 1978
LANGLEY-12176; LANGLEY-12177 **Vol. 3, No. 1, p. 36**

Technique uses phase-shift networks at optical and baseband frequencies and, as such, is optical adaptation of previously-existing microwave technology. Application is planned for wind-tunnel velocity measurements. Alternative configuration produces finite fringes that move in one direction or other as measured particle approaches or recedes.

B78-10030
FLUORESCENT PAINT SIMPLIFIES LASER-BEAM ALINEMENT
H. A. WILL
Jun. 1978
LEWIS-12571 **Vol. 3, No. 1, p. 38**

Usually to aline optics safely, low power laser which can safely operated without safety goggles is substituted for higher power laser during alinement procedure. Need for lower power substitute laser can be eliminated by painting target area with commercial paint which fluoresces strongly in red or yellow portion of spectrum when excited by argon laser beam.

B78-10031
GLASS TUBES FOR PROTECTING SOLAR CELLS
B. SHELPUK (RCA Corp.)
Jun. 1978
NPO-14200 **Vol. 3, No. 1, p. 38**

Protecting solar cells against environmental effects is accomplished by putting them inside glass tubes instead of hermetically sealing them between pairs of flat glass sheets. If cells are coupled with storage battery integrated into tube, freestanding power source could be built.

B78-10032
HIGH-TEMPERATURE SOLAR CONVERTER
G. ASCHER
Jun. 1978
GSFC-12234 **Vol. 3, No. 1, p. 39**

Converter has parabolic concentrator that directs sunlight on three-dimensional absorber assembly within an evacuated glass cylinder. No tracking mechanism is required. Concentrator aperture is adjustable to modify concentration in direct or diffuse sunlight. Range of adjustment is small.

B78-10033
DOUBLE-SIDED SOLAR-CELL PACKAGE
B. SHELPUK (RCA Corp.)
Jun. 1978
NPO-14199 **Vol. 3, No. 1, p. 40**

Cost-effective solar-cell package is proposed for development of practical solar-cell system. Since cells are enclosed in inexpensive plastic tubes, forced-air-cooling loop is proposed to maintain cell temperature at adequate levels. Loop must include desiccant to remove moisture from hermetic enclosures to prevent cell corrosion.

B78-10034
REAL-TIME MONITORING OF CRUSTAL DEFORMATIONS
P. F. MACDORAN
Jun. 1978
NPO-14124 **Vol. 3, No. 1, p. 42**

System with two radio interferometer systems is used to detect crustal bulging of Earth's surface, which may be directly related to earthquakes.

B78-10035
FLAT-PLATE HEAT PIPE
G. L. FLEISCHMAN (TRW, Inc.) and B. D. MARCUS (TRW, Inc.)
Jun. 1978
GSFC-11998 **Vol. 3, No. 1, p. 43**

Heat pipe has its working fluid sealed between two flat panels rather than in conventional cylindrical housing. Metal wick is installed between planes to provide continuous fluid path in cooperation with capillary groves on inside surfaces of plates. Heat pipe is easily coupled to flat surfaces such as integrated circuit substrates, mirrors, and electronic cold plates and is more effective than conventional heat pipes when removing heat in these applications.

B78-10036
VIDEO METHOD FOR STUDYING OPTICAL FIELDS
R. S. MEZRICH (RCA Corp.)
Jun. 1978
M-FS-23103 **Vol. 3, No. 1, p. 44**

Approach for measuring intensity distribution in optical field records pattern with vidicon and then displays it on oscilloscope, using vertical sweep as trigger. Single horizontal lines in field can be isolated by using sweep delay feature of oscilloscope.

B78-10037
SOLAR-ENERGY BIBLIOGRAPHY
S. GARGUS
Jun. 1978 See also NASA TM-X-73398(N78-13554)
M-FS-23823 **Vol. 3, No. 1, p. 44**

Bibliography lists over 100 ongoing projects, Tech Briefs, papers and periodicals, and technical reports and patents pertaining to work performed at Marshall Space Flight Center and by its contractors. Each item includes brief summary or abstract of work, its publication date (except for ongoing research), and a listing of other materials related to that work. Comprehensive subject index is also included.

B78-10167
IMPROVED 'SPECTROPHONE'
J. S. MARGOLIS and M. S. SHUMATE
Oct. 1978
NPO-14143 **Vol. 3, No. 2, p. 187**

Spectral lines of gas sample are modulated by electric field in optoacoustic gas analyzer. Pressure fluctuations caused by local heating of absorbing gas are picked up by microphone. Since laser is operated in continuous-wave (CW) mode, background noise due to heating of windows is eliminated.

B78-10168
LOW-BACKGROUND TRACE-GAS DETECTOR

L. ROSENGREN
Oct. 1978
NPO-13683 **Vol. 3, No. 2, p. 188**

Spectrophone detects very small concentrations of trace gases. With gas in sample cell, laser is tuned to absorption line of interest. Molecular absorption in cell produces pulsed acoustical pressure at chopper frequency. Two optical paths with very different absorption lengths are used to pretune cell to balance out background absorption by cell windows.

B78-10169
VIBRATION-FREE THERMAL LINK
D. E. JENNINGS
Oct. 1978
GSFC-12297 **Vol. 3, No. 2, p. 188**

System designed to hold laser at temperature of cold tip of helium refrigerator uses thermally-conducting flexible straps and special layered support structure.

B78-10170
PRACTICAL AND EFFICIENT MAGNETIC HEAT PUMP
G. V. BROWN
Oct. 1978 See also NASA TM-X-73676 (N77-26616)
LEWIS-12508 **Vol. 3, No. 2, p. 190**

Method for pumping heat magnetically at room temperature is more economical than existing refrigeration systems. Method uses natural magneto-thermal effect of gadolinium metal to establish temperature gradient across length of tube. Regenerative cyclic process in which gadolinium sample is magnetized and gives off heat at one end of tube, and then is demagnetized at other end to absorb heat has established temperature gradients of 144 degrees F in experiments near room temperature. Other materials with large magnetothermal effects can be used below room temperature. Possible commercial applications include freeze-drying and food processing, cold storage, and heating and cooling of buildings, plants, and ships.

B78-10171
PROTECTIVE COATING FOR LASER DIODES
I. LADANY (RCA Corp.) and J. L. VOSSEN, JR. (RCA Corp.)
Oct. 1978
LANGLEY-11746 **Vol. 3, No. 2, p. 191**

Coating for GaAs laser diodes should not alter optical and electrical properties. Borosilicate glass coating is easy to apply, breaks evenly when cleaved, and is abrasion and moisture resistant. Its low index of refraction makes thickness less critical when depositing half-wavelength coating.

B78-10172
INFRARED-ENHANCED TV FOR FIRE DETECTION
J. R. HALL (Rockwell Intern. Corp.)
Oct. 1978
M-FS-19380 **Vol. 3, No. 2, p. 191**

Closed-circuit television is superior to conventional smoke or heat sensors for detecting fires in large open spaces. Single TV camera scans entire area, whereas many conventional sensors and maze of interconnecting wiring might be required to get same coverage. Camera is monitored by person who would trip alarm if fire were detected, or electronic circuitry could process camera signal for fully-automatic alarm system.

B78-10173
WIDE ANGLE PINHOLE CAMERA
J. M. FRANKE
Oct. 1978
LANGLEY-11905 **Vol. 3, No. 2, p. 192**

Hemispherical refracting element gives pinhole camera 180 degree field-of-view without compromising its simplicity and depth-of-field. Refracting element, located just behind pinhole, bends light coming in from sides so that it falls within image area of film. In contrast to earlier pinhole cameras that used water or other transparent fluids to widen field, this model is not subject to leakage and is easily loaded and unloaded with film. Moreover, by selecting glass with different indices of refraction, field at film plane can be widened or reduced.

B78-10174
LASER BEAM COLOR SEPARATOR
J. M. FRANKE
Oct. 1978
LANGLEY-11806 **Vol. 3, No. 2, p. 193**

Multiwavelength laser beam is separated into series of parallel color beams using prism and retroreflector. Setup is inexpensive and needs no critical adjustments. It can incorporate several prisms to increase dispersion and reduce overall size. Transmission grating can be used instead of prism with sacrifice in efficiency. Spatial filter can remove unwanted beams.

B78-10175
PULSED NMR SPECTROSCOPY
D. P. BURUM, D. D. ELLEMAN, and W. RHIM
Oct. 1978
NPO-14023 **Vol. 3, No. 2, p. 194**

Method gives results approximating those of classical continuous-irradiation method but in less time. Method also makes it possible to measure chemical shifts and spin-lattice relaxation times with improved sensitivity. Equipment can be used for adiabatic demagnetization experiments, measurements of rotating-frame spin/lattice relaxation times, and accurate measurements of exact resonance points. When measuring relaxation times, pulse technique can be very effective since pulses may be limited in amplitude and length to prevent spin system from being driven into saturation.

B78-10176
OPTICAL GYROSCOPE
R. M. GOLDSTEIN and W. C. GOSS
Oct. 1978
NPO-14258 **Vol. 3, No. 2, p. 195**

Instrument uses phase difference between two beams of light to measure rotation. It is considerably simpler and more reliable than conventional spinning-mass gyroscopes used for inertial guidance and is more compact, lighter, and potentially less expensive. Moreover, optical gyroscope requires no warmup period. Although conceived for spacecraft and satellite stabilization, gyroscope should also find applications in flight instruments for private, commercial, and military aircraft.

B78-10177
IMPROVED DOUBLE-PASS MICHELSON INTERFEROMETER
R. A. SCHINDLER
Oct. 1978
NPO-13999 **Vol. 3, No. 2, p. 196**

Interferometer design separates beams by offsetting centerlines of cat's-eye retroreflectors vertically rather than horizontally. Since beam splitter is insensitive to minimum-thickness condition in this geometry, relatively-low-cost, optically flat plate can be used.

B78-10178
ENERGY CONSERVATION, USING REMOTE THERMAL SCANNING
R. L. BOWMAN and J. R. JACK
Oct. 1978 See also NASA TM-X-73570 (N77-21518)
LEWIS-12812 **Vol. 3, No. 2, p. 197**

Airborne thermal infrared scans and thermal maps utilized in NASA's energy conservation program have proven to be efficient cost-effective method for identifying heat losses from building roofs and heating system distribution lines. Method employs commercially available equipment in highly developed way.

B78-10179
ELECTROLYSIS CELL STIMULATION
L. H. GORDON, B. R. PHILLIPS, and J. EVANGELISTA (Wyandotte Corp.)
Oct. 1978
LEWIS-12740 **Vol. 3, No. 2, p. 198**

Computer program represents attempt to understand and model characteristics of electrolysis cells. It allows user to determine how cell efficiency is affected by temperature, pressure, current density, electrolyte concentration, characteristic dimen-

sions, membrane resistance, and electrolyte circulation rate. It also calculates ratio of bubble velocity to electrolyte velocity for anode and cathode chambers.

B78-10180
PROTOTYPE SOLAR-HEATING SYSTEM
Innovator not given (IBM Corp.) Oct. 1978 See also NASA CR-150534 (N78-17484); B78-10194; B78-10195
M-FS-23916 **Vol. 3, No. 2, p. 201**
Complete air-collector system to meet needs of single-family dwelling is designed to operate in any region of United States except extreme north and south. Design can be scaled up or down to accomodate wide range of heating and hot-water requirements for single-family, multi-family, or commercial buildings without significantly changing design concept.

B78-10181
RESIDENTIAL SOLAR-HEATING SYSTEM
Innovator not given (Solafern, Ltd.) Oct. 1978 See also NASA CR-150515 (N78-18526)
M-FS-23909 **Vol. 3, No. 2, p. 202**
Complete residential solar-heating and hot-water system, when installed in highly-insulated energy-saver home, can supply large percentage of total energy demand for space heating and domestic hot water. System which uses water-heating energy storage can be scaled to meet requirements of building in which it is installed.

B78-10182
MULTICHANNEL TEMPERATURE CONTROL FOR SOLAR HEATING
J. R. CURRIE
Oct. 1978
M-FS-23775 **Vol. 3, No. 2, p. 203**
Multiplexer/amplifier circuit monitors temperatures and temperature differences. Although primarily designed for cycle control in solar-heating systems, it can also measure temperatures in motors, ovens, electronic hardware, and other equipment.

B78-10183
PROGRAMMABLE CONTROLLER FOR SOLAR HEATING
Innovator not given (Rho Sigma, Inc.) Oct. 1978 See also NASA CR-150535 (N78-17485)
M-FS-23915 **Vol. 3, No. 2, p. 204**
Versatile microprocessor-based unit accepts sensor inputs and generates programmed control signals. Typical of possible applications would be to monitor differential temperature measurements in solar-heating systems, to turn on pumps and backup systems, and off-peak control for backup systems.

B78-10184
UNIVERSAL TEST FIXTURE FOR SOLAR CELLS
J. M. KOLYER (Rockwell Intern. Corp.)
Oct. 1978 See also B78-10185
NPO-14062 **Vol. 3, No. 2, p. 205**
Coverings for solar cells are evaluated conveniently with alumina ceramic circuit board holding three pairs of cells and three field-effect translator (FET) chips overlaid with candidate encapsulant. With fixture, solar cells and encapsulants are exposed to Sunlight and weather, either natural or artificial, to provide pertinent measurement and performance data.

B78-10185
ACCELERATED-WEATHERING TEST-SYSTEM FOR SOLAR CELLS
J. M. KOLYER (Rockwell Intern. Corp.)
Oct. 1978 See also B78-10184
NPO-14061 **Vol. 3, No. 2, p. 205**
Test system rapidly evaluates effects of sunlight, humidity, and temperature. System accelerates environmental testing since Sunlight is held at equivalent noon exposure (for a selected locality) for 12 hours; alternating light and dark periods are included to check for possible dark reactions in specimens.

B78-10186
AUTOMATED SOLAR-CELL-ARRAY ASSEMBLY MACHINE
E. N. COSTOGUE, R. L. MUELLER, J. K. PERSON, and R. K. YASUI
Oct. 1978
NPO-13652 **Vol. 3, No. 2, p. 206**
Continuous-feeding machine automatically bonds solar cells to printed-circuit substrate. In completed machine, cells move to test station where electrical characteristics could be checked. If performance of cell is below specifications, that cell is marked and removed. All machine functions are synchronized by electronics located within unit. It may help to lower costs in future solar-cell production.

B78-10187
IMPROVED CONICAL SOLAR CONCENTRATOR
J. S. GRIFFITH
Oct. 1978
NPO-13825 **Vol. 3, No. 2, p. 207**
Varied shapes give uniform concentration without significantly increasing fabrication costs. More complex shapes can be developed to make reflection pattern even more uniform without going over to parabolic surfaces. Various simple curves and S-shapes could be constructed by spinning or hydroforming methods.

B78-10188
INEXPENSIVE, PORTABLE, INTEGRATING SOLAR ENERGY METER
R. M. MASTERS
Oct. 1978 See also NASA TM-73791 (N78-14630); B75-10283
LEWIS-12804 **Vol. 3, No. 2, p. 208**
Silicon-cell insolometer automatically measures and totals amount of energy available in sunlight falling on the earth at specific location over selected period of time. Device incorporates single silicon solar cell as sensing element and relies on principle that short-circuit current from solar cell is directly proportional to amount of light that shines on cell.

B78-10189
OPTICS FOR NATURAL LIGHTING
H. B. EDWARDS
Oct. 1978
LANGLEY-12333 **Vol. 3, No. 2, p. 209**
Energy-saving optics utilize sky and sun for lighting. Innovative optical arrangements for transmitting outdoor light into building interiors are decribed using flat white and mirrored surfaces for converging and diverging light pipes.

B78-10190
SELECTION STANDARD FOR FEP FILMS FOR SOLAR ENERGY
M. W. REED (Vought Corp.)
Oct. 1978
MSC-16999 **Vol. 3, No. 2, p. 211**
Purple fluorocarbon ethylene propylene (FEP) films are more efficient due to low absorptance. Designers seeking to improve coatings quantify this effect and devise simple screening test based on transmittance of films.

B78-10191
PROTOTYPE RESIDENTIAL SOLAR-ENERGY SYSTEM
Innovator not given (IBM Corp) Oct. 1978 See also NASA CR-150558 (N78-19649); B78-10192
M-FS-23932 **Vol. 3, No. 2, p. 211**
Complete solar-energy domestic-hot-water system for single-family residences is described in brochure. It contains data on procurement, installation, operation, and maintainance of system in residential or light commercial buildings. Appendix includes vendor brochures for major system components. Drawings, tables, and graphs complement text.

B78-10192
PROTOTYPE RESIDENTIAL SOLAR-ENERGY SYSTEM-ENGINEERING ANALYSIS
Innovator not given (IBM Corp) Oct. 1978 See also NASA CR-150544 (N78-19604); B78-10191

M-FS-23929 **Vol. 3, No. 2, p. 212**

Tests indicate performance very close to theoretical predictions. Major objectives were to verify system installation techniques, operation, and performance; to verify performance of individual subsystems; and to provide general test data base comparison with field data.

B78-10193
RESIDENTIAL SOLAR-HEATING SYSTEM - DESIGN BROCHURE
Innovator not given (Contemporary Systems, Inc.) Oct. 1978 See also NASA CR-150600 (N78-20615)
M-FS-23933 **Vol. 3, No. 2, p. 212**

Design brochure for commercially-available solar-heating system is valuable to architects, engineers, and designers. It contains information on system configuration, system sizing, and mechanical layout. Drawings and specifications of all components and typical installation details are included in appendix.

B78-10194
PROTOTYPE SOLAR-HEATING SYSTEM-ENGINEERING ANALYSIS
Innovator not given (IBM Corp.) Oct. 1978 See also NASA CR-150522 (N78-18527) B78-10180; B78-10195
M-FS-23910 **Vol. 3, No. 2, p. 213**

Space and domestic-water solar-heating prototype was tested in three phases: simulated energy function, winter normal operation, summer normal operation. Prototype was judged suitable for field installation.

B78-10195
PROTOTYPE SOLAR-HEATING SYSTEM - INSTALLATION MANUAL
Innovator not given (IBM Corp.) Oct. 1978 See also NASA CR-150524 (N78-18523); B78-10180; B78-10194
M-FS-23907 **Vol. 3, No. 2, p. 213**

Manual for prototype solar-heating system gives detailed installation procedures for each of seven subsystems. Procedures for operation and maintenance are also included. It discusses architectural considerations, building construction considerations, and checkout-test procedures.

B78-10196
SOLAR-HEATING MODULE
D. L. CHRISTENSEN (Alabama Univ.)
Oct. 1978
M-FS-23925 **Vol. 3, No. 2, p. 213**

Comprehensive set of engineering drawings and instructions for installation, operation, repair, and maintenance are available for module that provides hot-air or hot-water needs for residence or commercial building. It can accommodate solar collectors of various sizes and types. It can provide utility, workshop, or storage space, in addition to providing hot water or hot air. Extensive insulation minimizes heat losses in structure and in storage and fluid-handling subsystems.

B78-10197
PASSIVE HEAT EXCHANGER FOR SOLAR HEATING
Innovator not given (Sigma Research, Inc.) Oct. 1978 See also NASA CR-150516 (N78-18522); B78-10198
M-FS-23914 **Vol. 3, No. 2, p. 214**

Requirements for design, manufacture, installation, and performance of passive heat-exchanger module with auxiliary heaters for use with solar-heating systems are described.

B78-10198
PASSIVE HEAT EXCHANGER - INSTALLATION PACKAGE
Innovator not given (Sigma Research, Inc.) Oct. 1978 See also NASA CR-150512 (N78-20602); B78-10197
M-FS-23930 **Vol. 3, No. 2, p. 214**

Package covers installation, operation, and maintenance of heat exchanger which has auxiliary heaters that provide backup heat in inclement weather. Drawings, including schematics, complement text material, which is organized as step-by-step instructions. Trouble-shooting section discusses probable causes and repairs for most common difficulties.

B78-10199
PROTOTYPE AIR FLAT-PLATE SOLAR COLLECTOR
Innovator not given (Life Sciences Engineering) Oct. 1978 See also NASA CR-150514 (N78-17479); B78-10200
M-FS-23893 **Vol. 3, No. 2, p. 214**

Four reports trace development from preliminary design through delivery of hardware. Developmental test, including airflow, air temperature, and efficiency are discussed in reports, as are qualification tests on prototypes and final acceptance tests. Qualification test program includes measurements tests, and structural analysis.

B78-10200
FLAT-PLATE SOLAR COLLECTOR - INSTALLATION PACKAGE
Innovator not given (Life Sciences Engineering) Oct. 1978 See also NASA CR-150536 (N78-19605); B78-10199
M-FS-23921 **Vol. 3, No. 2, p. 214**

Package includes installation, operation and maintenance manual for collector, analysis of safety hazards, special handling instructions, materials list, installation drawings, and warranty and certification statement. Manual includes instructions for roof preparation and for preparing collector for installation. Several pages are devoted to major and minor repairs.

B78-10201
TESTING OF THREE HOT- AIR SOLAR COLLECTORS
R. LOSEY (Wyle Laboratories)
Oct. 1978 See also NASA CR-150495 (N78-17471)
M-FS-23887 **Vol. 3, No. 2, p. 215**

Report presents procedures used and results obtained during program to determine pressure drops across three prototype hot-air solar collectors as function of air velocity and operating temperature.

B78-10202
THERMAL PERFORMANCE OF A HOT-AIR SOLAR COLLECTOR
J. CHIOU (Wyle Laboratories)
Oct. 1978 See also NASA CR-150509 (N78-17478)
M-FS-23891 **Vol. 3, No. 2, p. 215**

Series of tests evaluated thermal performance of hot-air solar collector. Evaluation included time constant, collector-efficiency, collector-stagnation, properties tests.

B78-10203
PERFORMANCE AND STRUCTURAL TESTS OF HOT-AIR SOLAR COLLECTORS
K. SHIH (Wyle Laboratories)
Oct. 1978 See also NASA CR-150506 (N78-18525)
M-FS-23911 **Vol. 3, No. 2, p. 215**

Report describes program to determine thermal performance and structural characteristics of selected hot-air collectors in both real and simulated environmental conditions.

B78-10204
THERMAL PERFORMANCE OF A HOT-AIR SOLAR COLLECTOR
Innovator not given (Wyle Laboratories) Oct. 1978 See also NASA CR-150572 (N78-19652)
M-FS-23924 **Vol. 3, No. 2, p. 216**

Report contains procedures and results of thermal-performance tests on double-glazed air solar collector. Four types of tests were carried out including thermal-efficiency and stagnation tests, collector time-constant tests to assess effects of transients, and incident-angle modifier tests. Data are presented in tables and as graphs and are discussed and analyzed.

B78-10205
FLAT-PLATE LIQUID SOLAR COLLECTOR
K. SHIH (Wyle Laboratories)
Oct. 1978 See also NASA CR-150511 (N78-18521)
M-FS-23912 **Vol. 3, No. 2, p. 216**

Report presents test procedures and results of program to obtain thermal performance data on liquid, incident-angle-modifier, heat-loss-coefficient, and stagnation tests.

B78-10206
PERFORMANCE EVALUATIONS OF A LIQUID SOLAR COLLECTOR
K. SHIH (Wyle Laboratories)
Oct. 1978 See also NASA CR-150573 (N78-19650)
M-FS-23931 **Vol. 3, No. 2, p. 216**

Report presents procedures and results of thermal performance tests on single-covered liquid solar collector under simulated comditions. Test conditions and data are given in tables and graphs for stagnation tests and thermal performance test. In addition, time-constant test and incident-angle modifier test were conducted to determine transient effect and incident-angle effect. Results of collector load tests are also given.

B78-10207
INDOOR AND OUTDOOR TESTS OF A LIQUID SOLAR COLLECTOR
R. LOSEY (Wyle Laboratories) and K. SHIH (Wyle Laboratories)
Oct. 1978 See also NASA CR-150505 (N78-17472); NASA CR-150507 (N78-17473)
M-FS-23886 **Vol. 3, No. 2, p. 217**

Two reports describe thermal-performance data obtained on double-covered liquid solar collector. One report describes data obtained during outdoor testing and the other describes indoor test data obtained by using Marshall Space Flight Center solar simulator. Indoor data were taken to verify performance of solar simulator.

B78-10208
THERMAL PERFORMANCE OF A FLAT-PLATE LIQUID SOLAR COLLECTOR
K. SHIH (Wyle Laboratories)
Oct. 1978 See also NASA CR-150508
M-FS-23890 **Vol. 3, No. 2, p. 217**

Report presents procedures and results of a program to obtain thermal performance data on double-covered liquid solar collectors.

B78-10209
CORROSION INHIBITORS FOR SOLAR HEATING AND COOLING SYSTEMS
J. H. TABONY (Southern Univ.)
Oct. 1978 See also NASA CR-150575 (N78-17475)
M-FS-23892 **Vol. 3, No. 2, p. 217**

Candidate materials were tested for their ability to limit corrosion under conditions that approximate those found in typical solar-energy system. In addition to presentation of data, report also includes discussion of different forms of corrosion and recommendations for future work.

B78-10210
PERFORMANCE OF BLACK-NICKEL AND BLACK-CHROME SOLAR COLLECTORS
R. LOSEY (Wyle Laboratories)
Oct. 1978 See also NASA CR-150497 (N78-17470)
M-FS-23888 **Vol. 3, No. 2, p. 218**

Report presents procedures used and results obtained during tests to determine comparative efficiency of black-nickel and black-chrome solar-collecting surfaces.

B78-10211
MEASURING METALLIC CONCENTRATIONS IN GLYCOL SOLUTIONS
Innovator not given (Houston Chemical Co.) Oct. 1978 See also NASA CR-150520 (N78-17174)
M-FS-23894 **Vol. 3, No. 2, p. 218**

A study of atomic absorption spectroscopy as a possible nonobtrusive corrosion indicator for solar-energy systems is described. Procedures were tested for determining low levels of metallic concentration in aqueous glycol formulations. Other methods for determining corrosion are suggested.

B78-10212
GLASS SOLAR COLLECTOR - MATERIALS ASSESSMENT
R. L. NICHOLS
Oct. 1978 See also NASA TM-78163 (N78-21597)
M-FS-23926 **Vol. 3, No. 2, p. 218**

Comprehensive series of tests evaluates design, materials, and failure modes of commercially-available glass solar-collector system. Results of materials analysis segment of program are presented to report.

B78-10213
PUMP EFFICIENCY IN SOLAR-ENERGY SYSTEMS
Innovator not given (Tennessee Tech. Univ.) Oct. 1978 See also NASA CR-150604 (N78-20617)
M-FS-23934 **Vol. 3, No. 2, p. 219**

Study investigates characteristics of typical off-the-shelf pumping systems that might be used in solar systems. Report includes discussion of difficulties in predicting pump efficiency from manufacturers' data. Sample calculations are given. Peak efficiencies, flow-rate control, and noise levels are investigated. Review or theory of pumps types and operating characteristics is presented.

B78-10214
THE ECONOMICS OF SOLAR POWERED ABSORPTION COOLING
J. C. BARTLETT (IBM Corp.)
Oct. 1978 See also NASA CR-150533 (N78-18524)
M-FS-23908 **Vol. 3, No. 2, p. 219**

Analytic procedure evaluates cost of combining absorption-cycle chiller with solar-energy system in residential or commercial application. Procedure assumes that solar-energy system already exists to heat building and that cooling system must be added. Decision is whether to cool building with conventional vapor-compression-cycle chiller or to use solar-energy system to provide heat input to absorption chiller.

B78-10215
APPLICATION OF SOLAR ENERGY TO AIR-CONDITIONING
A. J. HARSTAD (IBM Corp.) and J. M. NASH (IBM Corp.)
Oct. 1978 See also NASA CR-150532 (N78-17483)
M-FS-23913 **Vol. 3, No. 2, p. 220**

Results of survey of application of solar energy to air-conditioning systems are summarized in report. Survey reviewed air-conditioning techniques that are most likely to find residential applications and that are compatible with solar-energy systems being developed.

B78-10318
'PSEUDOBACKSCATTER' LASER VELOCIMETER
W. D. GUNTHER
Jan. 1979
ARC-10970 **Vol. 3, No. 3, p. 343**

Laser instrument measures speed of fluid flow with sensitivity of forward-scatter velocimeter and convenience of back scatter device. Velocimeter uses corner-cube reflector to return scattered laser beam to source. Device measures airflow around aircraft and in wind tunnels or other fluid-flow measurement applications.

B78-10319
SIGNAL-INTERLEAVING DEVICE
J. R. FISCHER
Jan. 1979
GSFC-12111 **Vol. 3, No. 3, p. 344**

Interleaving devices combine and duplicate optical electronic and other energy-saving signals in signal processing applications necessary for recording heads in interconnecting logic elements in computers and in data transmission systems. Simple cubic interleaver is characterized by high energy transmission and potentiality for low cost fabrication, and is designed to be easily interconnected with other signal processing elements.

B78-10320
COMMON-CAVITY PUMPED LASER
G. A. KOEPF (NASA)
Jan. 1979

GSFC-12237 **Vol. 3, No. 3, p. 345**

Two lasers linked by dichroic coupler are packaged in single cavity. Resulting system is more compact, efficient, and durable than conventional two-cavity lasers. Such instruments (portable pumped lasers) are needed for spectroscopy in plasma diagnostics in atmospheric research, and in radar-like devices for seeing through dense fog or smoke.

B78-10321
MEASURING SURFACE DISPLACEMENTS OPTICALLY
R. B. OWEN
Jan. 1979
M-FS-23861 **Vol. 3, No. 3, p. 346**

Laser system measures changes in position or roughness of surface without physical contact. Using optical correlation technique, displacement of surface is measured by reflection of laser beam and holographic correlation filtering system. System also determines changes in roughness or shape of surface.

B78-10322
COSINE-CORRECTED OPTICAL DIFFUSER
R. S. ESTEY
Jan. 1979
NPO-14288 **Vol. 3, No. 3, p. 347**

In solar energy utilization studies, correct measurements of flux arriving at other angles to optical axis must be given. Developed device (Cosine diffuser) significantly reduces measurement errors. In combination of radiation transmitter and diffuser co-operating with collimated optical instrument, relative aperture of instrument is filled.

B78-10323
VACUUM-ULTRAVIOLET LASER USES SUPERFLUID HELIUM
J. S. ZMUIDZINAS
Jan. 1979
NPO-13993 **Vol. 3, No. 3, p. 348**

Vacuum ultra violet laser in wavelength around 0.800 microns is produced by using optical pumping to increase lifetimes of excited metastable molecules in super fluid helium. In method, super fluid helium is pumped electronically to produce excited HE2, and then pumped by circularly polarized 0.9096 - micron radiation to aline excited HE2 molecular spins. High power ultraviolet radiation has potential applications in molecular reaction studies, power transmission in space, and biomedical research.

B78-10324
SOLAR-POWERED HOT-WATER SYSTEM
E. R. COLLINS
Jan. 1979
NPO-14270 **Vol. 3, No. 3, p. 349**

Hot-water system requires no external power except solar energy. System is completely self-controlling. It includes solar-powered pump, solar-thermally and hydrothermally operated valves, and storage tank filled with open-celled foam, to maintain thermal stratification in stored water.

B78-10325
THIN SILICON-SOLAR CELL FABRICATION
J. LINDMAYER (Solarex Corp.)
Jan. 1979
NPO-14047 **Vol. 3, No. 3, p. 350**

Flexible silicon slices of uniform thicknesses are fabricated by etching in sodium hydroxide solution. Maintaining uniform thickness across slices during process(fabrication) is important for cell strength and resistance to damage in handling. Slices formed by procedure have reproducible surface with fine orange peel texture, and are far superior to slices prepared by other methods.

B78-10326
NATURAL-OXIDE SOLAR-COLLECTOR COATINGS
A. C. KRUPNICK, M. L. ROBERTS, and M. H. SHARPE
Jan. 1979
M-FS-23518 **Vol. 3, No. 3, p. 350**

Optically selective coatings for solar collectors are produced by thermally treating stainless steel in furnace after series of cleaning and soaking operations. Coatings have withstood 18-month exposure tests at 100 percent relative humidity and temperatures of 95 F. Room temperature coatings are valuable as they are inexpensive to produce, highly production oriented, and environmentally stable.

B78-10327
MOUNTING PROCEDURE FOR GEOLOGICAL SAMPLES
D. I. JEZEK (Northrop Corp.)
Jan. 1979
MSC-18206 **Vol 3, No. 3, p. 351**

Mounting procedure originally developed for lunar samples preserves geological specimens. Sequence of potting and grinding operations produces thin sections through grains that are easy to handle and are well protected for storage. Method results in more representative sections of mixture of grains of different sizes and more effective distribution of grains uniformly over slide.

B78-10328
MODULAR HEAT-PIPE-RADIATOR PANEL
J. ALARIO (Grumman Aerospace Corp.)
Jan. 1979
MSC-16625 **Vol. 3, No. 3, p. 352**

Heat-Pipe panel assembled by joining series of Heat-Pipe modules is presented. Each module is identical and includes own radiator Fin and Fluid-Header section. Arrangement gives high turn-down ratio permitting ammonia heat pipes to freeze under low conditions.

B78-10329
ESTIMATING REGIONAL HEAT FLUX FROM SCANNING RADIOMETER DATA
T. D. BESS and G. L. SMITH
Jan. 1979
LANGLEY-12158 **Vol. 3, No. 3, p. 353**

Method using matrix approach to determine best linear estimate of total flux consistent with condition of minimum variance proves useful in meteorological studies. It is useful for researchers studying. options in scanner design such as scan pattern, scan rate, and radiometer field-of-view.

B78-10330
ENERGY CONVERSION ALTERNATIVES STUDY
L. T. SHURE
Jan. 1979 See also NASA-TM-73871 (N78-24659)
LEWIS-13096 **Vol. 3, No. 3, p. 353**

Comparison of coal based energy systems is given. Study identifies and compares various advanced energy conversion systems using coal or coal derived fuels for baselaoad electric power generation. Energy Conversion Alternatives Study (ECAS) reports provede government, industry, and general public with technically consistent basis for comparison of system's options of interest for fossilfired electric-utility application.

B78-10331
PROBLEMS ENCOUNTERED IN SOLAR HEATING AND COOLING SYSTEMS
M. CASH
Jan. 1979 See also NASA TM-78172 (N78-25539)
M-FS-23974 **Vol. 3, No. 3, p. 354**

Report discussing various experiences of workers at Marshall Space Flight Center in developing solar heating and cooling systems is presented. Presents compilation of problems and their resolutions which can assist designers of solar-energy systems and prevent repetition of errors.

B78-10332
PROTOTYPE SOLAR-HEATING SYSTEM DESIGN PACKAGE
Innovator not given (IBM) Jan. 1979 See also NASA-CR-150614 (N78-21589)
M-FS-23945 **Vol. 3, No. 3, p. 355**

Design package for complete residential solar-heating system is given. Includes documents and drawings describing performance

design, verification standards, and analysis of system with sufficient information to assemble working system.

B78-10333
PROTOTYPE RESIDENTIAL SOLAR-ENERGY SYSTEM-DESIGN PACKAGE
Innovator not given (IBM) Jan. 1979 See also NASA-CR-15052 (N78-22465); B78-10192
M-FS-23953 **Vol. 3, No. 3, p. 355**
Compilation includes documents and drawings for complete solar-heating system. It discussed system installed in residential building at Veterns' Administration Hospital in Togus, Maine. System can be adapted to other buildings without changing design.

B78-10334
PROTOTYPE RESIDENTIAL SOLAR-ENERGY SYSTEM-INSTALLATION PACKAGE
Innovator not given (IBM) Jan. 1979 See also NASA-CR-150639 (N78-22474)
M-FS-23956 **Vol. 3, No. 3, p. 355**
Installation guidelines for architects and engineers discussing solar-heating system built in Togus, Maine are presented. Includes brief, functional description of system and summary of operation. Drawings complement text.

B78-10335
HOT-AIR FLAT-PLATE SOLAR COLLECTOR-DESIGN PACKAGE
Innovator not given (Life Sciences Engineering) Jan. 1979 See also NASA-CR-150611 (N78-21602)
M-FS-23941 **Vol. 3, No. 3, p. 355**
Report contains design data, performance specifications, and drawings for hot-air flat-plate solar-energy collector. Evaluation consists of tests on thermal performance time constance, and incidence angle modifier test. Results are presented in table and graph form and are analyzed in detail.

B78-10336
EVALUATION OF AN AIR SOLAR COLLECTOR
Innovator not given (Wyle Labs., Inc.) Jan. 1979 See also NASA-CR-150665 (N78-25547)
M-FS-23978 **Vol. 3, No. 3, p. 356**
Performance verification under simulated conditions tested by using Marshall Space Flight Center solar simulator is presented. Evaluation included thermal performance tests, time constant tests, and incident angle modifier tests.

B78-10337
INDOOR TESTS OF A HOT-AIR SOLAR COLLECTOR
Innovator not given (Wyle Labs., Inc.) Jan. 1979 See also NASA-CR-150631 (N78-22466)
M-FS-23954 **Vol. 3, No. 3, p. 356**
Data taken relating indoor testing using solar simulator at Marshall Space Center has been compared with data taken during outdoor tests in previous studies. Data includes tests on thermal performance, time constance, and incidence-angle modifier tests in table/graph form.

B78-10338
PERFORMANCE EVALUATION OF AN AIR SOLAR COLLECTOR
Innovator not given (Wyle Labs., Inc.) Jan. 1979 See also NASA-CR-150666 (N78-24613)
M-FS-23968 **Vol. 3, No. 3, p. 356**
Indoor tests on signal-glazed flat-plate collector are described in report. Marhsall Space Flight Center solar simulator is used to make tests. Test included evaluations on thermal performance under various combinations of flow rate, incident flux, inlet temperature, and wind speed. Results are presented in graph/table form.

B78-10339
OUTDOOR TESTS OF A LIQUID SOLAR COLLECTOR
Innovator not given (Wyle Labs., Inc.) Jan. 1979 See also NASA-CR-150675 (N78-24614)
M-FS-23969 **Vol. 3, No. 3, p. 357**
Results of outdoor test program evaluating thermal performance of liquid solar collector are presented in report. Test article used is flatplate collector with antifreeze solution as working fluid.

B78-10340
POWER LOSS FOR HIGH-VOLTAGE SOLAR-CELL ARRAYS
L. W. PARKER (Lee W. Parker, Inc.)
Jan. 1979
LEWIS-12865 **Vol. 3, No. 3, p. 357**
Electric field particle collection and power loss are calculated in program written in FORTRAN IV for use on UNIVAC 1100/40 computer. Program incorporates positive and negative and negative charge flows and balance between positive and negative flows is performed by iteration.

B78-10341
OCEAN-WAVE RAY OR CREST DIAGRAMS IN SHOALING WATERS
W. D. MORRIS, L. R. POOLE, and S. R. LECROY (Vought Corp.)
Jan. 1979
LANGLEY-12380 **Vol. 3 No. 3, p. 357**
Program developed to aid studies of linear ocean-wave refraction features random-access modular storage of bathymetry data to minimize computer resource requirements. Program is study tool used to forecast ocean conditions for ship routing and offshore activities. It also allows very large geographical regions to be studied with fewer computer resources, but does not restrict applicability of model to smaller areas.

B78-10477
SOLAR SIMULATOR TEST FACILITY
W. R. HUMPHRIES
Mar. 1979 See also NASA-TM-78165 (N78-21605)
M-FS-23972 **Vol. 3, No. 4, p. 507**
Discusses facility constructed at Marshall Space Flight Center to evaluate performance of solar energy collectors under simulated outdoor conditions. Facility simulates sunfall properties such as radiation intensity, spectrum, collimation, uniformity, and direction.

B78-10478
VOLTAGE REGULATOR FOR SOLAR PANELS
T. A. CASAD
Mar. 1979
NPO-13895 **Vol. 3, No. 4, p. 508**
Shunt voltage regulators for solar panels uses internal resistance of panel to control its output voltage. Regulator can be scaled up for high-current solar panels by adding more transistors.

B78-10479
MORE EFFICIENT GAAS SOLAR CELLS
W. TANTRAPORN
Mar. 1979
LANGLEY-12216 **Vol. 3, No. 4, p. 509**
Electron-hole pair production in space charge layer converts nearly 100 percent of photogenerated carriers to useful current. Short life problem is eliminated.

B78-10480
INFRARED SCANNERS DETECT THERMAL GRADIENTS IN BUILDING WALLS
A. G. KANTSIOS
Mar. 1979
LANGLEY-12157 **Vol. 3, No. 4, p. 510**
Presents study on ability of infrared scanner used to detect thermal gradients in outside walls of two homes in Virginia Beach, Virginia under joint effort of Langley Research Center, Virginia Energy Office and Virginia Beach Energy Conservation Pilot Project. Details how study can be used to help minimize energy loss.

B78-10481
SOLAR-POWERED HOT-AIR SYSTEM
Innovator not given (Solar Engineering and Equipment Co.) Mar. 1979
M-FS-23976 **Vol. 3, No. 4, p. 511**

Solar-powered air heater supplies part or all of space heating requirements of residential or commercial buildings and is interfaced with air to water heat exchanger to heat domestic hot water. System has potential application in drying agricultural products such as cotton, lumber, corn, grains, and peanuts.

B78-10482
OCEAN THERMAL PLANT
L. J. OWENS
Mar. 1979
KSC-11034 **Vol. 3, No. 4, p. 512**

Modular Ocean Thermal-Energy Conversion (OTEC) plant permits vital component research and testing and serves as operational generator for 100 megawatts of electric power. Construction permits evaporators and condensers to be tested in same environment in which they will be used, and could result in design specifications for most efficient plant facilities in future.

B78-10483
WIND/WATER ENERGY CONVERTER
J. PAULKOVICH
Mar. 1979
GSFC-12361 **Vol. 3, No. 4, p. 513**

Device will convert wind, water, tidal or wave energy into electrical or mechanical energy. Is comprised of windmill-like paddles or blades synchronously geared to orient themselves to wind direction for optimum energy extraction.

B78-10484
THERMOELECTRICALLY-COOLED VARIABLE-TEMPERATURE PROBE
R. M. KELSO and R. G. RICHMOND
Mar. 1979
MSC-18192 **Vol. 3, No. 4, p. 514**

Variable-temperature probe for electron spectroscopy requires no cryogenic liquids or resistance heating elements. Device consists of heat sink, probe tip, and nickel-plated copper body which resists oxidation and transfers heat efficiently between tip and heat sink.

B78-10485
IMPROVED FOURIER INTERFERENCE SPECTROMETER
R. A. SCHINDLER
Mar. 1979
NPO-14025 **Vol. 3, No. 4, p. 515**

Proposed system compensates for velocity changes by multiplying detector output by signal proportional to scan velocity. Increases in velocity are compensated by increase signal from velocity circuit and decreases in velocity are offset by smaller signal from circuit thereby making output signal velocity independent.

B78-10486
LOW-POWER TUNER FOR LASERS
S. LEVINSON (United Aircraft Corp.)
Mar. 1979
M-FS-23863 **Vol. 3, No. 4, p. 515**

Magnetic transducers tunes laser by making small precise adjustments in length of laser resonant cavity. Device is simple and stable structure consisting of electromagnet pulling on spring supported magnetic plate.

B78-10487
DIFFRACTOID X-RAY FOCUSING
S. O. KASTNER
Mar. 1979
GSFC-12357 **Vol. 3, No. 4, p. 516**

Presents aspheric concave diffraction surface that is able to focus sharply single wavelength of x-ray or ultraviolet radiation which may originate from either nearby or far-distant source.

B78-10488
IMPROVED SERVO FOR A MICHAELSON INTERFEROMETER
R. A. SCHINDLER
Mar. 1979
NPO-14093 **Vol. 3, No. 4, p. 517**

Simplified constant-velocity servosystem for continuous-scan interferometer replaces earlier more complex system designed for atmospheric sampling experiments.

B78-10489
INSTRUMENT MEASURES MANY OPTICAL PROPERTIES IN VISIBLE AND IR
C. E. BATTEN
Mar. 1979
LANGLEY-12285 **Vol. 3, No. 4, p. 518**

Electro-optical system measures reflectance, reflectance ratio, transmission, absorption, refractive index, and absorption coefficient in both visible and infrared (IR) spectral regions. System effectively combining capabilities of ellisometer, reflectometer, and spectrophotometer is expected to find application in environmental and material composition testing fields.

B78-10490
HYDROGEN-MASER FREQUENCY STANDARD
V. REINHARDT and P. CERVENKA (Phoenix Corp.)
Mar. 1979
GSFC-12334 **Vol. 3, No. 4, p. 519**

Wall shift in frequency of proposed variable-shift maser that is caused by collisions between hydrogen atoms and container walls, could easily be determined, thereby allowing building of frequency standard with accuracy of 1 part in 10 to 14th power.

B78-10491
ULTRATHIN FILMS AS PHOTOMECHANICAL TRANSDUCER
R. F. FEDORS and M. N. SARBOLOUKI
Mar. 1979
NPO-14363 **Vol. 3, No. 4, p. 520**

Stretched ultrathin, metallized polyimide film is used as photochemical transducer for detection and measurement of total exposure to light. Film is potential nonelectrical replacement for solar cells.

B78-10492
SOLAR-HEATING SYSTEM DESIGN DATA BROCHURE
Innovator not given (Federal Systems Division of IBM Corp.) Mar. 1979
M-FS-23977 **Vol. 3, No. 4, p. 521**

Report details design and performance specifications of complete system for space and hot-water heating that is assembled from commercially available components. System can meet need of single family dwelling having approximately 1,200 sq ft of floor area and can be scaled to requirements of larger or smaller installations.

B78-10493
SOLAR-HEATING SYSTEM PERFORMANCE TESTS
Innovator not given (Federal Systems Division of IBM Corp.) Mar. 1979
M-FS-25021 **Vol. 3, No. 4, p. 522**

Report contains results of performance tests on complete system for solar space and hot-water heating system that uses commercially available components. Results were used to determine system suitability for field installation and to generate performance data base for comparison with future tests on field installed systems.

B78-10494
SOLAR-HEATING SYSTEM
Innovator not given (Federal Systems Division of IBM Corp.) Mar. 1979
M-FS-25022 **Vol. 3, No. 4, p. 522**

Report describes solar modular domestic-hot-water and space-heating system intended for use in small single family dwelling where roof-mounted collectors are not feasible. Contents include design, performance, and hardware specifications for assembly, installation, operation, and maintenance of system.

B78-10495
SOLAR HOT-WATER SYSTEM
Innovator not given (Solar Engineering and Manufacturing Co.) Mar. 1979
M-FS-25043 **Vol. 3, No. 4, p. 522**
Design data brochure describes domestic solar water system that uses direct-feed system designed to produce 80 gallons of 140 F hot water per day to meet needs of single family dwelling. Brochure also reviews annual movements of sun relative to earth and explains geographic considerations in collector orientation and sizing.

B78-10496
RESIDENTIAL SOLAR-HEATING SYSTEM-DESIGN PACKAGE
Innovator not given (Soiafern Ltd.) Mar. 1979
M-FS-25071 **Vol. 3, No. 4, p. 523**
Design package for modular solar heating system includes performance specifications, design data, installation guidelines, and other information that should be valuable to those interested in system (or similar systems) for projected installation. When installed in insulated 'energy saver' home, system can supply large percentage of total energy needs of building.

B78-10497
DEVELOPMENT AND TESTING OF A HOT-AIR SOLAR COLLECTOR
J. M. CAUDLE
Mar. 1979
M-FS-23997 **Vol. 3, No. 4, p. 523**
Summarized report on development and testing of hot-air flat-plate solar collector includes structural details, coating selection, and spacing between coating and glass plate. Report gives complete performance specifications and extensive certifications test report.

B78-10498
DESIGN AND INSTALLATION OF A FLAT-PLATE SOLAR COLLECTOR
Innovator not given (Calmac Manufacturing Co.) Mar. 1979 See also M-FS-25082 (B78-10499)
M-FS-25010 **Vol. 3, No. 4, p. 523**
Report presents performance, installation, operation, and maintenance information for flat-plate liquid solar energy collector. Methods for determining optimum collector sizing are described as well.

B78-10499
LIQUID SOLAR COLLECTOR-PERFORMANCE TESTS
Innovator not given (Calmac Manufacturing Co.) Mar. 1979 See also M-FS-25010 (B78-10498)
M-FS-25082 **Vol. 3, No. 4, p. 524**
Report describes comprehensive performances test on commercially-available modular nonmetallic single-glazed liquid solar collector to verify compliance with U. S. Housing and Urban Development Department standards for thermal stability. Program includes tests of initial thermal performance, 30 day stagnation, and final external performance.

B78-10500
CONCENTRATING SOLAR COLLECTOR-INSTALLATION PACKAGE
Innovator not given (Northrup Corp.) Mar. 1979
M-FS-25068 **Vol. 3, No. 4, p. 524**
Report contains general description of concentrating solar collector and tracking system kit, along with comprehensive drawings, instructions, and guidelines to assist in field assembly, installation, operation, and maintenance of system.

B78-10501
CORROSION INHIBITORS FOR SOLAR-HEATING AND COOLING
T. S. HUMPHRIES
Mar. 1979
M-FS-25023 **Vol. 3, No. 4, p. 525**
Report describes results of tests conducted to evaluate abilities of 12 candidate corrosion inhibitors to protect aluminum, steel, copper, or stainless steel at typical conditions encountered in solar heating and cooling systems. Inhibitors are based on sodium salts including nitrates, borates, silicates, and phosphates.

B78-10502
CHEMICAL-VAPOR DEPOSITION OF SILICON FROM SILANE
G. C. HSU, R. LUTWACK, and A. K. PRATURI
Mar. 1979 See also NASA-CR-155044 (N77-32265)
NPO-14403 **Vol. 3, No. 4, p. 525**
Report lists tables of standard free-energy change, equilibrium constant, and heat of reaction for chemical vapor deposition (CVD) of silicon from silane over temperature range of 100 to 1000 K. Data indicates silicon CVD may be a commercially economical process for production of silicon for solar arrays and other applications.

B78-10503
MULTIDIMENSIONAL HISTOGRAMS
R. R. JAYROE, JR.
Mar. 1979
M-FS-23855 **Vol. 3, No. 4, p. 526**
Program computes four dimensional histogram of Landsat multispectral image data. System enhances image handling and significantly reduces reprocessing costs.

04 MATERIALS

B78-10038
MICROBIAL DESULFURIZATION OF COAL
M. N. DASTOOR and J. J. KALVINSKAS
Jun. 1978
NPO-14227 **Vol. 3, No. 1, p. 47**
Experiments indicate that several sulfur-oxidizing bacteria strains have been very efficient in desulfurizing coal. Process occurs at room temperature and does not require large capital investments of high energy inputs. Process may expand use of abundant reserves of high-sulfur bituminous coal, which is currently restricted due to environmental pollution. On practical scale, process may be integrated with modern coal-slurry transportation lines.

B78-10039
HYDROGEN ENRICHMENT OF SYNTHETIC FUEL
C. G. JAY (Inst. of Gas Tech.)
Jun. 1978
M-FS-23279 **Vol. 3, No. 1, p. 47**
Synthetic gas may be produced at lower cost and higher efficiency by using outside source of hydrogen. Method is compatible with same temperatures and pressures as shift reaction. Process increases efficiency by using less coal and water to provide equal amount of synthetic gas.

B78-10040
POLYIMIDE ADHESIVES FOR TITANIUM AND COMPOSITE BONDING
A. K. ST. CLAIR and T. L. ST. CLAIR
Jun. 1978
LANGLEY-12257 **Vol. 3, No. 1, p. 48**
Approach results in synthesis of addition polyimide adhesives with exceptional high temperature capabilities that show excellent potential for bonding titanium metal, polyimide/graphite composites, and combinations of these materials. Adhesives compatible with materials used in high performance aircraft and spacecraft structures also prove highly desirable in many other applications involving similar adherents.

B78-10041
FLAME-RETARDANT ADHESIVE TAPE

Innovator not given (Arthur D. Little, Inc.) Jun. 1978 See also NASA CR-151224 (N77-19251)
MSC-16721 **Vol. 3, No. 1, p. 49**
Nonflammable tape adheres well, can be written on, and has other properties making it extra-safe general-purpose tape.

B78-10042
NEW ADHESIVE WITHSTANDS TEMPERATURE EXTREMES
J. J. PARK and B. SEIDENBERG
Jun. 1978
GSFC-12345 **Vol. 3, No. 1, p. 50**
Adhesive, developed for high-temperature components aboard satellites, is useful at both high and low temperatures and exhibits low-vacuum volatility and low shrinkage. System uses polyfunctional epoxy with high aromatic content, low equivalent weight, and more compact polymer than conventional bisphenol A tape.

B78-10043
BORON TRIFLUORIDE COATINGS FOR PLASTICS
R. M. KUBACKI (Bell & Howell Co.)
Jun. 1978
ARC-11057 **Vol. 3, No. 1, p. 51**
Tough, durable coatings of boron trifluoride can be deposited on plastic optical components to protect them from destructive effects of abrasion, scratching, and environment. Coating material can be applied simultaneously with organic polymers, using plasma glow-discharge methods, or it can be used as base material for other coatings to increase adhesion.

B78-10044
ELECTRICALLY-CONDUCTING THERMAL-CONTROL COATING
M. C. SHAI
Jun. 1978
GSFC-12207 **Vol. 3, No. 1, p. 52**
Coating comprised mainly of zinc and aluminum oxides is characterized by high thermal emittance, low thermal absorption, and high electrical conductivity. Originally developed to protect spacecraft, coating can be used to prevent charge buildup on components in other applications. Mixture is stable under ultraviolet and X-ray radiation and under bombardment by ionizing particles. It can be applied to aluminum, stainless steel, epoxy/fiberglass, and other substrates. When exposed to equivalent of 1,000 Sun-hours illumination, coating remained stable and retained its optical properties.

B78-10045
WROUGHT NICKEL-BASE SUPERALLOY
R. V. MINER, F. H. HARF, and W. B. KENT (Universal Cyclops Corp.)
Jun. 1978 See also B74-10002; B74-10003; NASA-CR-135131 (N77-20208)
LEWIS-12844 **Vol. 3, No. 1, p. 52**
Superalloy for advanced temperature use is suited to cost-saving powder-metallurgy manufacturing methods and has improved phase stability during longtime heating. Wide variety of applications exists where stainless steels are used for oxidation and/or corrosion resistance.

B78-10046
LOW-CHROMIUM STAINLESS STEELS
C. A. BARRETT, C. A. GYORGAK, and J. R. STEPHENS
Jun. 1978 See also NASA-TN-D-8459 (N77-23241)
LEWIS-12543 **Vol. 3, No. 1, p. 53**
Two modified stainless-steel formulations, with only two-thirds chromium content found in conventional type 304, have mechanical and chemical properties comparable to type 304. Low-chromium stainless steels have potential uses in heat exchangers, transfer lines for chemicals, automobile trim, and other applications.

B78-10047
MODIFIED CHEMILUMINESCENT NO ANALYZER ACCURATELY MEASURES NOX
R. L. SUMMERS
Jun. 1978 See also NASA-TM-X-73480 (N76-30319)
LEWIS-12850 **Vol. 3, No. 1, p. 54**
Installation of molybdenum nitric oxide (NO)-to-higher oxides of nitrogen (NOx) converter in chemiluminescent gas analyzer and use of air purge allow accurate measurements of NOx in exhaust gases containing as much as thirty percent carbon monoxide (CO). Measurements using conventional analyzer are highly inaccurate for NOx if as little as five percent CO is present. In modified analyzer, molybdenum has high tolerance to CO, and air purge substantially quenches NOx destruction. In test, modified chemiluminescent analyzer accurately measured NO and NOx concentrations for over 4 months with no denegration in performance.

B78-10048
MEASUREMENT OF TOTAL ORGANIC CONCENTRATION IN WATER
E. WINKLER
Jun. 1978
MSC-16497 **Vol. 3, No. 1, p. 55**
Instrument for determining total organic concentration in water uses no corrosive reagents or gases. Instead continuous ultraviolet photolysis process converts organic compounds to carbon dioxide (CO2). CO2 electrode is used to measure CO2 content. Only reagent necessary is oxygen, generated in situ by electrolyzing some water. In addition to application in aerospace industry, system has potential uses in pollution monitoring and in laboratory analyses.

B78-10049
SOLAR PHOTOLYSIS OF WATER
P. R. RYASON
Jun. 1978
NPO-14126 **Vol. 3, No. 1, p. 56**
Photolysis and regeneration reactions could be used in cycle process to generate hydrogen gas from water using sunlight.

B78-10050
LOW-COST HIGH PURITY PRODUCTION
V. K. KAPUR (Stanford Res. Inst.)
Jun. 1978
NPO-14198 **Vol. 3, No. 1, p. 57**
Economical process produces high-purity silicon crystals suitable for use in solar cells. Reaction is strongly exothermic and can be initiated at relatively low temperature, making it potentially suitable for development into low-cost commercial process. Important advantages include exothermic character and comparatively low process temperatures. These could lead to significant savings in equipment and energy costs.

B78-10051
ULTRA-HIGH-STRENGTH BORON FIBERS
D. R. BEHRENDT, J. A. DICARLO, H. H. GRIMES, and R. J. SMITH
Jun. 1978 See also NASA TN-D-8219 (N76-22313); NASA TM-X-73402 (N76-21293); NASA TM-X-73627 (N77-23207)
LEWIS-12739 **Vol. 3, No. 1, p. 57**
Boron-on-tungsten fibers with tensile strength and strain-to-failure values increased by fifty percent over commercial grades are produced by controlled chemical-etching process. Improved fibers have potential applications as lightweight composites in ground vehicles, spacecraft, and rotors for energy storage.

B78-10052
PARTIAL INTERLAMINAR SEPARATION FOR COMPOSITES
W. ELBER
Jun. 1978
LANGLEY-12065 **Vol. 3, No. 1, p. 58**
Epoxy-matrix composites with improved fracture toughnesses, tensile strengths, and impact resistances are fabricated by using perforated film to break part of bond between laminae. Separation diffuses local stress concentrations near cracks, inhibiting their ability to propagate. Tests on modified panels showed fifty percent increase in fracture strengths.

B78-10053
FIRE-RETARDANT FOAMS
J. GAGLIANI (Intern. Harvester Co.)
Jun. 1978 See also NASA CR-147496 (N76-18278)
MSC-16222 **Vol. 3, No. 1, p. 59**

Family of polyimide resins are being developed as foams with exceptional fire-retardant properties. Foams are potentially useful for seat cushions in aircraft and ground vehicles and for applications such as home furnishings and building-construction materials. Basic formulations can be modified with reinforcing fibers or fillers to produce celular materials for variety of applications. By selecting reactants, polymer structure can be modified to give foams with properties ranging from high resiliency and flexibility to brittleness and rigidity.

B78-10054
ABRASION-RESISTANT ANTIREFLECTIVE COATING FOR POLYCARBONATE
T. J. WYDEVEN
Jun. 1978
ARC-11047 **Vol. 3, No. 1, p. 60**

Following plasma-polymerization technique, treatment in oxygen glow discharge further enhances abrasion resistance and transmission. Improvement in abrasion resistance was shown by measuring percentage of haze resulting from abrasion. Coating samples were analyzed for abrasion using standard fresh rubber eraser. Other tests included spectra measurements and elemental analysis with spectrometers and spectrophotometers.

B78-10055
ELECTROPLATING AND STRIPPING COPPER ON MOLYBDENUM AND NIOBIUM
J. L. POWER
Jun. 1978
LEWIS-12151 **Vol. 3, No. 1, p. 60**

Molybdenum and niobium are often electroplated and subsequently stripped of copper. Since general standard plating techniques produce poor quality coatings, general procedures have been optimized and specified to give good results.

B78-10056
CUSTOM BLENDING OF LAMP PHOSPHORS
R. E. KLEMM (Singer Co.)
Jun. 1978
MSC-16692 **Vol. 3, No. 1, p. 62**

Spectral output of fluorescent lamps can be precisely adjusted by using computer-assisted analysis for custom blending lamp phosphors. With technique, spectrum of main bank of lamps is measured and stored in computer memory along with emission characteristics of commonly available phosphors. Computer then calculates ratio of green and blue intensities for each phosphor according to manufacturer's specifications and plots them as coordinates on graph. Same ratios are calculated for measured spectrum. Once proper mix is determined, it is applied as coating to fluorescent tubing.

B78-10057
CURE-RATE DATA FOR SILICONE ADHESIVE
C. CLATTERBUCK and A. FISHER
Jun. 1978
GSFC-12330 **Vol. 3, No. 1, p. 62**

Report describes work with concentrations down to 0.07 percent and is useful when applying adhesives in terrestrial and space applications. Cured Silicone retains low-outgassing properties as well as its snap, elongation, and resilience. Tests for hardness of silicone material also showed good results. No gross hysteresis observable on recovery from stretching nor was there any decrease in hardness.

B78-10058
FIRE-AND SMOKE-RETARDANT POLYESTERS AND ELASTOMERS
S. Y. CHUNG, J. D. INGHAM, D. D. LAWSON, and M. MOSESMAN
Jun. 1978
NPO-14053 **Vol. 3, No. 1, p. 63**

Test results indicate that most effective fire-and smoke-retardant fillers are inorganic hydrates and carbonates that release water and/or carbon dioxide. Most effective filler tested was hydrated sodium silicate. Effectiveness is due to high water content and formation of viscous molten glass when heated. Glass tends to inhibit polymer combustion and to promote formation of char residue.

B78-10059
MOSSBAUER STUDIES OF BULK AND THIN-FILM FETE
K. AGGARWAL, W. T. ESCUE, and R. G. MENDIRATTA
Jun. 1978 See also NASA TM-X-73380 (N77-23965)
M-FS-23773 **Vol. 3, No. 1, p. 63**

In study, dependence of Mossbauer parameters on film thickness and film substrate was measured and related to iron tellurium structure. Report also describes film deposition technique (flash deposition) and Mossbauer apparatus.

B78-10060
FAST-DRYING COATING
E. J. BARTOSZEK (Pennwalt Corp.)
Jun. 1978
MSC-16056 **Vol. 3, No. 1, p. 64**

Nontoxic coating has excellent optical properties and can be pigmented in many different colors. It bonds well, can be applied by conventional methods, weathers well, and is self-extinguishing. Coating composition comprises latex blends of fluorocarbons, acrylic resins, stabilizers, modifiers, variety of inorganic pigments, and other additives. Suitable latex primers have also been developed from acrylic latex base.

B78-10216
HIGH-YIELD PROCESS FOR PREPARING CALCIUM SUPEROXIDE
T. J. WYDEVEN
Oct. 1978
ARC-11053 **Vol. 3, No. 2, p. 223**

Pressure and temperature are controlled precisely and water is rapidly removed to inhibit back reaction in process.

B78-10217
INTERACTIVE DATA-PROCESSING SYSTEM FOR METALLURGY
T. J. RATHZ
Oct. 1978 See also NASA-TM-X-73379 (N77-23279)
M-FS-23774 **Vol. 3, No. 2, p. 224**

Equipment indicates that system can rapidly and accurately process metallurgical and materials-processing data for wide range of applications. Advantages include increase in contract between areas on image, ability to analyze images via operator-written programs, and space available for storing images.

B78-10218
FIRE-RETARDANT EPOXY POLYMERS
R. I. AKAWIE (Hughes Aircraft Co.), N. BILOW (Hughes Aircraft Co.), and T. W. GIANTS (Hughes Aircraft Co.)
Oct. 1978
ARC-11182 **Vol. 3, No. 2, p. 225**

Phosphorus atoms in molecular structure of epoxies make them fire-retardant without degrading their adhesive strength. Moreover, polymers are transparent, unlike compounds that contain arsenic or other inorganics. They have been used to bond polyvinylfluoride and polyether sulfone films onto polyimide glass laminates.

B78-10219
COMPATIBILITY OF AU-CU-NI BRAZE ALLOY WITH NH3
V. DIAZ, JR. (Rockwell Intern. Corp.)
Oct. 1978
MSC-16864 **Vol. 3, No. 2, p. 226**

Tests show that Gold-Copper-Nickel alloy is compatible with ammonia systems. Joining tubes by brazing has advantages such as reducing chances of excessive grain growth in base metal, saving weight, and cleanliness.

B78-10220
ANTISTATIC ADDITIVE FOR POLYIMIDE FILMS
M. N. SARBOLOUKI
Oct. 1978
NPO-14232 **Vol. 3, No. 2, p. 227**
Thin polyimide films are given excellent antistatic properties even at high temperature by low-level loading with lithium salts. Extremely hygroscopic, these salts absorb a layer of atmospheric water that provides conductive paths allowing charges to dissipate.

B78-10221
BRAZED BORON-SILICON CARBIDE/ALUMINUM STRUCTURAL PANELS
W. E. ARNOLD, JR., T. T. BALES, T. G. BROOKS, A. G. LAWSON, P. D. MITCHELL, D. M. ROYSTER, and R. WIANT (Vought Corp.)
Oct. 1978 See also NASA TM-X-3432 (N77-18220)
LANGLEY-12244 **Vol. 3, No. 2, p. 228**
Fluxless brazing process minimizes degradation of mechanical properties composite material of silicon carbide coated boron fibers in an aluminum matrix. Process is being used to fabricate full-scale Boron-Silicon Carbide/Aluminum-Titanium honeycomb core panels for flight testing and ground testing.

B78-10222
PULSE-ECHO PROBE OF ROCK PERMEABILITY NEAR OIL WELLS
K. Y. NARASIMHAN and S. P. PARTHASARATHY
Oct. 1978
NPO-14192 **Vol. 3, No. 2, p. 229**
Processing method involves sequential insonifications of borehole wall at number of different frequencies. Return signals are normalized in amplitude, and root-mean-square (rms) value of each signal is determined. Values can be processed to yield information on size and number density of microfractures at various depths in rock matrix by using averaging methods developed for pulse-echo technique.

B78-10223
PRESSURE-SENSITIVE GLASS REACTION CELL
R. T. ANSELMI (Martin Marietta Corp.)
Oct. 1978
LANGLEY-11256 **Vol. 3, No. 2, p. 230**
Special all glass reaction cell is used to determine catalytic effect of various materials on hydrazine decomposition.

B78-10224
IMPROVED ALKALI-METAL/SILICATE BINDERS
J. SCHUTT
Oct. 1978
GSFC-12303 **Vol. 3, No. 2, p. 231**
Family of inorganic binders utilizes potassium or sodium oxide/silicate dispersion and employs high mole ratio of silicon dioxide to alkali-metal binder. Binders are stable, inexpensive, extremely water resistant, and easy to apply.

B78-10225
IMPROVED EPOXY ADHESIVE WITH RADIOGRAPHIC TRACER
R. G. CAMPBELL (McDonnell Douglas Corp.)
Oct. 1978
MSC-18020 **Vol. 3, No. 2, p. 231**
Addition of tungsten powder (4 percent by weight) to commercially available low viscosity epoxy adhesive, yields nonmetal composite repair material with enhanced radiographic contrast for radiographic and ultrasonic inspection techniques.

B78-10226
REPAIRING SILICON CARBIDE COATINGS
D. M. SHUFORD (Vought Corp.)
Oct. 1978
MSC-18033 **Vol. 3, No. 2, p. 232**
Simple technique uses commercial binder, containing commercially available blended powder mixture for repairing silicon carbide coatings.

B78-10227
CORROSION DETECTION AND EVALUATION
C. C. KAMMERER (Rockwell Intern. Corp.), F. H. STUCKENBERG (Rockwell Intern. Corp.), and F. E. SUGG (Rockwell Intern. Corp.)
Oct. 1978
M-FS-24436 **Vol. 3, No. 2, p. 232**
Report details comprehensive study of nondestructive methods for detecting and/or evaluating up to six different types of corrosion: general, galvanic filiform, pitting, intergranular, and stress. Studied methods include: visual/optical inspection, radiography, penetrant inspection, analysis by polarized light, electrical conductivity measurements, pH analysis, and ultrasonic inspection.

B78-10228
RESPONSE OF GRAPHITE/EPOXY COMPOSITES TO MOISTURE
H. POWELL (Rockwell Intern. Corp.) and D. J. ZIGRANG (Rockwell Intern. Corp.)
Oct. 1978
MSC-16899 **Vol. 3, No. 2, p. 233**
Report presents comparative absorption and desorption data obtained from response of graphite epoxy composites to moisture experiments with Fiberite 934, Narmco 5208, and Hexcel F-263 epoxy resin systems in cross-piled collimated laminates containing Thornel-300 graphite fibers.

B78-10229
MECHANICAL PROPERTIES OF 18-2 MN STAINLESS STEEL
J. W. MONTANO
Oct. 1978 See also NASA TM-X-73375 (N77-21214)
M-FS-23843 **Vol. 3, No. 2, p. 233**
Report details experimental data from behavioral studies of mechanical properties of 18-2 Mn (Nitronic 32) stainless steel obtained under cryogenic temperatures and stress-corrosion conditions.

B78-10230
NITRONIC 60: A NEW ALLOY
J. W. MONTANO
Oct. 1978 See also NASA-TM-X-73359 (N77-16149); B78-10229; B78-10396
M-FS-23844 **Vol. 3, No. 2, p. 233**
Report presents test demonstrations of mechanical and stress-corrosion properties at very low temperatures. Included are design details of alloy specimens and test procedures.

B78-10231
HYDROGEN EMBRITTLEMENT OF NICKEL
M. H. KAMDAR
Oct. 1978
ARC-10966 **Vol. 3, No. 2, p. 234**
Report describes comprehensive study of hydrogen embrittlement in high purity single-crystal and polycrystalline nickel at temperatures from -130 degrees C to 20 degrees C.

B78-10342
COAL DESULFURIZATION WITH IRON PENTACARBONYL
G. C. HSU
Jan. 1979
NPO-14272 **Vol. 3, No. 3, p. 361**
Coal desulfurization with iron pentacarbonyl treatment under mild conditions removes up to eighty percent of organic sulfur. Preliminary tests on treatment process suggest it may be economical enough to encourage investigation of use for coal desulfurization. With mild operating conditions, process produces environmentally-acceptable clean coal at reasonable cost.

B78-10343
COAL LIQUEFACTION TO INCREASE JET FUEL PRODUCTION
Innovator not given (Institute of Gas Technology) Jan. 1979 See also NASA-CR-145028 (N78-75465)
LANGLEY-12038 **Vol. 3, No. 3, p. 362**
Processing concept that increases supply of jet fuel has been developed as part of study on methods for converting coal to

hydrogen, methane, and jet fuel. Concept takes advantage of high aromatic content of coal-derived liquids to make high-octane gasoline, instead of destroying aromatics to make jet fuel.

B78-10344
IMPROVED NUCLEONIC COAL-THICKNESS MONITOR
C. E. CROUCH, S. D. ROSE, and E. W. JONES (Mississippi State Univ.)
Jan. 1979 See also NASA-CR-150465 (N78-11454)
M-FS-23725 **Vol. 3, No. 3, p. 363**

Design for coal-thickness-sensing instrument features independent hydropneumatic suspension of radiation source and detector. Monitor uses source and detector which are independently mounted, to follow contour of coal surface more closely and to eliminate errors caused by variations in airgap along radiation path. Device may help to bring fully-automated coal mining closer to reality.

B78-10345
COAL MINING WITH A LIQUID SOLVENT
D. D. LAWSON and C. G. MILLER
Jan. 1979
NPO-14028 **Vol. 3, No. 3, p. 364**

Study suggests carbonated water can dissolve or suspend coal and carry it to surface. Mixture of carbon dioxide and water may be coal solvent that will make unmanned mining reality. When used with proposed process monitoring coal solubility with conventional strain gage, solvent is basis for rapid cost effective extraction of coal from underground seams.

B78-10346
LOW-TEMPERATURE ELASTOMER PRODUCTION AND CURING
J. D. INGHAM and R. A. RHEIN
Jan. 1979
NPO-13899 **Vol. 3, No. 3, p. 364**

Thermally and chemically stable polymers are needed for materials applications, particularly highly-stable elastomers for solid propellant binders where initial high temperature required for dissolving anhydride in polymer is deerimental. Solvent reactant system allows polymerization without condensation of products under low heat. Solvents utilized were dimethylacetamide, dimethyflormamide, etc.

B78-10347
GAS-PATH SEAL MATERIAL
R. L. JOHNSON, L. P. LUDWIG, and R. C. BILL (U. S. Army Res. & Tech. Labs.)
Jan. 1979 See also NASA-TP-1128 (N78-15229); NASA-TM-X-73650 (N77-23489)
LEWIS-12623 **Vol. 3, No. 3, p. 365**

Composite sealant reduces frictional heating, wear, and leakage. Sealant is needed to reduce wear of rotating compressor-blade tips if they rub against stationary engine casing. Nickel substrate with plasmasprayed aluminum top layer was evaluated. Results showed little wear on top layer took place; layer itself remained intact and provided heat conduction pathway from rub surface.

B78-10348
PRECISION CLEAVER FOR 'SOFT' CRYSTALS
J. S. J. BENEDICTO, F. HALLBERG, and B. E. WOODGATE
Jan. 1979
GSFC-12291 **Vol. 3, No. 3, p. 366**

'Soft' crystals are cleaved as thin 0.005 inch with special cleaver. Thin slices of soft crystalline materials are used in X-ray spectrometers. Slices are usually cut by hand with wire or blade. Wire tends to scratch surface and to produce slices of nonuniform thickness. Device will rapidly cut soft crystals in smooth, thin, uniform slices.

B78-10349
EMBRITTLEMENT PROOF NICKEL-ALLOY BELLOWS
C. M. DANIELS, JR. (Rockwell Intern. Corp.)
Jan. 1979
M-FS-19331 **Vol. 3, No. 3, p. 367**

Thin cover of corrosion-resistant steel (CRES) protects metal bellows and ducts against hydrogen embrittlement. Bellow current carries hydrogen at high pressure and currently is used in the engine of Space Shuttle.

B78-10350
CORONA-DISCHARGE AIR-PURIFICATION SYSTEM
T. J. WYDEVEN (Stanford Univ.) and D. L. FLAMM
Jan. 1979
ARC-10975 **Vol. 3, No. 3, p. 368**

Plasma reaction chamber removes trace contaminants from spacecraft, submarines, and other closed environments by oxidizing contaminants to produce carbon dioxide and water. Contaminants are alcohols, esters, hydrogen sulfide, and ammonia. Others are lubricant solvents such as Freons, aromatics, and Ketones. Contaminants are removed from chamber by scrubber.

B78-10351
ZONE-REFINING ENCAPSULATED SEMICONDUCTORS
M. C. DAVIDSON and L. R. HOLLAND
Jan. 1979
M-FS-23902 **Vol. 3, No. 3, p. 369**

Reflector directs intense, sharply focused heat precisely where it is needed for zone-refining semiconductor materials. Reflector is especially suited for compound semiconductors which must be sealed inside capsule to prevent vaporizing during zone refining. Device is flattened toroid with elliptical-cross-section, much like horizontal partly-inflated inner tube.

B78-10352
PREDICTING STRUCTURES OF CROSS-LINKED CONDENSATION POLYMERS
H. E. MARSH
Jan. 1979
NPO-14007 **Vol. 3, No. 3, p. 370**

Mathematical procedure is used to predict structure of cross-linked condensation polymer differentiated from an additional polymer resulting from specific reaction. Procedure will greatly reduce amount of empirical formulation and testing needed to produce desired product.

B78-10353
ECONOMICAL SYNTHESIS OF POTASSIUM SUPEROXIDE
A. T. BELL (California Univ., Berkeley) and P. SADHUKHAN (California Univ., Berkeley)
Jan. 1979
ARC-10992 **Vol. 3, No. 3, p. 372**

High-frequency discharge in oxygen can be used to prepare superoxides of alkali and alkaline-earth metals. Since no direct-current discharge at the electrodes is present, no sputtering can contaminate the product, hence a high conversion efficiency.

B78-10354
FIRE-RETARDANT COVERING FOR SMALL CONTAINERS
S. R. RICCITIELLO and P. M. SAWKO
Jan. 1979
ARC-11104 **Vol. 3, No. 3, p. 372**

Flexible intumescent sheets of exceptionally uniform thickness may be used to protect containers and other small objects less than 25.4 cm in diameter from fire hazards.

B78-10355
FIRE-RETARDANT LIGHTWEIGHT COMPOSITE
W. J. GILWRE, JR.
Jan. 1979
ARC-10918 **Vol. 3, No. 3, p. 373**

Low-density honeycomb-core composite minimizes fire-safety related hazards such as fire resistance and noxious gas generation.

B78-10356
HEAT RESISTANT NONTOXIC LAMINATE
D. A. KOURTIDES and J. A. PARKER
Jan. 1979
ARC-11040 **Vol. 3, No. 3, p. 374**

Light-weight low-cost laminate used to replace epoxy compound panels is suitable for auto, railcar, and aircraft structural

parts. Physical and thermal tests show panels made from formulation have better insulative properties, and burn cleaner with less toxic gas generation than panels made with conventional materials.

B78-10357
ION-BEAM TEXTURING OF MATERIALS
W. R. HUDSON
Jan. 1979 See also NASA-TM-X-73470 (N76-30957)
LEWIS-12996 **Vol. 3, No. 3, p. 374**
Xenon ion-beam source is used to create microscopically-rough surface texture by sputter-etching surface while simultaneously sputter depositing lower yield material onto surface.

B78-10358
CHEMICAL AGENT BOOSTS NATURAL-RUBBER OUTPUT
A. J. BAUMAN
Jan. 1979
NPO-14185 **Vol. 3, No. 3, p. 376**
Topical treatment of guayule plant with triethylamine compounds may boost rubber yield 400 to 500 percent.

B78-10359
TOXIC SUBSTANCES HANDBOOK
T. L. JUNOD
Jan. 1979 See also NASA-TM-73866 (N78-20755)
LEWIS-13124 **Vol. 3, No. 3, p. 376**
Handbook, published in conjunction with Toxic Substances Alert Program at NASA Lewis Research Center, profiles 187 toxic chemicals in their relatively pure states and include 27 known or suspected carcinogens.

B78-10360
EFFECTS OF MOISTURE ON GRAPHITE/EPOXY COMPOSITES
C. W. DILL (Rockwell Intern. Corp.)
Jan. 1979
MSC-18045 **Vol. 3, No. 3, p. 377**
Report describes tests made on commercially available graphite/epoxy composites to analyze effects of water absorption and temperature spiking on composite strength and stiffness.

B78-10361
OXYGEN AND NITROGEN RAMAN SPECTRA
G. C. FRALICK
Jan. 1979
LEWIS-12849 **Vol. 3, No. 3, p. 377**
Engineering design computer program that calculates rotational Raman spectrum of either nitrogen or oxygen can be used to increase performance of gas-turbine engines by predicting extent of pressure broadening associated with temperature measurements at elevated pressure.

B78-10504
ULTRAFINE PBI FIBERS AND YARNS
J. R. LEAL (Celanese Research Corp.) and M. TAN (Celanese Research Corp.)
Mar. 1979 See also NASA-CR-152057 (N78-16189)
ARC-11221 **Vol. 3, No. 4, p. 529**
Gentle precisely controlled process is used to draw polybenzimidazole (PBI) fibers to denier as low as 0.17 per fiber. Yarns of lightweight fibers could be useful in applications where lightweight textiles must withstand high temperatures, corrosion, or radiation.

B78-10505
MEASUREMENT OF SUBCOAT THICKNESS BY CHARACTERISTIC X-RAYS
W. J. HARRIS (Lockheed Missiles and Space Co.) and R. A. QUINN (Lockheed Missles and Space Co.)
Mar. 1979
MSC-16718 **Vol. 3, No. 4, p. 530**
Technique employs x-ray scanning system to measure thickness of topcoat and subcoat of heat shields and other ceramic materials. System scans sample in raster pattern and depicts image of structure on cathode-ray-tube for viewing or photocopying within seconds.

B78-10506
ION-BEAM-TEXTURED GRAPHITE
A. N. CURREN, R. FORMAN, J. S. SOVEY, and W. R. HUDSON
Mar. 1979 See also NASA-TP-1097 (N78-11230)
LEWIS-12724 **Vol. 3, No. 4, p. 530**
Results of evaluation of seven different materials (copper, tantalum, titanium carbide, soot, smooth pyrolytic graphite, and ion-beam-textured graphite) for low secondary-electron emitting surface for depressed collects in microwave amplifiers indicate that ion-beam-textured graphite shows greatest potential for use.

B78-10507
ABSORPTIVE COATING FOR ALUMINUM SOLAR PANELS
D. DESMET (Univ. of Alabama), A. JASON (Univ. of Alabama), and A. PARR (Univ. of Alabama)
Mar. 1979
M-FS-25033 **Vol. 3, No. 4, p. 532**
Method for coating forming coating of copper oxide from copper component of sheet aluminum/copper alloy provides strong durable solar heat collector panels. Copper oxide coating has solar absorption characteristics similar to black chrome and is much simpler and less costly to produce.

B78-10508
FIRE-RESISTANT WOOD COMPOSITES
P. M. SAWKO
Mar. 1979
ARC-11174 **Vol. 3, No. 4, p. 532**
Hot pressed wood panels made with modified novolak resins have burnthrough time of 450 s as compared to 280 s for products using conventional novolak resins. Incorporation of inorganic filler reduces flame spread index of panels from more than 200 to 60 or 70.

B78-10509
ANTISTATIC COATING FOR ACRYLICS
V. HADEK, A. REMBAUM, and R. B. SOMONO
Mar. 1979
NPO-13867 **Vol. 3, No. 4, p. 534**
After immersion in low molecular-weight solvents such as acetonitril or nitromethane, clear acrylic plastics dissipate up to 70% of induced electric charge within one minute, yet retain optical clarity.

B78-10510
COATED-FELT THERMAL INSULATION
R. L. DOTTS, B. J. MARAIA, J. A. SMITH, I. K. SPIKER, and G. STROUHAL
Mar. 1979
MSC-12737 **Vol. 3, No. 4, p. 535**
Thin coated-felt insulation tile is lighter and easier-to-install replacement for silica tiles for temperatures below 700 F.

B78-10511
LOW-TEMPERATURE REFINING OF COAL
P. S. GANGULI and G. C. MSU
Mar. 1979
NPO-14210 **Vol. 3, No. 4, p. 535**
Laboratory-tested process demonstrates technical feasibility of new low temperature chemical pretreatment of new coal that yields purified product with low sulfur, oxygen, and inorganic ash content.

B78-10512
ACCELERATED PURIFICATION OF COLLOIDAL SILICA SOLS
E. B. BAHNSEN (Lockheed Missiles and Space Co.), S. GAROFALINI (Lockheed Missles and Space Co.), and A. PECHMAN (Lockheed Missiles and Space Co.)
Mar. 1979
MSC-16793 **Vol. 3, No. 4, p. 536**
Accelerated purification process for colloidal sols using heat/deionization scheme, sharply reduces waiting time between deionization cycles from several months to a few days. Process produces same high purity silica sols as conventional methods.

B78-10513
FORMING 'DYNAMIC' MEMBRANES ON STAINLESS STEEL
C. A. BRANDON (Clemson University) and J. L. GADDIS (Clemson University)
Mar. 1979
MSC-18172 **Vol. 3, No. 4, p. 537**
'Dynamic' zirconium polyacrylic membrane is formed directly on stainless steel substrate without excessive corrosion of steel. Membrane is potentially useful in removal of contaminated chemicals from solution through reversed osmosis. Application includes use in filtration and desalination equipment, and in textile industry for separation of dyes from aqueous solvents.

B78-10514
DEAERATING HIGH-VISCOSITY SILICON RUBBER
R. W. GABRIEL (Rockwell Intern. Corp.)
Mar. 1979
MSC-16694 **Vol. 3, No. 4, p. 538**
Method utilizing a modified hand operated centrifuge is used to deaerate high velocity (6,000 poise) silicon rubber for economical production of void-free silicon rubber seals.

B78-10515
HIGH-PRESSURE LIQUID CHROMATOGRAPHY OF AROMATIC AMINES
P. R. YOUNG
Mar. 1979
LANGLEY-12163 **Vol. 3, No. 4, p. 538**
Analysis made on commercially available liquid chromatograph demonstrates high-pressure liquid chromatographic conditions for separation of approximately 50 aromatic amines ranging from simple aniline derivatives to complex multiring di- and tri-amines.

B78-10516
AUTOMATED ELECTROPHORESIS APPARATUS
L. R. BAKER (Univ. of Arizona), P. H. BARTELS (Univ. of Arizona), C. BLENMAN, JR. (Univ. of Arizona), J. M. HOLCOMB (Univ. of Arizona), and C. CHAN (Univ. of Arizona)
Mar. 1979
M-FS-23983 **Vol. 3, No. 4, p. 540**
Computer-controlled electro-optical system tracks particles in essentially real-time, analyzes data, and presents video and hard copy results. System presents significant increase in sampling rate and improved analysis of particle motion.

B78-10517
IMPROVED IMIDE POLYMERIZATION CATALYST
C. A. ESTRELLA, S. R. RICCITIELLO, and P. M. SAWKO
Mar. 1979
ARC-11107 **Vol. 3, No. 4, p. 541**
Catalyzation of imide polymers with metallic salts of 2-ethyl hexanoic acid allows reaction in production of flame resistant foams to proceed in one step without formation of undesirable heat-sensitive byproducts.

B78-10518
POROUS BEAD PACKINGS FOR GAS CHROMATOGRAPHY
G. E. POLLOCK and F. H. WOELLER
Mar. 1979
ARC-11222 **Vol. 3, No. 4, p. 542**
Porous polyaromatic packing beads have low polarity, high efficiency, short retention time, and may be synthesized in size range of 50 to 150 micrometers (100 to 270 mesh). Mechanically strong beads may be produced using various materials depending on elements and compounds to be identified.

B78-10519
SCRATCH RESISTANT PLASTIC LENSES
R. M. KUBACKI (Bell and Howell Co.)
Mar. 1979
ARC-11039 **Vol. 3, No. 4, p. 543**
Three-step plasma deposition process coats plastic lenses with strongly adhering scratch-resistant polymer film.

B78-10520
MODEL OF SILICON PRODUCTION IN A FLUIDIZED-BED REACTOR
G. C. HSU, K. KIM, R. LUTWACK, and A. K. PRATURI
Mar. 1979 See also NASA-CR-154120 (N77-28581)
NPO-14404 **Vol. 3, No. 4, p. 544**
Mathematical model of fluidized-bed process for making high-purity silicon suitable for use in solar cell production can help evaluate potential performance and economics of such processes.

05 LIFE SCIENCES

B78-10061
LOW-INTENSITY X-RAY AND GAMMA-RAY IMAGING DEVICE
L. I. YIN
Jun. 1978
GSFC-12263 **Vol. 3, No. 1, p. 67**
Low-dosage, low-power X-ray system can be made completely self-contained, allowing fluoroscopy and radiography to be carried out in field and remote locations. New device, known as 'lixiscope,' can be used with conventional X-ray machine turned down to low level, or, it can be operated with radioisotope source for hand-held portable applications. Originally developed for X-ray astronomy, lixiscope obtains high sensitivity by using intermediate stages of photoelectron conversion and electron amplification to generate image suitable for direct viewing or for recording on film.

B78-10062
DIP-MOLDED T-SHAPED CANNULA
H. F. BROYLES, E. F. CUDDIHY, and J. MOACANIN
Jun. 1978
NPO-14073 **Vol. 3, No. 1, p. 68**
Cannula, fabricated out of polyetherurethane, has been designed for long-term service. Improved cannula is T-shaped to collect blood from both directions, thus replacing two conventional cannulas that are usually required and eliminating need for large surgical wound. It is fabricated by using dip-molding process that can be adapted to other elastomeric objects having complex shapes. Dimensions of cannula were chosen to optimize its blood-flow properties and to reduce danger of excessive clotting, making it suitable for continuous service up to 21 days in vein or artery of patient.

B78-10063
IMPROVED CONTROL OF MEDICAL X-RAY FILM EXPOSURE
C. M. BERDAHL
Jun. 1978
NPO-13808 **Vol. 3, No. 1, p. 69**
Exposure sensing system for light-intensified motion-picture X-ray system uses aperture or adjustable diaphragm to sample light from image region of interest. Approach, along with approximate optics, can optimize exposure sensitivity.

B78-10064
SELF-STERILIZING CANISTER
L. C. YANG
Jun. 1978
NPO-14237 **Vol. 3, No. 1, p. 70**
Canister, originally conceived for remote sterilization of spacecraft packages, could be used terrestrially to handle samples in biologically hazardous environments. Multiwalled canister includes inner layer of pyrotechnic powder. For sterilization, electrically activated squib ignites powder, raising temperature of outer surface of canister to 230 degrees centigrade for several minutes. Thermal-buffer inner layer prevents inside temperature for exceeding 100 degrees centigrade to protect contents from damage. Samples in field hospitals and other emergency situations could also be handled by equipment.

B78-10065
CONTROLLED FREEZING OF BIOLOGICAL SAMPLES
T. A. CYGNAROWICZ and T. E. WILLIAMS
Jun. 1978
GSFC-12173 **Vol. 3, No. 1, p. 71**

Apparatus consists of thermocouple connected to semiconductor reference junction. Junction is connected to amplifier that boosts signal by 1,000. High-level signal is displayed on recorder and fed into second amplifier where it is compared with signal from potentiometer of programmed dc reference in bag-temperature programer. Difference in signals indicates output voltage. Remaining circuitry provides zero-phase, time-proportion control of heaters such that heater power is directly proportional to error signal.

B78-10066
BODY/BONE-MARROW DIFFERENTIAL-TEMPERATURE SENSOR
V. J. ANSELMO and C. M. BERDAHL
Jun. 1978
NPO-14121 **Vol. 3, No. 1, p. 72**

Differential-temperature sensor developed to compare bone-marrow and body temperature in leukemia patients uses single stable amplifier to monitor temperature difference recorded by thermocouples. Errors are reduced by referencing temperatures to each other, not to separate calibration points.

B78-10067
BACILLUS CEREUS STRAIN MCN AS A DEBRIDING AGENT
H. P. DALTON (Medical Coll. of Virginia), B. W. HAYNES (Medical Coll. of Virginia), and L. L. STONE (Medical Coll. of Virginia)
Jun. 1978
LANGLEY-12287 **Vol. 3, No. 1, p. 73**

Biologically active means are effective for rapidly removing scar tissue caused by burns or corrosive agents. Specially selected strain of bacteria applied to injury site releases enzymes which are active against eschar. These bacteria tend to locate between eschar and unburned tissue, thus providing optimal cell surface area arrangement for enzyme dispersal. Procedure may prove especially useful in treatment of disaster casualties under relatively primitive conditions.

B78-10068
FLUORESCENT MICROSPHERES
A. REMBAUM
Jun. 1978
NPO-13946 **Vol. 3, No. 1, p. 74**

Latex particles with attached antibodies have potential biochemical and environmental applications. Human red blood cells and lymphocytes have been labeled with fluorescent microspheres by either direct or indirect immunological technique. Immunolatex spheres can also be used for detecting and localizing specific cell surface receptors. Hormones and toxins may also be bondable.

B78-10232
RAPID MEASUREMENT OF BACTERIA IN WATER
E. CHAPPELLE, J. DEMING, G. L. PICCIOLO, E. L. JEFFERS (Boeing Co.), and R. R. THOMAS (Boeing Co.)
Oct. 1978
GSFC-12158 **Vol. 3, No. 2, p. 237**

Automated analysis system detects bacteria in saltwater, freshwater, sewage effluent, and other aqueous media. System may be adapted for computer control.

B78-10233
MONITORING SYSTEMS FOR COMMUNITY WATER SUPPLIES
R. E. TAYLOR (Boeing Co.), R. R. BROOKS (Boeing Co.), E. L. JEFFERS (Boeing Co.), A. T. LINTON (Boeing Co.), and G. D. POEL (Boeing Co.)
Oct. 1978 See also NASA-TM-X-58179 (N77-13909); B78-10234; B78-10236; B78-10237; B78-10267
MSC-16778 **Vol. 3, No. 2, p. 238**

Water monitoring system includes equipment and techniques for waste water sampling sensors for determining levels of microorganisms, oxygen, chlorine, and many other important parameters. System includes data acquisition and display system that allows computation of water quality information for real time display.

B78-10234
DATA PROCESSING FOR WATER MONITORING SYSTEM
L. MONFORD and A. T. LINTON (Boeing Co.)
Oct. 1978 See also NASA-TM-X-58179 (N77-13909); B78-10233
MSC-16842 **Vol. 3, No. 2, p. 240**

Water monitoring data acquisition system is structured about central computer that controls sampling and sensor operation, and analyzes and displays data in real time. Unit is essentially separated into two systems: computer system, and hard wire backup system which may function separately or with computer.

B78-10235
WATER SAMPLE-COLLECTION AND DISTRIBUTION SYSTEM
R. R. BROOKS (Boeing Co.)
Oct. 1978
MSC-16841 **Vol. 3, No. 2, p. 241**

Collection and distribution system samples water from six designated stations, filtered if desired, and delivers it to various analytical sensors. System may be controlled by Water Monitoring Data Acquisition System or operated manually.

B78-10236
AUTOMATED ELECTROCHEMICAL SELECTION OF COLIFORMS
R. E. TAYLOR, W. P. DILL (Boeing Co.), and E. L. JEFFERS (Boeing Co.)
Oct. 1978 See also B78-10233
MSC-16777 **Vol. 3, No. 2, p. 243**

Computer-controlled sensor system monitors and quantifies coliform organisms in waste water samples through molecular hydrogen detection techniques. System includes cleanup procedures, external sterilization of each sensor interface with working fluid as well as incubation cell interiors. Sensor system may also be operated manually.

B78-10237
CHEMILUMINESCENCE AND BIOLUMINESCENCE MICROBE DETECTION
R. E. TAYLOR, E. CHAPPELLE (GSFC), G. L. PICCIOLO (U.S. Food and Drug Admin.), E. L. JEFFERS (Boeing Co.), and R. R. THOMAS (Boeing Co.)
Oct. 1978 See also B78-10233
MSC-16779 **Vol. 3, No. 2, p. 244**

Automated biosensors for online use with NASA Water Monitoring System employs bioluminescence and chemiluminescence techniques to rapidly measure microbe contamination of water samples. System eliminates standard laboratory procedures requiring time duration of 24 hours or longer.

B78-10238
CHEMICAL MEASUREMENT OF URINE VOLUME
R. L. SAUER
Oct. 1978
MSC-16585 **Vol. 3, No. 2, p. 245**

Chemical method of measuring volume of urine samples using lithium chloride dilution technique, does not interfere with analysis, is faster, and more accurate than standard volumetric of specific gravity/weight techniques. Adaptation of procedure to urinalysis could prove generally practical for hospital mineral balance and catechoamine determinations.

B78-10239
ARTIFICIAL LEG WITH NATURAL GAIT
J. L. BURCH
Oct. 1978
M-FS-23225 **Vol. 3, No. 2, p. 246**

Prosthetic device employs actuator that stores energy from movement of natural leg and uses it to pivot artificial hip joint

in ensuing step reducing gait distortion and increasing stride cadence.

B78-10240
BOOSTING PRODUCTION YIELD OF BIOMEDICAL PEPTIDES
S. L. MANATT
Oct. 1978
NPO-14142 **Vol. 3, No. 2, p. 247**
Nuclear magnetic resonance (NMR) technique is employed to monitor synthesis of biomedical peptides. Application of NMR technique may improve production yields of insulin, ACTH, and growth hormones, as well as other synthesized biomedical peptides.

B78-10241
POSITIVELY CHARGED MEMBRANE FOR UREA DIALYSIS
W. A. MUELLER
Oct. 1978
NPO-14101 **Vol. 3, No. 2, p. 248**
Positively charged, porous membrane dividing two chamber dialysis machine allows urease decomposition within system while preventing return flow of ammonium ions to patient.

B78-10242
A PROBE FOR BLOOD-VESSEL AND SPINAL INTERIORS
R. E. FRAZER
Oct. 1978
NPO-14132 **Vol. 3, No. 2, p. 248**
Probe design allows insertion into lumen of blood vessels to perform oximetry and investigate plaque on interior vessel walls. Probe is more accurate than standard oximetry procedures of determining oxygenation of circulating blood.

B78-10243
STACKED SOLAR CELLS MEASURE X-RAY EXPOSURE
C. M. BERDAHL
Oct. 1978
NPO-13954 **Vol. 3, No. 2, p. 250**
Stacked arrangement of solar cells and scintillating sheets in alternating layers produces very sensitive X-ray measuring device. Sensor is compatible with short exposure times typical of modern X-ray film, making it suitable for application in medical soft X-ray facilities.

B78-10244
IN VIVO BLOOD-FLOW MAPPING
R. E. FRAZER
Oct. 1978
NPO-14133 **Vol. 3, No. 2, p. 251**
Application of laser doppler techniques to commercially available, low loss fiber optics allows direct reading of blood velocity within tiny blood vessels.

B78-10245
BIOLOGICAL SAMPLING AND CLEANING DEVICE
H. W. SCHEIDER
Oct. 1978
NPO-14010 **Vol. 3, No. 2, p. 252**
Flowing-liquid cleaner may be used to gently dislodge and remove 98 percent of biological particulates from surfaces. Cleaner may retain up to 90 percent of removed particulates for later analysis. If retention is not required, unit may be adapted to clean only. Cleaner is applicable wherever very clean surface is desired.

B78-10246
AUTOMATIC PRIMATE FEEDER
A. R. GANDY (Northrop Corp.)
Oct. 1978
LANGLEY-11586 **Vol. 3, No. 2, p. 253**
Zippered tubing and rotating wheel dispense food pellets reliably without contamination.

B78-10247
IMPROVEMENTS IN MICROELECTROPHORESIS APPARATUS
B. W. GRUNBAUM (Univ. of Calif., Berkley)
Oct. 1978
ARC-11121 **Vol. 3, No. 2, p. 253**
Improvements to conventional microelectrophoresis techniques can simplify and standardize clinical diagnosis of large electrically charged molecules. Improvements include special trays, tray and cell covers, membranes, and temperature controls.

B78-10362
REMOTELY-POWERED INTRACRANIAL PRESSURE MONITOR
T. B. FRYER
Jan. 1979
ARC-11120 **Vol. 3, No. 3, p. 382**
Implantable RF powered monitor uses capacitive transducer and stiff metal diaphragm that gives high stability for long term intracranial pressure monitoring. Design of monitor reduces risk of infection while improving patient comfort and mobility.

B78-10363
BIOMEDICAL APPLICATIONS OF ION-BEAM TECHNOLOGY
B. A. BANKS, A. J. WEIGAND, D. F. GIBBONS (Case Western Reserve Univ.), C. L. VANKAMPEN (St. Luke's Hospital), and C. A. BABBUSH
Jan. 1979 See also NASA-TM-X-73512 (N77-11655); NASA-TM-X-73468 (N76-30797); NASA-CR-135311 (N78-18672)
LEWIS-12807 **Vol. 3, No. 3, p. 382**
Microscopically-rough surface texture of various biocompatible alloys and polymers produced by ion-beam sputtering may result in improvements in response of hard or soft tissue to various surgical implants.

B78-10364
AUTOMATED CHROMOSOME ANALYSIS
K. R. CASTLEMAN, H. J. FRIEDEN, E. T. JOHNSON, P. A. RENNIE, and R. J. WALL
Jan. 1979
NPO-13913 **Vol. 3, No. 3, p. 383**
Minicomputer-controlled system automatically prepares and analyses blood samples and displays karyotype in pictorial form as primary output. System accuracy is assured by operator interaction at key points during process. System can process up to 576 specimens per day.

B78-10365
AUTOMATED CONTROLLER FOR LIQUID-COOLED GARMENTS
L. H. KUZNETZ
Jan. 1979 See also NASA-TM-58205 (N78-11704)
MSC-18055 **Vol. 3, No. 3, p. 385**
Automated controller is governed by inlet temperature of coolant and temperature differential across garment. Controller eliminates restrictive body attachments of physical sensors, while regulating temperature more efficiently than manual adjustment.

B78-10366
ANTIHISTAMINES REDUCE ULCERATION PRODUCED BY INDOMETHACIN
J. VERNIKOS-DANELLIS and P. A. BROWN (San Jose State Univ.)
Jan. 1979
ARC-11118 **Vol. 3, No. 3, p. 386**
Studies indicate that therapeutic application of antihistamines such as, metiamide, promethazine, or pyrilamide, may reduce occurance of gastric ulceration produced by indomethacin.

B78-10367
SWEAT COLLECTION CAPSULE
R. W. DELAPLAINE and J. E. GREENLEAF
Jan. 1979
ARC-11031 **Vol. 3, No. 3, p. 387**
Capsule, with filter paper insert, is used to collect sweat for rate monitoring, chromatographic analysis, or active sweat gland

location within specified area. Construction of capsule allows change of inserts while device remains strapped in place.

B78-10368
BIOCOMPATIBILITY OF SURGICAL IMPLANTS
D. H. KAELBLE (Rockwell Intern. Corp.)
Jan. 1979
NPO-14291 **Vol. 3, No. 3, p. 387**
Method of selecting biocompatible materials for surgical implants uses fracture mechanic relationships and surface energies of candidate materials in presence of blood plasma. Technique has been used to characterize 190 materials by parameters that reflect their biocompatibility.

B78-10369
MICROPROCESSOR-BASED CARDIOPULMONARY MONITOR
J. A. RUMMEL, C. F. SAWIN, M. C. BUDERER (Technology Inc.), D. G. MAULDIN (Technology Inc.), and K. M. TAMER (Technology Inc.)
Jan. 1979 See also NASA-CR-151688 (N78-21752)
MSC-18235 **Vol. 3, No. 3, p. 388**
Incorporation of microprocessors in design of complete cardiopulmonary monitoring system alloys size reduction and cuts power requirements by ninety percent.

B78-10370
RESTERILIZABLE ELECTRODE FOR ELECTROSURGERY
E. R. ENGSTROM (Univ. of Wisconsin-Madison) and J. C. HOUGE (Univ. of Wisconsin-Madison)
Jan. 1979
HQN-10915 **Vol. 3, No. 3, p. 389**
Required properties of flexibility, electrical conductivity, tensile strength, and tear resistance of electrosurgical electrodes is retained through utilization of flexible-polymer/conductive particle composites for electrodes.

B78-10371
RETAINER FOR LABORATORY ANIMALS
R. W. LEE
Jan. 1979
LANGLEY-12353 **Vol. 3, No. 3, p. 390**
Bio-retainer holds laboratory animals in fixed position for research and clinical experiments. Retainer allows full access to animals and can be rapidly opened and closed to admit and release specimens.

B78-10372
IMPROVED MYOCARDIUM TRANSDUCER
V. H. CULLER, C. FELDSTEIN, and G. W. LEWIS
Jan. 1979
NPO-14107 **Vol. 3, No. 3, p. 391**
Method of implanting myocardium transducer uses special indented pins that are caught and securely held by epicardial fibers. Pins are small enough to cause minimum of trauma to myocardium during implantation or removal.

B78-10373
IMPLANTABLE DIGITAL HEARING AID
A. M. KISSIAH, JR.
Jan. 1979
KSC-11009 **Vol. 3, No. 3, p. 391**
Hearing aid converts analog output of microphone into digital pulses in about 10 channels of audiofrequencies. Each pulse band could be directly connected to portion of auditory nerve most sensitive to that range.

B78-10374
AUTOMATED SYRINGE SAMPLER
G. C. PURGOLD
Jan. 1979
LANGLEY-12308 **Vol. 3, No. 3, p. 393**
Device is designed primarily for remotely collecting field samples of water or air from polluted sources or from tracer gases used to track such sources over long distances.

B78-10375
WIDEBAND EMG TELEMETRY SYSTEM
S. A. ROSATINO and R. M. WESTBROOK
Jan. 1979
ARC-11209 **Vol. 3, No. 3, p. 394**
Miniature, individual crystal-controlled RF transmitters located in EMG pressure sensors simplifies multichannel EMG telemetry for electronic gait monitoring. Transmitters which are assigned operating frequencies within 174 216 MHz band have linear frequency response from 20 - 2000 Hz and operate over range of 15 m.

B78-10376
MEDICAL INFORMATION MANAGEMENT SYSTEM
S. ALTERESCU, K. R. HIPKINS, and C. A. FRIEDMAN (Federal City College)
Jan. 1979
GSFC-12078 **Vol. 3, No. 3, p. 396**
On-line interactive information processing system easily and rapidly handles all aspects of data management related to patient care. General purpose system is flexible enough to be applied to other data management situations found in areas such as occupational safety data, judicial information, or personnel records.

B78-10521
SEPARATING BIOLOGICAL CELLS
D. E. BROOKS (Univ. of Oregon)
Mar. 1979
M-FS-23883 **Vol. 3, No. 4, p. 547**
Technique utilizing electric field to promote biological cell separation from suspending medium in zero gravity increases speed, reduces sedimentation, and improves efficiency of separation in normal gravity.

B78-10522
FLOW-COMPENSATING PRESSURE REGULATOR
E. F. BAEHR
Mar. 1979 See also B78-10523
LEWIS-12718 **Vol. 3, No. 4, p. 548**
Pressure regulator developed for use with cataract-surgery instrument controls intraocular pressure during substantial variations in flow rate of infusion fluid. Device may be applicable to variety of eye-surgery instruments.

B78-10523
INTRAOCULAR PRESSURE REDUCTION AND REGULATION
E. F. BAEHR and W. J. MCGANNON
Mar. 1979 See also B78-10522
LEWIS-12723 **Vol. 3, No. 4, p. 549**
System designed to reduce intraocular pressure hydraulically to any level desired by physician over set time and in controlled manner has number of uses in ophthalmology. Device may be most immediately useful in treatment of glaucoma.

B78-10524
HAND-HELD VITAL-SIGNALS MONITOR
G. A. RINARD (Denver Res. Inst.), D. A. STEFFEN (Denver Res. Inst.), and R. E. STURM (Denver Res. Inst.)
Mar. 1979
MSC-18232 **Vol. 3, No. 4, p. 551**
Complete miniaturized physiological vital-signs monitor displays body temperature, heart rate, and breath rate, and has provision to display blood-pressure data fed from external circuitery.

B78-10525
HYBRID TEMPERATURE-MONITORING CIRCUIT
G. A. RINARD (Denver Res. Inst.), D. A. STEFFEN (Denver Res. Inst.), and R. E. STURM (Denver Res. Inst.)
Mar. 1979 See also B78-10524
MSC-18231 **Vol. 3, No. 4, p. 553**
Hybrid circuit developed for use in hand-held vital signs monitor converts resistance of thermistor probe to 3 1/2 digit BCD (binary-coded-decimal) temperature readout. If used alone

circuit can form 'stand alone' temperature monitor or can transmit temperature data via telemetry to data acquisition systems.

B78-10526
HYBRID ECG SIGNAL CONDITIONER
G. A. RINARD (Denver Res. Inst.), D. A. STEFFEN (Denver Res. Inst.), and R. E. STURM (Denver Res. Inst.)
Mar. 1979 See also B78-10524; B78-10528
MSC-18230 **Vol. 3, No. 4, p. 554**
Circuit with high common-mode rejection has ability to filter and amplify accepted analog electrocardiogram (ECG) signals of varying amplitude, shape, and polarity. In addition, low power circuit develops standardized pulses that can be counted and averaged by heart/breath rate processor.

B78-10527
HYBRID RESPIRATION-SIGNAL CONDITIONER
G. A. RINARD (Denver Res. Inst.), D. A. STEFFEN (Denver Res. Inst.), and R. E. STURM (Denver Res. Inst.)
Mar. 1979 See also B78-10524; B78-10528
MSC-18226 **Vol. 3, No. 4, p. 556**
Hybrid impedance-pneumograph and respiration-rate signal conditioner element of hand-held vital signs monitor measures changes in impedance of chest during breathing cycle and generates analog respiration signal as output along with synchronous square wave that can be monitored by breath-rate processor.

B78-10528
HYBRID HEART/BREATH-RATE PROCESSOR
G. A. RINARD (Denver Res. Inst.), D. A. STEFFEN (Denver Res. Inst.), and R. E. STURM (Denver Res. Inst.)
Mar. 1979 See also B78-10524; B78-10526; B78-10527
MSC-18227 **Vol. 3, No. 4, p.557**
Single hybrid circuit converts time between pulses from ECG signal conditioner of breath-rate signal conditioner to determine heart-rate of respiration-rate output of hand-held vital signs monitor.

B78-10529
HYBRID LCD DRIVER
G. A. RINARD (Denver Res. Inst.), D. A. STEFFEN (Denver Res. Inst.), and R. E. STURM (Denver Res. Inst.)
Mar. 1979 See also B78-10524
MSC-18229 **Vol. 3, No. 4, p. 559**
Display driver for hand-held signs monitor can be configured to operate either 4 digit or, by paralleling four drivers, to operate 16 digit liquid crystal display (LCD).

B78-10530
HYBRID CLOCK GENERATOR
G. A. RINARD (Denver Res. Inst.), D. A. STEFFEN (Denver Res. Inst.), and R. E. STURM (Denver Res. Inst.)
Mar. 1979 See also B78-10524
MSC-18228 **Vol. 3, No. 4, p. 560**
Clock driver hybrid for hand-held vital signs monitor generates all frequencies required for operation of vital signs system in compact low power configuration.

B78-10531
IMPROVED PROBE FOR RECTAL-CANCER DETECTION
R. E. FRAZER
Mar. 1979
NPO-14247 **Vol. 3, No. 4, p. 562**
Modified protosigmoidoscope, with third partially mirrored lens, provides lateral as well as forward vision for thorough examination of patients for malignant or premalignant lesions of colon and rectum.

B78-10532
SELF-PROPELLING, SELF-LOCATING COLONOSCOPE
R. E. FAZER
Mar. 1979
NPO-14092 **Vol. 3, No. 4, p. 563**
Articulated instrument moves by air actuated bladder, while defining position by ultrasonic or RF signals. Device allows optical inspection of large bowel from cecum to rectum with minimal discomfort or risk to patient.

B78-10533
NONCONTACTING ELECTROKINETOGRAPHY SYSTEM
J. G. DAVIS (Lovelace-Bataan Medical Center) and D. M. HICKMAN (Lovelace-Bataan Medical Center)
Mar. 1979
MSC-18162 **Vol. 3, No. 4, p. 564**
Noncontact acoustic technique utilizing air-coupled ultrasonic transducers for measuring motion of chest wall during cardiac cycle gives information on changes in size and compliance of heart ventricles. Information is digitized and fed to microprocessor for rapid storage and analysis for aid in diagnosis of heart condition.

06 MECHANICS

B78-10069
AERODYNAMIC DESIGN LOWERS TRUCK FUEL CONSUMPTION
L. STEERS
Jun. 1978
FRC-11015 **Vol. 3, No. 1, p. 77**
Energy-saving concepts in truck design are emerging from developing new shapes with improved aerodynamic flow properties that can reduce air-drag coefficient of conventional tractor-trailers without requiring severe design changes or compromising load-carrying capability. Improvements are expected to decrease somewhat with increased wind velocities and would be affected by factors such as terrain, driving techniques, and mechanical condition.

B78-10070
COMBINATION FORCE AND ANGULAR-DEFLECTION INDICATOR
J. F. KAUPPI (Rockwell Intern. Corp.)
Jun. 1978
MSC-16155 **Vol. 3, No. 1, p. 78**
Verification of pedal operation is possible with tool that measures force and angular displacement. With tool, one can check both rudder- and break-pedal operation.

B78-10071
NONCONTACT MEASUREMENT OF ANGULAR DEFLECTION
E. L. BRYANT
Jun. 1978
LANGLEY-12178 **Vol. 3, No. 1, p. 79**
Technique for measuring instantaneous angular deflection of object requires no physical contact. Technique utilizes two flat refractors, converging lens, and different photocell. Distinction of method is its combination of optical and electromechanical components into feedback system in which measurement error is made to approach zero. Application is foreseen in measurement of torsional strain.

B78-10072
LOW-COST ULTRASONIC LAMB-WAVE TRANSDUCER
C. C. KAMMERER (Rockwell Intern. Corp.)
Jun. 1978
MSC-16333 **Vol. 3, No. 1, p. 80**
Transducer propagates Lamb wave through thin aluminum sheet material. Model includes two elements that measure effects of damping and loading which, in turn, are indirectly equated to bond integrity. Transducer has been used to evaluate bond integrity of aluminum facing adhesively bonded to aluminum facing. Because of versatility, it is now possible to inspect many objects of different configurations that could not be reached with earlier transducers.

B78-10073
QUICK-AND-EASY SHEAR-LOAD TESTING
J. A. GUSTAFSON (Rockwell Intern. Corp.) and J. K. NEARY (Rockwell Intern. Corp.)
Jun. 1978
MSC-16765 **Vol. 3, No. 1, p. 80**

Device for applying shear loads to test specimens can be attached and removed without damaging specimen surface. Because it is quick, clean, and inexpensive, method is expected to be useful in commercial testing laboratories for applying shear loads to smooth surfaces on which there is no provision for conventional attachments and which could be easily damaged.

B78-10074
IMPROVED STRAIN-GAGE CALIBRATION
R. W. TROKE (Rockwell Intern. Corp.)
Jun. 1978
MSC-16852 **Vol. 3, No. 1, p. 81**

Accuracy of quarter-bridge strain gage is improved by accounting for nonlinearity of bridges output for equivalent compression and tension strains. Method provides relationships that connect measured strain and shunt calibration.

B78-10075
SURFACE EXAMINATION OF SMALL PARTICLES
B. C. BUZEK and T. K. GLASGOW
Jun. 1978 See also NASA TM-X-71749 (N75-30262)
LEWIS-12842 **Vol. 3, No. 1, p. 82**

Electron-microscopy specimen-preparation technique is used to study micron size particles. Process involves coating particles with vacuum-evaporated carbon, dissolving particles in solvent, then examining residue. Process is applicable to study of catalysts, nucleation and growth of metal oxides, and to determine chemical nature of lubricated surfaces after wear has occurred.

B78-10076
THERMOCOUPLES MEASURE VERY-HOT GAS TEMPERATURES
G. E. GLAWE, L. N. KRAUSE, and H. A. WILL
Jun. 1978 See also NASA TM-X-71883 (N76-18408)
LEWIS-12843 **Vol. 3, No. 1, p. 83**

Thermocouple probe incorporates small jet of inert gas to cool thermocouple. To measure gas temperatures, cooling jet is turned off momentarily, allowing thermocouple to heat up to near its melting point, then cooling is reapplied. Heating curve is recorded by high speed digital system. Computing system extrapolates final temperature thermocouple would have attained.

B78-10077
INFRARED SCANNERS FOR TEMPERATURE MEASUREMENT IN WIND TUNNELS
A. G. KANTSIOS
Jun. 1978
LANGLEY-12171 **Vol. 3, No. 1, p. 84**

Remote infrared scanners allow large surfaces to be studied without disturbing model and without extensive sensor installation. Computer techniques analyze data with accuracy of + or - 5 percent. Scanners are applicable to tracking and diffusion studies of rocket exhausts, nondestructive testing of rocket motor nozzles and composite materials, and detection of nonuniformity in home insulation.

B78-10078
NOISE CALCULATION ON THE BASIS OF VORTEX FLOW MODELS
J. C. HARDIN
Jun. 1978
LANGLEY-12271 **Vol. 3, No. 1, p. 85**

Flow-modeling technique yields relatively simple method for calculating sound radiation involving planar, cylindrical, or spherical surfaces. Model employs potential flow theory with action of viscosity on flowfield described in terms of point vortices. Surface presence in flow is analyzed, using classical image method; sound is calculated through sound generation theory reformulation.

B78-10079
THERMAL-CONTROL CANISTER
S. OLLENDORF
Jun. 1978
GSFC-12253 **Vol. 3, No. 1, p. 87**

Use of variable-conductance heat-pipe link together with fixed-conductance system allows canister temperature to vary over wide range, yet hold stable to + or - 1 degree Centigrade. System has fewer parts and requires considerably less power than conventional heaters and thermostats.

B78-10080
CRYOSTAT SAFETY TENT
J. L. MILLMAN
Jun. 1978
GSFC-12206 **Vol. 3, No. 1, p. 88**

Transparent vinyl tent is designed for easy assembly with minimum use of handtools. Tent prevents toxic or explosive vapors from entering building. Frame posts are mounted on casters to allow easy mobility.

B78-10081
FILM ADHESIVE ENHANCES NEUTRON RADIOGRAPHIC IMAGES
M. W. REED (Vought Missiles and Space Co.)
Jun. 1978
MSC-18061 **Vol. 3, No. 1, p. 88**

Resolution of neutron radiographic images of thermally conductive film is increased by replacing approximately 5 percent of aluminum powder, which provides thermal conductivity, with gadolinium oxide. Oxide is also chemically stable.

B78-10082
THERMAL COMPENSATOR FOR HELIUM REFRIGERATORS
J. J. HILLMAN and D. E. JENNINGS
Jun. 1978
GSFC-12168 **Vol. 3, No. 1, p. 89**

Closed-cycle helium refrigerator sensor generates negative-feedback control signals that drive heating diode to maintain temperature stability. Temperature-sensing diode and heating diode are mounted on heat sink that provides conductive path between load and cold tip. Method is applicable to other temperature-control applications, such as laser equipment, electronic instruments, and computer systems.

B78-10083
CALIBRATION TARGET FOR TEMPERATURE RADIOMETER
S. F. EDWARDS, W. F. STEWART, and D. S. VANN
Jun. 1978
LANGLEY-12239 **Vol. 3, No. 1, p. 89**

Technique measures temperature/voltage drop characteristics of very thin filament. With constant current running through filament, voltage drop is recorded at various temperatures, as measured by calibrated thermocouple.

B78-10084
RAPID LEAK DETECTION WITH LIQUID CRYSTALS
R. M. HEISMAN (Rockwell Intern. Corp.), W. F. ICELAND (Rockwell Intern. Corp.), and E. P. RUPPE (Rockwell Intern. Corp.)
Jun. 1978
MSC-13804 **Vol. 3, No. 1, p. 90**

Small leaks in vacuum lines are detected by applying liquid-crystal coating, warming suspected area, and observing color change due to differential cooling by leak jet. Technique is used on inside or outside walls of vacuum-jacketed lines.

B78-10085
THERMAL-LEAK ANALYZER FOR VACUUM-JACKETED LINES
R. M. HEISMAN (Rockwell Intern. Corp.), W. F. ICELAND (Rockwell Intern. Corp.), and E. P. RUPPE (Rockwell Intern. Corp.)
Jun. 1978
MSC-16802 **Vol. 3, No. 1, p. 91**

Technique involves coating suspected area with water-soluble black paint that gives even, infrared emission. Painted area is warmed with heat gun; an infrared scanner is used to detect

cooled spot on jacket exterior. Introduction of atmospheric pressure into jacket intensifies leak jet and improves test sensitivity.

B78-10086
LONG-LASTING SOLID-POLYMER ELECTROLYTIC HYGROMETER
D. D. LAWSON
Jun. 1978
NPO-13948 **Vol. 3, No. 1, p. 92**

Device consists of hollow tube node of oxidation-resistant sulfonated fluorocarbon polymer. Tube absorbs moisture from air passing across inner and outer surfaces, causing change in polymer conductance. Change is related to change in water content in gas sample.

B78-10087
ULTRASONIC EVALUATION OF HIGH-VOLTAGE CIRCUIT BOARDS
S. J. KLIMA and T. J. RILEY
Jun. 1978 See also NASA TM-X-73432 (N76-27475)
LEWIS-12781 **Vol. 3, No. 1, p. 94**

Ultrasonic transmission technique, using reflector plate, indicates resistance to corona formation. Technique is useful as tool for mapping specific panels to permit selecting best areas of laminate for circuit board use. Procedure is relatively safe, fast, inexpensive, and uses commercially-available equipment.

B78-10088
FUSEHOLDERS ALLOW FAST SYSTEM CHECKOUT
R. L. WOOTERS (Rockwell Intern. Corp.)
Jun. 1978
MSC-16856 **Vol. 3, No. 1, p. 95**

Technique involves modifying fuseholder cap with drilled hole to allow each circuit to be connected to automatic circuit analyzer. Tester is commercially-available continuity device used for checking out wiring harnesses that sequentially steps from one circuit to the next automatically. Test results are printed.

B78-10089
WINDOW FLAW DETECTION BY BACKSCATTER LIGHTING
L. K. CROCKETT (Rockwell Intern. Corp.) and F. R. MINTON (Rockwell Intern. Corp.)
Jun. 1978
MSC-16605 **Vol. 3, No. 1, p. 96**

Portable fiber-optic probe detects tiny flaws in transparent materials. Probe transmits light through surface to illuminate interior of material by backscattering off its edges. Light-sensitive contact paper records scratch pattern. Technique can be used for rapid visual checks. Flexible fiber optics are safely used in explosive or flammable areas; they present no hazard of breakage or contamination in controlled environments.

B78-10090
PREDICTING SURFACE HEAT FLUX
D. M. CURRY and S. D. WILLIAMS (Lockheed Electronics Co.)
Jun. 1978 See also NASA TM-X-58176 (N76-20410); NASA TM-58204 (N77-27349)
MSC-16095 **Vol. 3, No. 1, p. 97**

Report presents technique involving single embedded thermocouple used to predict flux and temperature for high-or-low conductivity materials that have temperature-and-pressure dependent properties. Technique solves for heat rate and temperature at given surface at each time step, rather than for entire history. Newton-Raphson technique is used for temperature solutions; then quadratic fit is employed. Report contains representative graphs and tables.

B78-10091
APPROACH AND LANDING SIMULATION
A. J. OSTROFF and R. B. WOOD (Vought Missiles and Space Co.)
Jun. 1978
LANGLEY-12060 **Vol. 3, No. 1, p. 98**

Computer program integrates avionics research in navigation, guidance, controls, and displays with realistic aircraft model. Program gives researchers capability of evaluating avionics area independently from other research areas and thus allows more flexibility in time schedules. Program comprises many independent modules that represent specific hardware onboard actual aircraft.

B78-10092
STABILITY CHARACTERISTICS OF ELASTIC AIRPLANE
L. L. ERICKSON
Jun. 1978
ARC-11144 **Vol. 3, No. 1, p. 99**

System of computer programs uses linear theories to evaluate static and dynamic stability, trim state, inertial, and aerodynamic loading, and elastic deformations of aircraft configurations at subsonic and supersonic speeds. Primary emphasis is on analysis of stability and control characteristics of flexible aircraft. System also solves simple rigid aerodynamic problems.

B78-10093
WAKE AND WASH
F. O. SMETANA (North Carolina State Univ.) and D. C. SUMMEY (North Carolina State Univ.)
Jun. 1978
LANGLEY-12262 **Vol. 3, No. 1, p. 100**

Two computer programs determine onset flow in vicinity of horizontal tail of light aircraft.

B78-10094
FLOW VELOCITIES AND STREAMLINES
T. KATSANIS and W. D. MCNALLY
Jun. 1978 See also B74-10130
LEWIS-12966 **Vol. 3, No. 1, p. 100**

Computer program calculates subsonic or transonic flow on hubshroud, midchannel, stream surface of single-blade row of turbomachine. Program uses finite-different and quasi-orthogonal (velocity-gradient) methods. Program is reported in two volumes: Part I is User's Manual, Part II is Programmer's Manual.

B78-10095
HYDRAULIC DYNAMIC ANALYSIS
R. L. GALE (Rockwell Intern. Corp.), A. W. NEASE (Rockwell Intern. Corp.), and D. J. NELSON (Rockwell Intern. Corp.)
Jun. 1978
MSC-16795 **Vol. 3, No. 1, p. 101**

Computer program mathematically describes complete hydraulic systems to study their dynamic performance. Program employs subroutines that simulate components of hydraulic system, which are then controlled by main program. Program is useful to engineers working with detailed performance results of aircraft, spacecraft, or similar hydraulic systems.

B78-10096
PERFORMANCE OPTIMIZING
B. CLARK (Virginia Univ.), W. D. PILKEY (Virginia Univ.), and B. P. WANG (Virginia Univ.)
Jun. 1978
LANGLEY-11930 **Vol. 3, No. 1, p. 101**

System of computer programs determines optimal behavior of structural-mechanical system subject to transient disturbances or loadings. Program makes it possible to approach design problem directly from design criteria without prior commitment to particular design concept.

B78-10097
DYNAMICS OF GAS-THRUST BEARINGS
A. K. STIFFLER (Mississippi State Univ.) and R. R. TAPIA (Mississippi State Univ.)
Jun. 1978
LEWIS-12754 **Vol. 3, No. 1, p. 102**

Computer program calculates load coefficients, up to third harmonic, for hydrostatic gas thrust bearings. Program is useful in identification of industrial situations where gas-thrust bearings have potential applications.

B78-10248
PSEUDO-CONTINUOUS-WAVE ACOUSTIC INSTRUMENT
J. S. HEYMAN and F. D. STONE

Oct. 1978
LANGLEY-12260 **Vol. 3, No. 2, p. 257**

Simple, inexpensive, and portable ultrasonic device accurately measures acoustic properties of liquids, gases, and solids, using pseudo-continuous wave responses from samples to measure change in resonant frequency or amplitude in acoustic signal.

B78-10249
MASS SPECTROMETER CALIBRATION STANDARD
D. S. ROSS
Oct. 1978
NPO-14097 **Vol. 3, No. 2, p. 258**

Inert perfluorinated alkane and alkyl ethers mixture is used to calibrate mass spectrometer. Noncontaminating, commercially-available liquid provides series of reproducible reference peaks over broad mass spectrum that ranges over mass numbers from 1 to 200.

B78-10250
DAMAGE-DETECTION SYSTEM FOR LNG CARRIERS
J. R. MASTANDREA (McDonnell Douglas Corp.) and M. V. SCHERB (McDonnell Douglas Corp.)
Oct. 1978
LANGLEY-11463 **Vol. 3, No. 2, p. 258**

System utilizes array of acoustical transducers to detect cracks and leaks in liquefied natural gas (LNG) containers onboard ships. In addition to detecting leaks, device indicates location and leak rate.

B78-10251
FREE-AIR CONTENT IN FLUID SYSTEMS
G. R. GUM (Rockwell Intern. Corp.)
Oct. 1978
MSC-16703 **Vol. 3, No. 2, p. 260**

Nomograph used with compressibility tester automatically finds amount of free-air within closed fluid system. Device reduces time required for task and reduces likelihood of error.

B78-10252
TESTING COMPOSITE SHEETS AT HIGH TEMPERATURES
J. S. JONES (Rockwell Intern. Corp.) and B. J. PAYNE (Rockwell Intern. Corp.)
Oct. 1978
MSC-16237 **Vol. 3, No. 2, p. 260**

Candidate materials for skins of flexural sandwich beams can be compressive- or tensile-tested at high temperature by using corrosion resistant steel (CRES) for core material. Tests with CRES core have been made at temperatures as high as 260 C. Future tests at temperatures above 371 C may be permissible.

B78-10253
FLUIDIC-OSCILLATOR GAS ANALYZER
E. A. FABER (Univ. of Florida)
Oct. 1978
KSC-11014 **Vol. 3, No. 2, p. 261**

Fluidic oscillator identifies hazardous single, and multicomponent gases. Since oscillator has no moving parts, it is highly reliable.

B78-10254
IMPROVED ELECTRON-BEAM PROBE FOR HYPERSONIC FLOWS
A. D. MCRONALD
Oct. 1978
NPO-13793 **Vol. 3, No. 2, p. 261**

Probe uses differentially-pumped drift tube to connect high and low pressure regions thereby allowing higher gas densities to be studied. System uses higher beam voltages (50 kV) and currents (1 mA delivered to gas), and extends boundary layer penetration up to 15.2 cm, and test duration to one hour.

B78-10255
DETECTION OF BOUNDARY-LAYER TRANSITIONS IN WIND TUNNELS
W. R. WOOD and D. M. SOMERS
Oct. 1978
LANGLEY-12261 **Vol. 3, No. 2, p. 263**

Accelerometer replaces stethoscope in technique for detection of laminar-to-turbulent boundary-layer transitions on wind-tunnel models. Technique allows measurements above or below atmospheric pressure because human operator is not required within tunnel. Data may be taken from accelerometer, and pressure transducer simultaneously, and delivered to systems for analysis.

B78-10256
HELICOPTER POSITION STABILIZING SYSTEM
K. R. JENKIN (TRW, Inc.)
Oct. 1978
LANGLEY-11670 **Vol. 3, No. 2, P. 264**

System utilizes vertical gyroscope mounted on telescope handled by onboard observer, to help helicopter pilot fly precise circles over ground target without use of ground observer. Other possible uses include cargo discharge or pickup without ground controller, and hovering over invisible target with known coordinates.

B78-10257
AIRFRAME DESIGN FOR REDUCING CABIN NOISE
G. L. GETLINE (Gen. Dy. Corp.)
Oct. 1978 See also NASA-CR-145104 (N77-15029)
LANGLEY-12097 **Vol. 3, No. 2, p. 265**

Low-frequency noise might be reduced by stiffness-control of airframe structure.

B78-10258
PREDICTING DAMAGE FROM EXPLODING VESSELS
W. E. BAKER (Southwest Res. Inst.), R. L. BESSEY (Southwest Res. Inst.), J. J. KULESZ (Southwest Res. Inst.), G. A. OLOHAM (Southwest Res. Inst.), V. B. PARR (Southwest Res. Inst.), R. E. RICKER (Southwest Res. Inst.), and P. S. WESTINE (Southwest Res. Inst.)
Oct. 1978 See also NASA-CR-134906 (N76-19296)
LEWIS-13042 **Vol. 3, No. 2, p. 267**

Workbook provides designer and safety engineer with best currently available technology for predicting damage and hazards from explosions of propellant tanks and bursts of pressure vessels.

B78-10259
AIR CUSHION LANDING SYSTEM
K. M. BOGHAMI (Foster Miller Assoc.), K. M. CAPTAIN (Foster Miller Assoc.), and R. B. FISH (Foster Miller Assoc.)
Oct. 1978
LANGLEY-12303 **Vol. 3, No. 2, p. 267**

Static and dynamic performance of air cushion landing system is simulated in computer program that treats four primary ACLS subsystems: fan, feeding system, trunk, and cushion. Configuration of systems is sufficiently general to represent variety of practical designs.

B78-10260
INTERNAL AND EXTERNAL 2-D BOUNDARY LAYER FLOWS
M. E. CRAWFORD (Stanford Univ.) and W. M. KAYS (Stanford Univ.)
Oct. 1978
LEWIS-13009 **Vol. 3, No. 2, p. 268**

Computer program computes general two dimensional turbulent boundary-layer flow using finite-difference techniques. Structure allows for user modification to accommodate unique problems. Program should prove useful in many applications where accurate boundary-layer flow calculations are required.

B78-10261
STRESS ANALYSIS UNDER COMPONENT RELATIVE INTERFERENCE FIT
C. M. TAYLOR (Univ. of Leeds, England)
Oct. 1978
LEWIS-12911 **Vol. 3, No. 2, p. 268**

Finite-element computer program enables analysis of distortions and stresses occurring in components having relative interference. Program restricts itself to simple elements and axisymmetric loading situations. External inertial and thermal loads

may be applied in addition to forces arising from interference conditions.

B78-10262
EDGE GEOMETRY OF TURBOMACHINE BLADES
L. F. SCHUMANN (U. S. Army Air Mobility R and D Lab.)
Oct. 1978
LEWIS-12979 **Vol. 3, No. 2, p. 269**
Computer program calculates leading- and trailing-edge circle radii, tangency angles on leading- and trailing-edge circles, and stagger angle of turbomachinery blade sections, using only spline points defining blade surfaces.

B78-10263
THERMAL PERFORMANCE OF SHAFT BEARING SYSTEM
W. CRECELIUS (SKF Industries, Inc.)
Oct. 1978
LEWIS-12761 **Vol. 3, No. 2, p. 269**
Computer program calculates loads, torques, temperature, and fatigue life of multibearing shaft system operating with either wet or dry friction. Program is also capable of predicting system reactive to termination of lubricant supply to bearings and other lubricated mechanical elements.

B78-10264
STRUCTURAL PERFORMANCE ANALYSIS AND REDESIGN
W. D. WHETSTONE (Engineering Info. Sys. Co.)
Oct. 1978
LANGLEY-12213; LANGLEY-12234; M-FS-23944
Vol. 3, No. 2, p. 270
Program performs stress buckling and vibrational analysis of large, linear, finite-element systems in excess of 50,000 degrees of freedom. Cost, execution time, and storage requirements are kept reasonable through use of sparse matrix solution techniques, and other computational and data management procedures designed for problems of very large size.

B78-10265
THERMAL HYDRAULIC ANALYZER
E. E. GARCIA (Rockwell Intern. Corp.) and R. W. SANTEN (Rockwell Intern. Corp.)
Oct. 1978
MSC-18014; MSC-16797; MSC-16877 Vol. 3, No. 2, p. 271
Program solves both transient and steady-state thermal problems, steady-state hydraulic problems, and combined thermal, and hydraulic transient or steady-state problems.

B78-10266
ANALYSIS OF LINEAR VISCOELASTIC STRUCTURES
K. K. GUPTA and E. HEER
Oct. 1978
NPO-13197 **Vol. 3, No. 2, p. 271**
General purpose program solves equilibrium problems associated with one-, two-, and three-dimensional linear thermoviscoelastic structures. Program can be used to analyze wide variety of structures constructed of any isotropic, orthotropic, or anisotropic material.

B78-10377
NONCONTACT OPTICAL COMMUNICATION BETWEEN MOVING STATIONS
D. C. CUNNINGHAM (Sperry Rand Corp.) and B. J. HAMILTON (Sperry Rand Corp.)
Jan. 1979
LANGLEY-12283 **Vol. 3, No. 3, p. 399**
Optical coupler allows non-contact data transfer between parts having several degrees of relative motion. Rotation about one axis and limited axial and radial motion will not interrupt communications.

B78-10378
PHOTOVOLTAIC SYSTEMS TEST FACILITY
Innovator not given (Lewis Research Center) Jan. 1979
LEWIS-13073 **Vol. 3, No. 3, p. 400**
Facility provides broad and flexible capability for evaluating photovoltaic systems and design concepts. As 'breadboard' system, it can be used to check out complete systems, subsystems, and components before installation in actual service.

B78-10379
RUBY C-AXIS ALIGNMENT SYSTEM
R. C. CLAUSS and F. E. MCCREA
Jan. 1979
NPO-14252 **Vol. 3, No. 3, p. 401**
System locates C-axis of ruby slab fabricated for maser application to within + or - 3 minutes of arc at room temperature easier and faster than conventional procedures.

B78-10380
MODULATION IMPROVES ELECTRO-OPTIC OBJECT DETECTOR
J. R. CURRIE and R. R. SCHANSMAN
Jan. 1979
M-FS-23776 **Vol. 3, No. 3, p. 402**
Device as part of integrated circuit protection line is used to detect presence or absence of silicon wafer at point along air track. System is insensitive to ambient light and electrical noise, requires no special components or adjustments, operates from single supply source, and is relatively inexpensive to build.

B78-10381
IMPROVED HEAT-PIPE WICK
F. G. ARCELLA (Westinghouse Electric Corp.) and E. C. PHILLIPS, JR. (Westinghouse Electric Corp.)
Jan. 1979
NPO-13391 **Vol. 3, No. 3, p. 403**
Fabrication techniques in application with conventional heat pipe-wick technology produces high quality annular wicks with smaller pores, higher density, and greater rigidity.

B78-10382
CALCULATION OF PLANAR-TRUSS MODAL FREQUENCIES
R. M. GATES (Boeing Aerospace Co.)
Jan. 1979
LANGLEY-12137 **Vol. 3, No. 3, p. 404**
Simplified method for calculating modal frequencies of four types of large area planar trusses (tetrahedral, pentahedral, hexahedral, and radial rib) treat trusses as equivalent circular plates thus allowing classical plate theories to be used.

B78-10383
IMPROVED NOTATION CONTROLLER
J. DONOHUE and H. C. HOFFMAN
Jan. 1979
GSFC-12273 **Vol. 3, No. 3, p. 404**
Nutation controller equipped with angular accelerometer stabilizes spinning bodies without precise positioning or calibration.

B78-10384
HIGH-TEMPERATURE MICROPHONE SYSTEM
A. J. ZUCKERWAR (Old Dominion Univ. Res. Foundation)
Jan. 1979
LANGLEY-12375 **Vol. 3, No. 3, p. 405**
Microphone system that measures pressure fluctuations in air or other gases is not unduly effected by temperature or rate-of-change of temperature. Easily fabricated system has proved operable at temperatures up to 430 C.

B78-10385
A SOLID-STATE PHASE-INSENSITIVE ULTRASONIC TRANSDUCER
J. S. HEYMAN
Jan. 1979
LANGLEY-12304 **Vol. 3, No. 3, p. 406**
Photoconductive acoustoelectric transducer (AET) functions as phase-insensitive ultrasonic transducer. Device is easy to use and requires no additional noisy components such as light or thermal source.

B78-10386
NO2 MEASUREMENT BY CHEMILUMINESCENCE
E. J. CONWAY, R. S. ROGOWSKI, and R. R. RICHARDS

(Greenville College)
Jan. 1979
LANGLEY-11378 **Vol. 3, No. 3, p. 407**
Compact device monitors specific chemiluminescent reaction of heated solid material such as 3,5 diaminobezoic or polyvinyl alcohol after contact with gas sample to detect and quantify nitrogen dioxide concentration.

B78-10387
MEASURING POISSON'S RATIO IN ELASTOMERS
J. M. CLEMONS
Jan. 1979
M-FS-23878 **Vol. 3, No. 3, p. 408**
Simple water-displacement device rapidly and accurately determines poisson's ratio for elastometric materials.

B78-10388
CALIBRATION STANDARDS FOR PIND TESTS
S. GAUDIANO
Jan. 1979
MSC-18169 **Vol. 3, No. 3, p. 408**
Calibrated set of microcircuit packages containing tiny particles with known masses can be used as reference standards for Particle-Impact Noise-Detection (PIND) tests.

B78-10389
SHOCK DURING PIND TEST FREES PARTICLES
S. V. CARUSO and F. Z. KEISTER (Hughes Aircraft Co.)
Jan. 1979
M-FS-23829 **Vol. 3, No. 3, p. 409**
Recent study on Particle-Impact Noise-Detection (PIND) shows impact at 1,500 to 4,000 G normally imparted to hybrid microcircuits during testing knocks loose stray trapped particle that can be subsequentially removed. Process may be 80 to 90 percent effective in removal of particles depending on type of test utilized.

B78-10390
TEMPERATURE-GRADIENT OVEN
S. JUE (Grumman Aerospace Corp.)
Jan. 1979
M-FS-23919 **Vol. 3, No. 3, p. 409**
Tubular oven operates on principle of lengthwise linear temperature gradient of homogeneous conductive rod in absence of radiative or convective heat loss. Oven can be applied to controlled heating or cooling of test specimens.

B78-10391
AUTOMATED TEMPERATURE-CYCLING APPARATUS
M. L. LOCKARD
Jan. 1979
LANGLEY-12310 **Vol. 3, No. 3, p. 410**
Apparatus is used to test materials reaction to thermal shock by moving specimens between two chambers at high and low temperature extremes for specified number of cycles. Electrically motored system is completely automatic saving time and costs.

B78-10392
STANDARDIZED GAS-TEMPERATURE PROBES
G. E. GLAWE, R. HOLANDA, and L. N. KRAUSE
Jan. 1979 See also NASA-TP-1099 (N78-15463)
LEWIS-13059 **Vol. 3, No. 3, p. 411**
Standardization by two general probe designs and determination of various correction factors for range of sizes in each design reduces requirements for individual calibration and associated costs.

B78-10393
ORIFICE CALIBRATION MODULE
R. CULOTTA and D. L. POSEY
Jan. 1979
LANGLEY-12269 **Vol. 3, No. 3, p. 412**
Module, consisting of transparent plastic cylinder containing separate suction and calibration chambers, allows static-pressure orifices to be calibrated, and rapidly checked for leaks. Device is compact, saves time, and improves accuracy, and reliability of pressure measurements.

B78-10394
ELECTRONICALLY-SCANNED PRESSURE MEASUREMENT SYSTEM
T. BASTA, JR., C. GROSS, and D. B. JUANARENA
Jan. 1979
LANGLEY-12386 **Vol. 3, No. 3, p. 413**
Sensor and associated microcomputer-based data acquisition unit can measure up to 1,024 unknown pressures at data rates as high as 10 kHz with maximum system inaccuracies of + or - 0.25 percent of full scale. System can be calibrated in place, making it easy to calibrate between runs for high cost or short run time wind tunnel testing.

B78-10395
STATIC-PRESSURE PROBE FOR SMALL GEOMETRIES
S. Z. PINCKNEY
Jan. 1979 See also NASA-TN-D-7978 (N75-27305)
LANGLEY-11552 **Vol. 3, No. 3, p. 414**
Contoured pressure probe with static orifices located near tip is more effective than conventional probes in taking measurements in small high-Reynolds number geometries such as nozzles or flow inlets. Probe is less sensitive to pressure gradients and off axis variations in flow directions over short distances.

B78-10396
DETECTING SERVO FAILURES WITH SOFTWARE
D. LEW (Rockwell Intern. Corp.) and R. QUAM (Rockwell Intern. Corp.)
Jan. 1979
FRC-11003 **Vol. 3, No. 3, p. 415**
Program detects hardware failure in servosystems by comparing actual servo valve position with predictions of software model. In addition, system will also pick up most computer input/output failures. Process presents faster and more reliable results than previous failure detection methods.

B78-10397
PENETRATING FIRE EXTINGUISHER
N. C. GRAY, P. N. BOLTON (Boeing Co.), and R. M. SENSENY (Boeing Co.)
Jan. 1979
KSC-11064 **Vol. 3, No. 3, p. 416**
Fire extinguisher with replacable hard pointed tip is used to penetrate metal skins, wall panels, and other barriers and inject fire extinguishing chemicals.

B78-10398
HIGH-TEMPERATURE CAPACITIVE PRESSURE TRANSDUCER
R. L. EGGER (Boeing Aerospace Co.), R. A. MICKELSEN (Boeing Aerospace Co.), D. W. NELSON (Boeing Aerospace Co.), and E. J. NELSON (Boeing Aerospace Co.)
Jan. 1979 See also NASA-CR-135282 (N77-33483)
LEWIS-13078 **Vol. 3, No. 3, p. 416**
Capacitive pressure transducer operates continuously at temperatures as high 1,2000 F, and has been evaluated over full-scale differential pressure range of + or - 10 psi (69 x 1000 N/sq m).

B78-10399
DIRECTORY OF FIRE RESEARCH SPECIALISTS
T. L. JUNOD, G. MANDEL, and N. H. JASON (NES)
Jan. 1979 See also NASA-CR-135089 (N77-30271)
LEWIS-13123 **Vol. 3, No. 3, p. 417**
Directory indexes, 1,475 researchers and various organizations in the United States or Canada who have recently participated in or made contributions to fire science research or related areas of concern.

B78-10400
NACELLE INCREMENTAL DRAG
A. W. KNUDSEN (Rockwell Intern. Corp.) and R. Y. MAIRS (Rockwell Intern. Corp.)

Jan. 1979
LEWIS-12786 **Vol. 3, No. 3, p. 417**
Program is used to provide rapid approximate methodology for comparing alternative propulsion system designs for supersonic transports.

B78-10401
WING AERODYNAMICS UNDER BLOWING JETS
C. H. FOX, JR., G. L. FILLMAN (Univ. of Kansas), and C. E. LAN (Univ. of Kansas)
Jan. 1979
LANGLEY-12256 **Vol. 3, No. 3, p. 418**
Program determines aerodynamic characteristics of arbitrary wings under influence of single centered jet of pair of jets blowing on or above plane of wing.

B78-10402
ANALYSIS OF BEAM COLUMNS
L. I. GUIDRY (Rockwell Intern. Corp.)
Jan. 1979
MSC-18009 **Vol. 3, No. 3, p. 418**
FORTRAN IV program determines displacements, bending moments, and critical column loads for straight elastic beams or column beams.

B78-10403
SOLAR-ELECTRIC GEOCENTRIC TRANSFER
H. L. MALCHOW (Charles Stark Draper Lab., Inc.) and L. L. SACKETT (Charles Stark Draper Lab., Inc.)
Jan. 1979
LEWIS-12939 **Vol. 3, No. 3, p. 419**
Time-optimal or nearly-time-optimal trajectory computer program developed for solar-electric geocentric transfer considers yaw motion only, yaw and roll only, and unconstrained motion configurations.

B78-10404
CONVECTIVELY COOLED STRUCTURES
A. R. WIETING and E. A. THORNTON (Old Dominion Univ.)
Jan. 1979
LANGLEY-12347 **Vol. 3, No. 3, p. 419**
Finite-element program called TAP 1 aids in steady state thermal analysis of structures that employ conductive or convective heat transfer.

B78-10405
ANALYSIS OF CRACKED ORTHOTROPIC SHEETS
J. A. ABERSON (Georgia Inst. of Tech.), J. M. ANDERSON (Georgia Inst. of Tech.), W. J. BATDORF (Lockheed-Georgia Co.), and C. CHU (Lockheed-Georgia Co.)
Jan. 1979
LANGLEY-12288 **Vol. 3, No. 3, p. 420**
Computer program performs two dimensional elastostatic analysis of plane anisotropic homogeneous sheets with through-the-thickness cracks and temperature gradients.

B78-10406
PREDICTING ROTOR ROTATION NOISE
R. N. HOSIER (USAAMRDL), R. RAMAKRISHNAN (George Washington Univ.), and D. RANDALL (Computer Sci. Corp.)
Jan. 1979
LANGLEY-12098 **Vol. 3, No. 3, p. 420**
Program uses multiple sets of measured or hypothetical high-frequency blade-loading coefficients to calculate rotational noise of stationary helicopter rotors.

B78-10534
REAL-TIME INSTRUMENT AVERAGES 100 DATA SETS
A. G. BIRCHENOUGH, W. J. RICE, and G. B. TOMA
Mar. 1979 See also NASA-TP-1055 (N78-11301)
LEWIS-13093 **Vol. 3, No. 4, p. 567**
Instrument generates average curve of 100 consecutive cycles of any function that occurs as time varying electrical signal. Device has been used to average parameters on 1975 Chevrolet V-8 engine, and on Continental six cylinder aircraft engine.

B78-10535
MINIATURE THERMOCOUPLE DISCONNECT
K. L. QUINN
Mar. 1979
LANGLEY-12013 **Vol. 3, No. 4, p. 568**
Commercially available subminiature connector modified for utilization with both flexible and small diameter metal-sheathed thermocouples results in reliable thermocouple for instrumentation on wind-tunnel models smaller than commercial disconnects normally used.

B78-10536
HIGH-SAMPLING-RATE PRESSURE TRANSDUCER HAS IN SITU CALIBRATION
C. GROSS
Mar. 1979
LANGLEY-12230 **Vol. 3, No. 4, p. 569**
High-data-rate pressure sensor module can be calibrated after it is attached to an experimental setup. Electrically multiplexed sensor is designed for use in wind-tunnels and other applications requiring accurate measurement of many pressures in a short period of time.

B78-10537
SHOCK-SWALLOWING AIR SENSOR
J. NUGENT, G. M. SAKAMOTO, L. D. WEBB, and L. M. COUCH (Langley Res. Center)
Mar. 1979
FRC-10107 **Vol. 3, No. 4, p. 570**
An air-data probe allows air to flow through it so that supersonic and hypersonic shock waves form behind pressure measuring orifices and tube instead of directly on them. Measured pressures are close to those in free-flowing air and are used to determine mach numbers of flying aircraft.

B78-10538
MEASURING PROJECTILE SPEED
J. E. JORDAN and P. C. KASSEL, JR.
Mar. 1979
LANGLEY-12387 **Vol. 3, No. 4, p. 571**
Apparatus uses optoelectric detector to measure station-to-station time-of-flight of small spherical aluminum projectile down steel barrel. Instrument has been used to study impact resistance of composite materials used in aircraft structural research program.

B78-10539
MINIATURE VELOCIMETER
J. M. FRANKE, W. W. HUNTER, JR., J. F. MEYERS, and S. L. OCHELTREE
Mar. 1979
LANGLEY-12281 **Vol. 3, No. 4, p. 572**
Laser velocimeter (LV) designed to use semiconductor-diode laser is 100 times smaller than continuous-wave gas-laser velocimeter permitting mounting within wind-tunnel models or on engine walls. Mini LV uses only 0.4 watts of power and measures velocities with accuracy of 98% or better.

B78-10540
MULTIPLE-SAMPLE HOLDER FOR IC TESTING
R. F. HAACK
Mar. 1979
NPO-14314 **Vol. 3, No. 4, p. 573**
Carrousel tray speeds up testing process by feeding mass spectrometer up to 12 sealed integrated circuit packages in rapid succession for analysis of contaminants and total gas composition.

B78-10541
SEM PROBE OF IC RADIATION SENSITIVITY
M. K. GAUTHIER and A. G. STANLEY
Mar. 1979
NPO-14350 **Vol. 3, No. 4, p. 574**
Scanning Electron Microscope (SEM) used to irradiate single integrated circuit (IC) subcomponent to test for radiation sensitivity can localize area of IC less than .03 by .03 mm for determination of exact location of radiation sensitive section.

B78-10542
TOPPING PRESSURE FOR GAS-STORAGE CYLINDERS
R. L. HABEN (Rockwell Intern. Corp.)
Mar. 1979
MSC-18186 **Vol. 3, No. 4, p. 575**
With charts derived from gas-storage system model, required topping pressure can be determined from initial cylinder pressure and temperature of gas entering cylinder. Charts are available for hydrogen and oxygen and can be developed for other important industrial gases as well.

B78-10543
DYNAMIC MEASUREMENT OF BULK MODULUS
W. L. DOWLER and L. D. STRAND
Mar. 1979
NPO-13226 **Vol. 3, No. 4, p. 576**
Technique based on measuring phase difference between microwave reference and test signals and has been used to determine change in bulk modulus of solid-fuel rocket propellants should be useful in studying other dielectric materials.

B78-10544
ELASTIC DEFORMATION OF BALL BEARINGS, GEARS, AND CAMS
B. J. HAMROCK and D. E. BREWE (U.S. Army Res. and Development Labs.)
Mar. 1979 See also NASA-TM-X-3407 (N76-26517); B77-10414; B77-10415
LEWIS-13076 **Vol. 3, No. 4, p. 577**
Simplified technique aids designers in calculation of elastic deformation at center of contact area for ball bearings, gears, cams, and similar components.

B78-10545
COMPACT TURBIDITY METER
J. G. HIRSCHBERG (Univ. of Miami)
Mar. 1979
KSC-11063 **Vol. 3, No. 4, p. 578**
Proposed monitor that detects back-reflected infrared radiation makes in situ turbidity measurements of lakes, streams, and other bodies of water. Monitor is compact, works well in daylight as at night, and is easily operated in rough seas.

B78-10546
AUTOMATED INSPECTION OF WIRE-FRAME ASSEMBLIES
J. G. ETZEL and J. A. MUNFORD
Mar. 1979
GSFC-12321 **Vol. 3, No. 4, p. 579**
System improves accuracy of measurement between spaces of wire mesh and other wire frame assemblies while significantly reducing inspection time. Device operates automatically producing printout of measured spacings through use of optical scanner.

B78-10547
DETECTING SURFACE DEFORMATIONS PHOTOGRAPHICALLY
L. D. BECKERLE (Rockwell Intern. Corp.) and J. R. ROBSON (Rockwell Intern. Corp.)
Mar. 1979
MSC-16156 **Vol. 3, No. 4, p. 580**
Simple photographic technique detects cracks and changes as small as 0.08 mm in surface contours of opaque objects subjected to environmental and other tests.

B78-10548
COMPRESSION TESTING OF FLAMMABLE LIQUIDS
O. M. BRILES (Sundstrand Advanced Technology Operations) and R. P. HOLLENBAUGH (Sundstrand Advanced Technology Operations)
Mar. 1979
MSC-16121 **Vol. 3, No. 4, p. 581**
Small cylindrical test chamber determines catalytic effect of given container material on fuel that might contribute to accidental deflagration or detonation below expected temperature under adiabatic compression. Device is useful to producers and users of flammable liquids and to safety specialists.

B78-10549
ACOUSTIC-OPTICAL IMAGING WITHOUT IMMERSION
H. LIU (LUMIN INC.)
Mar. 1979
M-FS-23876 **Vol. 3, No. 4, p. 582**
System using membraneous end wall of Bragg cell to separate test specimen from acoustic transmission medium, operates in real time and uses readily available optical components. System can be easily set up and maintained by people with little or no training in holography.

B78-10550
DETECTING MOISTURE IN COMPOSITE HONEYCOMB PANELS
J. D. CULP (McDonnell Douglas Corp.) and J. W. SAPP, JR. (McDonnell Douglas Corp.)
Mar. 1979
MSC-16750 **Vol. 3, No. 4, p. 583**
Radiographic inspection technique detects liquids trapped in cells of honeycomb composite panels constructed with porous fiber-reinforced plastic skins. Procedure is of use in industries such as aerospace or automotive engineering where honeycomb composites are being used or studied.

B78-10551
REFRIGERANT LEAK DETECTOR
E. J. BYRNE (Rockwell Intern. Corp.)
Mar. 1979
MSC-18214 **Vol. 3, No. 4, p. 583**
Quantitative leak detector visually demonstrates refrigerant loss from precision volume of large refrigeration system over established period of time from single test point. Mechanical unit is less costly than electronic 'sniffers' and is more reliable due to absence of electronic circuits that are susceptible to drift.

B78-10552
'GENTLE' HOLDER FOR BRITTLE CERAMICS
E. G. STEVENS (Rockwell Intern. Corp.)
Mar. 1979
MSC-19645 **Vol. 3, No. 4, p. 585**
Fixture uses commercially available flexible refractory fabric to gently hold brittle ceramic specimens for alignment during high temperature tests up to 2000 F and above. Assembly is held at both ends by water cooled straps that keep fabric/fixture bond area cold during tests.

B78-10553
POTENTIAL FLOWS IN PROPULSION SYSTEM INLETS
C. A. FARRELL, JR. and N. O. STOCKMAN
Mar. 1979
LEWIS-13010 **Vol. 3, No. 4, p. 586**
Collection of computer programs used to calculate compressible potential flow in arbitrary axisymmetric inlet at any combination of operating conditions of inlet mass-flow rate, free stream velocity, and incident angle proves useful in development of wide variety of propulsion system inlet designs.

B78-10554
ORBITAL HEAT RATE PACKAGE
J. K. LOVIN (Lockheed Missiles and Space Co.) and L. W. SPRADLEY (Lockheed Missiles and Space Co.)
Mar. 1979
M-FS-23980 **Vol. 3, No. 4, p. 586**
Package consisting of three separate programs used to accurately predict temperature distribution of spacecraft in planetary orbit is invaluable tool for design and analysis of other structures that must function in complex thermal environment.

B78-10555
TUMBLING-VEHICLE ENTRY HEATING
C. D. ENGEL (REMTECH, Inc.)
Mar. 1979
M-FS-23712 **Vol. 3, No. 4, p. 587**
Programs rapidly determines heating rate for any point on

vehicle at any angle of attack or roll position during reentry into earth's atmosphere. Package can be used to accurately find heating environment for numerous points on vehicle as function of time for thermal protection systems or structural breakup studies.

B78-10556
FLOW IN AXISYMMETRIC DUCTS WITH STRUTS
O. L. ANDERSON (United Aircraft Corp.)
Mar. 1979
LEWIS-12798 **Vol. 3, No. 4, p. 588**
Program provides accurate analytical tool for development of optimum diffuser design for wide range of applications.

07 MACHINERY

B78-10098
RIGID COUPLING IS ALSO FLEXIBLE
W. T. APPLEBERRY (Rockwell Intern. Corp.)
Jun. 1978
MSC-16488 **Vol. 3, No. 1, p. 105**
Spring-loaded coupling is rigid under light loads and swivels under higher loads. Break-out point can be set at any desired value by selecting appropriate preload springs. Coupling requires no cushions or elastomeric joints that limit temperature range.

B78-10099
COMPACT PRESSURE-LINE COUPLING
J. W. GUEST (Rockwell Intern. Corp.)
Jun. 1978
MSC-16893 **Vol. 3, No. 1, p. 106**
Coupling saves space by using socket screws to compress gasket. Device can be installed in hard-to-reach locations.

B78-10100
PLASMA IGNITER FOR INTERNAL-COMBUSTION ENGINES
R. R. BRESHEARS and D. J. FITZGERALD
Jun. 1978
NPO-13828 **Vol. 3, No. 1, p. 106**
Hot ionized gas (plasma) ignites air/fuel mixture in internal combustion engines more effectively than spark. Electromagnetic forces propel plasma into combustion zone. Combustion rate is not limited by flame-front speed.

B78-10101
SELF-CENTERING STEPPED PISTON
I. ETSION and B. J. HAMROCK
Jun. 1978 See also NASA TN-D-8345 (N77-11402)
LEWIS-12997 **Vol. 3, No. 1, p. 108**
Device centers itself within cylinder, allowing minimum leakage past piston.

B78-10102
COMPACT PISTON-POSITION SENSOR
M. O. DUSTIN
Jun. 1978
LEWIS-12392 **Vol. 3, No. 1, p. 109**
Strain gage measures position of spring-loaded piston without interfering with its motion.

B78-10103
MODIFIED PIPE EXTENSION SAFELY RELEASES CHAIN BINDERS
D. W. HAW (Rockwell Intern. Corp.)
Jun. 1978
MSC-16937 **Vol. 3, No. 1, p. 110**
Pipe, cut partly in half lengthwise, and cupped and notched at one end, safely releases tension in chain binders that cinch tiedown chains around truck loads. Device prevents binder-handle from being thrown violently during release.

B78-10104
MAGNETOSTRICTIVE VALVE
C. C. CASABIANCA
Jun. 1978
NPO-14235 **Vol. 3, No. 1, p. 111**
Device requires no moving parts and has less stringent tolerances. Device uses magnetostrictive powdered metal and electromagnets, rather than solenoid. Device is more reliable than conventional valves.

B78-10105
BOOSTING THE POWER OF TWO-STAGE ENGINES
J. HOUSEMAN
Jun. 1978
NPO-14057 **Vol. 3, No. 1, p. 112**
Low-pollution advantages are retained and power output increased if first stage operates on two-stroke cycle.

B78-10106
PRECISION FLUID-PRESSURE REGULATOR
A. R. MCDOUGAL
Jun. 1978
NPO-13370 **Vol. 3, No. 1, p. 113**
Reshaping of metering orifice improves pressure control and stability. Slotted hollow pintle replaces poppet to increase linear motion required to obtain given pressure drop.

B78-10107
DESIGN OF TRANSMISSION SHAFTING
S. H. LOEWENTHAL
Jun. 1978 See also NASA TM-X-73639 (N77-20482)
LEWIS-12965 **Vol. 3, No. 1, p. 114**
Formula considers flexure fatigue characteristics of shaft material under combined cyclic bending and static torsion stress. Formula permits selecting shaft sizes that meet common loading conditions without adding on excessive shaft material. Formula is applicable to design of rotary power or torque transmission shafting external to machine elements.

B78-10108
'NONFLOATING' UNIVERSAL JOINT
W. T. APPLEBERRY (Rockwell Intern. Corp.)
Jun. 1978
MSC-19546 **Vol. 3, No. 1, p. 115**
Modified crowned-spline joint is lightweight, durable, and requires minimum of parts. It does not use rubber cushions to limit play and is useful over wide temperature range. It has inner ball and socket to provide rigid connection with no axial play. Joint can be adapted to form pinned connection between segmented torque tubes.

B78-10109
FLICKING-WIRE DRAG TENSIONER
M. A. DASSELE (Sperry Rand Corp.) and H. FAIRALL (Sperry Rand Corp.)
Jun. 1978
MSC-16367 **Vol. 3, No. 1, p. 116**
Wire-drag system improves wire profile and applies consistent drag to wire. Wire drag is continuously adjustable from zero drag to tensile strength of wire. No-sag wire drag is easier to thread than former system and requires minimal downtime for cleaning and maintenance.

B78-10110
SIMPLE AIR-PISTON GAS-SAMPLING SYSTEM
T. W. NYLAND
Jun. 1978
LEWIS-12922 **Vol. 3, No. 1, p. 117**
System traps contaminant-free samples without using mechanical pumps.

B78-10111
DUAL RELIEF-VALVE SYSTEM

J. R. KARNS and W. R. LATTA
Jun. 1978
LANGLEY-12267 **Vol. 3, No. 1, p. 118**
System allows removal and recertification of pressure-relief valve without compromising safety requirements or depressurizing pressure vessels.

B78-10267
METER FOR VERY SLOW FLOWS
W. J. BAXTER, JR. (Orion Res. Inc.), M. S. FRANT (Orion Res. Inc.), and S. J. WEST (Orion Res. Inc.)
Oct. 1978 See also B78-10233
MSC-18112 **Vol. 3, No. 2, p. 275**
Solid-state sensing unit developed for use with NASA's Water-Quality Monitoring System can detect small velocity changes in slow moving fluid. Nonprotruding sensor is applicable to numerous other uses requiring sensitive measurement of slow flows.

B78-10268
WIND-WHEEL ELECTRIC POWER GENERATOR
J. W. KAUFMAN
Oct. 1978
M-FS-23515 **Vol. 3, No. 2, p. 277**
Windpowered electric generator mounted in protective housing unit has improved efficiency and reliability.

B78-10269
SUBMINIATURE HYDRAULIC ACTUATOR
F. D. SEVART (Boeing Co.)
Oct. 1978
LANGLEY-11522 **Vol. 3, No. 2, p. 277**
Subminiature, single-vane rotary actuator for wind-tunnel test-model control-surface actuation systems presents severe torque and system band-pass requirements with stringent space and weight limitations. Actuator has very low leakage of fluid from one side to other, permitting use in precision position servo-systems.

B78-10270
EMERGENCY ESCAPE DEVICE
J. L. BURCH
Oct. 1978
M-FS-23235 **Vol. 3, No. 2, p. 278**
Modified egress mechanism used to deploy Lunar Roving Vehicle, could be used in shipping, safety exits, amusement parks, and other applications to gently lower people or equipment several hundred feet.

B78-10271
ULTRASONIC EXTENSOMETER MEASURES BOLT PRELOAD
C. M. DANIELS, JR. (Rockwell Intern. Corp.)
Oct. 1978
M-FS-19337 **Vol. 3, No. 2, p. 278**
Extensometer using ultrasonic pulse reflections to measure elongations in tightened belts and studs is much more accurate than conventional torque wrenches in application of specified preload to bolts and other threaded fasteners.

B78-10272
AIRCRAFT TRAILING VORTEX HAZARD ALLEVIATORS
D. R. CROOM
Oct. 1978 See also NASA TN-D-8162 (N76-18041); NASA TN-D-8360 (N77-11968); NASA TN-D-8373 (N77-21404); NASA SP-409 (N78-12017)
LANGLEY-12034 **Vol. 3, No. 2, p. 280**
Wind-tunnel tests show that existing flight spoilers on large wide-body jet transport aircraft can be used to reduce vortex hazard for trailing aircraft.

B78-10273
COMPACT RATCHET WRENCH
E. J. STRINGER (Rockwell Intern. Corp.)
Oct. 1978
M-FS-24252 **Vol. 3, No. 2, p. 281**
Round ratchet wrench handle that fits into palm can be inserted into most areas that are inaccessible to wrenches with conventional handles.

B78-10274
WIDE-TEMPERATURE CORROSION-RESISTANT PRESSURE REGULATOR
H. WICHMANN (Marquardt Co.)
Oct. 1978
NPO-13776 **Vol. 3, No. 2, p. 281**
Simplified design and all-metal-and-ceramic-components make pressure regulator compatible with corrosive fluids such as fluorine and hydrazine, and extends operating-temperature range. Flexure guidance eliminates hysteresis and friction, and self-generated contaminations are diminished enough to produce nearly unlimited maintenance-free lifetime.

B78-10275
LOW-FREQUENCY VIBRATION ISOLATION
D. C. MILLER and D. H. OTTH
Oct. 1978
NPO-13915 **Vol. 3, No. 2, p. 282**
Viscoelastic shear dampers help eliminate microinch deflections resulting from low frequency vibrations. Dampers are applicable to control of tones and resonances in record players and turntables and other audio engineering equipment where vibration isolation is critical.

B78-10276
SIMPLER VALVE FOR RECIPROCATING ENGINES
J. W. AKKERMAN
Oct. 1978
MSC-16239 **Vol. 3, No. 2, p. 283**
Simpler design eliminating camshafts, cams, and mechanical springs should improve reliability of hydrazine powered reciprocating engines. Valve is expected to improve efficiency, and reduce weight of engines in range up to 50 horsepower.

B78-10277
DUAL-ACTION EXPANDED-LATCH MECHANISM
R. A. SPENCER (Martin Marietta Corp.), J. R. TEWELL (Martin Marietta Corp.), and W. H. TOBEY (Martin Marietta Corp.)
Oct. 1978
M-FS-23557 **Vol. 3, No. 2, p. 285**
Single drive actuator operates novel mechanism that expands, attaches to object, and withdraws to latch object firmly to another part. Packaging is extremely simple and compact, and eliminates need for machined parts or close tolerances.

B78-10278
A SHARP KNIFE FOR HIGH TEMPERATURES
R. M. HEISMAN (Rockwell Intern. Corp.) and W. F. ICELAND (Rockwell Intern. Corp.)
Oct. 1978
MSC-16932 **Vol. 3, No. 2, p. 285**
Electrically heated nickel-chrome-steel alloy knife may be used to cut heat resistant plastic felt and similar materials with relative ease. Blade made of commercially available alloy RA 330 retains edge at temperatures as high as 927 C.

B78-10279
ADHESIVE-REMOVAL TOOL
C. C. HAYNIE (Rockwell Intern. Corp.)
Oct. 1978
MSC-19498 **Vol. 3, No. 2, p. 286**
Air-driven hand-held tool with acrylic cutting blade removes adhesives and paint from surfaces. Sidewise-slicing motion of cutter eliminates tendency to 'bounce' on resilient materials.

B78-10280
COLLAPSIBLE MODULE EXTENDS TENFOLD IN HEIGHT
A. R. MCDOUGAL
Oct. 1978
NPO-13371 **Vol. 3, No. 2, p. 287**
Low-cost hollow module rapidly converts into elevated platform for field applications. Module can be used as support

for communication antennas or for TV or movie cameras operated by news reporters. Alternatively, it can be used as extendible boom on vehicles.

B78-10281
THREE-PHASE INDUCTION MOTORS
M. E. WOOD and N. A. DEMERDASH (Virginia Polytechnic Inst.)
Oct. 1978
MSC-16904 **Vol. 3, No. 2, p. 288**
Program simulates performance characteristics of three-phase induction motors under normal conditions and extreme temperature, frequency, voltage magnitude, and voltage balance.

B78-10407
COUPLER FOR MOVING VEHICLES
A. A. RUDMANN
Jan. 1979
GSFC-12322 **Vol. 3, No. 3, p. 423**
Coupler for two moving vehicles gradually orients and retains target vehicle, avoiding any abrupt contact with parent vehicle. Mechanism gently releases captured vehicle with approximate speed and direction of parent vehicle. Coupler may be applicable to deployment and retrieval of oceanographic research equipment and vessels or coupling of aircraft in flight.

B78-10408
QUICK LOCKING/UNLOCKING RETAINER
G. OKAMOTO (Rockwell Intern. Corp.) and B. B. WILLIAMS (Rockwell Intern. Corp.)
Jan. 1979
MSC-18048 **Vol. 3, No. 3, p. 424**
Spring clip retainer may prove more convenient than clamps or wingnut and stud combination when holding two small parts together in test fixtures and other applications where parts must be frequently moved or changed.

B78-10409
ANTIBACKOFF LOCK FOR NUTS AND BOLTS
J. M. FEALY
Jan. 1979
MSC-16472 **Vol. 3, No. 3, p. 425**
Simple lock, designed for hydraulic system, is used to keep any nut or bolt in place under vibration.

B78-10410
DEVICE FOR PITCHING OFF METAL TUBES
E. O. STENGARD
Jan. 1979
GSFC-12274 **Vol. 3, No. 3, p. 426**
Toggle mechanism is used to trap gas samples within small diameter metal tubes. Device is easily actuated and seals off without fracture.

B78-10411
SPRING CONTROL OF WIRE HARNESS LOOPS
P. J. CURCIO (Fairchild Republic Co.)
Jan. 1979
MSC-18246 **Vol. 3, No. 3, p. 426**
Negator spring control guides wire harness between movable and fixed structure. It prevents electrical wire harness loop from jamming or being severed as wire moves in response to changes in position of aircraft rudder. Spring-loaded coiled cable controls wire loop regardless of rudder movement.

B78-10412
NONCONTACTING VALVE-POSITION INDICATOR
E. A. CROVELLA (Carleton Controls Corp.), R. D. CUMMINS (Carleton Controls Corp.), and J. M. WADA (Rockwell Intern. Corp.)
Jan. 1979
MSC-16048 **Vol. 3, No. 3, p. 427**
Position of sealed valve or other movable part is indicated without penetrating housing. Flux from magnets connected to stem of hydraulic valve penetrates pressure wall and is sensed by Hall-effect transducer outside wall. When valve closes, moving stem and magnets, voltage from transducer decreases; thus, stem position is indicated without physical contact.

B78-10413
IMPROVED GAS THRUST BEARINGS
W. J. ANDERSON and I. ETSION
Jan. 1979 See also NASA-TN-D-8279 (N76-29598); NASA-TN-D-8221 (N76-24588)
LEWIS-12569 **Vol. 3, No. 3, p. 428**
Two variations of gas-lubricated thrust bearings extend substantially load-carrying range over existing gas bearings. Dual-Action Gas Thrust Bearing's load-carrying capacity is more than ninety percent greater than that of single-action bearing over range of compressibility numbers. Advantages of Cantilever-mounted Thrust Bearing are greater tolerance to dirt ingestion, good initial lift-off characteristics, and operational capability over wide temperature range.

B78-10414
QUICK-CONNECT THREADED ATTACHMENT JOINT
M. H. LUCY, W. R. MESSICK, and P. VASQUEZ
Jan. 1979
LANGLEY-12232 **Vol. 3, No. 3, p. 430**
Joint is self-aligning and tightens with only sixty-five degrees of rotation for quick connects and disconnects. Made of injection-molded plastics or cast or machined aluminum, joint can carry wires, tubes, liquids, or gases. When two parts of joint are brought together, their shapes align them. Small projections on male section and slots on female section further aid alignment; slight rotation of male form engages projections in slots. At this point, threads engage and male section is rotated until joint is fully engaged.

B78-10415
SIMULATOR FOR TRAINING REMOTE-MANIPULATOR OPERATORS
D. H. ORR (McDonnell Douglas Corp.) and L. C. WARD (McDonnell Douglas Corp.)
Jan. 1979
MSC-14921 **Vol. 3, No. 3, p. 431**
Six-degree-of-freedom simulator uses economical components. Reduction in complexity makes this or similar system cost-effective for training manipulator operators, such as those in industries handling nuclear wastes and hazardous chemicals.

B78-10416
SHAFT SPEED CONTROL
A. G. FORD
Jan. 1979
NPO-14170 **Vol. 3, No. 3, p. 432**
Simple mechanism controls rotation of heavy-duty shaft by mechanical comparison with rotation of small, precise, stepper motor. Mechanism can be used to limit winding and unwinding speeds of large spools and reels and to control speed of other rotating shafts. Setup incorporates reference shaft geared down from stepper motor and feedback shaft geared up from shaft to be controlled. Feedback and reference shafts are coupled with brake assembly inside stationary cylinder. When work shaft speeds up, brakes are activated automatically to slow it down.

B78-10417
STABLE HYDRAULIC PRESSURE REGULATOR
H. GOLD
Jan. 1979 See also NASA-TM-X-73687 (N78-10415)
LEWIS-13058 **Vol. 3, No. 3, p. 433**
Neither sensing line restrictors nor frictional dampers are required for stability. Analysis presents method by which stability margin, response, and droop magnitude can be incorporated during design of direct-acting hydraulic pressure regulators.

B78-10418
LATCHING SOLENOID FOR CRYOGENIC VALVES
W. S. WANG (Consolidated Controls Corp.)
Jan. 1979
MSC-18106 **Vol. 3, No. 3, p. 434**
Pull-in and Delatching Coils of cryogenic solenoid contain

copper and low-resistance, low-temperature-coefficient alloy to limit current at low temperatures.

B78-10419
INSULATOR FOR CRYOGENIC JOINTS
E. L. HAWKINSON (Rockwell Intern. Corp.)
Jan. 1979
M-FS-19361 **Vol. 3, No. 3, p. 435**
Semirigid polyurethane foam is firm enough not to collapse yet soft enough not to crack in extreme cold. Silicone cover retards flames and glass-fabric reinforcement protects foam against accidental damage from tools during installation and maintenance.

B78-10420
LOW-LEAKAGE LOW-TEMPERATURE VALVE
W. S. WANG (Consolidated Controls Corp.)
Jan. 1979
MSC-18087 **Vol. 3, No. 3, p. 435**
Valve was originally designed to handle liquid nitrogen tetroxide and mononethyl hydrazine. It successfully survived leakage at temperature as low as minus 95.5 C. It seals tightly against cold fluids, even after thousands of opening-and-closing cycles.

B78-10421
HIGH-PRESSURE CRYOGENIC CYLINDER SEAL
M. E. BURR (Rockwell Intern. Corp.)
Jan. 1979
M-FS-19335 **Vol. 3, No. 3, p. 436**
Triangular-cross-section Teflon ring seals against cryogenic fluid at temperature where standard wedge of U-rings fail. Ring can be mounted in groove in either piston or bore.

B78-10422
VACUUM LEADTHROUGH FOR HYDROGEN MASER
D. A. NORRIS
Jan. 1979
NPO-14148 **Vol. 3, No. 3, p. 437**
Nonmagnetic leadthroughs are used in hydrogen maser for electrical interconnection into vacuum chamber. Seal uses uranium glass to form vacuum seal to tungsten rod. Epoxy resin seals glass-coated rod to aluminum body. Connector was subjected to temperature cycling between minus 65 degrees to 150 C, six to seven times over a sixteen hour period.

B78-10423
ELECTRIC AND HYBRID VEHICLES
Innovator not given (Electric and Hybrid Vehicle Project Office of Lewis Research Center) Jan. 1979 See also NASA-TM-73756 (N78-18988)
LEWIS-13077 **Vol. 3, No. 3, p. 436**
Report characterizes state-of-the-art electric and hybrid (combined electric and heat engine) vehicles. Performance data for representative number of these vehicles were obtained from track and dynamometer tests. User experience information was obtained from fleet operators and individual owners of electric vehicles. Data on performance and physical characteristics of large number of vehicles were obtained from manufacturers and available literature.

B78-10424
LINES, BELLOWS, FLEXIBLE HOSES, AND FILTERS
Innovator not given (Space Populsion and Power Division of Lewis Research Center) Jan. 1979 See also NASA SP-8123 (N78-16089)
LEWIS-13077 **Vol. 3, No. 3, p. 438**
Monograph organizes and presents significant experience and knowledge accumulated by NASA in development and operational programs. It reviews and assesses current design practices and establishes guidance for achieving greater consistency in design, increased reliability in end product, and greater efficiency in design effort.

B78-10557
TWO-POSITION WAX-MOTOR ROTARY ACTUATOR
W. C. STANGE
Mar. 1979
GSFC-12521 **Vol. 3, No. 4, p. 591**
Two position rotary actuator rotates shaft by precisely 180 deg and rotates it back on command. Mechanism consumes 11 watts of power and functions over wide range of temperatures under high vacuum for long unattended periods. Light weight device may be used to flip magnetometer for calibration in magnetic field.

B78-10558
AUTOMATIC BYPASS VALVE
R. F. MAYO
Mar. 1979
LANGLEY-12063 **Vol. 3, No. 4, p. 592**
Modified pressure-regulator valve developed for arc powered wind tunnels allows automatic, accurate, and easily adjustable transfer of excess airflow.

B78-10559
LOW PARTIAL DISCHARGE VACUUM FEEDTHROUGH
J. W. BENHAM (General Electric Co.) and S. R. PECK (General Electric Co.)
Mar. 1979
GSFC-12347 **Vol. 3, No. 4, p. 593**
Relatively discharge free vacuum feedthrough uses silver-plated copper conductor jacketed by carbon filled silicon semiconductor to reduce concentrated electric fields and minimize occurrence of partial discharge.

B78-10560
ADJUSTABLE GAS-FLOW RESTRICTOR
J. J. BROWN (Rockwell Intern. Corp.) and A. CARNEVALLE (Rockwell Intern. Corp.)
Mar. 1979
MSC-19486 **Vol. 3, No. 4, p. 594**
Flow restrictor uses long narrow helical path between mating threads to effect simultaneous pressure and temperature reduction of flowing gases within short axial distance. Pressure drop can be adjusted simply by screwing or unscrewing threaded parts to increase or decrease flow path.

B78-10561
TRANSMITTING ROTARY MOTION AT AN ANGLE
W. T. APPLEBERRY (Rockwell Intern. Corp.)
Mar. 1979
MSC-19483 **Vol. 3, No. 4, p. 594**
Transmission consisting of corrugated metal tube that can bend along its axis can transmit torques in range of 100 to 1000 pound-inches at corner angles as great as 180 deg. Possible uses include submerged mechanisms and food processing machinery where sealed drive line without contaminating lubricants is required.

B78-10562
COATING FOR HOT SLIDING SEALS
J. STOCK (Fairchild Industries, Inc.)
Mar. 1979
MSC-16529 **Vol. 3, No. 4, p. 595**
Heat resistant paint is effective surface coating for sliding seals that must operate at elevated temperatures. Economical paint is easy to apply, offers minimal friction, and improves reliability of seals.

B78-10563
DRAG-PUMP ROTATING FILTER
G. H. DAVIS (United Technologies, Inc.) and T. M. DOYLE (United Technologies, Inc.)
Mar. 1979
MSC-16180 **Vol. 3, No. 4, p. 596**
Rotating filter, incorporated in water separation section of fuel cell hydrogen pump separator, traps contaminants before they reach critical impeller/statorhousing interface.

B78-10564
COMPACT BYPASS-FLOW FILTER

W. G. SWIFT (Parker Hannifin Corp.) and J. M. ULANOVSKY (Parker Hannifin Corp.)
Mar. 1979
MSC-18311 **Vol. 3, No. 4, p. 597**

Annular filter consisting of stacked rings separates particulates from bypass fluid passing through it in radial direction without slowing down main flow across unimpeded flow of fluid through its center. Applications include fluidized bed reactors, equipment for catalyst operations, and water purification.

B78-10565
REDUCING STICKINESS OF ELASTOMER VALVE SEALS
T. V. BRASWELL (TRW, Inc.) and J. W. MARTIN (TRW, Inc.)
Mar. 1979
LANGLEY-11778 **Vol. 3, No. 4, p. 597**

Special boiling and drying process removes approximately one half of extractable hydrocarbon tail present in peroxide cured elastomer of valve seals.

B78-10566
METALLIC THERMAL SEAL
J. BELLAVIA (Rockwell Intern. Corp.) and J. O. KANE (Rockwell Intern. Corp.)
Mar. 1979
MSC-18135 **Vol. 3, No. 4, p. 598**

Thermal barrier, constructed of U-shaped metal strips and room temperature-vulcanized silicon rubber, prevents hot gas from escaping through gaps. In application metallic barrier could be used to prevent heat from escaping through gaps around door, windows, partitions, and similar structures.

B78-10567
DURABLE NONSLIP STAINLESS-STEEL DRIVEBELTS
H. BAHIMAN
Mar. 1979
GSFC-12276; GSFC-12289 **Vol. 3, No. 4, p. 599**

Two toothed stainless-steel drive belt retains its strength and flexibility in extreme heat or cold, intense radiation, or under high loading. Belt does not stretch or slip and is particularly suited to machinery for which replacement is difficult or impossible.

B78-10568
TWO (OR MORE) ROTARY OUTPUTS FROM ONE INPUT
W. T. APPLEBERRY (Rockwell Intern. Corp.)
Mar. 1979
MSC-19450 **Vol. 3, No. 4, p. 600**

Mechanical sequencing device produces cyclic rotations of two outputs from single cyclic rotary input. Device is useful in automatic assemble apparatus, in food-processing machinery, and as controller for sequentially operated valves.

B78-10569
LOCALIZED COOLING OF ELECTRONIC COMPONENTS
Innovator not given (Aerospace Div. of Honeywell, Inc.) Mar. 1979
LANGLEY-11955 **Vol. 3, No. 4, p. 601**

Board-mounted electronic components are cooled quickly and conveniently for troubleshooting with aid of device that produces cold jet of dry oxygen. It can cool nonflat and hard-to-reach components.

B78-10570
'BLIND' POSITION INDICATOR
R. C. CRUZAN (Rockwell Intern Corp.)
Mar. 1979
MSC-16972 **Vol. 3, No. 4, p. 602**

Position-indicating instrument helps operator align parts without seeing them. Device is useful in industrial operations where parts must be blind-positioned accurately.

B78-10571
FASTENER FOR THERMAL INSULATION BLANKETS
J. D. COLE (Rockwell Intern. Corp.) and M. L. MARKE (Rockwell Intern. Corp.)
Mar. 1979
MSC-18253 **Vol. 3, No. 4, p. 603**

Serrated-stem fastener, similar to those that hold wire harnesses, has been adapted to attach blankets to supporting structures. Easy installation and removal implemented.

B78-10572
COMBINED HINGE AND LATCH
W. T. APPLEBERRY (Rockwell Intern. Corp.)
Mar. 1979
MSC-19602 **Vol. 3, No. 4, p. 604**

In door mechanism, hinge and latch are combined in single four-part assembly. Latch eliminates need for protruding hook, and can be modified to lock door in ninety degree position.

B78-10573
GEAR-TOOTH FATIGUE-STRENGTH ESTIMATES
W. BRINKLEY (McDonnell Douglas Corp.)
Mar. 1979
MSC-18167 **Vol. 3, No. 4, p. 605**

Method helps to determine fatigue damage and safety margins for case-hardened gear teeth. It can help designers determine rapidly these important factors.

B78-10574
RIGID 'SLING' FOR TOPHEAVY LOADS
R. D. STEWART
Mar. 1979
GSFC-12359 **Vol. 3, No. 4, p. 605**

Easy-to-use gantry safely lifts topheavy loads. Gantry is designed for quick assembly and adjustment around payload.

B78-10575
BEND-ABSORBING CLAMP
J. R. ABBOTT (Rockwell Intern. Corp.) and B. VALENCIA, JR. (Rockwell Intern. Corp.)
Mar. 1979
MSC-16971 **Vol. 3, No. 4, p. 606**

Compact, inexpensive clamp for flexible cables or rigid tubes absorbs vibrations and other motion. It accomodates wide range of dimensions, and saves space by eliminating pigtails or bellows commonly used to absorb linear movement or vibrations

B78-10576
EXTENSION HANDLE FOR SPRAY CANS
W. G. LUCAS (Boeing Co.)
Mar. 1979
KSC-11083 **Vol. 3, No. 4, p. 607**

Tubing and trigger assembly directs aerosol spray into hard-to-reach areas.

B78-10577
SAFE, DURABLE SOIL SAMPLER
R. D. DURRANT (Lockheed Elec. Co.)
Mar. 1979
MSC-18171 **Vol. 3, No. 4, p. 607**

Soil sampling tool protects user from injury and resists effects of weather and hard use. Penetrometer has uses in construction, surveying, geological research and similar applications.

B78-10578
DYNAMIC BRAKING OF BIDIRECTIONAL MOTORS
P. F. DEXTER
Mar. 1979
ARC-11194 **Vol. 3, No. 4, p. 608**

Circuit controls switching of bidirectional motor with dynamic braking.

B78-10579
WRENCH FOR THIN-WALLED CYLINDERS
W. C. HEIER
Mar. 1979
LANGLEY-12286 **Vol. 3, No. 4, p. 609**

Torquing wrench holds thin-wall cylinders gently yet firmly. No wrenching flats, slots, or holes need to be added to cylinder.

B78-10580
STIRLING-ENGINE DESIGN MANUAL

W. R. MARTINI (Univ. of Washington)
Mar. 1979
LEWIS-13098 **Vol. 3, No. 4, p. 610**
Engine which offers high efficiency and low emissions is described. Fundamental operation, analytic tools for stimulation, design, evaluation, and optimization is offered.

08 FABRICATION TECHNOLOGY

B78-10112
HIGH-TEMPERATURE BRAZING OF STAINLESS STEEL
C. S. BEUYUKIAN (Rockwell Intern. Corp.), R. M. HEISMAN (Rockwell Intern. Corp.), and M. J. MITCHELL (Rockwell Intern. Corp.)
Jun. 1978 See also B78-10115; B78-10114; B78-10113
MSC-19459 **Vol. 3, No. 1, p. 121**
Prevention of iron contamination of platens is eliminated by placing alumina/silica ceramic-fiber blankets between platens and carbon-steel plate. Carbon-steel plates provide rigidity and improve heat transfer.

B78-10113
FORM DIE AND GLIDE PLATES FOR VACUUM BRAZING
C. S. BEUYUKIAN (Rockwell Intern. Corp.) and M. J. MITCHELL (Rockwell Intern. Corp.)
Jun. 1978 See also B78-10115; B78-10114; B78-10112
MSC-16549 **Vol. 3, No. 1, p. 122**
Die for fabricating steel retorts is made from commercial plywood with steel facing. Smooth-finished glide plates prevent partial bonding of plates to stainless-steel parts.

B78-10114
INTERNAL GRID FOR RELEASE OF BRAZING RETORTS
C. S. BEUYUKIAN (Rockwell Intern. Corp.) and M. J. MITCHELL (Rockwell Intern. Corp.)
Jun. 1978 See also B78-10115; B78-10113; B78-10112
MSC-19472 **Vol. 3, No. 1, p. 123**
Wire grid permits retorts to be opened more quickly after brazing. Grid also aids purging and evacuation, better control of vacuum in part area, and reduces thermocouple damage.

B78-10115
VACUUM CONTROL FOR BRAZING STAINLESS STEEL
C. S. BEUYUKIAN (Rockwell Intern. Corp.) and M. J. MITCHELL (Rockwell Intern. Corp.)
Jun. 1978 See also B78-10114; B78-10113; B78-10112
MSC-19457 **Vol. 3, No. 1, p. 124**
System controls outgassing, thus reducing vaporization of braze-alloy and release-agent components, and improving braze quality.

B78-10116
PROCESS FABRICATES FLAT PANELS AT HIGH TEMPERATURES
C. S. BEUYUKIAN (Rockwell Intern. Corp.), R. M. HEISMAN (Rockwell Intern. Corp.), and M. J. MITCHELL (Rockwell Intern. Corp.)
Jun. 1978
MSC-16969 **Vol. 3, No. 1, p. 125**
Panel contours are precisely recorded on compression grid for compensating machine operations.

B78-10117
TWO BRAZE ALLOYS FOR THIN-WALL COMPONENTS
A. BRENNAN (Rockwell Intern. Corp.) and R. D. MCKOWN (Rockwell Intern. Corp.)
Jun. 1978
M-FS-19206 **Vol. 3, No. 1, p. 126**
Alloys are ductile and are not subject to hydrogen or cryogenic embrittlement. During brazing operation, alloys demonstrate excellent wetting, flow and gap-filling capacities, and resist oxidation and salt-spray corrosion. Alloys are producible as foils, tape, wire, and powder. They may be used to join stainless steels and nickel and cobalt high-temperature alloys.

B78-10118
LASER WIRE STRIPPING
R. M. HEISMAN (Rockwell Intern. Corp.), W. F. ICELAND (Rockwell Intern. Corp.), A. R. KEIR (Rockwell Intern. Corp.), L. A. SMALL (Rockwell Intern. Corp.), and F. R. YEARIAN (Rockwell Intern. Corp.)
Jun. 1978 See also NASA SP-5107
MSC-18000 **Vol. 3, No. 1, p. 126**
Bench-mounted and hand-held laser units cut insulation from wires without nipping or scraping conductor. Process eliminates quality control problems and is fast, clean, precise, and repeatable.

B78-10119
CALCULATING WIRE-BUNDLE DIAMETER
E. J. STRINGER (Rockwell Intern. Corp.)
Jun. 1978
MSC-16378 **Vol. 3, No. 1, p. 127**
Outside diameters of wire bundles are calculated rapidly and accurately using table of empirical factors (bundle factors).

B78-10120
WIRE SELECTOR/CALCULATOR
J. R. FUHRMAN (Rockwell Intern. Corp.)
Jun. 1978
MSC-16632 **Vol. 3, No. 1, p. 128**
Circular device contains five scales that rotate in relation to fixed scale. Device is contained in folding booklike enclosure, giving step-by-step instructions and presenting useful tables.

B78-10121
BENCH-TOP SOLDERING AID FOR PC BOARDS
N. R. MANTON (Rockwell Intern. Corp.) and R. A. SCHROFF (Rockwell Intern. Corp.)
Jun. 1978
MSC-16274 **Vol. 3, No. 1, p. 129**
Multiple-board rack allows technician to insert components into several boards, flip them all in single motion, and then systematically solder leads on reverse side. Two adjustable crossbars allow boards of any size up to 10 by 24 inches. Operator can rotate racks and adjust angle of boards from standing or sitting position.

B78-10122
LASER BEAM ASSISTS IN PRECISION WELDING
V. R. TOLMEI (Rockwell Intern. Corp.)
Jun. 1978
M-FS-19319 **Vol. 3, No. 1, p. 130**
Laser beam aiming method eliminates trial-and-error beam alinement in electron-beam welding.

B78-10123
TOOL SIMPLIFIES WELD PREPARATION OF ALUMINUM
H. C. LARUE and E. L. SHROPSHIRE
Jun. 1978
MSC-16992 **Vol. 3, No. 1, p. 130**
Chisel fits into standard riveting gun. Device has V-shaped cutting end, allowing for easy penetration of material and removal of cuttings.

B78-10124
HIGH-VACUUM, LOW-TEMPERATURE BOND FOR SECOND-SURFACE MIRRORS
D. MCKEOWN (Faraday Labs., Inc.) and G. SONNENSCHEIN (Faraday Labs., Inc.)
Jun. 1978
M-FS-23405 **Vol. 3, No. 1, p. 131**
Indium solder reliably bonds second-surface mirrors to radiant coolers in cryogenic environments.

B78-10125
INSPECTION OF ADHESIVE-BONDED RADIATORS

M. W. REED (Vought Missiles and Space Co.)
Jun. 1978
MSC-18062 **Vol. 3, No. 1, p. 131**

Adhesive-bond thickness in honeycomb-sandwich radiators is verified by visual inspection. Markoff on flow tubes created during curing process is directly related to adhesive thickness.

B78-10126
MATCH-MOLD PROCESS FOR FOAM INSULATION
H. E. RUMENAPP (Rockwell Intern. Corp.), G. G. LISKAY (Rockwell Intern. Corp.), and D. S. WANG (Rockwell Intern. Corp.)
Jun. 1978 See also B78-10128; B78-10127
MSC-16631 **Vol. 3, No. 1, p. 132**

Process, using fast-setting putty-type thixotropic epoxy material, eliminates need for leakproof enclosures. Method reduces cure time from 15 to 4 hours. Epoxy masters are stronger and do not require special coating for storage. Manufacturers of form-fitted insulation or packaging forms will find this process to be of interest.

B78-10127
VOID-FREE FOAM INSULATION
G. G. LISKAY (Rockwell Intern. Corp.) and D. S. WANG (Rockwell Intern. Corp.)
Jun. 1978 See also B78-10128; B78-10126
MSC-16805 **Vol. 3, No. 1, p. 133**

Sectional casting method uses blocking piece for first pour, which limits pour height to 12 inches.

B78-10128
HIGH-RISE FOAM-IN-PLACE PROCESS
G. G. LISKAY (Rockwell Intern. Corp.)
Jun. 1978 See also B78-10127; B78-10126
MSC-16931 **Vol. 3, No. 1, p. 133**

Large polyurethane parts are molded by sequential pouring without waiting for foam to cure. Joints between pours and tops of parts are free of voids and need no trimming.

B78-10129
RECLAIMING HYBRID INTEGRATED CIRCUITS
G. EBEL (Singer Co.) and H. GROSSBARD (Singer Co.)
Jun. 1978
MSC-16463 **Vol. 3, No. 1, p. 135**

Reclamation method consists of opening very small hole in package and shaking out trapped particles. Procedure is performed in dry box through which an inert gas is flowing to insure no room air enters package. Acoustic transducer monitors sound of vibrating particles. Amplifier produces audio and oscilloscope output. Hole is sealed with heated solder form.

B78-10130
BONDING KOVAR PINS TO AN ALUMINA SUBSTRATE
G. D. BENNETT (Simmonds Precision, Instrument Systems Division)
Jun. 1978
MSC-16828 **Vol. 3, No. 1, p. 135**

Assemblies for cryogenic applications are shockproof and vibrationproof.

B78-10131
'PC FABRICATION' FOR SILICON SOLAR-CELL ARRAYS
J. A. AMICK (RCA)
Jun. 1978
NPO-13991 **Vol. 3, No. 1, p. 136**

Batch bonding number of solar cells to preconfigured printed-wiring board is inexpensive and reduces assembly and setup time of multi-element solar cell power units.

B78-10132
CONTINUOUS PROCESS FABRICATES BATTERY PLAQUE
M. J. TURCHAN (Tyco Labs., Inc.)
Jun. 1978
GSFC-12054 **Vol. 3, No. 1, p. 137**

Fast coating/drying/sintering line produces high-quality nickel plague for nickel-cadmium cells, having uniform, reproducible characteristics and carefully controlled thickness.

B78-10133
IMPROVED THERMAL-TILE BARRIER
D. H. CADE (Rockwell Intern. Corp.), R. N. SIDRIC (Rockwell Intern. Corp.), and M. SURBAT (Rockwell Intern. Corp.)
Jun. 1978
MSC-16929 **Vol. 3, No. 1, p. 138**

Improved filler design, laser processing to seal ceramic fibers, and device for sliding barrier into tile gap improves thermal tile.

B78-10134
TILE-BONDING TOOL
C. C. HAYNIE (Rockwell Intern. Corp.) and J. W. HOLT (Rockwell Intern. Corp.)
Jun. 1978
KSC-11053 **Vol. 3, No. 1, p. 139**

Device applies uniform, constant, precise pressure to hold tiles in place during bonding. Tool consists of pressure bladders supported by adjustable pole. Pole can accomodate single or multiple bladders. Tiles can be flat or contoured.

B78-10135
HIGH-TEMPERATURE WATERPROOFING FOR TILES
E. B. BAHNSEN (Lockheed Missiles and Space Co.,) and Y. D. IZU (Lockheed Missiles and Space Co.,)
Jun. 1978
MSC-16773 **Vol. 3, No. 1, p. 140**

Vapor-deposited coating protects silica tiles against water vapor up to 800 degrees Fahrenheit. Degradation products formed do not affect optical properties of coating. Application method makes it particularly suitable for fragile components.

B78-10136
SIMPLIFIED TOOLING FOR SPRAY MASKING
B. J. DINBAR (Rockwell Intern. Corp.) and R. E. HAMMONS (Rockwell Intern. Corp.)
Jun. 1978
MSC-16927 **Vol. 3, No. 1, p. 140**

Tooling technique involves positioning tiles within acrylic plastic masking frames that attach magnetically to holding fixture. Plastics are 'magnetized' with adhesive mangetic-rubber strips. Technique is simpler and less expensive than conventional methods. L-shaped masks are easily cut and altered.

B78-10137
LADLE FOR POURING HOT MELT
E. P. RUPPE (Rockwell Intern. Corp.) and K. TERAMURA (Rockwell Intern. Corp.)
Jun. 1978
MSC-16974 **Vol. 3, No. 1, p. 141**

Device has two weld-attached stubs that include guide plates. One stub accepts handle horizontally; other accepts it at an angle. Pinlock secures handle to stub.

B78-10138
'SPACE SLITTER' FOR FILM OR TAPE
W. H. JOHNSON (Boeing Co.)
Jun. 1978
KSC-10894 **Vol. 3, No. 1, p. 142**

Device cuts film or tape into strips by guiding film in channel under cutting blades. Device is operated by lifting pressure bar to insert blades into film. Film is then pulled through blades. Cutter has potential uses in advertising, commercial art, and publishing fields.

B78-10139
PORTABLE FLUORESCENT-DYE INSPECTION DEVICE
F. E. SUGG (Rockwell Intern. Corp.)
Jun. 1978
M-FS-24019 **Vol. 3, No. 1, p. 143**

Hand-held device blocks ambient light from inspection area and can be used to examine sections of large objects without requiring objects to be moved or placed in darkroom. Bellows-type flexible shield has foam ends that seal surface to be inspected. Ultraviolet lamp and magnifier mounted in bellows permit localization of light. Rigid eyeshield hood allows in situ inspection.

B78-10140
HANDBOOK FOR ESTIMATING FABRICATION COSTS
L. M. FREEMAN
Jun. 1978 See also NASA TM-X-73397 (N77-27248)
M-FS-23795 **Vol. 3, No. 1, p. 144**
Guide helps design engineers determine total cost of fabricating electronic equipment. It contains tables of 'factors' for determining costs associated with fabrication. 'Standards' section includes estimations of time required for procedures ranging from machining, to wiring, to printed-circuit board fabrication.

B78-10141
SCALE PARACHUTE FABRICATION
D. BACCHUS and D. HENKE (Goodyear Aerospace Corp.)
Jun. 1978 See also NASA CR-120719 (N76-18055)
M-FS-23139 **Vol. 3, No. 1, p. 144**
Report describes highlights in developing six 12.5-percent scale drogue parachute models. Deployment bags are fabricated for each model.

B78-10142
CMOS BULK-METAL DESIGN HANDBOOK
T. M. EDGE
Jun. 1978 See also NASA TM-78126 (N77-86193)
M-FS-23856 **Vol. 3, No. 1, p. 145**
User's guide describes techniques for generating precision mask artwork for complex CMOS integrated circuits, starting from logic diagram. Techniques are based on standard-cell approach. Guide also includes user guidelines for designing efficient CMOS arrays.

B78-10143
IMPROVED ELECTRON-BEAM WELDER
R. A. SMOCK, R. A. TAYLOR, and W. A. WALL
Jun. 1978 See also NASA TM-X-73390 (N77-23491)
M-FS-23772 **Vol. 3, No. 1, p. 145**
Report describes comprehensive test-and-evaluation program designed to improve performance of 7.5 kW electron-beam welder. Report describes prototype and seventeen changes incorporated to improve performance.

B78-10144
PNEUMATIC SERVOMECHANISMS
T. E. BAILEY (Martin Marietta Corp.) and G. M. JOSEPH (Martin Marietta Corp.)
Jun. 1978
M-FS-23295 **Vol. 3, No. 1, p. 146**
Dynamic analysis computer program analyzes pneumatic servomechanism and the system it controls. System and device to be modeled can contain up to twenty ullage chambers, twenty moving parts, and forty flow lines. Program is easily modified to model larger systems.

B78-10282
IMPROVED TRANSFORMER-WINDING METHOD
W. T. MCLYMAN
Oct. 1978 See also B78-10283
NPO-14243 **Vol. 3, No. 2, p. 291**
Proposed technique using special bobbin and fixture to wind copper wire directly on core eliminates need core cut prior to assembly. Application of technique could result in production of quieter core with increased permeability and no localized heating.

B78-10283
BONDING CORE MATING SURFACES IMPROVES TRANSFORMER
W. T. MCLYMAN
Oct. 1978 See also B78-10282
NPO-13855 **Vol. 3, No. 2, p. 292**
Modifications to assembly procedures for C-core transformers virtually eliminates changes in core end gaps due to temperature cycling during impregnation and potting stages, thus stabilizing magnetization properties of core.

B78-10284
FRICTION OF THICK LAMINATES
G. E. DICKERSON
Oct. 1978
LANGLEY-12010 **Vol. 3, No. 2, p. 292**
Technique which improves fiber alignment and reduces void content of thick laminated structures is readily applicable to structures that contain sections such as ribs, channels, or bosses joined to thin stems of same material.

B78-10285
VOID-FREE BENDS IN LAMINATED STRUCTURES
S. W. RICE (Vought Corp.), F. A. SCHWIND (Vought Corp.), and J. H. WILSON (Vought Corp.)
Oct. 1978
MSC-16998 **Vol. 3, No. 2, p. 293**
Layup technique involving repositioning of filler plies and redesigning of bleeder pressure pad reduces wrinkles, voids, pores, and other defects at sharp bends in laminated materials.

B78-10286
PROTECTIVE COATING FOR COPPER IN ALUMINUM HEAT EXCHANGERS
R. AVAZIAN (Rockwell Intern. Corp.)
Oct. 1978
M-FS-19334 **Vol. 3, No. 2, p. 194**
Application of ultrathin layer of molybdenum disulfied coating to copper tubing permits utilization of tubing in cast-aluminum heat exchangers. Coating prevents formation of copper/aluminum eutectic, but does not impede heat transfer.

B78-10287
HIGH-STRENGTH BLIND RIVET
L. R. JACKSON and A. H. TAYLOR (Vought Corp.)
Oct. 1978
LANGLEY-12154 **Vol. 3, No. 2, p. 294**
Method of upsetting blind head of rivets produces reliable, strong, pressure-tight fastenings.

B78-10288
SPECIAL WEAVE FOR INSULATING FABRICS
J. A. FRYE (Rockwell Intern. Corp.) and R. M. PUSCH (HITCO)
Oct. 1978
MSC-16380 **Vol. 3, No. 2, p. 295**
Special weave forms tight fabric for high-alumina-content alumina/boria/silica fibers, without leading to expensive filament fracture during weaving process. Resultant abrasion-resistant material is superior to conventional insulating materials at elevated temperatures.

B78-10289
INSTALLING FIBER INSULATION IN TIGHT SPACES
B. C. PATEL (Rockwell Intern. Corp.), D. S. WANG (Rockwell Intern. Corp.), and A. D. WARREN (Rockwell Intern. Corp.)
Oct. 1978
MSC-16934 **Vol. 3, No. 2, p. 296**
Two techniques using organic resin binders or thin clear-burning plastic film have been successfully used to simplify, and facilitate handling of aluminum/zirconia fiber batting as insulation material for high temperature seals.

B78-10290
VERIFYING THE FIT OF MATING CONTOURED SURFACES
W. D. LEONARD, P. G. SANDEFUR, JR., and L. E. WILKINSON
Oct. 1978
LANGLEY-11731 **Vol. 3, No. 2, p. 297**
Simple inexpensive process uses commercially available compressible film to verify fit between mating metal surfaces within 0.08 mm to 0. 13 mm.

B78-10291
GENTLE SUPPORT STANDS FOR FLUID-LINE MOCKUPS
A. U. MILLET (Rockwell Intern. Corp.) and J. A. STEIN (Rockwell Intern. Corp.)
Oct. 1978
MSC-16479 **Vol. 3, No. 2, p. 298**

Screw clamp stand for fluid-line mockup support prevents distortion of tubing by color coded indicator lamps that acknowledge clamp contact.

B78-10292
MICROCIRCUIT-CLEANING MACHINE
W. W. ROBINSON (Sperry Rand Corp.) and J. C. WILLIAMSON (Sperry Rand Corp.)
Oct. 1978
MSC-16060 **Vol. 3, No. 2, p. 299**

Circuit shaker removes loose particles from hybrid microcircuit packages. Machine can reduce rejections from particle impact noise determination (PIND) tests to less than 7 percent. Shaker is easily constructed and could be manufactured for distribution as kit.

B78-10293
SLURRY-POWDER SINTERING FURNACE
J. BENE, J. F. JANSEN (Heliotech Corp.), and H. N. SEIGER (Heliotech Corp.)
Oct. 1978
LANGLEY-11423; LANGLEY-11426 **Vol. 3, No. 2, p. 300**

Furnace design and filler material allow uniform sintered nickel plaque to be manufactured reliably.

B78-10425
HIGH-GRADIENT CONTINUOUS-CASTING FURNACE
C. M. SCHEUERMANN, M. C. FLEMINGS (MIT), M. A. NEFF (MIT), B. A. RICKINSON (MIT), and K. P. YOUNG (MIT)
Jan. 1979
LEWIS-12934 **Vol. 3, No. 3, p. 441**

High gradient allows rapid growth rates in directionally-solidified eutectic alloys. Furnace design permits cost reductions in directional solidification process through its increased solidification rates, which reduces melt/mold interaction. It produces structural engineering materials for any application requiring properties directionally-solidified eutectic materials.

B78-10426
LATTICE PANELS WITH HIGH STRUCTURAL EFFICIENCY
M. M. MIKULAS, JR. and M. D. RHODES
Jan. 1979 See also NASA-TM-X-72771 (N75-32160)
LANGLEY-11898 **Vol. 3, No. 3, p. 442**

By orienting strips for maximum strength, composite lattice panel is nearly as strong as 'conventional' composite panels. They can be custom-tailored for various applications and also be useful in moderately loaded structures.

B78-10427
LOW-COST GRAPHITE/EPOXY STRUCTURAL PANELS
J. R. LAGER (Martin Marietta Corp.), D. PADILLA (Martin Marietta Corp.), W. F. THIEMET (Martin Marietta Corp.), and D. A. THOMAS (Martin Marietta Corp.)
Jan. 1979
M-FS-23871 **Vol. 3, No. 3, p. 443**

Manufacturing process precures components of composite panels prior to assembly. Process separately cures the graphite/epoxy skin, stiffener ribs, and stiffener grid. After curing, panels are assembled using special adhesive. With implementation of cost effective manufacturing techniques, uses of graphite-epoxy laminate panels may be found in other areas such as auto industry.

B78-10428
WELDING FIXTURE FOR THIN METAL PARTS
S. R. MCCLURE
Jan. 1979
GSFC-12318 **Vol. 3, No. 3, p. 444**

Approach of supporting entire part contour and applying uniform pressure to joints is useful in fabricating other lightweight metal structures. Fixture has three essential components: spring-finger collet that applies pressure to joint, compressing device for tightening collet, and mandrel that supports parts. Besides preserving contour of parts, mandrel also functions as heat sink.

B78-10429
HOLDING FIXTURE FOR VARIABLE-CONTOUR PARTS
C. C. HAYNIE (Rockwell Intern. Corp.), P. N. PACKER (Rockwell Intern. Corp.), and P. P. ZEBUS (Rockwell Intern. Corp.)
Jan. 1979
MSC-16270 **Vol. 3, No. 3, p. 445**

Array of vacuum cups on spindles holds parts for safe machining and other processings. Variable-contour part resting on fixture is held firmly enough for machining, coating, or other mechanical treatment.

B78-10430
CONTROL OF DIELECTRIC FILM DEPOSITION
E. C. GRAEBNER and T. J. RILEY
Jan. 1979
LEWIS-13092 **Vol. 3, No. 3, p. 446**

Airgap capacitor in deposition chamber is used to monitor deposition. Coating process is completely uniform over edges, points, and internal areas. Areas not requiring coating can be marked. Since deposition process is accomplished at or near room temperature, there is no risk of thermal damage to coated components. With control method, deposition material is fully utilized and no excess coating is necessary to insure protection of coated parts.

B78-10431
REPAIRING PIN-FIN COLD PLATES
E. P. RUPPE (Rockwell Intern. Corp.)
Jan. 1979
MSC-16424 **Vol. 3, No. 3, p. 447**

Inexpensive technique avoids high temperatures that deform thin stainless steel plates. Because repair disks have small diameters, repaired area can sustain greater loads that larger unsupported areas of faceplate.

B78-10432
RIVETING-FORCE GAGE
J. W. ROTTA, JR.
Jan. 1979
NPO-13477 **Vol. 3, No. 3, p. 448**

Gage monitors riveting forces applied when components are mounted on printed-circuit boards. Correct swaging pressures have been established for specific substrate materials such as phenolics and ceramics.

B78-10433
REDUCING WELD PEAKING IN ALUMINUM
E. BAYLESS, R. POORMAN, and J. SEXTON
Jan. 1979 See also NASA-TM-78176 (N78-25427)
M-FS-23973 **Vol. 3, No. 3, p. 448**

Excessive weld peaking can be corrected in heavy aluminum structures according to procedure. When peaking varies along weld joint, weld energy must be varied to compensate for nonuniformity.

B78-10434
PROCESS FOR GROWING THIN POLISHED SILICON SHEETS
C. C. RADICS
Jan. 1979
NPO-14172 **Vol. 3, No. 3, p. 449**

Single-crystal sheets pulled from polten silicon floating on refractory melt require no slicing or polishing. Possible materials are chlorides and fluorides of barium, calcium, and strontium. Refractory melt may be able to absorb impurities from silicon and thus obviate postgrowth purification.

B78-10435
NO-WARP POTTED CIRCUITS
W. W. ROBINSON (Rockwell Intern. Corp.)
Jan. 1979
MSC-19729 **Vol. 3, No. 3, p. 450**

Sponge inserts compensate for potting-compound expansion and relieve thermal stresses on circuit boards. Technique quality of production runs on PC boards intended for applications in environments less severe than those for aerospace equipment.

Pads reduce weight of modules because they weigh far less than potting compound they displace.

B78-10436
FASTENER FOR THIN FRAGILE MATERIALS
S. SOKOL (Rockwell Intern. Corp.)
Jan. 1979
MSC-18097 **Vol. 3, No. 3, p. 451**

Two-piece fastener is ideal for securing thin delicate parts that might be damaged by conventional fasteners, such as rivets or upset collars. Strength of new fastener approaches that of riveted connection. Easily fabricated, fastener consists of plastic button and spring-steel collar. Parts have large contact area to distribute loads on delicate assemblies and low profile so that they fit into narrow spaces. Fastener is suitable for materials ranging in density from sheet metal to fabric sandwiches.

B78-10437
CERAMIC-TO-METAL VACUUM SEAL
O. H. SACKERLOTZKY (Weston Instruments, Inc.)
Jan. 1979
NPO-13803 **Vol. 3, No. 3, p. 452**

Knife-edge sealing technique forms reliable, vacuum-tight bonds between materials having very different thermal-expansion characteristics. Seal is thin and flexible and absorb shear, hoop, and bonding stresses at joint so that seal remains vacuum tight.

B78-10438
IMPROVED METHOD OF SOLAR-CELL ASSEMBLY
J. D. BRODER, A. F. FORESTIERI, and J. MANDELKORN
Jan. 1979 See also NASA-TM-X-52875 (N70-41903); NASA-TM-X-73674 (N77-26615); NASA-TM-X-73655 (N77-22610)
LEWIS-12729 **Vol. 3, No. 3, p. 452**

Method bonds solar-cell modules between rigid or flexible base and plastic protective cover. Method relies on using one of several commercially-available, transparent, silicone adhesives as bonding agent. Should it ever be necessary to repair or replace some part of assembly, it may be possible to remove cover without destroying package since adhesive remains flexible.

B78-10439
CIRCUIT-LEAD TRIMMING TEMPLATE
K. OFARRELL (Sperry Rand Corp.) and E. WINN (Sperry Rand Corp.)
Jan. 1979
MSC-16589 **Vol. 3, No. 3, p. 453**

Template for use in trimming leads on production wiring boards is low-cost means for eliminating rejections for short leads and improving lead-strength uniformity. Template is simply unclad piece of printed-circuit board material that is drilled using same drill control tape used in making original production board. Revisions in component layout of board can therefore be made simultaneously in template.

B78-10440
BREATHER CLOTH FOR VACUUM CURING
M. W. REED (Vought Corp.)
Jan. 1979
MSC-18063 **Vol. 3, No. 3, p. 454**

Finely-woven nylon cloth that has been treated with Teflon improves vacuum adhesive bonding of coatings to substrates. Cloth is placed over coating; entire assembly, including substrate, coating, and cloth, is placed in plastic vacuum bag for curing. Cloth allows coating to 'breathe' when bag is evacuated. Applications include bonding film coatings to solar concentrators and collectors.

B78-10441
PROCESSING HIGH-STRENGTH STEEL ALLOYS
L. E. MCKNIGHT (Bertea Corp.)
Jan. 1979
MSC-16172 **Vol. 3, No. 3, p. 454**

Four-part report describes processing procedures for high-strength alloy steel suitable for use in pistons, piston rods, cylinder barrels, and other critical applications.

B78-10581
CONTROLLING THE GROWTH OF SILICON SHEETS
T. F. CISZEK (IBM Corp.)
Mar. 1979
NPO-14295 **Vol. 3, No. 4, p. 613**

Automated systems regulates sheet width, thickness, and composition. Deviations from preset brightness levels create error signals that alter gas flow, crystal-pulling speed, and melt temperature to produce uniform single-crystal sheets.

B78-10582
AUTOMATED CONTROL OF CRYSTAL GROWTH
A. HATCH (Mobile Tyco Solar Energy Corp.) and D. YATES (Mobile Tyco Solar Energy Corp.)
Mar. 1979
NPO-14420 **Vol. 3, No. 4, p. 614**

Optical sensors detect liquid/crystal-interface growth parameters. Technique enables automation by using cold-cathode-discharge sensors and linear imaging devices to determine process status and direct growth process.

B78-10583
APPLYING UNIFORM ADHESIVE COATINGS
D. S. WANG (Rockwell Intern. Corp.)
Mar. 1979
MSC-19462 **Vol. 3, No. 4, p. 615**

Removable overlay keeps thickness variations small, saving material and application time. In comparative tests against roller, brush, and spray application, thickness variations in the conventional techniques were at least three times greater.

B78-10584
ELECTROPLATED 'COLD PATCH' FOR CRITICAL PARTS
H. A. TRIPP (Rockwell Intern. Corp.)
Mar. 1979
M-FS-19401 **Vol. 3, No. 4, p. 616**

Cracks in metal parts are filled by electrodeposition in plating tank that conforms to part to be repaired. Principle is applicable to repair of cracks in components of chemical reactors and other critical structures.

B78-10585
ACCELERATED HYBRID-CIRCUIT PRODUCTION
J. E. BERG (Sperry Rand Corp.) and M. A. DASSELE (Sperry Rand Corp.)
Mar. 1979
MSC-18272 **Vol. 3, No. 4, p. 617**

Modified die-bonding machine speeds up hybrid-circuit production. Utilizing two pedestals, one for die tray and another for substrate tray, increased production and decreased error-margin are possible.

B78-10586
DETECTING OVERPENETRATION OF ELECTRON-BEAM WELDS
D. I. MACFARLANE (Rockwell Intern. Corp.) and F. D. YOUNG (Rockwell Intern. Corp.)
Mar. 1979
M-FS-19396 **Vol. 3, No. 4, p. 618**

Gold plate beneath weldment reveals areas of excess penetration during X-ray inspection. Technique is applicable to critical electron-beam welds, such as those in gas turbines and pressure vessels.

B78-10587
BRAZING DISSIMILAR ALUMINUM ALLOYS
H. DALALIAN (Singer Co.)
Mar. 1979
MSC-16340 **Vol. 3, No. 4, p. 619**

Dip-brazing process joins aluminum castings to aluminum sheet made from different aluminum alloy. Process includes careful cleaning, surface preparation, and temperature control. It causes minimum distortion of parts.

B78-10588
CONTOURING PILE-BRUSH SEALS

L. B. NORWOOD (Rockwell Intern. Corp.)
Mar. 1979
MSC-16231 **Vol. 3, No. 4, p. 588**
Variety of shapes are produced by simple flat machining. Freeze-cut method is cost-efficient by eliminating necessity to cut brushes individually.

B78-10589
EASILY INSTALLED INSULATION FOR STEAMFITTINGS
G. OWENS and J. E. POUZAR
Mar. 1979
MSC-18277 **Vol. 3, No. 4, p. 620**
Insulating blanket trimmed by hook-and-loop fasteners adds safety and prevents heat loss. For maintenance or adjustments, borders are quickly unfastened and fabric slipped off.

B78-10590
ALL-ION-IMPLANTATION PROCESS FOR INTEGRATED CIRCUITS
D. S. WOO (RCA Corp.)
Mar. 1979
M-FS-23995 **Vol. 3, No. 4, p. 621**
Simpler than diffusion fabrication, ion bombardment produces complementary-metal-oxide-semiconductor / silicon-on-sapphire (CMOS/SOS) circuits that are one-third faster. Ion implantation simplifies the integrated circuit fabrication procedure and produces circuits with uniform characteristics.

B78-10591
PREPARING THIN ALUMINUM FILMS FOR ADHESIVE BONDING
T. SMITH (Rockwell Intern. Corp.)
Mar. 1979
NPO-14357 **Vol. 3, No. 4, p. 621**
Carbonate pretreatment produces highly bondable surface without harming film. Treatment is useful in developing low-cost mirrors and solar concentrators fabricated from metal-coated plastic films. Treatment should cost no more than standard degreasing and rinsing procedures.

B78-10592
SEALING MICROCIRCUITS WITH ADHESIVES
J. J. LICARI (Rockwell Intern. Corp.) and K. L. PERKINS (Rockwell Intern. Corp.)
Mar. 1979 See also NASA-CR-150420 (N77-33349)
M-FS-23869 **Vol. 3, No. 4, p. 622**
Report describes study of adhesive-sealed packages for hybrid microcircuits. Ten commercially available adhesives were used to seal metal and ceramic packages and were tested for moisture resistance at high humidity.

09 MATHEMATICS AND INFORMATION SCIENCES

B78-10145
VERIFICATION OF REDUNDANCY MANAGEMENT DESIGN
H. C. GELDERLOOS (Honeywell, Inc.) and D. V. WILSON (Honeywell, Inc.)
Jun. 1978
MSC-16713 **Vol. 3, No. 1, p. 149**
Statistical method checks designs by simulating system operating conditions and adding error factors. Method has potential applicability to commercial and industrial situations where redundancy management system is used to detect and isolate failed components.

B78-10146
MODEL FOR REDUNDANT-SENSOR SIGNAL ERRORS
D. J. SOWADA (Honeywell, Inc.)
Jun. 1978
MSC-16715 **Vol. 3, No. 1, p. 149**
Report describes application of order statistics to analysis of failure modes in redundant systems. Report provides detailed mathematical discussion of approach, accompanied by graphs and equations. Techniques are relevant to process that demand high reliability, such as manufacture of dangerous chemicals. It also includes discussion of quad-redundant system.

B78-10147
BODY-FITTED COORDINATES SYSTEMS TRANSFORMATIONS
C. W. MASTIN (Mississippi State Univ.), F. C. THAMES (Mississippi State Univ.), and J. F. THOMPSON (Mississippi State Univ.)
Jun. 1978
LANGLEY-12307 **Vol. 3, No. 1, p. 150**
Two computer programs generate two-dimensional body-fitted coordinate systems and coordinate transformation. Programs are useful in fields requiring accurate numerical representation of boundary conditions and accurate numerical solutions of partial differential equations.

B78-10294
DETECTING AND CORRECTING BIT ERRORS ON MAGNETIC TAPE
M. PERLMAN
Oct. 1978
NPO-13842 **Vol. 3, No. 2, p. 303**
Procedure detects and corrects errors in data held for long term storage on magnetic tape.

B78-10295
FABRICATION OF SEA-FLOOR MODELS
G. L. HALE, C. E. LEVOE, and R. E. RENNER
Oct. 1978
NPO-13554 **Vol. 3, No. 2, p. 303**
Sea-floor models are fabricated simply and inexpensively by utilizing milling machine programmed with data tapes from ocean sounding surveys, and cement vermiculite mixture.

B78-10296
MARSHALL SYSTEM FOR AEROSPACE SIMULATION
H. H. TRAUBOTH, T. L. BALENTINE (Computer Sci. Corp.), W. L. MCCOLLUM (Computer Sci. Corp.), R. SEVIGNY (Computer Sci. Corp.), and A. J. VENTRE
Oct. 1978
M-FS-22672 **Vol. 3, No. 2, p. 305**
Software system allow facilitates quick and relatively easy simulations of physical systems on digital computers. Language is simple and flexible, and can be used by people who have little or no familiarity with computer programming.

B78-10442
PROCESSING MULTISPECTRAL SIGNALS FROM A DISCRETE-SENSOR ARRAY
J. B. WELLMAN
Jan. 1979
NPO-14211 **Vol. 3, No. 3, p. 457**
Technique encoding and decoding color-image signals from array of discrete sensors can simplify fabrication of remote-sensing imaging system. Imaging system projects output on charge-coupled-device array. Computerized matrix decoding scheme decodes image.

B78-10443
ALGORITHMS FOR LINEAR-SYSTEMS CONTROL
E. S. ARMSTRONG
Jan. 1979
LANGLEY-12313 **Vol. 3, No. 3, p. 458**
Control-theory design package aids design of linear-quadratic-Gaussian (LOG) controllers and optimal filters. It is applicable to systems that can be modeled by linear time-invariant differential or difference equations.

B78-10444
MULTIPURPOSE SYSTEM SIMULATOR

C. A. PACKARD
Jan. 1979
GSFC-12333 **Vol. 3, No. 3, p. 459**

Multipurpose System Simulator (MPSS) evaluates relative performance of competitive computer systems and isolates areas for enhancement in existing or proposed systems. Model can simulate multiple central-processing-unit (CPU) interactive systems.

B78-10445
PLOTTING SHEAR-FLOW FORCES
T. FURUIKE and J. C. LONG
Jan. 1979
MSC-18013 **Vol. 3, No. 3, p. 459**

Structural analysts can use computer program to study shear-flow and in-plane forces characteristic of quadrilateral panels subjected to different loading conditions. Digital outputs are presented for engineers and management, with various options to allow bulk of data to be analyzed quickly.

B78-10446
SPARES-OPTIMIZED MODEL
A. W. CAIN (Rockwell Intern. Corp.) and R. E. PAULIN (Rockwell Intern. Corp.)
Jan. 1979
MSC-18015 **Vol. 3, No. 3, p. 459**

Computerized spares optimization for Space Shuttle Project comprises analytical process for developing spares quantification and budget forecasts. Model, which assesses risk associated with recommended spares quantities, is enconomical way to determine best mix of large number of spare types.

B78-10447
A PARAMETER-ESTIMATION SUBROUTINE PACKAGE
G. BIERMAN and M. W. NEAD
Jan. 1979
NPO-14263 **Vol. 3, No. 3, p. 460**

Estimation subroutine package comprises fast, efficient, and simple least-squares data-processing algorithms for use in orbit determination and related analyses. Very reliable and general algorithms have been documented. Package contains collection of streamlined subroutines that can be used to solve large variety of parameter-estimation and filtering problems. Special routines are included for problems with colored process noise and covariance (factor) mapping.

B78-10593
COMPUTATION OF SPARE PARTS REQUIREMENTS
M. A. MEZZACAPPA (Rockwell Intern. Corp.)
Mar. 1979
MSC-16872 **Vol. 3, No. 4, p. 625**

Statistical analysis determines probability of failure for N-1 spares. Analysis can help reduce downtime in industrial processes by determining number of spare parts that must be stockpiled. Analysis can also be inverted to decide if number of spares on hand is sufficient for lifetime needs of system.

B78-10594
RESIZING ALGORITHM FOR LOADED STRUCTURES
H. M. ADELMAN and R. NARAYANASWAMI (ODU Res. Foundation)
Mar. 1979 See also NASA-TM-X-72816 (N76-18530)
LANGLEY-12064 **Vol. 3, No. 4, p. 625**

Algorithm for resizing structural members subjected to combined thermal and mechanical loading is discussed.

B78-10595
PREDICTING CROP PRODUCTION FROM SATELLITE DATA
J. E. COLWELL (Environmental Res. Inst. of Mich.), R. F. NALEPKA (Environmental Res. Inst. of Mich.), and D. T. RICE
Mar. 1979
GSFC-12379 **Vol. 3, No. 4, p. 626**

Crop area and yield for winter wheat is found by analysis of LANDSAT pictures. Correlation between measure and yield is established from measurements on known wheatfields with known yields.

B78-10596
REPRESENTATION OF MULTIVALUED LOGIC FUNCTIONS
B. BENJAUTHRIT and I. S. REED (Southern California Univ.)
Mar. 1979
NPO-13760 **Vol. 3, No. 4, p. 627**

Systematic method for representing multivariate finite Galois field functions can simplify synthesis of multivalued logic elements.

B78-10597
PLOTTING MAX/MIN DATA ENVELOPES
T. FURUIKE (Rockwell Intern. Corp.) and J. C. LONG (Rockwell Intern. Corp.)
Mar. 1979
MSC-18016 **Vol. 3, No. 4, p. 627**

Study of maximum and minimum load distributions along structural section is aided by visual display of load distribution data. Maximum/minimum envelope plot program plots these envelopes of the stresses and shear loads at selected points in beam modeled by series of finite elements. Digital output for engineers and management is presented for quick analysis and understanding.

B78-10598
GRAPHICS PROGRAM FOR CHARTS
R. C. HENDRICKS and R. J. TRIVISONNO
Mar. 1979
LEWIS-12811 **Vol. 3, No. 4, p. 628**

GASPLOT program is reliable, economical, and easy-to-use method of producing variety of thermophysical-property charts.

B78-10599
PRICE AND COST ESTIMATION
R. D. STEWART
Mar. 1979
M-FS-23812 **Vol. 3, No. 4, p. 628**

Price and Cost Estimating Program (PACE II) was developed to prepare man-hour and material cost estimates. Versatile and flexible tool significantly reduces computation time and errors and reduces typing and reproduction time involved in preparation of cost estimates.

B78-10600
PROCESSOR FOR THE UNIVAC 1100 SERIES
F. H. BRACHER, R. E. HOLZMAN, D. I. LEWIS, and R. C. TAUSWORTHE
Mar. 1979
NPO-13469 **Vol. 3, No. 4, p. 629**

MBASIC, advanced version of BASIC, is high-level interactive computer language designed to minimize time required for user to program task for computer execution. Language usually results in shorter and simpler programs that are easier to write and understand.

B78-10601
POSTPROCESSING CLASSIFICATION IMAGES
E. P. KAN (Lockheed Elec. Co, Inc.)
Mar. 1979
MSC-18238 **Vol. 3, No. 4, p. 629**

Program cleans up remote-sensing maps. It can be used with existing image-processing software. Remapped images closely resemble familiar resource information maps and can replace or supplement classification images not postprocessed by this program.

SUBJECT INDEX

Subject Index

The title of each Tech Brief is listed under several selected subject headings to provide the user with a variety of approaches in his search for specific information. The Tech Brief number, e.g., B78-10240, is located under and to the right of the title and is followed by a two-digit number, e.g., 05, which designates the subject category in which the entire entry can be found.

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ARRAYS
Phase-shift array, arbitrary and continuous through 360 deg
LANGLEY-12272 B78-10308 01

ARTIFICIAL INTELLIGENCE
Self-navigating robot
NPO-14190 B78-10026 02

ASSAYING
Rapid measurement of bacteria in water
GSFC-12158 B78-10232 05

ASSEMBLING
High-vacuum, low-temperature bond for second-surface mirrors
M-FS-23405 B78-10124 08
Automated solar-cell-array assembly machine
NPO-13652 B78-10186 03
Bonding core mating surfaces improves transformer
NPO-13855 B78-10283 08
Reducing weld peaking in aluminum
M-FS-23973 B78-10433 08
Improved method of solar-cell assembly
LEWIS-12729 B78-10438 08
Accelerated hybrid-circuit production
MSC-18272 B78-10585 08
Brazing dissimilar aluminum alloys
MSC-16340 B78-10587 08

ATMOSPHERIC HEAT BUDGET
Estiuating regional heat flux from scanning radiometer data
LANGLEY-12158 B78-10329 03

ATMOSPHERIC PRESSURE
Housing protects laser in vacuum
GSFC-12241 B78-10028 03

ATTENUATORS
S-Band complex-weight module for adaptive processing
LANGLEY-12197 B78-10005 01
Pulse-width-modulated attenuator for AGC
NPO-14127 B78-10459 01

ATTITUDE CONTROL
Solar-electric geocentric transfer
LEWIS-12939 B78-10403 06

AUDIO EQUIPMENT
Automatic circuit interrupter
MSC-16697 B78-10300 01
Portable data system
ARC-11136 B78-10316 02

AUDITORY PERCEPTION
Implantable digital hearing aid
KSC-11009 B78-10373 05

AUSTENITIC STAINLESS STEELS
Low-chromium stainless steels
LEWIS-12543 B78-10046 04

AUTOMATIC CONTROL
Improved servocontrol system
M-FS-19358 B78-10150 01
Automated controller for liquid-cooled garments
MSC-18055 B78-10365 05
Modulation improves electro-optic object detector
M-FS-23776 B78-10380 06

Automated temperature-cycling apparatus
LANGLEY-12310 B78-10391 06
Detecting servo failures with software
FRC-11003 B78-10396 06
Controlling the growth of silicon sheets
NPO-14295 B78-10581 08

AUTOMATIC CONTROL VALVES
Magnetostrictive valve
NPO-14235 B78-10104 07

AUTOMATIC FREQUENCY CONTROL
Multichannel VCO needs only one reference
MSC-18225 B78-10448 01

AUTOMATIC GAIN CONTROL
Improved servocontrol system
M-FS-19358 B78-10150 01
Pulse-width-modulated attenuator for AGC
NPO-14127 B78-10459 01
Measuring radio-signal power accurately
NPO-13373 B78-10464 02

AUTOMATIC TEST EQUIPMENT
Automated tester for MOS devices
NPO-14088 B78-10001 01
Curve tracer checks CMOS IC's
GSFC-12209 B78-10007 01
Strobe-margin test for plated memory systems
M-FS-23838 B78-10154 01
Monitoring systems for community water supplies
MSC-16778 B78-10233 05
Water sample-collection and distribution system
MSC-16841 B78-10235 05
Testing integrated circuits by photoexcitation
M-FS-23943 B78-10451 01
Multiplexed battery-bypass control system
NPO-14414 B78-10474 02
Multiple-sample holder for IC testing
NPO-14314 B78-10540 06

AUTOMOBILE ENGINES
Boosting the power of two-stage engines
NPO-14057 B78-10105 07
Real-time instrument averages 100 data sets
LEWIS-13093 B78-10534 06

AUTOMOBILES
Heat resistant nontoxic laminate
ARC-11040 B78-10356 04
Electric and hybrid vehicles
LEWIS-13077 B78-10423 07
Low-cost graphite/epoxy structural panels
M-FS-23871 B78-10427 08
Stirling-engine design manual
LEWIS-13098 B78-10580 07

AUXILIARY POWER SOURCES
Efficient dc-to-dc converter
FRC-11014 B78-10012 01
Wind-wheel electric power generator
M-FS-23515 B78-10268 07

AVALANCHE DIODES
All-ion-implantation process for integrated circuits
M-FS-23995 B78-10590 08

AVIONICS
Approach and landing simulation
LANGLEY-12060 B78-10091 06

AXES OF ROTATION
Improved notation controller
GSFC-12273 B78-10383 06

AXIAL LOADS
Design of transmission shafting
LEWIS-12965 B78-10107 07

AXISYMMETRIC BODIES
Potential flows in propulsion system inlets
LEWIS-13010 B78-10553 06

AXISYMMETRIC FLOW
Flow in axisymmetric ducts with struts
LEWIS-12798 B78-10556 06

B

BACKGROUND NOISE
Low-background trace-gas detector
NPO-13683 B78-10168 03

BACTERIA
Microbial desulfurization of coal
NPO-14227 B78-10038 04
Bacillus cereus strain MCN as a debriding agent
LANGLEY-12287 B78-10067 05
Rapid measurement of bacteria in water
GSFC-12158 B78-10232 05
Automated electrochemical selection of coliforms
MSC-16777 B78-10236 05
Chemiluminescence and bioluminescence microbe detection
MSC-16779 B78-10237 05

BAGS
Verifying the fit of mating contoured surfaces
LANGLEY-11731 B78-10290 08

BALL BEARINGS
Thermal performance of shaft bearing system
LEWIS-12761 B78-10263 06
Elastic deformation of ball bearings, gears, and cams
LEWIS-13076 B78-10544 06

BALLISTICS
Measuring projectile speed
LANGLEY-12387 B78-10538 06

BANDPASS FILTERS
Improved optical filter
GSFC-12225 B78-10027 03

BANDWIDTH
Adaptive polarization separation experiments
LANGLEY-12196 B78-10006 01
Narrow-bandwidth receiver
GSFC-12142 B78-10463 02
Determining the response of an FM receiver
MSC-16751 B78-10465 02

BARRIER LAYERS
Improved thermal-tile barrier
MSC-16929 B78-10133 08
Metallic thermal seal
MSC-18135 B78-10566 07

BASIC (PROGRAMMING LANGUAGE)
Processor for the UNIVAC 1100 series
NPO-13469 B78-10600 09

BATTERY CHARGERS
Multiplexed battery-bypass control system
NPO-14414 B78-10474 02

BEAM LEADS
Flicking-wire drag tensioner
MSC-16367 B78-10109 07

BEAM SPLITTERS
Improved double-pass michelson interferometer
NPO-13999 B78-10177 03

BEAMS (SUPPORTS)
Analysis of beam columns
MSC-18009 B78-10402 06
Plotting max/min data envelopes
MSC-18016 B78-10597 09

BEARINGS
Improved gas thrust bearings
LEWIS-12569 B78-10413 07

BELLOWS
Embrittlement proof nickel-alloy bellows
M-FS-19331 B78-10349 04
Lines, bellows, flexible hoses, and filters
LEWIS-13077 B78-10424 07
Transmitting rotary motion at an angle
MSC-19483 B78-10561 07

BENDING
Bend-absorbing clamp
MSC-16971 B78-10575 07

BENDING FATIGUE
Design of transmission shafting
LEWIS-12965 B78-10107 07

BINARY DIGITS
Detecting and correcting bit errors on magnetic tape
NPO-13842 B78-10294 09

BINDERS (MATERIALS)
Improved alkali-metal/silicate binders
GSFC-12303 B78-10224 04
Installing fiber insulation in tight spaces
MSC-16934 B78-10289 08
Fire-resistant wood composites
ARC-11174 B78-10508 04

BIOASSAY
Biological sampling and cleaning device
NPO-14010 B78-10245 05

BIOENGINEERING
Remotely-powered intracranial pressure monitor
ARC-11120 B78-10362 05
Sweat collection capsule
ARC-11031 B78-10367 05
Biocompatibility of surgical implants
NPO-14291 B78-10368 05
Improved myocardium transducer
NPO-14107 B78-10372 05
Implantable digital hearing aid
KSC-11009 B78-10373 05
Wideband EMG telemetry system
ARC-11209 B78-10375 05

BIOINSTRUMENTATION
Monitoring systems for community water supplies
MSC-16778 B78-10233 05
Water sample-collection and distribution system
MSC-16841 B78-10235 05
Chemiluminescence and bioluminescence microbe detection
MSC-16779 B78-10237 05
Retainer for laboratory animals
LANGLEY-12353 B78-10371 05
Improved probe for rectal-cancer detection
NPO-14247 B78-10531 05
Self-propelling, self-locating colonoscope
NPO-14092 B78-10532 05

BIOLUMINESCENCE
Chemiluminescence and bioluminescence microbe detection
MSC-16779 B78-10237 05

BIOMEDICAL DATA
Portable data system
ARC-11136 B78-10316 02
Microprocessor-based cardiopulmonary monitor
MSC-18235 B78-10369 05
BIOSYNTHESIS
Boosting production yield of biomedical peptides
NPO-14142 B78-10240 05
BIOTELEMETRY
Wideband EMG telemetry system
ARC-11209 B78-10375 05
Self-propelling, self-locating colonoscope
NPO-14092 B78-10532 05
BIREFRINGENCE
Improved optical filter
GSFC-12225 B78-10027 03
BIT SYNCHRONIZATION
Bit-synchronizer lock detector
MSC-16744 B78-10164 02
BITS
Detecting and correcting bit errors on magnetic tape
NPO-13842 B78-10294 09
28-Bit serial word simulator/monitor
MSC-16418 B78-10315 02
BLADES (CUTTERS)
'Space slitter' for film or tape
KSC-10894 B78-10138 08
A sharp knife for high temperatures
MSC-16932 B78-10278 07
BLOCK DIAGRAMS
Marshall system for aerospace simulation
M-FS-22672 B78-10296 09
BLOOD
Automated chromosome analysis
NPO-13913 B78-10364 05
Automated electrophoresis apparatus
M-FS-23983 B78-10516 04
BLOOD FLOW
Dip-molded t-shaped cannula
NPO-14073 B78-10062 05
In vivo blood-flow mapping
NPO-14133 B78-10244 05
BLOOD PRESSURE
Hand-held vital-signals monitor
MSC-18232 B78-10524 05
BLOOD VESSELS
A probe for blood-vessel and spinal interiors
NPO-14132 B78-10242 05
In vivo blood-flow mapping
NPO-14133 B78-10244 05
BOARDS (PAPER)
'Space slitter' for film or tape
KSC-10894 B78-10138 08
BODY FLUIDS
Sweat collection capsule
ARC-11031 B78-10367 05
BODY MEASUREMENT (BIOLOGY)
Remotely-powered intracranial pressure monitor
ARC-11120 B78-10362 05
Microprocessor-based cardiopulmonary monitor
MSC-18235 B78-10369 05
Hybrid respiration-signal conditioner
MSC-18226 B78-10527 05
BODY TEMPERATURE
Hand-held vital-signals monitor
MSC-18232 B78-10524 05
Hybrid temperature-monitoring circuit
MSC-18231 B78-10525 05
BOILERS
Energy conversion alternatives study
LEWIS-13096 B78-10330 03
BOLTS
Ultrasonic extensometer measures bolt preload
M-FS-19337 B78-10271 07
Antibackoff lock for nuts and bolts
MSC-16472 B78-10409 07
BONDING
Flicking-wire drag tensioner
MSC-16367 B78-10109 07
Form die and glide plates for vacuum brazing
MSC-16549 B78-10113 08
High-vacuum, low-temperature bond for second-surface mirrors
M-FS-23405 B78-10124 08
Bonding Kovar pins to an alumina substrate
MSC-16828 B78-10130 08
'PC fabrication' for silicon solar-cell arrays
NPO-13991 B78-10131 08
Improved method of solar-cell assembly
LEWIS-12729 B78-10438 08
Breather cloth for vacuum curing
MSC-18063 B78-10440 08
Applying uniform adhesive coatings
MSC-19462 B78-10583 08
Preparing thin aluminum films for adhesive bonding
NPO-14357 B78-10591 08
BONE MARROW
Body/bone-marrow ture sensor
NPO-14121 B78-10066 05
BOOLEAN ALGEBRA
Representation of multivalued logic functions
NPO-13760 B78-10596 09
BOOMS (EQUIPMENT)
Collapsible module extends tenfold in height
NPO-13371 B78-10280 07
BORON CARBIDES
Brazed boron-silicon carbide/aluminum structural panels
LANGLEY-12244 B78-10221 04
BORON REINFORCED MATERIALS
Ultra-high-strength boron fibers
LEWIS-12739 B78-10051 04
BOROSILICATE GLASS
Protective coating for laser diodes
LANGLEY-11746 B78-10171 03
BOUNDARY LAYER FLOW
Detection of boundary-layer transitions in wind tunnels
LANGLEY-12261 B78-10255 06
Internal and external 2-d boundary layer flows
LEWIS-13009 B78-10260 06
BOUNDARY LAYER STABILITY
Detection of boundary-layer transitions in wind tunnels
LANGLEY-12261 B78-10255 06
BOUNDARY LAYERS
Tumbling-vehicle entry heating
M-FS-23712 B78-10555 06
BOURDON TUBES
Pressure-sensitive glass reaction cell
LANGLEY-11256 B78-10223 04
BRAGG ANGLE
Measurement of subcoat thickness by characteristic x-rays
MSC-16718 B78-10505 04
BRAKING
Dynamic braking of bidirectional motors
ARC-11194 B78-10578 07
BRAZING
High-temperature brazing of stainless steel
MSC-19459 B78-10112 08
Form die and glide plates for vacuum brazing
MSC-16549 B78-10113 08
Internal grid for release of brazing retorts
MSC-19472 B78-10114 08
Vacuum control for brazing stainless steel
MSC-19457 B78-10115 08
Process fabricates flat panels at high temperatures
MSC-16969 B78-10116 08
Two braze alloys for thin-wall components
M-FS-19206 B78-10117 08
Compatibility of Au-Cu-Ni braze alloy with NH3
MSC-16864 B78-10219 04
Brazed boron-silicon carbide/aluminum structural panels
LANGLEY-12244 B78-10221 04
Repairing pin-fin cold plates
MSC-16424 B78-10431 08
Brazing dissimilar aluminum alloys
MSC-16340 B78-10587 08
BRIGHTNESS
Z-axis control loop for cathode-ray tubes
NPO-13775 B78-10305 01
BRITTLE MATERIALS
Tile-bonding tool
KSC-11053 B78-10134 08
'Gentle' holder for brittle ceramics
MSC-19645 B78-10552 06
BUDGETING
Price and cost estimation
M-FS-23812 B78-10599 09
BULK MODULUS
Dynamic measurement of bulk modulus
NPO-13226 B78-10543 06
BURNING TIME
Fire-resistant wood composites
ARC-11174 B78-10508 04
BURNS (INJURIES)
Directory of fire research specialists
LEWIS-13123 B78-10399 06
BUTT JOINTS
Detecting overpenetration of electron-beam welds
M-FS-19396 B78-10586 08
BYPASSES
Multiplexed battery-bypass control system
NPO-14414 B78-10474 02
Automatic bypass valve
LANGLEY-12063 B78-10558 07
Compact bypass-flow filter
MSC-18311 B78-10564 07

C

CALCIUM OXIDES
High-yield process for preparing calcium superoxide
ARC-11053 B78-10216 04
CALCULATORS
Wire selector/calculator
MSC-16632 B78-10120 08

CALIBRATING
Calibration method for an ultrasonic gray-scale recorder
LEWIS-12782 B78-10016 02
High-resolution gray-scale recorder
LEWIS-12783 B78-10017 02
Improved strain-gage calibration
MSC-16852 B78-10074 06
Calibration target for temperature radiometer
LANGLEY-12239 B78-10083 06
Mass spectrometer calibration standard
NPO-14097 B78-10249 06
Calibration standards for PIND tests
MSC-18169 B78-10388 06
Standardized gas-temperature probes
LEWIS-13059 B78-10392 06
Orifice calibration module
LANGLEY-12269 B78-10393 06
High-sampling-rate pressure transducer has in situ calibration
LANGLEY-12230 B78-10536 06
CAMERA SHUTTERS
Wide angle pinhole camera
LANGLEY-11905 B78-10173 03
CAMERAS
Wide angle pinhole camera
LANGLEY-11905 B78-10173 03
CAMS
Elastic deformation of ball bearings, gears, and cams
LEWIS-13076 B78-10544 06
CANCELLATION
Adaptive polarization separation experiments
LANGLEY-12196 B78-10006 01
CANCER
Improved probe for rectal-cancer detection
NPO-14247 B78-10531 05
CANNULAE
Dip-molded t-shaped cannula
NPO-14073 B78-10062 05
CANS
Self-sterilizing canister
NPO-14237 B78-10064 05
Thermal-control canister
GSFC-12253 B78-10079 06
CAPACITANCE
Improved driver for capacitive loads
LANGLEY-11609 B78-10304 01
CAPACITORS
High-temperature capacitive pressure transducer
LEWIS-13078 B78-10398 06
Control of dielectric film deposition
LEWIS-13092 B78-10430 08
All-ion-implantation process for integrated circuits
M-FS-23995 B78-10590 08
CARBON DIOXIDE CONCENTRATION
Measurement of total organic concentration in water
MSC-16497 B78-10048 04
CARBON DIOXIDE LASERS
Laser wire stripping
MSC-18000 B78-10118 08
Low-power tuner for lasers
M-FS-23863 B78-10486 03
CARBON FIBER REINFORCED PLASTICS
Effects of moisture on graphite/epoxy composites
MSC-18045 B78-10360 04
Low-cost graphite/epoxy structural panels
M-FS-23871 B78-10427 08
CARBON FIBERS
Response of graphite/epoxy composites to moisture
MSC-16899 B78-10228 04
CARBON STEELS
High-temperature brazing of stainless steel
MSC-19459 B78-10112 08
CARBONATES
Fire-and smoke-retardant polyesters and elastomers
NPO-14053 B78-10058 04
CARDIOGRAMS
Microprocessor-based cardiopulmonary monitor
MSC-18235 B78-10369 05
CARDIOVASCULAR SYSTEM
Improved myocardium transducer
NPO-14107 B78-10372 05
CARRIER INJECTION
All-ion-implantation process for integrated circuits
M-FS-23995 B78-10590 08
CASES (CONTAINERS)
Fire-retardant covering for small containers
ARC-11104 B78-10354 04
CAST ALLOYS
Brazing dissimilar aluminum alloys
MSC-16340 B78-10587 08
CASTING
Void-free foam insulation
MSC-16805 B78-10127 08
Portable fluorescent-dye inspection device
M-FS-24019 B78-10139 08
High-gradient continuous-casting furnace
LEWIS-12934 B78-10425 08
CATALYSTS
Hydrogen enrichment of synthetic fuel
M-FS-23279 B78-10039 04
Improved imide polymerization catalyst
ARC-11107 B78-10517 04
CATECHOLAMINE
Chemical measurement of urine volume
MSC-16585 B78-10238 05
CATHETERIZATION
In vivo blood-flow mapping
NPO-14133 B78-10244 05
CATHETOMETERS
A probe for blood-vessel and spinal interiors
NPO-14132 B78-10242 05
CATHODE RAY TUBES
Accurate positioning of characters on CRT displays
MSC-16505 B78-10014 02
Z-axis control loop for cathode-ray tubes
NPO-13775 B78-10305 01
Plotting shear-flow forces
MSC-18013 B78-10445 09
CATHODES
Ion-beam-textored graphite
LEWIS-12724 B78-10506 04
CELLS (BIOLOGY)
Automated chromosome analysis
NPO-13913 B78-10364 05
Separating biological cells
M-FS-23883 B78-10521 05
CEMENTATION
Bonding Kovar pins to an alumina substrate
MSC-16828 B78-10130 08
CEMENTS
Bonding Kovar pins to an alumina substrate
MSC-16828 B78-10130 08
CENTRAL PROCESSING UNITS
Multipurpose system simulator
GSFC-12333 B78-10444 09
CENTRIFUGAL PUMPS
Drag-pump rotating filter
MSC-16180 B78-10563 07
CERAMIC BONDING
Tile-bonding tool
KSC-11053 B78-10134 08
Ceramic-to-metal vacuum seal
NPO-13803 B78-10437 08
CERAMIC COATINGS
Measurement of subcoat thickness by characteristic x-rays
MSC-16718 B78-10505 04
CERAMICS
Improved thermal-tile barrier
MSC-16929 B78-10133 08
'Gentle' holder for brittle ceramics
MSC-19645 B78-10552 06
CEREBRUM
Remotely-powered intracranial pressure monitor
ARC-11120 B78-10362 05
CHAINS
Modified pipe extension safely releases chain binders
MSC-16937 B78-10103 07
CHARGE DISTRIBUTION
Antistatic coating for acrylics
NPO-13867 B78-10509 04
Low partial discharge vacuum feedthrough
GSFC-12347 B78-10559 07
CHARGED PARTICLES
Portable spark-gap arc generator
LEWIS-12886 B78-10008 01
Power loss for high-voltage solar-cell arrays
LEWIS-12865 B78-10340 03
Automated electrophoresis apparatus
M-FS-23983 B78-10516 04
CHARTS
'Space slitter' for film or tape
KSC-10894 B78-10138 08
CHECKOUT
Fuseholders allow fast system checkout
MSC-16856 B78-10088 06
Performance evaluation of an air solar collector
M-FS-23968 B78-10338 03
Outdoor tests of a liquid solar collector
M-FS-23969 B78-10339 03
CHEMICAL ANALYSIS
Modified chemiluminescent NO analyzer accurately measures NOX
LEWIS-12850 B78-10047 04
Improved 'spectrophone'
NPO-14143 B78-10167 03
Measuring metallic concentrations in glycol solutions
M-FS-23894 B78-10211 03
Improvements in microelectrophoresis apparatus
ARC-11121 B78-10247 05
Thermoelectrically-cooled erature probe
MSC-18192 B78-10484 03
CHEMICAL ATTACK
Corrosion detection and evaluation
M-FS-24436 B78-10227 04
Embrittlement proof nickel-alloy bellows
M-FS-19331 B78-10349 04

Corrosion inhibitors for solar-heating and cooling
M-FS-25023 B78-10501 03
CHEMICAL BONDS
Predicting structures of cross-linked condensation polymers
NPO-14007 B78-10352 04
Fire-resistant wood composites
ARC-11174 B78-10508 04
CHEMICAL REACTION CONTROL
High-yield process for preparing calcium superoxide
ARC-11053 B78-10216 04
Boosting production yield of biomedical peptides
NPO-14142 B78-10240 05
CHEMICAL REACTIONS
Coal desulfurization with iron pentacarbonyl
NPO-14272 B78-10342 04
Low-temperature elastomer production and curing
NPO-13899 B78-10346 04
Economical synthesis of potassium superoxide
ARC-10992 B78-10353 04
Reducing stickiness of elastomer valve seals
LANGLEY-11778 B78-10565 07
CHEMICAL REACTORS
Model of silicon production in a fluidized-bed reactor
NPO-14404 B78-10520 04
CHEMICAL TESTS
Improvements in microelectrophoresis apparatus
ARC-11121 B78-10247 05
Fluidic-oscillator gas analyzer
KSC-11014 B78-10253 06
CHEMILUMINESCENCE
Modified chemiluminescent NO analyzer accurately measures NOX
LEWIS-12850 B78-10047 04
Chemiluminescence and bioluminescence microbe detection
MSC-16779 B78-10237 05
NO2 measurement by chemiluminescence
LANGLEY-11378 B78-10386 06
CHROMATOGRAPHY
High-pressure liquid chromatography of aromatic amines
LANGLEY-12163 B78-10515 04
Porous bead packings for gas chromatography
ARC-11222 B78-10518 04
CHROMIUM
Low-chromium stainless steels
LEWIS-12543 B78-10046 04
CHROMIUM ALLOYS
Two braze alloys for thin-wall components
M-FS-19206 B78-10117 08
CHROMIUM STEELS
A sharp knife for high temperatures
MSC-16932 B78-10278 07
CHROMOSOMES
Automated chromosome analysis
NPO-13913 B78-10364 05
CIRCUIT BOARDS
Simple tool removes IC flat packs
MSC-16058 B78-10010 01
Ultrasonic evaluation of high-voltage circuit boards
LEWIS-12781 B78-10087 06
Bench-top soldering aid for PC boards
MSC-16274 B78-10121 08
No-warp potted circuits
MSC-19729 B78-10435 08
Circuit-lead trimming template
MSC-16589 B78-10439 08
Localized cooling of electronic components
LANGLEY-11955 B78-10569 07
CIRCUIT DIAGRAMS
CMOS bulk-metal design handbook
M-FS-23856 B78-10142 08
CIRCUIT PROTECTION
Electrical-ground monitor
MSC-18281 B78-10455 01
Overload protection system
NPO-13872 B78-10460 01
Load balancing multimodule switching power converters
NPO-13832 B78-10461 01
Voltage regulator for solar panels
NPO-13895 B78-10478 03
CIRCUIT RELIABILITY
Gate-assisted turn-off thyristor
LEWIS-12535 B78-10004 01
Shock during PIND test frees particles
M-FS-23829 B78-10389 06
CIRCUITS
Representation of multivalued logic functions
NPO-13760 B78-10596 09
CIRCULAR ORBITS
Helicopter position stabilizing system
LANGLEY-11670 B78-10256 06
CIRCULAR TUBES
Glass tubes for protecting solar cells
NPO-14200 B78-10031 03
Self-centering stepped piston
LEWIS-12997 B78-10101 07
CIRCULATORS (PHASE SHIFT CIRCUITS)
More efficient microwave-power transmission
NPO-13885 B78-10466 02
CIRCULATORY SYSTEM
Improved myocardium transducer
NPO-14107 B78-10372 05
CLAMPS
Gentle support stands for fluid-line mockups
MSC-16479 B78-10291 08
Quick locking/unlocking retainer
MSC-18048 B78-10408 07
Fastener for thin fragile materials
MSC-18097 B78-10436 08
Fastener for thermal insulation blankets
MSC-18253 B78-10571 07
Bend-absorbing clamp
MSC-16971 B78-10575 07
CLARITY
Compact turbidity meter
KSC-11063 B78-10545 06
CLASSIFICATIONS
Directory of fire research specialists
LEWIS-13123 B78-10399 06
Postprocessing classification images
MSC-18238 B78-10601 09
CLEAN ENERGY
Solar-heating system design data brochure
M-FS-23977 B78-10492 03
Solar-heating system performance tests
M-FS-25021 B78-10493 03
Design and installation of a flat-plate solar collector
M-FS-25010 B78-10498 03
CLEANING
Electroplating and stripping copper on molybdenum and niobium
LEWIS-12151 B78-10055 04
Biological sampling and cleaning device
NPO-14010 B78-10245 05
Microcircuit-cleaning machine
MSC-16060 B78-10292 08
Shock during PIND test frees particles
M-FS-23829 B78-10389 06
CLEARANCES
Reducing weld peaking in aluminum
M-FS-23973 B78-10433 08
CLEAVAGE
Precision cleaver for 'soft' crystals
GSFC-12291 B78-10348 04
CLIPS
Quick locking/unlocking retainer
MSC-18048 B78-10408 07
Fastener for thin fragile materials
MSC-18097 B78-10436 08
Fastener for thermal insulation blankets
MSC-18253 B78-10571 07
CLOCKS
Hybrid clock generator
MSC-18228 B78-10530 05
CLOSED CIRCUIT TELEVISION
Infrared-enhanced TV for fire detection
M-FS-19380 B78-10172 03
CLOSURES
Low-leakage low-temperature valve
MSC-18087 B78-10420 07
Ceramic-to-metal vacuum seal
NPO-13803 B78-10437 08
CLOTHING
Automated controller for liquid-cooled garments
MSC-18055 B78-10365 05
COAGULATION
resterilizable electrode for electrosurgery
HQN-10915 B78-10370 05
COAL
Microbial desulfurization of coal
NPO-14227 B78-10038 04
Coal desulfurization with iron pentacarbonyl
NPO-14272 B78-10342 04
Improved nucleonic coal-thickness monitor
M-FS-23725 B78-10344 04
Coal mining with a liquid solvent
NPO-14028 B78-10345 04
Low-temperature refining of coal
NPO-14210 B78-10511 04
COAL LIQUEFACTION
Coal liquefaction to increase jet fuel production
LANGLEY-12038 B78-10343 04
Coal mining with a liquid solvent
NPO-14028 B78-10345 04
COAL UTILIZATION
Energy conversion alternatives study
LEWIS-13096 B78-10330 03
Coal mining with a liquid solvent
NPO-14028 B78-10345 04
COANDA EFFECT
Wing aerodynamics under blowing jets
LANGLEY-12256 B78-10401 06
COATING
Holding fixture for variable-contour parts
MSC-16270 B78-10429 08
Control of dielectric film deposition
LEWIS-13092 B78-10430 08
Scratch resistant plastic lenses
ARC-11039 B78-10519 04

Coating for hot sliding seals
MSC-16529 B78-10562 07
COATINGS
Electrically-conducting thermal-control coating
GSFC-12207 B78-10044 04
Fast-drying coating
MSC-16056 B78-10060 04
High-temperature waterproofing for tiles
MSC-16773 B78-10135 08
Repairing silicon carbide coatings
MSC-18033 B78-10226 04
Protective coating for copper in aluminum heat exchangers
M-FS-19334 B78-10286 08
Natural-oxide solar-collector coatings
M-FS-23518 B78-10326 03
Fire-retardant covering for small containers
ARC-11104 B78-10354 04
Ion-beam texturing of materials
LEWIS-12996 B78-10357 04
Measurement of subcoat thickness by characteristic x-rays
MSC-16718 B78-10505 04
Antistatic coating for acrylics
NPO-13867 B78-10509 04
Forming 'dynamic' membranes on stainless steel
MSC-18172 B78-10513 04
Applying uniform adhesive coatings
MSC-19462 B78-10583 08
COAXIAL CABLES
Coaxial isolator has versatile interface
MSC-16908 B78-10009 01
CODING
Noise tolerant computer link
NPO-14152 B78-10160 02
Efficient digital encoding scheme
MSC-18267 B78-10467 02
Eliminating ambiguity in digital signals
NPO-14289 B78-10469 02
COHERENT ELECTROMAGNETIC RADIATION
Common-cavity pumped laser
GSFC-12237 B78-10320 03
Vacuum-ultraviolet laser uses superfluid helium
NPO-13993 B78-10323 03
COILS
Safe, durable soil sampler
MSC-18171 B78-10577 07
COLD SURFACES
Repairing pin-fin cold plates
MSC-16424 B78-10431 08
COLLECTION
Safe, durable soil sampler
MSC-18171 B78-10577 07
COLLOIDS
Accelerated purification of colloidal silica sols
MSC-16793 B78-10512 04
COLOR
Laser beam color separator
LANGLEY-11806 B78-10174 03
COLOR TELEVISION
Processing multispectral signals from a discrete-sensor array
NPO-14211 B78-10442 09
COLORIMETRY
A probe for blood-vessel and spinal interiors
NPO-14132 B78-10242 05
COMBINED STRESS
Stress analysis under component relative interference fit
LEWIS-12911 B78-10261 06
COMBUSTION
Penetrating fire extinguisher
KSC-11064 B78-10397 06
COMBUSTION CHAMBERS
Simpler valve for reciprocating engines
MSC-16239 B78-10276 07
COMBUSTION EFFICIENCY
Boosting the power of two-stage engines
NPO-14057 B78-10105 07
Stirling-engine design manual
LEWIS-13098 B78-10580 07
COMMAND AND CONTROL
Verification of redundancy management design
MSC-16713 B78-10145 09
COMMUNICATION CABLES
Calculating wire-bundle diameter
MSC-16378 B78-10119 08
Splicing shielded cables
MSC-18297 B78-10453 01
COMMUNICATION EQUIPMENT
Microstrip backfire antenna
LANGLEY-12172 B78-10019 02
Automatic circuit interrupter
MSC-16697 B78-10300 01
Implementing OQASK by using MSK
NPO-13896 B78-10309 01
Noncontact optical communication between moving stations
LANGLEY-12283 B78-10377 06
Processing multispectral signals from a discrete-sensor array
NPO-14211 B78-10442 09
COMPARATORS
Femtosecond time-domain phase comparator
GSFC-12228 B78-10162 02
Automatic radio-transmission monitor
NPO-13941 B78-10165 02
Pseudo-continuous-wave acoustic instrument
LANGLEY-12260 B78-10248 06
Automatic gain-balancing circuit
LANGLEY-12074 B78-10297 01
COMPATIBILITY
Biocompatibility of surgical implants
NPO-14291 B78-10368 05
Compression testing of flammable liquids
MSC-16121 B78-10548 06
COMPENSATORS
Thermal compensator for helium refrigerators
GSFC-12168 B78-10082 06
Improved servocontrol system
M-FS-19358 B78-10150 01
COMPONENT RELIABILITY
Curve tracer checks CMOS IC's
GSFC-12209 B78-10007 01
Multiple-sample holder for IC testing
NPO-14314 B78-10540 06
COMPOSITE MATERIALS
Ultra-high-strength boron fibers
LEWIS-12739 B78-10051 04
Partial interlaminar separation for composites
LANGLEY-12065 B78-10052 04
Response of graphite/epoxy composites to moisture
MSC-16899 B78-10228 04
Testing composite sheets at high temperatures
MSC-16237 B78-10252 06
Friction of thick laminates
LANGLEY-12010 B78-10284 08
Effects of moisture on graphite/epoxy composites
MSC-18045 B78-10360 04
Fire-resistant wood composites
ARC-11174 B78-10508 04
COMPOSITE STRUCTURES
Void-free bends in laminated structures
MSC-16998 B78-10285 08
Fire-retardant lightweight composite
ARC-10918 B78-10355 04
Heat resistant nontoxic laminate
ARC-11040 B78-10356 04
Lattice panels with high structural efficiency
LANGLEY-11898 B78-10426 08
Low-cost graphite/epoxy structural panels
M-FS-23871 B78-10427 08
Detecting moisture in composite honeycomb panels
MSC-16750 B78-10550 06
COMPOSITION (PROPERTY)
Instrument measures many optical properties in visible and IR
LANGLEY-12285 B78-10489 03
COMPRESSED GAS
Topping pressure for gas-storage cylinders
MSC-18186 B78-10542 06
COMPRESSIBILITY
Verifying the fit of mating contoured surfaces
LANGLEY-11731 B78-10290 08
Dynamic measurement of bulk modulus
NPO-13226 B78-10543 06
COMPRESSIBLE FLOW
Flow in axisymmetric ducts with struts
LEWIS-12798 B78-10556 06
Automatic bypass valve
LANGLEY-12063 B78-10558 07
COMPRESSING
Improved strain-gage calibration
MSC-16852 B78-10074 06
COMPRESSION TESTS
Compression testing of flammable liquids
MSC-16121 B78-10548 06
COMPRESSOR ROTORS
Gas-path seal material
LEWIS-12623 B78-10347 04
COMPUTATION
Noise calculation on the basis of vortex flow models
LANGLEY-12271 B78-10078 06
COMPUTER ASSISTED INSTRUCTION
Computer interface for mechanical arm
M-FS-23849 B78-10015 02
COMPUTER GRAPHICS
Accurate positioning of characters on CRT displays
MSC-16505 B78-10014 02
COMPUTER PROGRAMS
Detecting servo failures with software
FRC-11003 B78-10396 06
COMPUTER STORAGE DEVICES
Strobe-margin test for plated memory systems
M-FS-23838 B78-10154 01
Detecting and correcting bit errors on magnetic tape
NPO-13842 B78-10294 09

CMOS-array design-automation techniques
M-FS-23762 B78-10311 01
One-third selection for matrix-addressing ferroelectrics
LANGLEY-11993 B78-10456 01

COMPUTER SYSTEMS DESIGN
28-Bit serial word simulator/monitor
MSC-16418 B78-10315 02

COMPUTER SYSTEMS PROGRAMS
Marshall system for aerospace simulation
M-FS-22672 B78-10296 09

COMPUTER TECHNIQUES
Noise tolerant computer link
NPO-14152 B78-10160 02
Automated chromosome analysis
NPO-13913 B78-10364 05

COMPUTERIZED DESIGN
Edge geometry of turbomachine blades
LEWIS-12979 B78-10262 06
Structural performance analysis and redesign
LANGLEY-12213 B78-10264 06

COMPUTERIZED SIMULATION
Approach and landing simulation
LANGLEY-12060 B78-10091 06
Hydraulic dynamic analysis
MSC-16795 B78-10095 06
Three-phase induction motors
MSC-16904 B78-10281 07
Detecting servo failures with software
FRC-11003 B78-10396 06

COMPUTERS
Multipurpose system simulator
GSFC-12333 B78-10444 09

CONCENTRATION (COMPOSITION)
Measuring metallic concentrations in glycol solutions
M-FS-23894 B78-10211 03

CONCENTRATORS
High-temperature solar converter
GSFC-12234 B78-10032 03
Improved conical solar concentrator
NPO-13825 B78-10187 03
Concentrating solar collector-installation package
M-FS-25068 B78-10500 03

CONDUCTIVE HEAT TRANSFER
Vibration-free thermal link
GSFC-12297 B78-10169 03
Convectively cooled structures
LANGLEY-12347 B78-10404 06

CONICAL BODIES
Improved conical solar concentrator
NPO-13825 B78-10187 03
Lightweight conical antenna reflector
NPO-13552 B78-10472 02

CONNECTORS
Automatic circuit interrupter
MSC-16697 B78-10300 01
Modular ground-wire connector
MSC-16633 B78-10454 01
Miniature thermocouple disconnect
LANGLEY-12013 B78-10535 06

CONSECUTIVE EVENTS
Measuring projectile speed
LANGLEY-12387 B78-10538 06

CONSTRAINTS
Performance optimizing
LANGLEY-11930 B78-10096 06
Spring control of wire harness loops
MSC-18246 B78-10411 07

CONSTRUCTION
Analysis of beam columns
MSC-18009 B78-10402 06

CONSTRUCTION MATERIALS
Lattice panels with high structural efficiency
LANGLEY-11898 B78-10426 08
Fire-resistant wood composites
ARC-11174 B78-10508 04

CONTAMINANTS
Simple air-piston gas-sampling system
LEWIS-12922 B78-10110 07
Low-background trace-gas detector
NPO-13683 B78-10168 03

CONTAMINATION
Simple air-piston gas-sampling system
LEWIS-12922 B78-10110 07
Rapid measurement of bacteria in water
GSFC-12158 B78-10232 05
Monitoring systems for community water supplies
MSC-16778 B78-10233 05

CONTENT
Noncontact measurement of angular deflection
LANGLEY-12178 B78-10071 06

CONTOURS
Process fabricates flat panels at high temperatures
MSC-16969 B78-10116 08
Verifying the fit of mating contoured surfaces
LANGLEY-11731 B78-10290 08
Holding fixture for variable-contour parts
MSC-16270 B78-10429 08
Contouring pile-brush seals
MSC-16231 B78-10588 08

CONTROL BOARDS
Computer interface for mechanical arm
M-FS-23849 B78-10015 02

CONTROL EQUIPMENT
Programmable controller for solar heating
M-FS-23915 B78-10183 03
Z-axis control loop for cathode-ray tubes
NPO-13775 B78-10305 01
Automated controller for liquid-cooled garments
MSC-18055 B78-10365 05
Shaft speed control
NPO-14170 B78-10416 07

CONTROL MOMENT GYROSCOPES
Helicopter position stabilizing system
LANGLEY-11670 B78-10256 06

CONTROL SURFACES
Subminiature hydraulic actuator
LANGLEY-11522 B78-10269 07

CONTROL THEORY
Algorithms for linear-systems control
LANGLEY-12313 B78-10443 09

CONTROLLERS
Multichannel temperature control for solar heating
M-FS-23775 B78-10182 03
Programmable controller for solar heating
M-FS-23915 B78-10183 03
Power-switch dV/dt sensing
MSC-16707 B78-10307 01

CONVECTIVE HEAT TRANSFER
Convectively cooled structures
LANGLEY-12347 B78-10404 06

CONVEYORS
Automatic primate feeder
LANGLEY-11586 B78-10246 05

COOLING
Modular heat-pipe-radiator panel
MSC-16625 B78-10328 03
Convectively cooled structures
LANGLEY-12347 B78-10404 06
Orbital heat rate package
M-FS-23980 B78-10554 06
Localized cooling of electronic components
LANGLEY-11955 B78-10569 07

COOLING SYSTEMS
Flat-plate heat pipe
GSFC-11998 B78-10035 03
Thermal-control canister
GSFC-12253 B78-10079 06
The economics of solar powered absorption cooling
M-FS-23908 B78-10214 03
Application of solar energy to air-conditioning
M-FS-23913 B78-10215 03
Protective coating for copper in aluminum heat exchangers
M-FS-19334 B78-10286 08
Automated controller for liquid-cooled garments
MSC-18055 B78-10365 05
Improved heat-pipe wick
NPO-13391 B78-10381 06

COORDINATE TRANSFORMATIONS
Body-fitted coordinates systems transformations
LANGLEY-12307 B78-10147 09

COORDINATES
Body-fitted coordinates systems transformations
LANGLEY-12307 B78-10147 09

COPPER
Electroplating and stripping copper on molybdenum and niobium
LEWIS-12151 B78-10055 04
Compatibility of Au-Cu-Ni braze alloy with NH3
MSC-16864 B78-10219 04
Protective coating for copper in aluminum heat exchangers
M-FS-19334 B78-10286 08

COPPER OXIDES
Absorptive coating for aluminum solar panels
M-FS-25033 B78-10507 04

CORRECTION
Adaptive polarization separation experiments
LANGLEY-12196 B78-10006 01

CORRELATION DETECTION
Digital correlator with fewer IC's
MSC-16743 B78-10458 01

CORROSION
Corrosion inhibitors for solar heating and cooling systems
M-FS-23892 B78-10209 03
Measuring metallic concentrations in glycol solutions
M-FS-23894 B78-10211 03
Corrosion detection and evaluation
M-FS-24436 B78-10227 04
Corrosion inhibitors for solar-heating and cooling
M-FS-25023 B78-10501 03

CORROSION PREVENTION
Corrosion inhibitors for solar heating and cooling systems
M-FS-23892 B78-10209 03
Improved alkali-metal/silicate binders
GSFC-12303 B78-10224 04

Corrosion detection and evaluation
M-FS-24436 B78-10227 04
Embrittlement proof nickel-alloy bellows
M-FS-19331 B78-10349 04
Eliminating gold migration in microcircuits
MSC-18213 B78-10462 01

CORROSION RESISTANCE
Polyimide adhesives for titanium and composite bonding
LANGLEY-12257 B78-10040 04
Compatibility of Au-Cu-Ni braze alloy with NH3
MSC-16864 B78-10219 04
Wide-temperature corrosion-resistant pressure regulator
NPO-13776 B78-10274 07

CORROSION TESTS
Corrosion detection and evaluation
M-FS-24436 B78-10227 04

COST ANALYSIS
Handbook for estimating fabrication costs
M-FS-23795 B78-10140 08
The economics of solar powered absorption cooling
M-FS-23908 B78-10214 03

COST EFFECTIVENESS
Double-sided solar-cell package
NPO-14199 B78-10033 03
Laser wire stripping
MSC-18000 B78-10118 08

COST ESTIMATES
Price and cost estimation
M-FS-23812 B78-10599 09

COST REDUCTION
Telecommunications network optimization
NPO-14486 B78-10476 02

COSTS
Handbook for estimating fabrication costs
M-FS-23795 B78-10140 08

COUNTERS
Simple air-piston gas-sampling system
LEWIS-12922 B78-10110 07
Synchronous transfer circuits for redundant systems
NPO-14162 B78-10157 01

COUPLERS
Noncontact optical communication between moving stations
LANGLEY-12283 B78-10377 06

COUPLING CIRCUITS
Human arm may act as antenna
ARC-11195 B78-10161 02

COUPLINGS
Rigid coupling is also flexible
MSC-16488 B78-10098 07
Compact pressure-line coupling
MSC-16893 B78-10099 07
'Nonfloating' universal joint
MSC-19546 B78-10108 07
High-strength blind rivet
LANGLEY-12154 B78-10287 08
Coupler for moving vehicles
GSFC-12322 B78-10407 07
Insulator for cryogenic joints
M-FS-19361 B78-10419 07
Durable nonslip stainless-steel drivebelts
GSFC-12276 B78-10567 07
Two (or more) rotary outputs from one input
MSC-19450 B78-10568 07

COVERINGS
Fire-retardant covering for small containers
ARC-11104 B78-10354 04

CRACK PROPAGATION
Analysis of cracked orthotropic sheets
LANGLEY-12288 B78-10405 06

CRACKING (FRACTURING)
Gear-tooth fatigue-strength estimates
MSC-18167 B78-10573 07

CRACKS
Window flaw detection by backscatter lighting
MSC-16605 B78-10089 06
Electroplated 'cold patch' for critical parts
M-FS-19401 B78-10584 08

CRANIUM
Remotely-powered intracranial pressure monitor
ARC-11120 B78-10362 05

CROP GROWTH
Predicting crop production from satellite data
GSFC-12379 B78-10595 09

CROSSLINKING
Predicting structures of cross-linked condensation polymers
NPO-14007 B78-10352 04

CRUSTAL FRACTURES
Real-time monitoring of crustal deformations
NPO-14124 B78-10034 03

CRYOGENIC EQUIPMENT
Latching solenoid for cryogenic valves
MSC-18106 B78-10418 07

CRYOGENICS
Bonding Kovar pins to an alumina substrate
MSC-16828 B78-10130 08
Insulator for cryogenic joints
M-FS-19361 B78-10419 07
High-pressure cryogenic cylinder seal
M-FS-19335 B78-10421 07

CRYOSTATS
Cryostat safety tent
GSFC-12206 B78-10080 06

CRYSTAL GROWTH
Process for growing thin polished silicon sheets
NPO-14172 B78-10434 08
Controlling the growth of silicon sheets
NPO-14295 B78-10581 08
Automated control of crystal growth
NPO-14420 B78-10582 08

CRYSTAL OSCILLATORS
Multichannel VCO needs only one reference
MSC-18225 B78-10448 01

CRYSTAL SURFACES
Ruby c-axis alignment system
NPO-14252 B78-10379 06

CRYSTALS
Precision cleaver for 'soft' crystals
GSFC-12291 B78-10348 04

CUMULATIVE DAMAGE
Damage-detection system for LNG carriers
LANGLEY-11463 B78-10250 06

CURING
Cure-rate data for silicone adhesive
GSFC-12330 B78-10057 04
Fast-drying coating
MSC-16056 B78-10060 04
Match-mold process for foam insulation
MSC-16631 B78-10126 08
Void-free foam insulation
MSC-16805 B78-10127 08
High-rise foam-in-place process
MSC-16931 B78-10128 08
Predicting structures of cross-linked condensation polymers
NPO-14007 B78-10352 04
Breather cloth for vacuum curing
MSC-18063 B78-10440 08

CURRENT AMPLIFIERS
Improved driver for capacitive loads
LANGLEY-11609 B78-10304 01

CURRENT DENSITY
Electroplating and stripping copper on molybdenum and niobium
LEWIS-12151 B78-10055 04

CURRENT REGULATORS
Automatic load sharing in inverter modules
NPO-14056 B78-10302 01
Improved driver for capacitive loads
LANGLEY-11609 B78-10304 01
Overload protection system
NPO-13872 B78-10460 01
Load balancing multimodule switching power converters
NPO-13832 B78-10461 01

CURVE FITTING
Real-time instrument averages 100 data sets
LEWIS-13093 B78-10534 06

CUSHIONS
Air cushion landing system
LANGLEY-12303 B78-10259 06
Low-frequency vibration isolation
NPO-13915 B78-10275 07

CUTTERS
Tool simplifies weld preparation of aluminum
MSC-16992 B78-10123 08
Precision cleaver for 'soft' crystals
GSFC-12291 B78-10348 04

CUTTING
Laser wire stripping
MSC-18000 B78-10118 08
Contouring pile-brush seals
MSC-16231 B78-10588 08

CYCLES
Automated temperature-cycling apparatus
LANGLEY-12310 B78-10391 06

CYCLIC LOADS
Two (or more) rotary outputs from one input
MSC-19450 B78-10568 07

CYLINDRICAL CHAMBERS
Topping pressure for gas-storage cylinders
MSC-18186 B78-10542 06

CYLINDRICAL SHELLS
Self-centering stepped piston
LEWIS-12997 B78-10101 07
Wrench for thin-walled cylinders
LANGLEY-12286 B78-10579 07

CZOCHRALSKI METHOD
Process for growing thin polished silicon sheets
NPO-14172 B78-10434 08

D

DAMAGE
Predicting damage from exploding vessels
LEWIS-13042 B78-10258 06

DAMPERS (VALVES)
Stable hydraulic pressure regulator
LEWIS-13058 B78-10417 07
DAMPING
Low-frequency vibration isolation
NPO-13915 B78-10275 07
DATA
Postprocessing classification images
MSC-18238 B78-10601 09
DATA ACQUISITION
Chopper-stabilized phase detector
MSC-16461 B78-10163 02
Monitoring systems for community water supplies
MSC-16778 B78-10233 05
Data processing for water monitoring system
MSC-16842 B78-10234 05
Water sample-collection and distribution system
MSC-16841 B78-10235 05
28-Bit serial word simulator/monitor
MSC-16418 B78-10315 02
Electronically-scanned pressure measurement system
LANGLEY-12386 B78-10394 06
DATA COMPRESSION
Simplified data compressor
NPO-14041 B78-10023 02
DATA CONVERTERS
28-Bit serial word simulator/monitor
MSC-16418 B78-10315 02
DATA CORRELATION
Digital correlator with fewer IC's
MSC-16743 B78-10458 01
DATA LINKS
Noise tolerant computer link
NPO-14152 B78-10160 02
28-Bit serial word simulator/monitor
MSC-16418 B78-10315 02
DATA PROCESSING
Interactive data-processing system for metallurgy
M-FS-23774 B78-10217 04
A parameter-estimation subroutine package
NPO-14263 B78-10447 09
Wideband digital spectrum analyzer
NPO-14394 B78-10468 02
Telecommunications network optimization
NPO-14486 B78-10476 02
DATA PROCESSING EQUIPMENT
28-Bit serial word simulator/monitor
MSC-16418 B78-10315 02
Multipurpose system simulator
GSFC-12333 B78-10444 09
DATA RECORDING
Portable data system
ARC-11136 B78-10316 02
Efficient digital encoding scheme
MSC-18267 B78-10467 02
DATA REDUCTION
Infrared scanners for temperature measurement in wind tunnels
LANGLEY-12171 B78-10077 06
Data reformatting with less hardware
NPO-13676 B78-10470 02
DATA STORAGE
Automatic radio-transmission monitor
NPO-13941 B78-10165 02
Water sample-collection and distribution system
MSC-16841 B78-10235 05
DATA SYSTEMS
Accurate positioning of characters on CRT displays
MSC-16505 B78-10014 02
DATA TRANSMISSION
Simplified data compressor
NPO-14041 B78-10023 02
Noise tolerant computer link
NPO-14152 B78-10160 02
Detecting and correcting bit errors on magnetic tape
NPO-13842 B78-10294 09
Implementing OQASK by using MSK
NPO-13896 B78-10309 01
28-Bit serial word simulator/monitor
MSC-16418 B78-10315 02
Noncontact optical communication between moving stations
LANGLEY-12283 B78-10377 06
Efficient digital encoding scheme
MSC-18267 B78-10467 02
DECODING
Processing multispectral signals from a discrete-sensor array
NPO-14211 B78-10442 09
DECOMMUTATORS
Data reformatting with less hardware
NPO-13676 B78-10470 02
DECONTAMINATION
Self-sterilizing canister
NPO-14237 B78-10064 05
Biological sampling and cleaning device
NPO-14010 B78-10245 05
Coal desulfurization with iron pentacarbonyl
NPO-14272 B78-10342 04
Corona-discharge air-purification system
ARC-10975 B78-10350 04
Shock during PIND test frees particles
M-FS-23829 B78-10389 06
Accelerated purification of colloidal silica sols
MSC-16793 B78-10512 04
DEEP SCATTERING LAYERS
Acoustic-optical imaging without immersion
M-FS-23876 B78-10549 06
DEFLECTION
Combination force and angular-deflection indicator
MSC-16155 B78-10070 06
Noncontact measurement of angular deflection
LANGLEY-12178 B78-10071 06
Aircraft trailing vortex hazard alleviators
LANGLEY-12034 B78-10272 07
DEFORMATION
Stress analysis under component relative interference fit
LEWIS-12911 B78-10261 06
Measuring surface displacements optically
M-FS-23861 B78-10321 03
No-warp potted circuits
MSC-19729 B78-10435 08
Elastic deformation of ball bearings, gears, and cams
LEWIS-13076 B78-10544 06
Detecting surface deformations photographically
MSC-16156 B78-10547 06
DEGASSING
Deaerating high-viscosity silicon rubber
MSC-16694 B78-10514 04
DEGRADATION
Corrosion detection and evaluation
M-FS-24436 B78-10227 04
DEHUMIDIFICATION
Long-lasting solid-polymer electrolytic hygrometer
NPO-13948 B78-10086 06
DEMODULATION
Automatic acquisition and ranging system
NPO-13982 B78-10312 02
DEMODULATORS
Minature Ku-Band down converter
MSC-18313 B78-10450 01
Simplified phase detector
NPO-13395 B78-10457 01
Narrow-bandwidth receiver
GSFC-12142 B78-10463 02
DENDRITIC CRYSTALS
Eliminating gold migration in microcircuits
MSC-18213 B78-10462 01
DEPOSITION
Ion-beam texturing of materials
LEWIS-12996 B78-10357 04
Control of dielectric film deposition
LEWIS-13092 B78-10430 08
DEPTH MEASUREMENT
Ocean-wave ray or crest diagrams in shoaling waters
LANGLEY-12380 B78-10341 03
DESIGN ANALYSIS
Performance optimizing
LANGLEY-11930 B78-10096 06
CMOS bulk-metal design handbook
M-FS-23856 B78-10142 08
Thermal performance of shaft bearing system
LEWIS-12761 B78-10263 06
CMOS-array design-automation techniques
M-FS-23762 B78-10311 01
Problems encountered in solar heating and cooling systems
M-FS-23974 B78-10331 03
Lines, bellows, flexible hoses, and filters
LEWIS-13077 B78-10424 07
DESULFURIZING
Microbial desulfurization of coal
NPO-14227 B78-10038 04
Coal desulfurization with iron pentacarbonyl
NPO-14272 B78-10342 04
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NPO-14210 B78-10511 04
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Thermal-leak analyzer for vacuum-jacketed lines
MSC-16802 B78-10085 06
Compact piston-position sensor
LEWIS-12392 B78-10102 07
Portable data system
ARC-11136 B78-10316 02
Modulation improves electro-optic object detector
M-FS-23776 B78-10380 06
Simplified phase detector
NPO-13395 B78-10457 01
System for monitoring lightning strikes
KSC-11018 B78-10475 02
Measurement of subcoat thickness by characteristic x-rays
MSC-16718 B78-10505 04
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Predicting damage from exploding vessels
LEWIS-13042 B78-10258 06

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Automated tester for MOS devices
NPO-14088 B78-10001 01
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Positively charged membrane for urea dialysis
NPO-14101 B78-10241 05
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Calculating wire-bundle diameter
MSC-16378 B78-10119 08
DIAMINES
Polyimide adhesives for titanium and composite bonding
LANGLEY-12257 B78-10040 04
DIAPHRAGMS (MECHANICS)
High-temperature capacitive pressure transducer
LEWIS-13078 B78-10398 06
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LEWIS-13092 B78-10430 08
DIES
Form die and glide plates for vacuum brazing
MSC-16549 B78-10113 08
DIFFERENTIAL EQUATIONS
Algorithms for linear-systems control
LANGLEY-12313 B78-10443 09
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MSC-16802 B78-10085 06
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GSFC-12357 B78-10487 03
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MSC-16718 B78-10505 04
DIGESTIVE SYSTEM
Antihistamines reduce ulceration produced by indomethacin
ARC-11118 B78-10366 05
DIGITAL DATA
Digital correlator with fewer IC's
MSC-16743 B78-10458 01
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MSC-18267 B78-10467 02
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LEWIS-12740 B78-10179 03
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NPO-14394 B78-10468 02
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NPO-14289 B78-10469 02
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NPO-13676 B78-10470 02
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MSC-18227 B78-10528 05
DIGITAL TO ANALOG CONVERTERS
Fast differential analog-to-digital conversion
LEWIS-12909 B78-10149 01
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MSC-16777 B78-10236 05
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Abrasion-resistant antireflective coating for polycarbonate
ARC-11047 B78-10054 04
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Precise matching of diodes
NPO-14293 B78-10452 01
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Efficient rectifying antenna
NPO-13884 B78-10471 02
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NPO-14073 B78-10062 05
DIRECTIONAL ANTENNAS
Compact antenna has symmetrical radiation pattern
ARC-11189 B78-10473 02
DIRECTIVITY
Directional laser velocimeter with doppler velocity simulator
LANGLEY-12176 B78-10029 03
DISCONNECT DEVICES
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MSC-19696 B78-10024 02
Compact pressure-line coupling
MSC-16893 B78-10099 07
Automatic circuit interrupter
MSC-16697 B78-10300 01
Easily-wired toggle switch
MSC-18102 B78-10301 01
Miniature thermocouple disconnect
LANGLEY-12013 B78-10535 06
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LANGLEY-11586 B78-10246 05
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MSC-18009 B78-10402 06
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M-FS-23861 B78-10321 03
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Accurate positioning of characters on CRT displays
MSC-16505 B78-10014 02
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KSC-10894 B78-10138 08
Water sample-collection and distribution system
MSC-16841 B78-10235 05
Plotting shear-flow forces
MSC-18013 B78-10445 09
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MSC-18229 B78-10529 05
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Electroplating and stripping copper on molybdenum and niobium
LEWIS-12151 B78-10055 04
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MSC-16841 B78-10235 05
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GSFC-12078 B78-10376 05
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MSC-19602 B78-10572 07
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Stacked solar cells measure X-ray exposure
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MSC-16872 B78-10593 09
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LANGLEY-12262 B78-10093 06
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MSC-16367 B78-10109 07
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LEWIS-12786 B78-10400 06
Wing aerodynamics under blowing jets
LANGLEY-12256 B78-10401 06
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Aerodynamic design lowers truck fuel consumption
FRC-11015 B78-10069 06
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NPO-14192 B78-10222 04
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Antihistamines reduce ulceration produced by indomethacin
ARC-11118 B78-10366 05
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Continuous process fabricates battery plaque
GSFC-12054 B78-10132 08
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LEWIS-12798 B78-10556 06
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M-FS-23829 B78-10389 06
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Fluorescent paint simplifies laser-beam alinement
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Portable fluorescent-dye inspection device
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Multiple-input land-use system concept
NPO-13903 B78-10018 02
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M-FS-23855 B78-10503 03
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Multiple-input land-use system concept
NPO-13903 B78-10018 02
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LEWIS-12997 B78-10101 07
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M-FS-23795 B78-10140 08
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M-FS-23908 B78-10214 03
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Gate-assisted turn-off thyristor
LEWIS-12535 B78-10004 01
Pump efficiency in solar-energy systems
M-FS-23934 B78-10213 03
Power loss for high-voltage solar-cell arrays
LEWIS-12865 B78-10340 03
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LANGLEY-12313 B78-10443 09
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LANGLEY-12313 B78-10443 09
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Elastic deformation of ball bearings, gears, and cams
LEWIS-13076 B78-10544 06
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Analysis of linear viscoelastic structures
NPO-13197 B78-10266 06
Measuring poisson's ratio in elastomers
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LANGLEY-12288 B78-10405 06
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NPO-14053 B78-10058 04
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NPO-13899 B78-10346 04
Predicting structures of cross-linked condensation polymers
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LANGLEY-11778 B78-10565 07
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NPO-13377 B78-10449 01
Low partial discharge vacuum feedthrough
GSFC-12347 B78-10559 07
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Multiplexed battery-bypass control system
NPO-14414 B78-10474 02
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MSC-16852 B78-10074 06
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Chopper-stabilized phase detector
MSC-16461 B78-10163 02
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Coaxial isolator has versatile interface
MSC-16908 B78-10009 01
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MSC-16367 B78-10109 07
Automatic circuit interrupter
MSC-16697 B78-10300 01
Easily-wired toggle switch
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MSC-16589 B78-10439 08
Modular ground-wire connector
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LEWIS-12781 B78-10087 06
ELECTRIC DISCHARGES
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ARC-10975 B78-10350 04
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ELECTRIC FUSES
Fuseholders allow fast system checkout
MSC-16856 B78-10088 06
ELECTRIC GENERATORS
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M-FS-23515 B78-10268 07
Hall devices improve electric motor efficiency
M-FS-23828 B78-10303 01
Terrestrial photovoltaic measurements
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LEWIS-13073 B78-10378 06
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ELECTRIC MOTORS
Three-phase induction motors
MSC-16904 B78-10281 07
High-Speed, high-power, switching transistor
LEWIS-13021 B78-10298 01
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M-FS-23828 B78-10303 01
Dynamic braking of bidirectional motors
ARC-11194 B78-10578 07
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Phase-shift array, arbitrary and continuous through 360 deg
LANGLEY-12272 B78-10308 01
ELECTRIC POWER PLANTS
Energy conversion alternatives study
LEWIS-13096 B78-10330 03
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NPO-13832 B78-10461 01
ELECTRIC POWER TRANSMISSION
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MSC-16707 B78-10307 01
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LEWIS-13077 B78-10423 07
ELECTRIC PULSES
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NPO-13747 B78-10299 01
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MSC-16697 B78-10300 01
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MSC-18106 B78-10418 07
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NPO-14229 B78-10151 01
IC implementation of crossbar switches
NPO-13837 B78-10153 01
Easily-wired toggle switch
MSC-18102 B78-10301 01
ELECTRIC WELDING
Improved electron-beam welder
M-FS-23772 B78-10143 08
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GSFC-12318 B78-10428 08
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M-FS-19396 B78-10586 08
ELECTRIC WIRE
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MSC-16367 B78-10109 07
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MSC-16378 B78-10119 08
Wire selector/calculator
MSC-16632 B78-10120 08
Easily-wired toggle switch
MSC-18102 B78-10301 01
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MSC-16633 B78-10454 01
ELECTRICAL GROUNDING
Electrical-ground monitor
MSC-18281 B78-10455 01
ELECTRICAL INSULATION
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MSC-16632 B78-10120 08
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Improved 'spectrophone'
NPO-14143 B78-10167 03
Modulation improves electro-optic object detector
M-FS-23776 B78-10380 06
Instrument measures many optical properties in visible and IR
LANGLEY-12285 B78-10489 03
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M-FS-23983 B78-10516 04
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MSC-18230 B78-10526 05
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MSC-18226 B78-10527 05
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MSC-18162 B78-10533 05
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MSC-16777 B78-10236 05
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KSC-11018 B78-10475 02
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resterilizable electrode for electrosurgery
HQN-10915 B78-10370 05
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LEWIS-12724 B78-10506 04
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MSC-16497 B78-10048 04
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ELECTROLYTIC CELLS
Long-lasting solid-polymer electrolytic hygrometer
NPO-13948 B78-10086 06
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LEWIS-12740 B78-10179 03
ELECTROMAGNETIC ABSORPTION
Selection standard for FEP films for solar energy
MSC-16999 B78-10190 03
Ultrathin films as photomechanical transducer
NPO-14363 B78-10491 03
ELECTROMAGNETIC INTERFERENCE
Finding radiant-energy sources
GSFC-12147 B78-10159 02
ELECTROMAGNETIC NOISE
Finding radiant-energy sources
GSFC-12147 B78-10159 02
ELECTROMAGNETIC RADIATION
Finding radiant-energy sources
GSFC-12147 B78-10159 02
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NPO-14088 B78-10001 01
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ARC-11209 B78-10375 05
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Laser beam assists in precision welding
M-FS-19319 B78-10122 08
Improved electron-beam welder
M-FS-23772 B78-10143 08
Detecting overpenetration of electron-beam welds
M-FS-19396 B78-10586 08
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Improved electron-beam probe for hypersonic flows
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LEWIS-12724 B78-10506 04
ELECTRON MICROSCOPES
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NPO-14350 B78-10541 06
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M-FS-23915 B78-10183 03
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NPO-13747 B78-10299 01
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Automated tester for MOS devices
NPO-14088 B78-10001 01
Measuring oxide trapping parameters in MOS structure
NPO-14120 B78-10002 01
Reclaiming hybrid integrated circuits
MSC-16463 B78-10129 08
Strobe-margin test for plated memory systems
M-FS-23838 B78-10154 01
Universal test fixture for solar cells
NPO-14062 B78-10184 03
Testing integrated circuits by photoexcitation
M-FS-23943 B78-10451 01
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NPO-14293 B78-10452 01
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M-FS-23869 B78-10592 08
ELECTRONIC FILTERS
A parameter-estimation subroutine package
NPO-14263 B78-10447 09
Efficient rectifying antenna
NPO-13884 B78-10471 02
ELECTRONIC MODULES
S-Band complex-weight module for adaptive processing
LANGLEY-12197 B78-10005 01
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LANGLEY-12060 B78-10091 06
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MSC-18007 B78-10155 01
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NPO-14162 B78-10157 01
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NPO-14056 B78-10302 01
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MSC-16633 B78-10454 01
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MSC-16060 B78-10292 08
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NPO-14314 B78-10540 06
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MSC-18272 B78-10585 08
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MSC-18162 B78-10533 05
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MSC-16972 B78-10570 07
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ARC-11121 B78-10247 05
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M-FS-23983 B78-10516 04
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M-FS-23883 B78-10521 05
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MSC-16497 B78-10048 04
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Electroplating and stripping copper on molybdenum and niobium
LEWIS-12151 B78-10055 04
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M-FS-19401 B78-10584 08
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Antistatic additive for polyimide films
NPO-14232 B78-10220 04
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Portable spark-gap arc generator
LEWIS-12886 B78-10008 01
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Instrument measures many optical properties in visible and IR
LANGLEY-12285 B78-10489 03
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MSC-18226 B78-10527 05
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MSC-18007 B78-10155 01
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NPO-14247 B78-10531 05
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M-FS-23941 B78-10335 03
ENERGY ABSORPTION FILMS
Selection standard for FEP films for solar energy
MSC-16999 B78-10190 03
Natural-oxide solar-collector coatings
M-FS-23518 B78-10326 03
ENERGY CONSERVATION
Energy conservation, using remote thermal scanning
LEWIS-12812 B78-10178 03
Optics for natural lighting
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LANGLEY-12157 B78-10480 03
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M-FS-23828 B78-10303 01
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Application of solar energy to air-conditioning
M-FS-23913 B78-10215 03
Wind-wheel electric power generator
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Solar-powered hot-water system
NPO-14270 B78-10324 03
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M-FS-25022 B78-10494 03
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M-FS-25071 B78-10496 03
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M-FS-23997 B78-10497 03
Liquid solar collector-performance tests
M-FS-25082 B78-10499 03
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Simpler valve for reciprocating engines
MSC-16239 B78-10276 07
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Flow in axisymmetric ducts with struts
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Self-centering stepped piston
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Portable fluorescent-dye inspection device
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MSC-16239 B78-10276 07

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Real-time instrument averages 100 data sets
LEWIS-13093 B78-10534 06

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Hot-air flat-plate solar collector-design package
M-FS-23941 B78-10335 03

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LEWIS-13077 B78-10423 07

ENVIRONMENT MODELS
Fabrication of sea-floor models
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LEWIS-13077 B78-10423 07

ENVIRONMENT SIMULATORS
Accelerated-weathering test-system for solar cells
NPO-14061 B78-10185 03

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MSC-19486 B78-10560 07

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Automated syringe sampler
LANGLEY-12308 B78-10374 05
Compact turbidity meter
KSC-11063 B78-10545 06

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Universal test fixture for solar cells
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NPO-14061 B78-10185 03
Instrument measures many optical properties in visible and IR
LANGLEY-12285 B78-10489 03
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LANGLEY-12287 B78-10067 05

EPOXY COMPOUNDS
New adhesive withstands temperature extremes
GSFC-12345 B78-10042 04
Effects of moisture on graphite/epoxy composites
MSC-18045 B78-10360 04

EPOXY RESINS
New adhesive withstands temperature extremes
GSFC-12345 B78-10042 04
Match-mold process for foam insulation
MSC-16631 B78-10126 08
Fire-retardant epoxy polymers
ARC-11182 B78-10218 04
Improved epoxy adhesive with radiographic tracer
MSC-18020 B78-10225 04
Response of graphite/epoxy composites to moisture
MSC-16899 B78-10228 04
Vacuum leadthrough for hydrogen maser
NPO-14148 B78-10422 07
Low-cost graphite/epoxy structural panels
M-FS-23871 B78-10427 08

EQUILIBRIUM EQUATIONS
Analysis of linear viscoelastic structures
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Improved electron-beam welder
M-FS-23772 B78-10143 08
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ERROR CORRECTING DEVICES
Verification of redundancy management design
MSC-16713 B78-10145 09
Model for redundant-sensor signal errors
MSC-16715 B78-10146 09
Detecting and correcting bit errors on magnetic tape
NPO-13842 B78-10294 09

ERROR DETECTION CODES
Digital correlator with fewer IC's
MSC-16743 B78-10458 01

ESCAPE SYSTEMS
Emergency escape device
M-FS-23235 B78-10270 07

ESTIMATING
Handbook for estimating fabrication costs
M-FS-23795 B78-10140 08
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NPO-14263 B78-10447 09

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Thin silicon-solar cell fabrication
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Thin silicon-solar cell fabrication
NPO-14047 B78-10325 03

EUTECTIC ALLOYS
High-gradient continuous-casting furnace
LEWIS-12934 B78-10425 08

EVACUATING (VACUUM)
Internal grid for release of brazing retorts
MSC-19472 B78-10114 08

EXHAUST GASES
Modified chemiluminescent NO analyzer accurately measures NOX
LEWIS-12850 B78-10047 04
Oxygen and nitrogen raman spectra
LEWIS-12849 B78-10361 04

EXOTHERMIC REACTIONS
Low-cost high purity production
NPO-14198 B78-10050 04

EXPANDABLE STRUCTURES
Collapsible module extends tenfold in height
NPO-13371 B78-10280 07

EXPLOSIONS
Predicting damage from exploding vessels
LEWIS-13042 B78-10258 06
Simulator for training remote-manipulator operators
MSC-14921 B78-10415 07

EXPOSURE
Improved control of medical x-ray film exposure
NPO-13808 B78-10063 05

EXTENSIONS
Modified pipe extension safely releases chain binders
MSC-16937 B78-10103 07
Extension handle for spray cans
KSC-11083 B78-10576 07

EXTENSOMETERS
Ultrasonic extensometer measures bolt preload
M-FS-19337 B78-10271 07

EXTINGUISHING
Penetrating fire extinguisher
KSC-11064 B78-10397 06

EXTRACTION
Simple tool removes IC flat packs
MSC-16058 B78-10010 01
Drag-pump rotating filter
MSC-16180 B78-10563 07
Compact bypass-flow filter
MSC-18311 B78-10564 07

EYE DISEASES
Intraocular pressure reduction and regulation
LEWIS-12723 B78-10523 05

F

FABRICATION
'PC fabrication' for silicon solar-cell arrays
NPO-13991 B78-10131 08
Handbook for estimating fabrication costs
M-FS-23795 B78-10140 08

FABRICS
Special weave for insulating fabrics
MSC-16380 B78-10288 08

FAILURE ANALYSIS
Curve tracer checks CMOS IC's
GSFC-12209 B78-10007 01
Glass solar collector - materials assessment
M-FS-23926 B78-10212 03

FAILURE MODES
Glass solar collector - materials assessment
M-FS-23926 B78-10212 03
Detecting servo failures with software
FRC-11003 B78-10396 06
FAR FIELDS
Noise calculation on the basis of vortex flow models
LANGLEY-12271 B78-10078 06
FARM CROPS
Predicting crop production from satellite data
GSFC-12379 B78-10595 09
FAST FOURIER TRANSFORMATIONS
Wideband digital spectrum analyzer
NPO-14394 B78-10468 02
FASTENERS
Ultrasonic extensometer measures bolt preload
M-FS-19337 B78-10271 07
High-strength blind rivet
LANGLEY-12154 B78-10287 08
Quick locking/unlocking retainer
MSC-18048 B78-10408 07
Antibackoff lock for nuts and bolts
MSC-16472 B78-10409 07
Fastener for thin fragile materials
MSC-18097 B78-10436 08
Fastener for thermal insulation blankets
MSC-18253 B78-10571 07
Combined hinge and latch
MSC-19602 B78-10572 07
Bend-absorbing clamp
MSC-16971 B78-10575 07
FATIGUE (MATERIALS)
Gear-tooth fatigue-strength estimates
MSC-18167 B78-10573 07
FEED SYSTEMS
Low partial discharge vacuum feedthrough
GSFC-12347 B78-10559 07
FEEDBACK
Noncontact measurement of angular deflection
LANGLEY-12178 B78-10071 06
FEEDBACK CIRCUITS
Thermal compensator for helium refrigerators
GSFC-12168 B78-10082 06
Symmetric voltage-controlled variable resistance
MSC-16685 B78-10148 01
FEEDBACK CONTROL
Improved servocontrol system
M-FS-19358 B78-10150 01
Automatic load sharing in inverter modules
NPO-14056 B78-10302 01
Z-axis control loop for cathode-ray tubes
NPO-13775 B78-10305 01
Shaft speed control
NPO-14170 B78-10416 07
Improved servo for a michaelson interferometer
NPO-14093 B78-10488 03
FEEDERS
Automatic primate feeder
LANGLEY-11586 B78-10246 05
FELTS
Coated-felt thermal insulation
MSC-12737 B78-10510 04
FERRITES
Temperature stabilization of microwave ferrite devices
MSC-16833 B78-10152 01
FERROELECTRICITY
One-third selection for matrix-addressing ferroelectrics
LANGLEY-11993 B78-10456 01
FIBER OPTICS
Signal-interleaving device
GSFC-12111 B78-10319 03
FIBER ORIENTATION
Friction of thick laminates
LANGLEY-12010 B78-10284 08
FIBERS
Installing fiber insulation in tight spaces
MSC-16934 B78-10289 08
Ultrafine PBI fibers and yarns
ARC-11221 B78-10504 04
Contouring pile-brush seals
MSC-16231 B78-10588 08
FIELD EFFECT TRANSISTORS
Symmetric voltage-controlled variable resistance
MSC-16685 B78-10148 01
FILLERS
Fire-and smoke-retardant polyesters and elastomers
NPO-14053 B78-10058 04
Fire-resistant wood composites
ARC-11174 B78-10508 04
FILLING
Topping pressure for gas-storage cylinders
MSC-18186 B78-10542 06
FILM THICKNESS
Applying uniform adhesive coatings
MSC-19462 B78-10583 08
FINANCIAL MANAGEMENT
Handbook for estimating fabrication costs
M-FS-23795 B78-10140 08
Price and cost estimation
M-FS-23812 B78-10599 09
FINISHES
Repairing silicon carbide coatings
MSC-18033 B78-10226 04
FINITE ELEMENT METHOD
Structural performance analysis and redesign
LANGLEY-12213 B78-10264 06
Convectively cooled structures
LANGLEY-12347 B78-10404 06
Analysis of cracked orthotropic sheets
LANGLEY-12288 B78-10405 06
Plotting max/min data envelopes
MSC-18016 B78-10597 09
FIRE DAMAGE
Fire-retardant covering for small containers
ARC-11104 B78-10354 04
FIRE EXTINGUISHERS
Penetrating fire extinguisher
KSC-11064 B78-10397 06
FIRE PREVENTION
Fire-retardant foams
MSC-16222 B78-10053 04
Infrared-enhanced TV for fire detection
M-FS-19380 B78-10172 03
Fire-retardant covering for small containers
ARC-11104 B78-10354 04
Fire-retardant lightweight composite
ARC-10918 B78-10355 04
Heat resistant nontoxic laminate
ARC-11040 B78-10356 04
Toxic substances handbook
LEWIS-13124 B78-10359 04
Directory of fire research specialists
LEWIS-13123 B78-10399 06
Fire-resistant wood composites
ARC-11174 B78-10508 04
FIREPROOFING
Fire-retardant foams
MSC-16222 B78-10053 04
Match-mold process for foam insulation
MSC-16631 B78-10126 08
Fire-retardant covering for small containers
ARC-11104 B78-10354 04
Fire-retardant lightweight composite
ARC-10918 B78-10355 04
FIRST AID
Toxic substances handbook
LEWIS-13124 B78-10359 04
Directory of fire research specialists
LEWIS-13123 B78-10399 06
FITTING
Reducing weld peaking in aluminum
M-FS-23973 B78-10433 08
'Blind' position indicator
MSC-16972 B78-10570 07
FITTINGS
Compact pressure-line coupling
MSC-16893 B78-10099 07
Fastener for thin fragile materials
MSC-18097 B78-10436 08
Easily installed insulation for steamfittings
MSC-18277 B78-10589 08
FIXTURES
Welding fixture for thin metal parts
GSFC-12318 B78-10428 08
Holding fixture for variable-contour parts
MSC-16270 B78-10429 08
'Gentle' holder for brittle ceramics
MSC-19645 B78-10552 06
Wrench for thin-walled cylinders
LANGLEY-12286 B78-10579 07
FLAME PROPAGATION
Fire-resistant wood composites
ARC-11174 B78-10508 04
FLAME RETARDANTS
Flame-retardant adhesive tape
MSC-16721 B78-10041 04
Fire-retardant foams
MSC-16222 B78-10053 04
Fire-and smoke-retardant polyesters and elastomers
NPO-14053 B78-10058 04
Improved imide polymerization catalyst
ARC-11107 B78-10517 04
FLAMMABILITY
Compression testing of flammable liquids
MSC-16121 B78-10548 06
FLAMMABLE GASES
Cryostat safety tent
GSFC-12206 B78-10080 06
FLAT PLATES
Flat-plate heat pipe
GSFC-11998 B78-10035 03
Process fabricates flat panels at high temperatures
MSC-16969 B78-10116 08
Flat-plate liquid solar collector
M-FS-23912 B78-10205 03
FLATNESS
Process fabricates flat panels at high temperatures
MSC-16969 B78-10116 08
FLEXIBILITY
Stability characteristics of elastic airplane
ARC-11144 B78-10092 06

Lines, bellows, flexible hoses, and filters
LEWIS-13077 B78-10424 07

FLEXING
Artificial leg with natural gait
M-FS-23225 B78-10239 05

FLIP-FLOPS
Synchronous transfer circuits for redundant systems
NPO-14162 B78-10157 01
Signal-interleaving device
GSFC-12111 B78-10319 03

FLOW DISTRIBUTION
Noise calculation on the basis of vortex flow models
LANGLEY-12271 B78-10078 06
Hydraulic dynamic analysis
MSC-16795 B78-10095 06
Detection of boundary-layer transitions in wind tunnels
LANGLEY-12261 B78-10255 06
Internal and external 2-d boundary layer flows
LEWIS-13009 B78-10260 06

FLOW MEASUREMENT
In vivo blood-flow mapping
NPO-14133 B78-10244 05
Meter for very slow flows
MSC-18112 B78-10267 07
Aircraft trailing vortex hazard alleviators
LANGLEY-12034 B78-10272 07
'Pseudobackscatter' laser velocimeter
ARC-10970 B78-10318 03
Orifice calibration module
LANGLEY-12269 B78-10393 06
Static-pressure probe for small geometries
LANGLEY-11552 B78-10395 06
Miniature velocimeter
LANGLEY-12281 B78-10539 06

FLOW REGULATORS
Precision fluid-pressure regulator
NPO-13370 B78-10106 07
Meter for very slow flows
MSC-18112 B78-10267 07
Flow-compensating pressure regulator
LEWIS-12718 B78-10522 05
Automatic bypass valve
LANGLEY-12063 B78-10558 07
Adjustable gas-flow restrictor
MSC-19486 B78-10560 07

FLOW VELOCITY
Flow velocities and streamlines
LEWIS-12966 B78-10094 06
Pneumatic servomechanisms
M-FS-23295 B78-10144 08
Flow-compensating pressure regulator
LEWIS-12718 B78-10522 05

FLOW VISUALIZATION
Detection of boundary-layer transitions in wind tunnels
LANGLEY-12261 B78-10255 06

FLOWMETERS
Meter for very slow flows
MSC-18112 B78-10267 07

FLUID DYNAMICS
Convectively cooled structures
LANGLEY-12347 B78-10404 06
Graphics program for charts
LEWIS-12811 B78-10598 09

FLUID FILTERS
Lines, bellows, flexible hoses, and filters
LEWIS-13077 B78-10424 07
Drag-pump rotating filter
MSC-16180 B78-10563 07
Compact bypass-flow filter
MSC-18311 B78-10564 07

FLUID FLOW
Precision fluid-pressure regulator
NPO-13370 B78-10106 07
Thermal hydraulic analyzer
MSC-18014 B78-10265 06
Meter for very slow flows
MSC-18112 B78-10267 07
Static-pressure probe for small geometries
LANGLEY-11552 B78-10395 06
Plotting shear-flow forces
MSC-18013 B78-10445 09
Adjustable gas-flow restrictor
MSC-19486 B78-10560 07

FLUID MECHANICS
Thermal hydraulic analyzer
MSC-18014 B78-10265 06

FLUID SWITCHING ELEMENTS
Magnetostrictive valve
NPO-14235 B78-10104 07
Fluidic-oscillator gas analyzer
KSC-11014 B78-10253 06

FLUID TRANSMISSION LINES
Gentle support stands for fluid-line mockups
MSC-16479 B78-10291 08
Lines, bellows, flexible hoses, and filters
LEWIS-13077 B78-10424 07
Refrigerant leak detector
MSC-18214 B78-10551 06
Transmitting rotary motion at an angle
MSC-19483 B78-10561 07

FLUIDIC CIRCUITS
Fluidic-oscillator gas analyzer
KSC-11014 B78-10253 06

FLUIDIZED BED PROCESSORS
Model of silicon production in a fluidized-bed reactor
NPO-14404 B78-10520 04

FLUORESCENCE
Fluorescent paint simplifies laser-beam alinement
LEWIS-12571 B78-10030 03
Custom blending of lamp phosphors
MSC-16692 B78-10056 04
Fluorescent microspheres
NPO-13946 B78-10068 05
Portable fluorescent-dye inspection device
M-FS-24019 B78-10139 08

FLUORINE
Wide-temperature corrosion-resistant pressure regulator
NPO-13776 B78-10274 07

FLUOROCARBONS
Fast-drying coating
MSC-16056 B78-10060 04

FOAMS
Fire-retardant foams
MSC-16222 B78-10053 04
Void-free foam insulation
MSC-16805 B78-10127 08
High-rise foam-in-place process
MSC-16931 B78-10128 08
Fire-retardant lightweight composite
ARC-10918 B78-10355 04
Improved imide polymerization catalyst
ARC-11107 B78-10517 04

FOCUSING
Zone-refining encapsulated semiconductors
M-FS-23902 B78-10351 04
Diffractoid x-ray focusing
GSFC-12357 B78-10487 03

FOLDING STRUCTURES
Collapsible module extends tenfold in height
NPO-13371 B78-10280 07

FORCE DISTRIBUTION
Plotting shear-flow forces
MSC-18013 B78-10445 09
Gear-tooth fatigue-strength estimates
MSC-18167 B78-10573 07

FORECASTING
Predicting surface heat flux
MSC-16095 B78-10090 06

FOSSIL FUELS
Energy conversion alternatives study
LEWIS-13096 B78-10330 03
Coal desulfurization with iron pentacarbonyl
NPO-14272 B78-10342 04

FOURIER ANALYSIS
Improved fourier interference spectrometer
NPO-14025 B78-10485 03

FRACTURE STRENGTH
Partial interlaminar separation for composites
LANGLEY-12065 B78-10052 04

FRAGMENTATION
Predicting damage from exploding vessels
LEWIS-13042 B78-10258 06

FRAMES
Calculation of planar-truss modal frequencies
LANGLEY-12137 B78-10382 06
Rigid 'Sling' for topheavy loads
GSFC-12359 B78-10574 07

FREEZING
Controlled freezing of biological samples
GSFC-12173 B78-10065 05

FREON
Refrigerant leak detector
MSC-18214 B78-10551 06

FREQUENCY ANALYZERS
Hybrid random-sound test-control system
NPO-13900 B78-10025 02
Wideband digital spectrum analyzer
NPO-14394 B78-10468 02

FREQUENCY CONVERTERS
More efficient microwave-power transmission
NPO-13885 B78-10466 02

FREQUENCY DISTRIBUTION
Improved fourier interference spectrometer
NPO-14025 B78-10485 03

FREQUENCY DIVIDERS
Data reformatting with less hardware
NPO-13676 B78-10470 02

FREQUENCY MEASUREMENT
Pseudo-continuous-wave acoustic instrument
LANGLEY-12260 B78-10248 06

FREQUENCY MODULATION
Determining the response of an FM receiver
MSC-16751 B78-10465 02

FREQUENCY MULTIPLIERS
Digital phase shifter synchronizes local oscillators
MSC-16695 B78-10011 01

FREQUENCY SHIFT KEYING
Implementing OQASK by using MSK
NPO-13896 B78-10309 01

FREQUENCY STABILITY
Multichannel VCO needs only one reference
MSC-18225 B78-10448 01
FREQUENCY STANDARDS
Hydrogen-maser frequency standard
GSFC-12334 B78-10490 03
FREQUENCY SYNCHRONIZATION
Digital phase shifter synchronizes local oscillators
MSC-16695 B78-10011 01
FRICTION DRAG
Tumbling-vehicle entry heating
M-FS-23712 B78-10555 06
FRICTION REDUCTION
Dynamics of gas-thrust bearings
LEWIS-12754 B78-10097 06
Gas-path seal material
LEWIS-12623 B78-10347 04
Coating for hot sliding seals
MSC-16529 B78-10562 07
FUEL CELLS
Energy conversion alternatives study
LEWIS-13096 B78-10330 03
FUEL CONSUMPTION
Aerodynamic design lowers truck fuel consumption
FRC-11015 B78-10069 06
Boosting the power of two-stage engines
NPO-14057 B78-10105 07
FUEL CONTROL
Electric and hybrid vehicles
LEWIS-13077 B78-10423 07
FUEL VALVES
Simpler valve for reciprocating engines
MSC-16239 B78-10276 07
Low-leakage low-temperature valve
MSC-18087 B78-10420 07
FUELS
Coal liquefaction to increase jet fuel production
LANGLEY-12038 B78-10343 04
Low-temperature elastomer production and curing
NPO-13899 B78-10346 04
Predicting structures of cross-linked condensation polymers
NPO-14007 B78-10352 04
FUNCTION GENERATORS
Three-function signal generator
MSC-16672 B78-10306 01
FURNACES
Slurry-powder sintering furnace
LANGLEY-11423 B78-10293 08
Temperature-gradient oven
M-FS-23919 B78-10390 06
High-gradient continuous-casting furnace
LEWIS-12934 B78-10425 08
FUSION (MELTING)
Improved thermal-tile barrier
MSC-16929 B78-10133 08
FUSION WELDING
Improved electron-beam welder
M-FS-23772 B78-10143 08

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GALLIUM ARSENIDE LASERS
Protective coating for laser diodes
LANGLEY-11746 B78-10171 03
GALLIUM ARSENIDES
More efficient GaAs solar cells
LANGLEY-12216 B78-10479 03
GALVANOMETERS
Noncontact measurement of angular deflection
LANGLEY-12178 B78-10071 06
GANTRY CRANES
Rigid 'Sling' for topheavy loads
GSFC-12359 B78-10574 07
GARMENTS
Automated controller for liquid-cooled garments
MSC-18055 B78-10365 05
GAS ANALYSIS
Simple air-piston gas-sampling system
LEWIS-12922 B78-10110 07
Improved 'spectrophone'
NPO-14143 B78-10167 03
Mass spectrometer calibration standard
NPO-14097 B78-10249 06
Free-air content in fluid systems
MSC-16703 B78-10251 06
Fluidic-oscillator gas analyzer
KSC-11014 B78-10253 06
Device for pitching off metal tubes
GSFC-12274 B78-10410 07
Porous bead packings for gas chromatography
ARC-11222 B78-10518 04
GAS BEARINGS
Dynamics of gas-thrust bearings
LEWIS-12754 B78-10097 06
Improved gas thrust bearings
LEWIS-12569 B78-10413 07
GAS COMPOSITION
Free-air content in fluid systems
MSC-16703 B78-10251 06
GAS COOLING
Controlled freezing of biological samples
GSFC-12173 B78-10065 05
Thermocouples measure very-hot gas temperatures
LEWIS-12843 B78-10076 06
Localized cooling of electronic components
LANGLEY-11955 B78-10569 07
GAS DENSITY
Improved electron-beam probe for hypersonic flows
NPO-13793 B78-10254 06
GAS DETECTORS
Thermal-leak analyzer for vacuum-jacketed lines
MSC-16802 B78-10085 06
Low-background trace-gas detector
NPO-13683 B78-10168 03
Damage-detection system for LNG carriers
LANGLEY-11463 B78-10250 06
Improved electron-beam probe for hypersonic flows
NPO-13793 B78-10254 06
NO2 measurement by chemiluminescence
LANGLEY-11378 B78-10386 06
GAS EVOLUTION
Deaerating high-viscosity silicon rubber
MSC-16694 B78-10514 04
GAS FLOW
Automatic bypass valve
LANGLEY-12063 B78-10558 07
Adjustable gas-flow restrictor
MSC-19486 B78-10560 07
GAS LUBRICANTS
Dynamics of gas-thrust bearings
LEWIS-12754 B78-10097 06
GAS MASERS
Vacuum leadthrough for hydrogen maser
NPO-14148 B78-10422 07
Hydrogen-maser frequency standard
GSFC-12334 B78-10490 03
GAS PIPES
Thermal-leak analyzer for vacuum-jacketed lines
MSC-16802 B78-10085 06
GAS PRESSURE
Vacuum control for brazing stainless steel
MSC-19457 B78-10115 08
High-temperature microphone system
LANGLEY-12375 B78-10384 06
Topping pressure for gas-storage cylinders
MSC-18186 B78-10542 06
GAS TEMPERATURE
High-temperature microphone system
LANGLEY-12375 B78-10384 06
Standardized gas-temperature probes
LEWIS-13059 B78-10392 06
GAS VALVES
Magnetostrictive valve
NPO-14235 B78-10104 07
Low-leakage low-temperature valve
MSC-18087 B78-10420 07
GASES
Embrittlement proof nickel-alloy bellows
M-FS-19331 B78-10349 04
Oxygen and nitrogen raman spectra
LEWIS-12849 B78-10361 04
Graphics program for charts
LEWIS-12811 B78-10598 09
GASKETS
High-pressure cryogenic cylinder seal
M-FS-19335 B78-10421 07
Ceramic-to-metal vacuum seal
NPO-13803 B78-10437 08
Metallic thermal seal
MSC-18135 B78-10566 07
GASOLINE
Coal liquefaction to increase jet fuel production
LANGLEY-12038 B78-10343 04
GASTROINTESTINAL SYSTEM
Antihistamines reduce ulceration produced by indomethacin
ARC-11118 B78-10366 05
GATES (CIRCUITS)
Gate-assisted turn-off thyristor
LEWIS-12535 B78-10004 01
GEAR TEETH
Gear-tooth fatigue-strength estimates
MSC-18167 B78-10573 07
GEARS
Shaft speed control
NPO-14170 B78-10416 07
Elastic deformation of ball bearings, gears, and cams
LEWIS-13076 B78-10544 06
Gear-tooth fatigue-strength estimates
MSC-18167 B78-10573 07
GELS
Predicting structures of cross-linked condensation polymers
NPO-14007 B78-10352 04
GEOCENTRIC COORDINATES
Solar-electric geocentric transfer
LEWIS-12939 B78-10403 06
GEOLOGY
Mounting procedure for geological samples
MSC-18206 B78-10327 03

GLASS
Pressure-sensitive glass reaction cell
LANGLEY-11256 B78-10223 04
Vacuum leadthrough for hydrogen maser
NPO-14148 B78-10422 07
GLASS COATINGS
Boron triflouride coatings for plastics
ARC-11057 B78-10043 04
Protective coating for laser diodes
LANGLEY-11746 B78-10171 03
GLASS FIBER REINFORCED PLASTICS
Heat resistant nontoxic laminate
ARC-11040 B78-10356 04
GLASS FIBERS
Contouring pile-brush seals
MSC-16231 B78-10588 08
GLAUCOMA
Intraocular pressure reduction and regulation
LEWIS-12723 B78-10523 05
GLOW DISCHARGES
Boron triflouride coatings for plastics
ARC-11057 B78-10043 04
Abrasion-resistant antireflective coating for polycarbonate
ARC-11047 B78-10054 04
GLYCOLS
Measuring metallic concentrations in glycol solutions
M-FS-23894 B78-10211 03
GOLD ALLOYS
Compatibility of Au-Cu-Ni braze alloy with NH3
MSC-16864 B78-10219 04
GOLD COATINGS
Eliminating gold migration in microcircuits
MSC-18213 B78-10462 01
GONIOMETERS
Instrument measures many optical properties in visible and IR
LANGLEY-12285 B78-10489 03
GRANULAR MATERIALS
Wrought nickel-base superalloy
LEWIS-12844 B78-10045 04
Mounting procedure for geological samples
MSC-18206 B78-10327 03
GRAPHITE
Response of graphite/epoxy composites to moisture
MSC-16899 B78-10228 04
Low-cost graphite/epoxy structural panels
M-FS-23871 B78-10427 08
Ion-beam-textored graphite
LEWIS-12724 B78-10506 04
GRAPHS (CHARTS)
Graphics program for charts
LEWIS-12811 B78-10598 09
GROUP VELOCITY
Direct-reading group-delay measurement
NPO-13909 B78-10156 01
GUNN DIODES
Multichannel VCO needs only one reference
MSC-18225 B78-10448 01
GYROSCOPES
Optical gyroscope
NPO-14258 B78-10176 03

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HALL EFFECT
Hall devices improve electric motor efficiency
M-FS-23828 B78-10303 01
Noncontacting valve-position indicator
MSC-16048 B78-10412 07
HANDBOOKS
Toxic substances handbook
LEWIS-13124 B78-10359 04
HANDLES
Modified pipe extension safely releases chain binders
MSC-16937 B78-10103 07
Ladle for pouring hot melt
MSC-16974 B78-10137 08
Compact ratchet wrench
M-FS-24252 B78-10273 07
Extension handle for spray cans
KSC-11083 B78-10576 07
HARDNESS
Scratch resistant plastic lenses
ARC-11039 B78-10519 04
HARDWARE
Holding fixture for variable-contour parts
MSC-16270 B78-10429 08
HARNESSES
Spring control of wire harness loops
MSC-18246 B78-10411 07
HAZARDS
Predicting damage from exploding vessels
LEWIS-13042 B78-10258 06
Simulator for training remote-manipulator operators
MSC-14921 B78-10415 07
HEARING
Implantable digital hearing aid
KSC-11009 B78-10373 05
HEART
Improved myocardium transducer
NPO-14107 B78-10372 05
HEART DISEASES
Noncontacting electrokinetography system
MSC-18162 B78-10533 05
HEART FUNCTION
Hand-held vital-signals monitor
MSC-18232 B78-10524 05
Hybrid ECG signal conditioner
MSC-18230 B78-10526 05
HEART RATE
Microprocessor-based cardiopulmonary monitor
MSC-18235 B78-10369 05
Hybrid heart/breath-rate processor
MSC-18227 B78-10528 05
HEAT BALANCE
Thermal compensator for helium refrigerators
GSFC-12168 B78-10082 06
HEAT EXCHANGERS
Passive heat exchanger for solar heating
M-FS-23914 B78-10197 03
Protective coating for copper in aluminum heat exchangers
M-FS-19334 B78-10286 08
HEAT FLUX
Predicting surface heat flux
MSC-16095 B78-10090 06
Estiuating regional heat flux from scanning radiometer data
LANGLEY-12158 B78-10329 03
HEAT PIPES
Flat-plate heat pipe
GSFC-11998 B78-10035 03
Modular heat-pipe-radiator panel
MSC-16625 B78-10328 03
Improved heat-pipe wick
NPO-13391 B78-10381 06
HEAT PUMPS
Practical and efficient magnetic heat pump
LEWIS-12508 B78-10170 03
HEAT RADIATORS
Flat-plate heat pipe
GSFC-11998 B78-10035 03
Inspection of adhesive-bonded radiators
MSC-18062 B78-10125 08
Modular heat-pipe-radiator panel
MSC-16625 B78-10328 03
Breather cloth for vacuum curing
MSC-18063 B78-10440 08
HEAT RESISTANT ALLOYS
Wrought nickel-base superalloy
LEWIS-12844 B78-10045 04
A sharp knife for high temperatures
MSC-16932 B78-10278 07
HEAT SHIELDING
Coated-felt thermal insulation
MSC-12737 B78-10510 04
Metallic thermal seal
MSC-18135 B78-10566 07
Contouring pile-brush seals
MSC-16231 B78-10588 08
HEAT SOURCES
Glass tubes for protecting solar cells
NPO-14200 B78-10031 03
HEAT STORAGE
Glass tubes for protecting solar cells
NPO-14200 B78-10031 03
HEAT TRANSFER
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'Pseudobackscatter' laser velocimeter
ARC-10970 B78-10318 03
Miniature velocimeter
LANGLEY-12281 B78-10539 06
LASER HEATING
Thermal compensator for helium refrigerators
GSFC-12168 B78-10082 06
Laser wire stripping
MSC-18000 B78-10118 08
LASER OUTPUTS
Laser beam color separator
LANGLEY-11806 B78-10174 03
LASER RANGE FINDERS
Self-navigating robot
NPO-14190 B78-10026 02
LASERS
Housing protects laser in vacuum
GSFC-12241 B78-10028 03
Common-cavity pumped laser
GSFC-12237 B78-10320 03
Vacuum-ultraviolet laser uses superfluid helium
NPO-13993 B78-10323 03

Low-power tuner for lasers
M-FS-23863 B78-10486 03

LATCHES
Dual-action expanded-latch mechanism
M-FS-23557 B78-10277 07
Coupler for moving vehicles
GSFC-12322 B78-10407 07
Combined hinge and latch
MSC-19602 B78-10572 07

LATEX
Fast-drying coating
MSC-16056 B78-10060 04
Chemical agent boosts natural-rubber output
NPO-14185 B78-10358 04

LEAKAGE
Rapid leak detection with liquid crystals
MSC-13804 B78-10084 06
Thermal-leak analyzer for vacuum-jacketed lines
MSC-16802 B78-10085 06
Self-centering stepped piston
LEWIS-12997 B78-10101 07
Damage-detection system for LNG carriers
LANGLEY-11463 B78-10250 06

LEARNING MACHINES
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NPO-14190 B78-10026 02

LEAST SQUARES METHOD
A parameter-estimation subroutine package
NPO-14263 B78-10447 09

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Noncontact measurement of angular deflection
LANGLEY-12178 B78-10071 06
Cosine-corrected optical diffuser
NPO-14288 B78-10322 03
Scratch resistant plastic lenses
ARC-11039 B78-10519 04

LEUKEMIAS
Body/bone-marrow differential-temperature sensor
NPO-14121 B78-10066 05

LIFE SUPPORT SYSTEMS
Economical synthesis of potassium superoxide
ARC-10992 B78-10353 04

LIFT
Wing aerodynamics under blowing jets
LANGLEY-12256 B78-10401 06

LIGHT AIRCRAFT
WAKE and WASH
LANGLEY-12262 B78-10093 06

LIGHT BEAMS
Fluorescent paint simplifies laser-beam alinement
LEWIS-12571 B78-10030 03
Noncontact optical communication between moving stations
LANGLEY-12283 B78-10377 06

LIGHT EMITTING DIODES
Protective coating for laser diodes
LANGLEY-11746 B78-10171 03

LIGHT MODULATION
Modulation improves electro-optic object detector
M-FS-23776 B78-10380 06

LIGHT SOURCES
Noncontact measurement of angular deflection
LANGLEY-12178 B78-10071 06
Portable fluorescent-dye inspection device
M-FS-24019 B78-10139 08
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GSFC-12237 B78-10320 03

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Improved optical filter
GSFC-12225 B78-10027 03
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LANGLEY-12333 B78-10189 03
Signal-interleaving device
GSFC-12111 B78-10319 03
Compact turbidity meter
KSC-11063 B78-10545 06

LIGHTING EQUIPMENT
Custom blending of lamp phosphors
MSC-16692 B78-10056 04

LIMITER CIRCUITS
Overload protection system
NPO-13872 B78-10460 01

LINEAR PROGRAMMING
Performance optimizing
LANGLEY-11930 B78-10096 06

LINEAR SYSTEMS
Algorithms for linear-systems control
LANGLEY-12313 B78-10443 09

LINING PROCESSES
Installing fiber insulation in tight spaces
MSC-16934 B78-10289 08

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Dual-action expanded-latch mechanism
M-FS-23557 B78-10277 07
Coupler for moving vehicles
GSFC-12322 B78-10407 07

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Compatibility of Au-Cu-Ni braze alloy with NH3
MSC-16864 B78-10219 04

LIQUID COOLING
Automated controller for liquid-cooled garments
MSC-18055 B78-10365 05

LIQUID CRYSTALS
Hybrid LCD driver
MSC-18229 B78-10529 05

LIQUID HELIUM
Vacuum-ultraviolet laser uses superfluid helium
NPO-13993 B78-10323 03

LIQUID INJECTION
High-rise foam-in-place process
MSC-16931 B78-10128 08

LIQUID METALS
Ladle for pouring hot melt
MSC-16974 B78-10137 08
Interactive data-processing system for metallurgy
M-FS-23774 B78-10217 04

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Directory of fire research specialists
LEWIS-13123 B78-10399 06

LITHIUM CHLORIDES
Chemical measurement of urine volume
MSC-16585 B78-10238 05

LOAD DISTRIBUTION (FORCES)
Plotting max/min data envelopes
MSC-18016 B78-10597 09

LOAD TESTS
'Gentle' holder for brittle ceramics
MSC-19645 B78-10552 06

LOADS (FORCES)
Combination force and angular-deflection indicator
MSC-16155 B78-10070 06
Resizing algorithm for loaded structures
LANGLEY-12064 B78-10594 09

LOCKING
Quick locking/unlocking retainer
MSC-18048 B78-10408 07
Antibackoff lock for nuts and bolts
MSC-16472 B78-10409 07

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MSC-19602 B78-10572 07

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CMOS bulk-metal design handbook
M-FS-23856 B78-10142 08
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NPO-13837 B78-10153 01
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GSFC-12111 B78-10319 03

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CMOS bulk-metal design handbook
M-FS-23856 B78-10142 08
CMOS-array design-automation techniques
M-FS-23762 B78-10311 01
Representation of multivalued logic functions
NPO-13760 B78-10596 09

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Low-cost ultrasonic lamb-wave transducer
MSC-16333 B78-10072 06

LOW DENSITY MATERIALS
Match-mold process for foam insulation
MSC-16631 B78-10126 08

LOW FREQUENCIES
Airframe design for reducing cabin noise
LANGLEY-12097 B78-10257 06

LOW TEMPERATURE
Practical and efficient magnetic heat pump
LEWIS-12508 B78-10170 03

LOW TEMPERATURE BRAZING
Compatibility of Au-Cu-Ni braze alloy with NH3
MSC-16864 B78-10219 04

LOW TEMPERATURE TESTS
Bonding Kovar pins to an alumina substrate
MSC-16828 B78-10130 08
Mechanical properties of 18-2 Mn stainless steel
M-FS-23843 B78-10229 04
Nitronic 60: a new alloy
M-FS-23844 B78-10230 04
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MSC-18192 B78-10484 03

LUBRICATION
Dynamics of gas-thrust bearings
LEWIS-12754 B78-10097 06

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A probe for blood-vessel and spinal interiors
NPO-14132 B78-10242 05

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Mounting procedure for geological samples
MSC-18206 B78-10327 03

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MACH NUMBER
Shock-swallowing air sensor
FRC-10107 B78-10537 06

MACHINING
Holding fixture for variable-contour parts
MSC-16270 B78-10429 08
Processing high-strength steel alloys
MSC-16172 B78-10441 08

MAGNETIC CIRCUITS
Bonding core mating surfaces improves transformer
NPO-13855 B78-10283 08
MAGNETIC CORES
Improved transformer-winding method
NPO-14243 B78-10282 08
Bonding core mating surfaces improves transformer
NPO-13855 B78-10283 08
MAGNETIC FILMS
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M-FS-23773 B78-10059 04
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Two-position wax-motor rotary actuator
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More efficient microwave-power transmission
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Portable fluorescent-dye inspection device
M-FS-24019 B78-10139 08
MAINTENANCE
Improved epoxy adhesive with radiographic tracer
MSC-18020 B78-10225 04
Repairing silicon carbide coatings
MSC-18033 B78-10226 04
Problems encountered in solar heating and cooling systems
M-FS-23974 B78-10331 03
Repairing pin-fin cold plates
MSC-16424 B78-10431 08
Spares-optimized model
MSC-18015 B78-10446 09
Splicing shielded cables
MSC-18297 B78-10453 01
Concentrating solar collector-installation package
M-FS-25068 B78-10500 03
Localized cooling of electronic components
LANGLEY-11955 B78-10569 07
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MSC-16872 B78-10593 09
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NPO-14190 B78-10026 02
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NPO-13469 B78-10600 09
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M-FS-23812 B78-10599 09
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LANGLEY-12380 B78-10341 03
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MSC-18238 B78-10601 09
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NPO-14252 B78-10379 06
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GSFC-12334 B78-10490 03
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Simplified tooling for spray masking
MSC-16927 B78-10136 08
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GSFC-12359 B78-10574 07
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NPO-14097 B78-10249 06
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Precise matching of diodes
NPO-14293 B78-10452 01
MATERIAL ABSORPTION
Low-background trace-gas detector
NPO-13683 B78-10168 03
MATERIALS
A solid-state phase-insensitive ultrasonic transducer
LANGLEY-12304 B78-10385 06
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NPO-14237 B78-10064 05
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LANGLEY-12267 B78-10111 07
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GSFC-12359 B78-10574 07
MATHEMATICAL LOGIC
Representation of multivalued logic functions
NPO-13760 B78-10596 09
MATHEMATICAL MODELS
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MSC-16795 B78-10095 06
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MSC-16904 B78-10281 07
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NPO-14211 B78-10442 09
Algorithms for linear-systems control
LANGLEY-12313 B78-10443 09
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NPO-14263 B78-10447 09
MEASUREMENT
Long-lasting solid-polymer electrolytic hygrometer
NPO-13948 B78-10086 06
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Measuring surface displacements optically
M-FS-23861 B78-10321 03
Sweat collection capsule
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Measuring poisson's ratio in elastomers
M-FS-23878 B78-10387 06
Instrument measures many optical properties in visible and IR
LANGLEY-12285 B78-10489 03
Measurement of subcoat thickness by characteristic x-rays
MSC-16718 B78-10505 04
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KSC-11063 B78-10545 06
Automated inspection of wire-frame assemblies
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Simple tool removes IC flat packs
MSC-16058 B78-10010 01
Computer interface for mechanical arm
M-FS-23849 B78-10015 02
Compact ratchet wrench
M-FS-24252 B78-10273 07
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MSC-16472 B78-10409 07
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MSC-16270 B78-10429 08
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MSC-18171 B78-10577 07
Wrench for thin-walled cylinders
LANGLEY-12286 B78-10579 07
MECHANICAL DRIVES
Design of transmission shafting
LEWIS-12965 B78-10107 07
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MSC-19546 B78-10108 07
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M-FS-23557 B78-10277 07
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GSFC-12521 B78-10557 07
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GSFC-12276 B78-10567 07
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MSC-19450 B78-10568 07
Gear-tooth fatigue-strength estimates
MSC-18167 B78-10573 07
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Quick-and-easy shear-load testing
MSC-16765 B78-10073 06
MECHANICAL PROPERTIES
Brazed boron-silicon carbide/aluminum structural panels
LANGLEY-12244 B78-10221 04
Response of graphite/epoxy composites to moisture
MSC-16899 B78-10228 04
Mechanical properties of 18-2 Mn stainless steel
M-FS-23843 B78-10229 04
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M-FS-23844 B78-10230 04
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ARC-10966 B78-10231 04
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MSC-18014 B78-10265 06
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M-FS-23878 B78-10387 06
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NPO-13226 B78-10543 06
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Shock during PIND test frees particles
M-FS-23829 B78-10389 06
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Wideband EMG telemetry system
ARC-11209 B78-10375 05
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MSC-18232 B78-10524 05
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MSC-18231 B78-10525 05
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MSC-18230 B78-10526 05
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MSC-18228 B78-10530 05
Noncontacting electrokinetography system
MSC-18162 B78-10533 05
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Improvements in microelectrophoresis apparatus
ARC-11121 B78-10247 05
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ARC-11031 B78-10367 05
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MSC-18226 B78-10527 05
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MSC-18227 B78-10528 05
Improved probe for rectal-cancer detection
NPO-14247 B78-10531 05
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Toxic substances handbook
LEWIS-13124 B78-10359 04
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GSFC-12078 B78-10376 05
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MSC-16974 B78-10137 08
MELTING POINTS
Thermocouples measure very-hot gas temperatures
LEWIS-12843 B78-10076 06
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NPO-14101 B78-10241 05
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MSC-18172 B78-10513 04
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MSC-16692 B78-10056 04
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MSC-19472 B78-10114 08
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ARC-11031 B78-10367 05
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Process fabricates flat panels at high temperatures
MSC-16969 B78-10116 08
Two braze alloys for thin-wall components
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NPO-14357 B78-10591 08
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NPO-14088 B78-10001 01
Measuring oxide trapping parameters in MOS structure
NPO-14120 B78-10002 01
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M-FS-23788 B78-10158 01
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M-FS-23762 B78-10311 01
All-ion-implantation process for integrated circuits
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LEWIS-12842 B78-10075 06
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ARC-11195 B78-10161 02
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NPO-13391 B78-10381 06
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Improved double-pass michelson interferometer
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NPO-14025 B78-10485 03
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NPO-14093 B78-10488 03
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NPO-14192 B78-10222 04
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LANGLEY-12172 B78-10019 02
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MSC-16367 B78-10109 07
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MSC-16060 B78-10292 08
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LANGLEY-12375 B78-10384 06
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NPO-13913 B78-10364 05
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Mounting procedure for geological samples
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NPO-13884 B78-10471 02
Compact antenna has symmetrical radiation pattern
ARC-11189 B78-10473 02
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S-Band complex-weight module for adaptive processing
LANGLEY-12197 B78-10005 01
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Coaxial isolator has versatile interface
MSC-16908 B78-10009 01
Temperature stabilization of microwave ferrite devices
MSC-16833 B78-10152 01
Direct-reading group-delay measurement
NPO-13909 B78-10156 01
Arc detector uses fiber optics
NPO-13377 B78-10449 01
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MSC-18313 B78-10450 01
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NPO-13885 B78-10466 02
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NPO-13552 B78-10472 02
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NPO-13377 B78-10449 01
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M-FS-23725 B78-10344 04
Coal mining with a liquid solvent
NPO-14028 B78-10345 04
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M-FS-23405 B78-10124 08
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LANGLEY-12333 B78-10189 03
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Pulse-width-modulated attenuator for AGC
NPO-14127 B78-10459 01
MODAL RESPONSE
Calculation of planar-truss modal frequencies
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Noise calculation on the basis of vortex flow models
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M-FS-23295 B78-10144 08
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Collapsible module extends tenfold in height
NPO-13371 B78-10280 07
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LEWIS-13073 B78-10378 06
Orifice calibration module
LANGLEY-12269 B78-10393 06
Improved method of solar-cell assembly
LEWIS-12729 B78-10438 08
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Response of graphite/epoxy composites to moisture
MSC-16899 B78-10228 04
Effects of moisture on graphite/epoxy composites
MSC-18045 B78-10360 04
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MSC-16750 B78-10550 06
Sealing microcircuits with adhesives
M-FS-23869 B78-10592 08
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Dip-molded t-shaped cannula
NPO-14073 B78-10062 05
Void-free foam insulation
MSC-16805 B78-10127 08
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Positively charged membrane for urea dialysis
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Modified chemiluminescent NO analyzer accurately measures NOX
LEWIS-12850 B78-10047 04
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LEWIS-12151 B78-10055 04
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Real-time monitoring of crustal deformations
NPO-14124 B78-10034 03
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NPO-13941 B78-10165 02
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LANGLEY-12074 B78-10297 01
28-Bit serial word simulator/monitor
MSC-16418 B78-10315 02
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NPO-14224 B78-10317 02
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M-FS-23725 B78-10344 04
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ARC-11120 B78-10362 05
Microprocessor-based cardiopulmonary monitor
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NPO-14414 B78-10474 02
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GSFC-12273 B78-10383 06
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M-FS-23828 B78-10303 01
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MSC-18253 B78-10571 07
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Nacelle incremental drag
LEWIS-12786 B78-10400 06
NETWORK ANALYSIS
Telecommunications network optimization
NPO-14486 B78-10476 02
NEUTRON ACTIVATION ANALYSIS
Film adhesive enhances neutron radiographic images
MSC-18061 B78-10081 06
NEUTRON SCATTERING
Film adhesive enhances neutron radiographic images
MSC-18061 B78-10081 06
NEWTON-RAPHSON METHOD
Predicting surface heat flux
MSC-16095 B78-10090 06
Analysis of beam columns
MSC-18009 B78-10402 06
Convectively cooled structures
LANGLEY-12347 B78-10404 06
NICKEL
Compatibility of Au-Cu-Ni braze alloy with NH3
MSC-16864 B78-10219 04

Hydrogen embrittlement of nickel
ARC-10966 B78-10231 04

NICKEL ALLOYS
Wrought nickel-base superalloy
LEWIS-12844 B78-10045 04
Two braze alloys for thin-wall components
M-FS-19206 B78-10117 08
A sharp knife for high temperatures
MSC-16932 B78-10278 07
Embrittlement proof nickel-alloy bellows
M-FS-19331 B78-10349 04
High-gradient continuous-casting furnace
LEWIS-12934 B78-10425 08

NICKEL CADMIUM BATTERIES
Continuous process fabricates battery plaque
GSFC-12054 B78-10132 08

NICKEL COATINGS
Continuous process fabricates battery plaque
GSFC-12054 B78-10132 08

NICKEL PLATE
Processing high-strength steel alloys
MSC-16172 B78-10441 08

NIOBIUM
Electroplating and stripping copper on molybdenum and niobium
LEWIS-12151 B78-10055 04

NITROGEN
Oxygen and nitrogen raman spectra
LEWIS-12849 B78-10361 04

NITROGEN DIOXIDE
NO2 measurement by chemiluminescence
LANGLEY-11378 B78-10386 06

NITROGEN OXIDES
Modified chemiluminescent NO analyzer accurately measures NOX
LEWIS-12850 B78-10047 04

NOISE MEASUREMENT
Noise calculation on the basis of vortex flow models
LANGLEY-12271 B78-10078 06
Calibration standards for PIND tests
MSC-18169 B78-10388 06
Shock during PIND test frees particles
M-FS-23829 B78-10389 06
Predicting rotor rotation noise
LANGLEY-12098 B78-10406 06

NOISE METERS
Pseudo-continuous-wave acoustic instrument
LANGLEY-12260 B78-10248 06

NOISE REDUCTION
Noise tolerant computer link
NPO-14152 B78-10160 02
Airframe design for reducing cabin noise
LANGLEY-12097 B78-10257 06

NOMOGRAPHS
Free-air content in fluid systems
MSC-16703 B78-10251 06

NONDESTRUCTIVE TESTS
Calibration method for an ultrasonic gray-scale recorder
LEWIS-12782 B78-10016 02
High-resolution gray-scale recorder
LEWIS-12783 B78-10017 02
Infrared scanners for temperature measurement in wind tunnels
LANGLEY-12171 B78-10077 06
Film adhesive enhances neutron radiographic images
MSC-18061 B78-10081 06
Window flaw detection by backscatter lighting
MSC-16605 B78-10089 06
Inspection of adhesive-bonded radiators
MSC-18062 B78-10125 08
Improved epoxy adhesive with radiographic tracer
MSC-18020 B78-10225 04
Corrosion detection and evaluation
M-FS-24436 B78-10227 04
Pseudo-continuous-wave acoustic instrument
LANGLEY-12260 B78-10248 06
A solid-state phase-insensitive ultrasonic transducer
LANGLEY-12304 B78-10385 06
Automated inspection of wire-frame assemblies
GSFC-12321 B78-10546 06
Acoustic-optical imaging without immersion
M-FS-23876 B78-10549 06
Detecting moisture in composite honeycomb panels
MSC-16750 B78-10550 06
Detecting overpenetration of electron-beam welds
M-FS-19396 B78-10586 08

NONFLAMMABLE MATERIALS
Flame-retardant adhesive tape
MSC-16721 B78-10041 04
Fire-retardant epoxy polymers
ARC-11182 B78-10218 04
Heat resistant nontoxic laminate
ARC-11040 B78-10356 04
Coated-felt thermal insulation
MSC-12737 B78-10510 04

NUCLEAR MAGNETIC RESONANCE
Pulsed NMR spectroscopy
NPO-14023 B78-10175 03
Boosting production yield of biomedical peptides
NPO-14142 B78-10240 05

NUCLEAR POWER PLANTS
Directory of fire research specialists
LEWIS-13123 B78-10399 06

NUCLEAR RADIATION SPECTROSCOPY
Mossbauer studies of bulk and thin-film FeTe
M-FS-23773 B78-10059 04

NUCLEAR REACTORS
Convectively cooled structures
LANGLEY-12347 B78-10404 06

NUCLEONICS
Improved nucleonic coal-thickness monitor
M-FS-23725 B78-10344 04

NUMERICAL ANALYSIS
Bit-synchronizer lock detector
MSC-16744 B78-10164 02
Analysis of beam columns
MSC-18009 B78-10402 06

NUMERICAL CONTROL
Data processing for water monitoring system
MSC-16842 B78-10234 05
Microprocessor-based cardiopulmonary monitor
MSC-18235 B78-10369 05

NUTATION
Improved notation controller
GSFC-12273 B78-10383 06

NUTS (FASTENERS)
Antibackoff lock for nuts and bolts
MSC-16472 B78-10409 07

O

O RING SEALS
High-pressure cryogenic cylinder seal
M-FS-19335 B78-10421 07

OCEAN MODELS
Fabrication of sea-floor models
NPO-13554 B78-10295 09

OCEANOGRAPHY
Ocean-wave ray or crest diagrams in shoaling waters
LANGLEY-12380 B78-10341 03

OIL EXPLORATION
Pulse-echo probe of rock permeability near oil wells
NPO-14192 B78-10222 04

OIL FIELDS
Pulse-echo probe of rock permeability near oil wells
NPO-14192 B78-10222 04

OIL RECOVERY
Pulse-echo probe of rock permeability near oil wells
NPO-14192 B78-10222 04

OPACITY
Compact turbidity meter
KSC-11063 B78-10545 06

OPHTHALMOLOGY
Intraocular pressure reduction and regulation
LEWIS-12723 B78-10523 05

OPTICAL COMMUNICATION
Noncontact optical communication between moving stations
LANGLEY-12283 B78-10377 06

OPTICAL DATA PROCESSING
Video method for studying optical fields
M-FS-23103 B78-10036 03

OPTICAL DENSITY
Calibration method for an ultrasonic gray-scale recorder
LEWIS-12782 B78-10016 02
High-resolution gray-scale recorder
LEWIS-12783 B78-10017 02
Compact turbidity meter
KSC-11063 B78-10545 06

OPTICAL EQUIPMENT
Improved double-pass michelson interferometer
NPO-13999 B78-10177 03
Signal-interleaving device
GSFC-12111 B78-10319 03
Cosine-corrected optical diffuser
NPO-14288 B78-10322 03
NO2 measurement by chemiluminescence
LANGLEY-11378 B78-10386 06
Processing multispectral signals from a discrete-sensor array
NPO-14211 B78-10442 09
Diffractoid x-ray focusing
GSFC-12357 B78-10487 03

OPTICAL FILTERS
Improved optical filter
GSFC-12225 B78-10027 03

OPTICAL GYROSCOPES
Optical gyroscope
NPO-14258 B78-10176 03

OPTICAL MEASUREMENT
Measuring surface displacements optically
M-FS-23861 B78-10321 03
Ocean-wave ray or crest diagrams in shoaling waters
LANGLEY-12380 B78-10341 03

Automated chromosome analysis
NPO-13913 B78-10364 05
Detecting surface deformations photographically
MSC-16156 B78-10547 06

OPTICAL MEASURING INSTRUMENTS
Video method for studying optical fields
M-FS-23103 B78-10036 03
Improved double-pass michelson interferometer
NPO-13999 B78-10177 03
'Pseudobackscatter' laser velocimeter
ARC-10970 B78-10318 03
Modulation improves electro-optic object detector
M-FS-23776 B78-10380 06
Improved fourier interference spectrometer
NPO-14025 B78-10485 03
Improved servo for a michaelson interferometer
NPO-14093 B78-10488 03
Miniature velocimeter
LANGLEY-12281 B78-10539 06
Automated control of crystal growth
NPO-14420 B78-10582 08

OPTICAL PATHS
Low-background trace-gas detector
NPO-13683 B78-10168 03

OPTICAL PROPERTIES
Instrument measures many optical properties in visible and IR
LANGLEY-12285 B78-10489 03

OPTICAL PUMPING
Common-cavity pumped laser
GSFC-12237 B78-10320 03
Vacuum-ultraviolet laser uses superfluid helium
NPO-13993 B78-10323 03

OPTICAL RADAR
Optical traffic-sensing concept
NPO-13603 B78-10021 02

OPTICAL RANGE FINDERS
Optical traffic-sensing concept
NPO-13603 B78-10021 02

OPTICAL REFLECTION
Optics for natural lighting
LANGLEY-12333 B78-10189 03

OPTICAL SCANNERS
Testing integrated circuits by photoexcitation
M-FS-23943 B78-10451 01

OPTIMAL CONTROL
Performance optimizing
LANGLEY-11930 B78-10096 06

ORBITAL POSITION ESTIMATION
A parameter-estimation subroutine package
NPO-14263 B78-10447 09

ORGANIC COMPOUNDS
Low-temperature elastomer production and curing
NPO-13899 B78-10346 04

ORGANIC MATERIALS
Predicting structures of cross-linked condensation polymers
NPO-14007 B78-10352 04

ORIFICE FLOW
Orifice calibration module
LANGLEY-12269 B78-10393 06

ORTHOPEDICS
Biomedical applications of ion-beam technology
LEWIS-12807 B78-10363 05
Wideband EMG telemetry system
ARC-11209 B78-10375 05

ORTHOTROPIC PLATES
Analysis of cracked orthotropic sheets
LANGLEY-12288 B78-10405 06

OSCILLATING FLOW
Fluidic-oscillator gas analyzer
KSC-11014 B78-10253 06

OSCILLATION DAMPERS
Vibration-free thermal link
GSFC-12297 B78-10169 03
Low-frequency vibration isolation
NPO-13915 B78-10275 07

OSCILLATORS
Three-function signal generator
MSC-16672 B78-10306 01

OSMOSIS
Forming 'dynamic' membranes on stainless steel
MSC-18172 B78-10513 04

OUTGASSING
Vacuum control for brazing stainless steel
MSC-19457 B78-10115 08

OVENS
Verifying the fit of mating contoured surfaces
LANGLEY-11731 B78-10290 08
Slurry-powder sintering furnace
LANGLEY-11423 B78-10293 08
Temperature-gradient oven
M-FS-23919 B78-10390 06

OXIDATION
Surface examination of small particles
LEWIS-12842 B78-10075 06

OXIDATION RESISTANCE
Low-chromium stainless steels
LEWIS-12543 B78-10046 04
Long-lasting solid-polymer electrolytic hygrometer
NPO-13948 B78-10086 06

OXIDE FILMS
Surface examination of small particles
LEWIS-12842 B78-10075 06
Natural-oxide solar-collector coatings
M-FS-23518 B78-10326 03

OXIDES
NO2 measurement by chemiluminescence
LANGLEY-11378 B78-10386 06

OXIMETRY
A probe for blood-vessel and spinal interiors
NPO-14132 B78-10242 05

OXYGEN
Oxygen and nitrogen raman spectra
LEWIS-12849 B78-10361 04

OXYGEN PRODUCTION
High-yield process for preparing calcium superoxide
ARC-11053 B78-10216 04
Economical synthesis of potassium superoxide
ARC-10992 B78-10353 04

OXYGEN REGULATORS
Adjustable gas-flow restrictor
MSC-19486 B78-10560 07

OXYGEN SUPPLY EQUIPMENT
High-yield process for preparing calcium superoxide
ARC-11053 B78-10216 04

OXYGENATION
Dip-molded t-shaped cannula
NPO-14073 B78-10062 05
A probe for blood-vessel and spinal interiors
NPO-14132 B78-10242 05

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PACKAGING
Self-sterilizing canister
NPO-14237 B78-10064 05

PAINTS
Fluorescent paint simplifies laser-beam alinement
LEWIS-12571 B78-10030 03
Fast-drying coating
MSC-16056 B78-10060 04
Improved alkali-metal/silicate binders
GSFC-12303 B78-10224 04
Coating for hot sliding seals
MSC-16529 B78-10562 07

PANELS
Lattice panels with high structural efficiency
LANGLEY-11898 B78-10426 08
Low-cost graphite/epoxy structural panels
M-FS-23871 B78-10427 08

PANORAMIC CAMERAS
Wide angle pinhole camera
LANGLEY-11905 B78-10173 03

PARABOLIC ANTENNAS
Optimizing multislot feeds for reflecting antennas
NPO-14064 B78-10314 02

PARABOLIC REFLECTORS
High-temperature solar converter
GSFC-12234 B78-10032 03

PARACHUTE FABRICS
Scale parachute fabrication
M-FS-23139 B78-10141 08

PARACHUTES
Scale parachute fabrication
M-FS-23139 B78-10141 08

PARTIAL DIFFERENTIAL EQUATIONS
Body-fitted coordinates systems transformations
LANGLEY-12307 B78-10147 09

PARTICLE MOTION
Automated electrophoresis apparatus
M-FS-23983 B78-10516 04
Separating biological cells
M-FS-23883 B78-10521 05

PARTICLES
Calibration standards for PIND tests
MSC-18169 B78-10388 06
Shock during PIND test frees particles
M-FS-23829 B78-10389 06

PARTICULATE SAMPLING
Water sample-collection and distribution system
MSC-16841 B78-10235 05
Biological sampling and cleaning device
NPO-14010 B78-10245 05

PATIENTS
Medical Information Management System
GSFC-12078 B78-10376 05

PAYLOADS
Rigid 'Sling' for topheavy loads
GSFC-12359 B78-10574 07

PEDALS
Combination force and angular-deflection indicator
MSC-16155 B78-10070 06

PENETRATION
Penetrating fire extinguisher
KSC-11064 B78-10397 06
Detecting overpenetration of electron-beam welds
M-FS-19396 B78-10586 08

PEPTIDES
Boosting production yield of biomedical peptides
NPO-14142 B78-10240 05
PERFORMANCE PREDICTION
Air cushion landing system
LANGLEY-12303 B78-10259 06
PERFORMANCE TESTS
Test-vehicle cycle programmer
LEWIS-12977 B78-10020 02
Performance optimizing
LANGLEY-11930 B78-10096 06
Strobe-margin test for plated memory systems
M-FS-23838 B78-10154 01
Prototype solar-heating system-engineering analysis
M-FS-23910 B78-10194 03
Testing of three hot- air solar collectors
M-FS-23887 B78-10201 03
Performance and structural tests of hot-air solar collectors
M-FS-23911 B78-10203 03
Thermal performance of a hot-air solar collector
M-FS-23924 B78-10204 03
Flat-plate liquid solar collector
M-FS-23912 B78-10205 03
Performance evaluations of a liquid solar collector
M-FS-23931 B78-10206 03
Evaluation of an air solar collector
M-FS-23978 B78-10336 03
Indoor tests of a hot-air solar collector
M-FS-23954 B78-10337 03
Performance evaluation of an air solar collector
M-FS-23968 B78-10338 03
Outdoor tests of a liquid solar collector
M-FS-23969 B78-10339 03
Solar simulator test facility
M-FS-23972 B78-10477 03
Solar-heating system performance tests
M-FS-25021 B78-10493 03
Development and testing of a hot-air solar collector
M-FS-23997 B78-10497 03
Liquid solar collector-performance tests
M-FS-25082 B78-10499 03
PERSPIRATION
Sweat collection capsule
ARC-11031 B78-10367 05
PHASE CONTROL
Femtosecond time-domain phase comparator
GSFC-12228 B78-10162 02
Phase-shift array, arbitrary and continuous through 360 deg
LANGLEY-12272 B78-10308 01
PHASE DETECTORS
Femtosecond time-domain phase comparator
GSFC-12228 B78-10162 02
Chopper-stabilized phase detector
MSC-16461 B78-10163 02
Simplified phase detector
NPO-13395 B78-10457 01
Narrow-bandwidth receiver
GSFC-12142 B78-10463 02
PHASE ERROR
Femtosecond time-domain phase comparator
GSFC-12228 B78-10162 02
Bit-synchronizer lock detector
MSC-16744 B78-10164 02
PHASE LOCKED SYSTEMS
Digital phase shifter synchronizes local oscillators
MSC-16695 B78-10011 01
Bit-synchronizer lock detector
MSC-16744 B78-10164 02
PHASE MODULATION
Determining the response of an FM receiver
MSC-16751 B78-10465 02
PHASE SHIFT
Femtosecond time-domain phase comparator
GSFC-12228 B78-10162 02
PHASE SHIFT CIRCUITS
Digital phase shifter synchronizes local oscillators
MSC-16695 B78-10011 01
Directional laser velocimeter with doppler velocity simulator
LANGLEY-12176 B78-10029 03
Control of small phased-array antennas
MSC-14938 B78-10166 02
Phase-shift array, arbitrary and continuous through 360 deg
LANGLEY-12272 B78-10308 01
PHASE SHIFT KEYING
Eliminating ambiguity in digital signals
NPO-14289 B78-10469 02
PHASED ARRAYS
Control of small phased-array antennas
MSC-14938 B78-10166 02
PHONOCARDIOGRAPHY
Noncontacting electrokinetography system
MSC-18162 B78-10533 05
PHOSPHORIC ACID
Long-lasting solid-polymer electrolytic hygrometer
NPO-13948 B78-10086 06
PHOSPHORS
Custom blending of lamp phosphors
MSC-16692 B78-10056 04
PHOSPHORUS
Fire-retardant epoxy polymers
ARC-11182 B78-10218 04
PHOTODECOMPOSITION
Solar photolysis of water
NPO-14126 B78-10049 04
PHOTOELECTRIC CELLS
Noncontact measurement of angular deflection
LANGLEY-12178 B78-10071 06
More efficient GaAs solar cells
LANGLEY-12216 B78-10479 03
Ultrathin films as photomechanical transducer
NPO-14363 B78-10491 03
PHOTOELECTRIC EMISSION
Testing integrated circuits by photoexcitation
M-FS-23943 B78-10451 01
PHOTOGRAPHIC MEASUREMENT
Detecting surface deformations photographically
MSC-16156 B78-10547 06
PHOTOGRAPHIC RECORDING
Z-axis control loop for cathode-ray tubes
NPO-13775 B78-10305 01
PHOTOGRAPHY
Wide angle pinhole camera
LANGLEY-11905 B78-10173 03
PHOTOLUMINESCENCE
Custom blending of lamp phosphors
MSC-16692 B78-10056 04
PHOTOLYSIS
Solar photolysis of water
NPO-14126 B78-10049 04
PHOTOMECHANICAL EFFECT
Ultrathin films as photomechanical transducer
NPO-14363 B78-10491 03
PHOTOMETERS
Video method for studying optical fields
M-FS-23103 B78-10036 03
PHOTOVOLTAIC CELLS
Terrestrial photovoltaic measurements
LEWIS-13057 B78-10310 01
Power loss for high-voltage solar-cell arrays
LEWIS-12865 B78-10340 03
Photovoltaic systems test facility
LEWIS-13073 B78-10378 06
Improved method of solar-cell assembly
LEWIS-12729 B78-10438 08
PHYSIOLOGICAL RESPONSES
Hand-held vital-signals monitor
MSC-18232 B78-10524 05
Hybrid temperature-monitoring circuit
MSC-18231 B78-10525 05
Hybrid ECG signal conditioner
MSC-18230 B78-10526 05
Hybrid LCD driver
MSC-18229 B78-10529 05
Hybrid clock generator
MSC-18228 B78-10530 05
PIERCING
Penetrating fire extinguisher
KSC-11064 B78-10397 06
PIEZOELECTRIC TRANSDUCERS
A solid-state phase-insensitive ultrasonic transducer
LANGLEY-12304 B78-10385 06
PINHOLES
Rapid leak detection with liquid crystals
MSC-13804 B78-10084 06
PINS
High-strength blind rivet
LANGLEY-12154 B78-10287 08
PIPELINES
Solar hot-water system
M-FS-25043 B78-10495 03
PIPES (TUBES)
Gentle support stands for fluid-line mockups
MSC-16479 B78-10291 08
Device for pitching off metal tubes
GSFC-12274 B78-10410 07
Quick-connect threaded attachment joint
LANGLEY-12232 B78-10414 07
Insulator for cryogenic joints
M-FS-19361 B78-10419 07
PISTON ENGINES
Boosting the power of two-stage engines
NPO-14057 B78-10105 07
Simpler valve for reciprocating engines
MSC-16239 B78-10276 07
PISTONS
Self-centering stepped piston
LEWIS-12997 B78-10101 07
Compact piston-position sensor
LEWIS-12392 B78-10102 07
Simple air-piston gas-sampling system
LEWIS-12922 B78-10110 07
High-pressure cryogenic cylinder seal
M-FS-19335 B78-10421 07
PITCHING MOMENTS
Aircraft trailing vortex hazard alleviators
LANGLEY-12034 B78-10272 07

PITOT TUBES
Static-pressure probe for small geometries
LANGLEY-11552 B78-10395 06
PIVOTS
Rigid coupling is also flexible
MSC-16488 B78-10098 07
PLANNING
Thin silicon-solar cell fabrication
NPO-14047 B78-10325 03
PLANTS (BOTANY)
Chemical agent boosts natural-rubber output
NPO-14185 B78-10358 04
PLASMA ELECTRODES
Plasma igniter for internal-combustion engines
NPO-13828 B78-10100 07
PLASMA HEATING
Plasma igniter for internal-combustion engines
NPO-13828 B78-10100 07
PLASTIC COATINGS
Boron triflouride coatings for plastics
ARC-11057 B78-10043 04
PLASTIC PROPERTIES
Scratch resistant plastic lenses
ARC-11039 B78-10519 04
PLASTICS
Predicting structures of cross-linked condensation polymers
NPO-14007 B78-10352 04
Antistatic coating for acrylics
NPO-13867 B78-10509 04
PLATENS
High-temperature brazing of stainless steel
MSC-19459 B78-10112 08
Form die and glide plates for vacuum brazing
MSC-16549 B78-10113 08
PLATES (STRUCTURAL MEMBERS)
Brazed boron-silicon carbide/aluminum structural panels
LANGLEY-12244 B78-10221 04
PLATING
Electroplated 'cold patch' for critical parts
M-FS-19401 B78-10584 08
PLATINUM
Calibration target for temperature radiometer
LANGLEY-12239 B78-10083 06
PLENUM CHAMBERS
Air cushion landing system
LANGLEY-12303 B78-10259 06
PLOTTING
Plotting shear-flow forces
MSC-18013 B78-10445 09
Plotting max/min data envelopes
MSC-18016 B78-10597 09
PLUGGING
Device for pitching off metal tubes
GSFC-12274 B78-10410 07
Repairing pin-fin cold plates
MSC-16424 B78-10431 08
PLUGS
Repairing pin-fin cold plates
MSC-16424 B78-10431 08
PLYWOOD
Form die and glide plates for vacuum brazing
MSC-16549 B78-10113 08
PNEUMATIC CONTROL
Improved gas thrust bearings
LEWIS-12569 B78-10413 07
PNEUMATIC EQUIPMENT
Pneumatic servomechanisms
M-FS-23295 B78-10144 08
POISONS
Toxic substances handbook
LEWIS-13124 B78-10359 04
POISSON RATIO
Measuring poisson's ratio in elastomers
M-FS-23878 B78-10387 06
POLISHING
Process for growing thin polished silicon sheets
NPO-14172 B78-10434 08
POLLUTION
Automated syringe sampler
LANGLEY-12308 B78-10374 05
POLLUTION CONTROL
Microbial desulfurization of coal
NPO-14227 B78-10038 04
POLLUTION MONITORING
Rapid measurement of bacteria in water
GSFC-12158 B78-10232 05
Monitoring systems for community water supplies
MSC-16778 B78-10233 05
Data processing for water monitoring system
MSC-16842 B78-10234 05
Compact turbidity meter
KSC-11063 B78-10545 06
POLYBENZIMIDAZOLE
Ultrafine PBI fibers and yarns
ARC-11221 B78-10504 04
POLYCARBONATES
Abrasion-resistant antireflective coating for polycarbonate
ARC-11047 B78-10054 04
Long-lasting solid-polymer electrolytic hygrometer
NPO-13948 B78-10086 06
POLYESTERS
Fire-and smoke-retardant polyesters and elastomers
NPO-14053 B78-10058 04
POLYIMIDES
Polyimide adhesives for titanium and composite bonding
LANGLEY-12257 B78-10040 04
Fire-retardant foams
MSC-16222 B78-10053 04
Antistatic additive for polyimide films
NPO-14232 B78-10220 04
POLYISOPRENES
Chemical agent boosts natural-rubber output
NPO-14185 B78-10358 04
POLYMER CHEMISTRY
High-pressure liquid chromatography of aromatic amines
LANGLEY-12163 B78-10515 04
Porous bead packings for gas chromatography
ARC-11222 B78-10518 04
POLYMER PHYSICS
Separating biological cells
M-FS-23883 B78-10521 05
POLYMERIC FILMS
Selection standard for FEP films for solar energy
MSC-16999 B78-10190 03
Antistatic additive for polyimide films
NPO-14232 B78-10220 04
POLYMERIZATION
Improved imide polymerization catalyst
ARC-11107 B78-10517 04
POLYMERS
Fire-retardant epoxy polymers
ARC-11182 B78-10218 04
POLYURETHANE FOAM
High-rise foam-in-place process
MSC-16931 B78-10128 08
Insulator for cryogenic joints
M-FS-19361 B78-10419 07
POROUS MATERIALS
Tool simplifies weld preparation of aluminum
MSC-16992 B78-10123 08
PORPHYRINS
Chemiluminescence and bioluminescence microbe detection
MSC-16779 B78-10237 05
PORTABLE EQUIPMENT
Portable spark-gap arc generator
LEWIS-12886 B78-10008 01
Hand-held vital-signals monitor
MSC-18232 B78-10524 05
Hybrid temperature-monitoring circuit
MSC-18231 B78-10525 05
Hybrid ECG signal conditioner
MSC-18230 B78-10526 05
Hybrid LCD driver
MSC-18229 B78-10529 05
Hybrid clock generator
MSC-18228 B78-10530 05
POSITION (LOCATION)
Compact piston-position sensor
LEWIS-12392 B78-10102 07
Helicopter position stabilizing system
LANGLEY-11670 B78-10256 06
POSITION INDICATORS
Compact piston-position sensor
LEWIS-12392 B78-10102 07
Noncontacting valve-position indicator
MSC-16048 B78-10412 07
'Blind' position indicator
MSC-16972 B78-10570 07
POSITIONING
Housing protects laser in vacuum
GSFC-12241 B78-10028 03
Laser beam assists in precision welding
M-FS-19319 B78-10122 08
Tile-bonding tool
KSC-11053 B78-10134 08
POSITIONING DEVICES (MACHINERY)
Collapsible module extends tenfold in height
NPO-13371 B78-10280 07
POTASSIUM COMPOUNDS
Economical synthesis of potassium superoxide
ARC-10992 B78-10353 04
POTENTIAL FLOW
Potential flows in propulsion system inlets
LEWIS-13010 B78-10553 06
POTTING COMPOUNDS
No-warp potted circuits
MSC-19729 B78-10435 08
POURING
Void-free foam insulation
MSC-16805 B78-10127 08
High-rise foam-in-place process
MSC-16931 B78-10128 08
POWDER METALLURGY
Wrought nickel-base superalloy
LEWIS-12844 B78-10045 04
Slurry-powder sintering furnace
LANGLEY-11423 B78-10293 08
POWER EFFICIENCY
Boosting the power of two-stage engines
NPO-14057 B78-10105 07

POWER LINES
Power-switch dV/dt sensing
MSC-16707 B78-10307 01
Transmitting rotary motion at an angle
MSC-19483 B78-10561 07
POWER SPECTRA
Measuring radio-signal power accurately
NPO-13373 B78-10464 02
POWER SUPPLY CIRCUITS
Efficient dc-to-dc converter
FRC-11014 B78-10012 01
Automatic load sharing in inverter modules
NPO-14056 B78-10302 01
Voltage regulator for solar panels
NPO-13895 B78-10478 03
PRECIPITATION (CHEMISTRY)
Positively charged membrane for urea dialysis
NPO-14101 B78-10241 05
PRECONDITIONING
Tool simplifies weld preparation of aluminum
MSC-16992 B78-10123 08
PREDICTION ANALYSIS TECHNIQUES
Predicting rotor rotation noise
LANGLEY-12098 B78-10406 06
PREFORMS
Match-mold process for foam insulation
MSC-16631 B78-10126 08
PREPOLYMERS
Polyimide adhesives for titanium and composite bonding
LANGLEY-12257 B78-10040 04
PRESERVING
Mounting procedure for geological samples
MSC-18206 B78-10327 03
PRESSURE CHAMBERS
Compression testing of flammable liquids
MSC-16121 B78-10548 06
PRESSURE DISTRIBUTION
Hydraulic dynamic analysis
MSC-16795 B78-10095 06
Tile-bonding tool
KSC-11053 B78-10134 08
Wing aerodynamics under blowing jets
LANGLEY-12256 B78-10401 06
PRESSURE MEASUREMENTS
Pressure-sensitive glass reaction cell
LANGLEY-11256 B78-10223 04
Oxygen and nitrogen raman spectra
LEWIS-12849 B78-10361 04
High-temperature microphone system
LANGLEY-12375 B78-10384 06
Orifice calibration module
LANGLEY-12269 B78-10393 06
Shock-swallowing air sensor
FRC-10107 B78-10537 06
Dynamic measurement of bulk modulus
NPO-13226 B78-10543 06
PRESSURE REDUCTION
Dual relief-valve system
LANGLEY-12267 B78-10111 07
Testing of three hot- air solar collectors
M-FS-23887 B78-10201 03
Topping pressure for gas-storage cylinders
MSC-18186 B78-10542 06
PRESSURE REGULATORS
Magnetostrictive valve
NPO-14235 B78-10104 07
Precision fluid-pressure regulator
NPO-13370 B78-10106 07
Wide-temperature corrosion-resistant pressure regulator
NPO-13776 B78-10274 07
Stable hydraulic pressure regulator
LEWIS-13058 B78-10417 07
Flow-compensating pressure regulator
LEWIS-12718 B78-10522 05
Intraocular pressure reduction and regulation
LEWIS-12723 B78-10523 05
Automatic bypass valve
LANGLEY-12063 B78-10558 07
Adjustable gas-flow restrictor
MSC-19486 B78-10560 07
PRESSURE SENSORS
Remotely-powered intracranial pressure monitor
ARC-11120 B78-10362 05
Electronically-scanned pressure measurement system
LANGLEY-12386 B78-10394 06
Static-pressure probe for small geometries
LANGLEY-11552 B78-10395 06
High-temperature capacitive pressure transducer
LEWIS-13078 B78-10398 06
High-sampling-rate pressure transducer has in situ calibration
LANGLEY-12230 B78-10536 06
PRESSURE VESSELS
Compact pressure-line coupling
MSC-16893 B78-10099 07
Dual relief-valve system
LANGLEY-12267 B78-10111 07
Predicting damage from exploding vessels
LEWIS-13042 B78-10258 06
PRESTRESSING
Ultrasonic extensometer measures bolt preload
M-FS-19337 B78-10271 07
PRIMATES
Automatic primate feeder
LANGLEY-11586 B78-10246 05
PRIMERS (COATINGS)
Fast-drying coating
MSC-16056 B78-10060 04
PRINTED CIRCUITS
Fuseholders allow fast system checkout
MSC-16856 B78-10088 06
Bench-top soldering aid for PC boards
MSC-16274 B78-10121 08
'PC fabrication' for silicon solar-cell arrays
NPO-13991 B78-10131 08
No-warp potted circuits
MSC-19729 B78-10435 08
Circuit-lead trimming template
MSC-16589 B78-10439 08
PRISMS
Laser beam color separator
LANGLEY-11806 B78-10174 03
PROBES
Standardized gas-temperature probes
LEWIS-13059 B78-10392 06
PROBLEM SOLVING
Performance optimizing
LANGLEY-11930 B78-10096 06
Body-fitted coordinates systems transformations
LANGLEY-12307 B78-10147 09
Problems encountered in solar heating and cooling systems
M-FS-23974 B78-10331 03
PRODUCT DEVELOPMENT
CMOS-array design-automation techniques
M-FS-23762 B78-10311 01
PRODUCTION MANAGEMENT
Handbook for estimating fabrication costs
M-FS-23795 B78-10140 08
PRODUCTION PLANNING
Electrolysis cell stimulation
LEWIS-12740 B78-10179 03
PROGRAMMING LANGUAGES
Processor for the UNIVAC 1100 series
NPO-13469 B78-10600 09
PROJECT PLANNING
Price and cost estimation
M-FS-23812 B78-10599 09
PROJECTILES
Measuring projectile speed
LANGLEY-12387 B78-10538 06
PROPELLANT BINDERS
Low-temperature elastomer production and curing
NPO-13899 B78-10346 04
PROPELLANT DECOMPOSITION
Pressure-sensitive glass reaction cell
LANGLEY-11256 B78-10223 04
PROPELLANT TANKS
Predicting damage from exploding vessels
LEWIS-13042 B78-10258 06
PROPELLER DRIVE
Predicting rotor rotation noise
LANGLEY-12098 B78-10406 06
PROPULSION SYSTEM CONFIGURATIONS
Potential flows in propulsion system inlets
LEWIS-13010 B78-10553 06
PROSTHETIC DEVICES
Artificial leg with natural gait
M-FS-23225 B78-10239 05
Biomedical applications of ion-beam technology
LEWIS-12807 B78-10363 05
PROTECTION
Housing protects laser in vacuum
GSFC-12241 B78-10028 03
Simulator for training remote-manipulator operators
MSC-14921 B78-10415 07
PROTECTIVE COATINGS
Boron triflouride coatings for plastics
ARC-11057 B78-10043 04
Protective coating for laser diodes
LANGLEY-11746 B78-10171 03
Improved alkali-metal/silicate binders
GSFC-12303 B78-10224 04
Repairing silicon carbide coatings
MSC-18033 B78-10226 04
Protective coating for copper in aluminum heat exchangers
M-FS-19334 B78-10286 08
Embrittlement proof nickel-alloy bellows
M-FS-19331 B78-10349 04
Predicting structures of cross-linked condensation polymers
NPO-14007 B78-10352 04
Measurement of subcoat thickness by characteristic x-rays
MSC-16718 B78-10505 04
PROTOTYPES
Prototype solar-heating system-engineering analysis
M-FS-23910 B78-10194 03

Prototype solar-heating system - innstallation manual
M-FS-23907 B78-10195 03
PROTRACTORS
Combination force and angular-deflection indicator
MSC-16155 B78-10070 06
PUBLIC HEALTH
Toxic substances handbook
LEWIS-13124 B78-10359 04
Medical Information Management System
GSFC-12078 B78-10376 05
PULLEYS
Emergency escape device
M-FS-23235 B78-10270 07
Durable nonslip stainless-steel drivebelts
GSFC-12276 B78-10567 07
PULMONARY FUNCTIONS
Microprocessor-based cardiopulmonary monitor
MSC-18235 B78-10369 05
PULSE CODE MODULATION
Noise tolerant computer link
NPO-14152 B78-10160 02
PULSE COMMUNICATION
Noise tolerant computer link
NPO-14152 B78-10160 02
PULSE DURATION
Pulsed NMR spectroscopy
NPO-14023 B78-10175 03
PULSE DURATION MODULATION
Pulse-width-modulated attenuator for AGC
NPO-14127 B78-10459 01
PULSE GENERATORS
Simple digital pulse-programing circuit
NPO-13747 B78-10299 01
PULSE MODULATION
Noncontact optical communication between moving stations
LANGLEY-12283 B78-10377 06
PULSED LASERS
Low-background trace-gas detector
NPO-13683 B78-10168 03
PULSES
Simple digital pulse-programing circuit
NPO-13747 B78-10299 01
PUMPS
Pump efficiency in solar-energy systems
M-FS-23934 B78-10213 03
Solar-powered hot-water system
NPO-14270 B78-10324 03
Stable hydraulic pressure regulator
LEWIS-13058 B78-10417 07
Drag-pump rotating filter
MSC-16180 B78-10563 07
PUNCHES
Form die and glide plates for vacuum brazing
MSC-16549 B78-10113 08
PURGING
Internal grid for release of brazing retorts
MSC-19472 B78-10114 08
Deaerating high-viscosity silicon rubber
MSC-16694 B78-10514 04
PURIFICATION
Corona-discharge air-purification system
ARC-10975 B78-10350 04
Low-temperature refining of coal
NPO-14210 B78-10511 04
Accelerated purification of colloidal silica sols
MSC-16793 B78-10512 04
PYRANOMETERS
Voice-output solar energy reporter
LEWIS-12947 B78-10022 02
PYRITES
Coal desulfurization with iron pentacarbonyl
NPO-14272 B78-10342 04
PYROLYSIS
Chemical-vapor deposition of silicon from silane
NPO-14403 B78-10502 03
PYROMETALLURGY
Model of silicon production in a fluidized-bed reactor
NPO-14404 B78-10520 04

Q

QUALITY CONTROL
Automated tester for MOS devices
NPO-14088 B78-10001 01
Measuring oxide trapping parameters in MOS structure
NPO-14120 B78-10002 01
Curve tracer checks CMOS IC's
GSFC-12209 B78-10007 01
Window flaw detection by backscatter lighting
MSC-16605 B78-10089 06
Reclaiming hybrid integrated circuits
MSC-16463 B78-10129 08
Water sample-collection and distribution system
MSC-16841 B78-10235 05
Precise matching of diodes
NPO-14293 B78-10452 01
SEM probe of IC radiation sensitivity
NPO-14350 B78-10541 06
Automated inspection of wire-frame assemblies
GSFC-12321 B78-10546 06

R

RADAR
Air-traffic surveillance systems
NPO-14173 B78-10313 02
RADAR EQUIPMENT
Minature Ku-Band down converter
MSC-18313 B78-10450 01
RADIANT COOLING
Modular heat-pipe-radiator panel
MSC-16625 B78-10328 03
RADIATION
Finding radiant-energy sources
GSFC-12147 B78-10159 02
RADIATION DETECTORS
Low-intensity x-ray and gamma-ray imaging device
GSFC-12263 B78-10061 05
Inexpensive, portable, integrating solar energy meter
LEWIS-12804 B78-10188 03
Stacked solar cells measure X-ray exposure
NPO-13954 B78-10243 05
RADIATION DISTRIBUTION
Improved conical solar concentrator
NPO-13825 B78-10187 03
Compact antenna has symmetrical radiation pattern
ARC-11189 B78-10473 02
RADIATION DOSAGE
Low-intensity x-ray and gamma-ray imaging device
GSFC-12263 B78-10061 05
Improved control of medical x-ray film exposure
NPO-13808 B78-10063 05
Stacked solar cells measure X-ray exposure
NPO-13954 B78-10243 05
RADIATION HARDENING
SEM probe of IC radiation sensitivity
NPO-14350 B78-10541 06
RADIATION HAZARDS
Simulator for training remote-manipulator operators
MSC-14921 B78-10415 07
RADIATION MEASUREMENT
Inexpensive, portable, integrating solar energy meter
LEWIS-12804 B78-10188 03
RADIATION MEASURING INSTRUMENTS
Stacked solar cells measure X-ray exposure
NPO-13954 B78-10243 05
Improved nucleonic coal-thickness monitor
M-FS-23725 B78-10344 04
RADIATION PROTECTION
Electrically-conducting thermal-control coating
GSFC-12207 B78-10044 04
Microwave-beam safety subsystem
NPO-14224 B78-10317 02
RADIATION SHIELDING
Electrically-conducting thermal-control coating
GSFC-12207 B78-10044 04
RADIATION SOURCES
Finding radiant-energy sources
GSFC-12147 B78-10159 02
RADIATIVE HEAT TRANSFER
Orbital heat rate package
M-FS-23980 B78-10554 06
RADIO ANTENNAS
Human arm may act as antenna
ARC-11195 B78-10161 02
RADIO COMMUNICATION
Human arm may act as antenna
ARC-11195 B78-10161 02
RADIO EQUIPMENT
High-power RF switch
NPO-14229 B78-10151 01
RADIO FREQUENCIES
High-power RF switch
NPO-14229 B78-10151 01
RADIO FREQUENCY INTERFERENCE
Portable spark-gap arc generator
LEWIS-12886 B78-10008 01
Finding radiant-energy sources
GSFC-12147 B78-10159 02
Automatic radio-transmission monitor
NPO-13941 B78-10165 02
RADIO INTERFEROMETERS
Real-time monitoring of crustal deformations
NPO-14124 B78-10034 03
RADIO RECEIVERS
Narrow-bandwidth receiver
GSFC-12142 B78-10463 02
Wideband digital spectrum analyzer
NPO-14394 B78-10468 02
RADIO RELAY SYSTEMS
Preventing radio-paging system tieup
MSC-19696 B78-10024 02

RADIO SIGNALS
Automatic acquisition and ranging system
NPO-13982 B78-10312 02
Measuring radio-signal power accurately
NPO-13373 B78-10464 02
RADIO SPECTRA
Wideband digital spectrum analyzer
NPO-14394 B78-10468 02
RADIO TRANSMISSION
Automatic radio-transmission monitor
NPO-13941 B78-10165 02
Implementing OQASK by using MSK
NPO-13896 B78-10309 01
More efficient microwave-power transmission
NPO-13885 B78-10466 02
RADIO TRANSMITTERS
Multichannel VCO needs only one reference
MSC-18225 B78-10448 01
RADIOGRAPHY
Low-intensity x-ray and gamma-ray imaging device
GSFC-12263 B78-10061 05
Improved control of medical x-ray film exposure
NPO-13808 B78-10063 05
Film adhesive enhances neutron radiographic images
MSC-18061 B78-10081 06
Improved epoxy adhesive with radiographic tracer
MSC-18020 B78-10225 04
Stacked solar cells measure X-ray exposure
NPO-13954 B78-10243 05
Detecting moisture in composite honeycomb panels
MSC-16750 B78-10550 06
Detecting overpenetration of electron-beam welds
M-FS-19396 B78-10586 08
RADIOLOGY
Improved control of medical x-ray film exposure
NPO-13808 B78-10063 05
RADIOMETERS
Calibration target for temperature radiometer
LANGLEY-12239 B78-10083 06
Cosine-corrected optical diffuser
NPO-14288 B78-10322 03
Estiuating regional heat flux from scanning radiometer data
LANGLEY-12158 B78-10329 03
RADIOTELEPHONES
Preventing radio-paging system tieup
MSC-19696 B78-10024 02
RADOMES
Efficient rectifying antenna
NPO-13884 B78-10471 02
RAIL TRANSPORTATION
Heat resistant nontoxic laminate
ARC-11040 B78-10356 04
RAMAN SPECTRA
Oxygen and nitrogen raman spectra
LEWIS-12849 B78-10361 04
RANDOM SIGNALS
Hybrid random-sound test-control system
NPO-13900 B78-10025 02
RATINGS
Low-chromium stainless steels
LEWIS-12543 B78-10046 04
RATS
Retainer for laboratory animals
LANGLEY-12353 B78-10371 05
REACTION KINETICS
Model of silicon production in a fluidized-bed reactor
NPO-14404 B78-10520 04
RECEIVERS
Wideband EMG telemetry system
ARC-11209 B78-10375 05
Minature Ku-Band down converter
MSC-18313 B78-10450 01
Narrow-bandwidth receiver
GSFC-12142 B78-10463 02
Determining the response of an FM receiver
MSC-16751 B78-10465 02
RECORDING INSTRUMENTS
High-resolution gray-scale recorder
LEWIS-12783 B78-10017 02
RECORDS
Medical Information Management System
GSFC-12078 B78-10376 05
RECOVERY PARACHUTES
Scale parachute fabrication
M-FS-23139 B78-10141 08
RECTIFIERS
Precise matching of diodes
NPO-14293 B78-10452 01
Efficient rectifying antenna
NPO-13884 B78-10471 02
RECTUM
Improved probe for rectal-cancer detection
NPO-14247 B78-10531 05
Self-propelling, self-locating colonoscope
NPO-14092 B78-10532 05
REDUNDANCY
Verification of redundancy management design
MSC-16713 B78-10145 09
Model for redundant-sensor signal errors
MSC-16715 B78-10146 09
REDUNDANCY ENCODING
Detecting and correcting bit errors on magnetic tape
NPO-13842 B78-10294 09
REDUNDANT COMPONENTS
Verification of redundancy management design
MSC-16713 B78-10145 09
Model for redundant-sensor signal errors
MSC-16715 B78-10146 09
Synchronous transfer circuits for redundant systems
NPO-14162 B78-10157 01
Computation of spare parts requirements
MSC-16872 B78-10593 09
REENTRY EFFECTS
Tumbling-vehicle entry heating
M-FS-23712 B78-10555 06
REENTRY SHIELDING
Coated-felt thermal insulation
MSC-12737 B78-10510 04
REFINING
Coal desulfurization with iron pentacarbonyl
NPO-14272 B78-10342 04
Zone-refining encapsulated semiconductors
M-FS-23902 B78-10351 04
Low-temperature refining of coal
NPO-14210 B78-10511 04
Accelerated purification of colloidal silica sols
MSC-16793 B78-10512 04
Model of silicon production in a fluidized-bed reactor
NPO-14404 B78-10520 04
REFLECTANCE
Ion-beam texturing of materials
LEWIS-12996 B78-10357 04
REFLECTION
Improved conical solar concentrator
NPO-13825 B78-10187 03
REFLECTOMETERS
Laser beam color separator
LANGLEY-11806 B78-10174 03
Instrument measures many optical properties in visible and IR
LANGLEY-12285 B78-10489 03
REFLECTORS
High-vacuum, low-temperature bond for second-surface mirrors
M-FS-23405 B78-10124 08
Optimizing multislot feeds for reflecting antennas
NPO-14064 B78-10314 02
Zone-refining encapsulated semiconductors
M-FS-23902 B78-10351 04
Lightweight conical antenna reflector
NPO-13552 B78-10472 02
REFRACTION
Ocean-wave ray or crest diagrams in shoaling waters
LANGLEY-12380 B78-10341 03
REFRACTIVITY
Protective coating for laser diodes
LANGLEY-11746 B78-10171 03
REFRIGERATING MACHINERY
Refrigerant leak detector
MSC-18214 B78-10551 06
REFRIGERATORS
Thermal compensator for helium refrigerators
GSFC-12168 B78-10082 06
Practical and efficient magnetic heat pump
LEWIS-12508 B78-10170 03
REGENERATORS
Dynamic braking of bidirectional motors
ARC-11194 B78-10578 07
REGULATORS
Precision fluid-pressure regulator
NPO-13370 B78-10106 07
Power-switch dV/dt sensing
MSC-16707 B78-10307 01
Voltage regulator for solar panels
NPO-13895 B78-10478 03
REINFORCING FIBERS
Ultrafine PBI fibers and yarns
ARC-11221 B78-10504 04
REJECTION
S-Band complex-weight module for adaptive processing
LANGLEY-12197 B78-10005 01
Biocompatibility of surgical implants
NPO-14291 B78-10368 05
RELIABILITY
Verification of redundancy management design
MSC-16713 B78-10145 09
Model for redundant-sensor signal errors
MSC-16715 B78-10146 09
Shock during PIND test frees particles
M-FS-23829 B78-10389 06

Electric and hybrid vehicles
LEWIS-13077 B78-10423 07
Circuit-lead trimming template
MSC-16589 B78-10439 08
Low partial discharge vacuum feedthrough
GSFC-12347 B78-10559 07
Reducing stickiness of elastomer valve seals
LANGLEY-11778 B78-10565 07

RELIEF VALVES
Dual relief-valve system
LANGLEY-12267 B78-10111 07
Air cushion landing system
LANGLEY-12303 B78-10259 06

REMOTE CONSOLES
28-Bit serial word simulator/monitor
MSC-16418 B78-10315 02

REMOTE HANDLING
Computer interface for mechanical arm
M-FS-23849 B78-10015 02
Simulator for training remote-manipulator operators
MSC-14921 B78-10415 07

REMOTE SENSORS
Optical traffic-sensing concept
NPO-13603 B78-10021 02
Automated syringe sampler
LANGLEY-12308 B78-10374 05
Thermoelectrically-cooled variable-temperature probe
MSC-18192 B78-10484 03
Self-propelling, self-locating colonoscope
NPO-14092 B78-10532 05

REMOVAL
Adhesive-removal tool
MSC-19498 B78-10279 07
Drag-pump rotating filter
MSC-16180 B78-10563 07
Compact bypass-flow filter
MSC-18311 B78-10564 07

REPLACING
Spares-optimized model
MSC-18015 B78-10446 09

REPLENISHMENT
Spares-optimized model
MSC-18015 B78-10446 09

REPLICAS
Fabrication of sea-floor models
NPO-13554 B78-10295 09

REPORT GENERATORS
Voice-output solar energy reporter
LEWIS-12947 B78-10022 02

REPRESENTATIONS
Body-fitted coordinates systems transformations
LANGLEY-12307 B78-10147 09

RESIDUAL GAS
Mass spectrometer calibration standard
NPO-14097 B78-10249 06

RESIDUAL STRESS
Ultra-high-strength boron fibers
LEWIS-12739 B78-10051 04

RESIN BONDING
New adhesive withstands temperature extremes
GSFC-12345 B78-10042 04

RESINS
Fire-resistant wood composites
ARC-11174 B78-10508 04

RESISTANCE HEATING
Temperature stabilization of microwave ferrite devices
MSC-16833 B78-10152 01

RESISTANCE THERMOMETERS
Calibration target for temperature radiometer
LANGLEY-12239 B78-10083 06

RESONANT FREQUENCIES
Calculation of planar-truss modal frequencies
LANGLEY-12137 B78-10382 06

RESONATORS
Ruby c-axis alignment system
NPO-14252 B78-10379 06
Low-power tuner for lasers
M-FS-23863 B78-10486 03

RESOURCES
Postprocessing classification images
MSC-18238 B78-10601 09

RESOURCES MANAGEMENT
Multiple-input land-use system concept
NPO-13903 B78-10018 02

RESPIRATION
Hand-held vital-signals monitor
MSC-18232 B78-10524 05
Hybrid respiration-signal conditioner
MSC-18226 B78-10527 05
Hybrid heart/breath-rate processor
MSC-18227 B78-10528 05

RETAINING
Retainer for laboratory animals
LANGLEY-12353 B78-10371 05
Quick locking/unlocking retainer
MSC-18048 B78-10408 07

RIBBON PARACHUTES
Scale parachute fabrication
M-FS-23139 B78-10141 08

RIGID MOUNTING
Vibration-free thermal link
GSFC-12297 B78-10169 03

RIVETED JOINTS
High-strength blind rivet
LANGLEY-12154 B78-10287 08

RIVETS
High-strength blind rivet
LANGLEY-12154 B78-10287 08
Riveting-force gage
NPO-13477 B78-10432 08
Fastener for thin fragile materials
MSC-18097 B78-10436 08

ROBOTS
Self-navigating robot
NPO-14190 B78-10026 02

ROCKS
Mounting procedure for geological samples
MSC-18206 B78-10327 03

RODS
Vacuum leadthrough for hydrogen maser
NPO-14148 B78-10422 07

ROLLER BEARINGS
Thermal performance of shaft bearing system
LEWIS-12761 B78-10263 06

ROLLING MOMENTS
Aircraft trailing vortex hazard alleviators
LANGLEY-12034 B78-10272 07

ROTARY STABILITY
Improved notation controller
GSFC-12273 B78-10383 06

ROTARY WINGS
Predicting rotor rotation noise
LANGLEY-12098 B78-10406 06

ROTATING BODIES
Improved notation controller
GSFC-12273 B78-10383 06

ROTATING SHAFTS
Shaft speed control
NPO-14170 B78-10416 07
Two (or more) rotary outputs from one input
MSC-19450 B78-10568 07

ROTATION
Transmitting rotary motion at an angle
MSC-19483 B78-10561 07

ROTOR BLADES
Gas-path seal material
LEWIS-12623 B78-10347 04

ROTOR BLADES (TURBOMACHINERY)
Edge geometry of turbomachine blades
LEWIS-12979 B78-10262 06

ROTORS
Predicting rotor rotation noise
LANGLEY-12098 B78-10406 06

RUBBER
Chemical agent boosts natural-rubber output
NPO-14185 B78-10358 04
No-warp potted circuits
MSC-19729 B78-10435 08
Reducing stickiness of elastomer valve seals
LANGLEY-11778 B78-10565 07

RUBY
Ruby c-axis alignment system
NPO-14252 B78-10379 06

RUDDERS
Spring control of wire harness loops
MSC-18246 B78-10411 07

RUNGE-KUTTA METHOD
Solar-electric geocentric transfer
LEWIS-12939 B78-10403 06

RUSTING
Corrosion inhibitors for solar-heating and cooling
M-FS-25023 B78-10501 03

RUTHENIUM COMPOUNDS
Solar photolysis of water
NPO-14126 B78-10049 04

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SAFETY
Microwave-beam safety subsystem
NPO-14224 B78-10317 02
Heat resistant nontoxic laminate
ARC-11040 B78-10356 04
Simulator for training remote-manipulator operators
MSC-14921 B78-10415 07
Fire-resistant wood composites
ARC-11174 B78-10508 04

SAFETY DEVICES
Cryostat safety tent
GSFC-12206 B78-10080 06
Modified pipe extension safely releases chain binders
MSC-16937 B78-10103 07
Penetrating fire extinguisher
KSC-11064 B78-10397 06

SAFETY MANAGEMENT
Infrared-enhanced TV for fire detection
M-FS-19380 B78-10172 03
Toxic substances handbook
LEWIS-13124 B78-10359 04
Directory of fire research specialists
LEWIS-13123 B78-10399 06

SAMPLERS
Biological sampling and cleaning device
NPO-14010 B78-10245 05
Automated syringe sampler
LANGLEY-12308 B78-10374 05
Safe, durable soil sampler
MSC-18171 B78-10577 07

SAMPLES
Simple air-piston gas-sampling system
LEWIS-12922 B78-10110 07
SAMPLING
Rapid measurement of bacteria in water
GSFC-12158 B78-10232 05
Monitoring systems for community water supplies
MSC-16778 B78-10233 05
Water sample-collection and distribution system
MSC-16841 B78-10235 05
Device for pitching off metal tubes
GSFC-12274 B78-10410 07
High-sampling-rate pressure transducer has in situ calibration
LANGLEY-12230 B78-10536 06
SANDWICH STRUCTURES
Inspection of adhesive-bonded radiators
MSC-18062 B78-10125 08
Testing composite sheets at high temperatures
MSC-16237 B78-10252 06
Friction of thick laminates
LANGLEY-12010 B78-10284 08
Void-free bends in laminated structures
MSC-16998 B78-10285 08
SATELLITE SOLAR POWER STATIONS
Microwave-beam safety subsystem
NPO-14224 B78-10317 02
SCALE (RATIO)
Calibration method for an ultrasonic gray-scale recorder
LEWIS-12782 B78-10016 02
High-resolution gray-scale recorder
LEWIS-12783 B78-10017 02
Test-vehicle cycle programmer
LEWIS-12977 B78-10020 02
SCANNING
Ultrasonic evaluation of high-voltage circuit boards
LEWIS-12781 B78-10087 06
Energy conservation, using remote thermal scanning
LEWIS-12812 B78-10178 03
SCRAMBLING (COMMUNICATION)
Video scrambler/descrambler
MSC-16843 B78-10013 02
SCRAPERS
Adhesive-removal tool
MSC-19498 B78-10279 07
SCREWS
Nylon screws make inexpensive coil forms
MSC-16912 B78-10003 01
Ultrasonic extensometer measures bolt preload
M-FS-19337 B78-10271 07
Antibackoff lock for nuts and bolts
MSC-16472 B78-10409 07
SEA ROUGHNESS
Fabrication of sea-floor models
NPO-13554 B78-10295 09
SEALING
Device for pitching off metal tubes
GSFC-12274 B78-10410 07
Sealing microcircuits with adhesives
M-FS-23869 B78-10592 08
SEALS (STOPPERS)
Gas-path seal material
LEWIS-12623 B78-10347 04
High-pressure cryogenic cylinder seal
M-FS-19335 B78-10421 07
Ceramic-to-metal vacuum seal
NPO-13803 B78-10437 08
Multiple-sample holder for IC testing
NPO-14314 B78-10540 06
Coating for hot sliding seals
MSC-16529 B78-10562 07
Reducing stickiness of elastomer valve seals
LANGLEY-11778 B78-10565 07
Metallic thermal seal
MSC-18135 B78-10566 07
SECONDARY EMISSION
Ion-beam-textored graphite
LEWIS-12724 B78-10506 04
SEGMENTS
Hydraulic dynamic analysis
MSC-16795 B78-10095 06
SEMICONDUCTOR DEVICES
Automated tester for MOS devices
NPO-14088 B78-10001 01
Analyzing CMOS/SOS fabrication for LSI arrays
M-FS-23788 B78-10158 01
High-Speed, high-power, switching transistor
LEWIS-13021 B78-10298 01
Zone-refining encapsulated semiconductors
M-FS-23902 B78-10351 04
Precise matching of diodes
NPO-14293 B78-10452 01
SEMICONDUCTOR LASERS
Thermal compensator for helium refrigerators
GSFC-12168 B78-10082 06
SEMICONDUCTORS (MATERIALS)
Low partial discharge vacuum feedthrough
GSFC-12347 B78-10559 07
SENSITIVITY
Directional laser velocimeter with doppler velocity simulator
LANGLEY-12176 B78-10029 03
SEPARATORS
Improvements in microelectrophoresis apparatus
ARC-11121 B78-10247 05
SEQUENCING
High-rise foam-in-place process
MSC-16931 B78-10128 08
SERVOCONTROL
Improved servocontrol system
M-FS-19358 B78-10150 01
Detecting servo failures with software
FRC-11003 B78-10396 06
Improved servo for a michaelson interferometer
NPO-14093 B78-10488 03
SERVOMECHANISMS
Pneumatic servomechanisms
M-FS-23295 B78-10144 08
SETUPS
Simplified tooling for spray masking
MSC-16927 B78-10136 08
SHAFTS (MACHINE ELEMENTS)
Design of transmission shafting
LEWIS-12965 B78-10107 07
Thermal performance of shaft bearing system
LEWIS-12761 B78-10263 06
Shaft speed control
NPO-14170 B78-10416 07
Two-position wax-motor rotary actuator
GSFC-12521 B78-10557 07
Two (or more) rotary outputs from one input
MSC-19450 B78-10568 07
SHAKERS
Microcircuit-cleaning machine
MSC-16060 B78-10292 08
SHAPES
Form die and glide plates for vacuum brazing
MSC-16549 B78-10113 08
SHEAR FLOW
Plotting shear-flow forces
MSC-18013 B78-10445 09
SHEAR STRENGTH
Quick-and-easy shear-load testing
MSC-16765 B78-10073 06
SHEAR STRESS
Quick-and-easy shear-load testing
MSC-16765 B78-10073 06
SHELLS (STRUCTURAL FORMS)
Ladle for pouring hot melt
MSC-16974 B78-10137 08
SHIELDING
Splicing shielded cables
MSC-18297 B78-10453 01
SHIFT REGISTERS
Data reformatting with less hardware
NPO-13676 B78-10470 02
SHOCK ABSORBERS
Vibration-free thermal link
GSFC-12297 B78-10169 03
Low-frequency vibration isolation
NPO-13915 B78-10275 07
Bend-absorbing clamp
MSC-16971 B78-10575 07
SHOCK WAVES
Shock-swallowing air sensor
FRC-10107 B78-10537 06
SHORT CIRCUITS
Electrical-ground monitor
MSC-18281 B78-10455 01
SHOT PEENING
Processing high-strength steel alloys
MSC-16172 B78-10441 08
SIGNAL ANALYSIS
Hybrid random-sound test-control system
NPO-13900 B78-10025 02
Wideband digital spectrum analyzer
NPO-14394 B78-10468 02
SIGNAL DETECTION
High-resolution gray-scale recorder
LEWIS-12783 B78-10017 02
Simplified phase detector
NPO-13395 B78-10457 01
SIGNAL DETECTORS
Narrow-bandwidth receiver
GSFC-12142 B78-10463 02
Hybrid heart/breath-rate processor
MSC-18227 B78-10528 05
SIGNAL ENCODING
Video scrambler/descrambler
MSC-16843 B78-10013 02
Simplified data compressor
NPO-14041 B78-10023 02
Efficient digital encoding scheme
MSC-18267 B78-10467 02
SIGNAL GENERATORS
Three-function signal generator
MSC-16672 B78-10306 01
SIGNAL MEASUREMENT
Measuring radio-signal power accurately
NPO-13373 B78-10464 02
SIGNAL PROCESSING
Automatic gain-balancing circuit
LANGLEY-12074 B78-10297 01
Hybrid ECG signal conditioner
MSC-18230 B78-10526 05

SIGNAL STABILIZATION
Chopper-stabilized phase detector
MSC-16461 B78-10163 02
SIGNAL TO NOISE RATIOS
Noise tolerant computer link
NPO-14152 B78-10160 02
Measuring radio-signal power accurately
NPO-13373 B78-10464 02
SIGNAL TRANSMISSION
Implementing OQASK by using MSK
NPO-13896 B78-10309 01
Eliminating ambiguity in digital signals
NPO-14289 B78-10469 02
SILANES
Abrasion-resistant antireflective coating for polycarbonate
ARC-11047 B78-10054 04
Chemical-vapor deposition of silicon from silane
NPO-14403 B78-10502 03
Model of silicon production in a fluidized-bed reactor
NPO-14404 B78-10520 04
SILICATES
Improved alkali-metal/silicate binders
GSFC-12303 B78-10224 04
SILICON
Low-cost high purity production
NPO-14198 B78-10050 04
Inexpensive, portable, integrating solar energy meter
LEWIS-12804 B78-10188 03
Thin silicon-solar cell fabrication
NPO-14047 B78-10325 03
Process for growing thin polished silicon sheets
NPO-14172 B78-10434 08
Chemical-vapor deposition of silicon from silane
NPO-14403 B78-10502 03
Model of silicon production in a fluidized-bed reactor
NPO-14404 B78-10520 04
Controlling the growth of silicon sheets
NPO-14295 B78-10581 08
Automated control of crystal growth
NPO-14420 B78-10582 08
SILICON CARBIDES
Brazed boron-silicon carbide/aluminum structural panels
LANGLEY-12244 B78-10221 04
Repairing silicon carbide coatings
MSC-18033 B78-10226 04
SILICON COMPOUNDS
Low-cost high purity production
NPO-14198 B78-10050 04
SILICON DIOXIDE
High-temperature brazing of stainless steel
MSC-19459 B78-10112 08
High-temperature waterproofing for tiles
MSC-16773 B78-10135 08
High-temperature capacitive pressure transducer
LEWIS-13078 B78-10398 06
Accelerated purification of colloidal silica sols
MSC-16793 B78-10512 04
SILICONE RESINS
Cure-rate data for silicone adhesive
GSFC-12330 B78-10057 04
SILICONE RUBBER
No-warp potted circuits
MSC-19729 B78-10435 08
Deaerating high-viscosity silicon rubber
MSC-16694 B78-10514 04
SILICONES
Flame-retardant adhesive tape
MSC-16721 B78-10041 04
Cure-rate data for silicone adhesive
GSFC-12330 B78-10057 04
SILVER CADMIUM BATTERIES
Continuous process fabricates battery plaque
GSFC-12054 B78-10132 08
SIMULATION
Multipurpose system simulator
GSFC-12333 B78-10444 09
SIMULATORS
Directional laser velocimeter with doppler velocity simulator
LANGLEY-12176 B78-10029 03
Approach and landing simulation
LANGLEY-12060 B78-10091 06
28-Bit serial word simulator/monitor
MSC-16418 B78-10315 02
Simulator for training remote-manipulator operators
MSC-14921 B78-10415 07
Solar simulator test facility
M-FS-23972 B78-10477 03
SINGLE CRYSTALS
Precision cleaver for 'soft' crystals
GSFC-12291 B78-10348 04
SINTERING
Slurry-powder sintering furnace
LANGLEY-11423 B78-10293 08
SIZE DETERMINATION
Resizing algorithm for loaded structures
LANGLEY-12064 B78-10594 09
SIZE SEPARATION
Compact bypass-flow filter
MSC-18311 B78-10564 07
SKIN (ANATOMY)
Sweat collection capsule
ARC-11031 B78-10367 05
SKIN GRAFTS
Bacillus cereus strain MCN as a debriding agent
LANGLEY-12287 B78-10067 05
SKY RADIATION
Optics for natural lighting
LANGLEY-12333 B78-10189 03
SLICING
Precision cleaver for 'soft' crystals
GSFC-12291 B78-10348 04
SLIPSTREAMS
WAKE and WASH
LANGLEY-12262 B78-10093 06
SLURRIES
Continuous process fabricates battery plaque
GSFC-12054 B78-10132 08
Slurry-powder sintering furnace
LANGLEY-11423 B78-10293 08
SMOKE ABATEMENT
Fire-and smoke-retardant polyesters and elastomers
NPO-14053 B78-10058 04
SODIUM
Low-cost high purity production
NPO-14198 B78-10050 04
SOL-GEL PROCESSES
Predicting structures of cross-linked condensation polymers
NPO-14007 B78-10352 04
SOLAR ARRAYS
'PC fabrication' for silicon solar-cell arrays
NPO-13991 B78-10131 08
Universal test fixture for solar cells
NPO-14062 B78-10184 03
SOLAR CELLS
Glass tubes for protecting solar cells
NPO-14200 B78-10031 03
Double-sided solar-cell package
NPO-14199 B78-10033 03
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NPO-13991 B78-10131 08
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Accelerated-weathering test-system for solar cells
NPO-14061 B78-10185 03
Automated solar-cell-array assembly machine
NPO-13652 B78-10186 03
Terrestrial photovoltaic measurements
LEWIS-13057 B78-10310 01
Thin silicon-solar cell fabrication
NPO-14047 B78-10325 03
Power loss for high-voltage solar-cell arrays
LEWIS-12865 B78-10340 03
Photovoltaic systems test facility
LEWIS-13073 B78-10378 06
Process for growing thin polished silicon sheets
NPO-14172 B78-10434 08
Improved method of solar-cell assembly
LEWIS-12729 B78-10438 08
More efficient GaAs solar cells
LANGLEY-12216 B78-10479 03
Chemical-vapor deposition of silicon from silane
NPO-14403 B78-10502 03
Automated control of crystal growth
NPO-14420 B78-10582 08
SOLAR COLLECTORS
High-temperature solar converter
GSFC-12234 B78-10032 03
Solar-energy bibliography
M-FS-23823 B78-10037 03
Automated solar-cell-array assembly machine
NPO-13652 B78-10186 03
Prototype air flat-plate solar collector
M-FS-23893 B78-10199 03
Flat-plate solar collector - installation package
M-FS-23921 B78-10200 03
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M-FS-23888 B78-10210 03
Glass solar collector - materials assessment
M-FS-23926 B78-10212 03
Natural-oxide solar-collector coatings
M-FS-23518 B78-10326 03
Hot-air flat-plate solar collector-design package
M-FS-23941 B78-10335 03
Evaluation of an air solar collector
M-FS-23978 B78-10336 03
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M-FS-23968 B78-10338 03
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M-FS-23969 B78-10339 03
Convectively cooled structures
LANGLEY-12347 B78-10404 06
Design and installation of a flat-plate solar collector
M-FS-25010 B78-10498 03

SOLAR ELECTRIC PROPULSION
Solar-electric geocentric transfer
LEWIS-12939 B78-10403 06

SOLAR ENERGY
Voice-output solar energy reporter
LEWIS-12947 B78-10022 02
Double-sided solar-cell package
NPO-14199 B78-10033 03
Solar-energy bibliography
M-FS-23823 B78-10037 03
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M-FS-23916 B78-10180 03
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M-FS-23909 B78-10181 03
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NPO-14062 B78-10184 03
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NPO-14061 B78-10185 03
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NPO-13652 B78-10186 03
Inexpensive, portable, integrating solar energy meter
LEWIS-12804 B78-10188 03
Selection standard for FEP films for solar energy
MSC-16999 B78-10190 03
Prototype residential solar-energy system
M-FS-23932 B78-10191 03
Prototype residential solar-energy system-engineering analysis
M-FS-23929 B78-10192 03
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M-FS-23910 B78-10194 03
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M-FS-23907 B78-10195 03
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M-FS-23925 B78-10196 03
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M-FS-23892 B78-10209 03
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Measuring metallic concentrations in glycol solutions
M-FS-23894 B78-10211 03
Glass solar collector - materials assessment
M-FS-23926 B78-10212 03
Pump efficiency in solar-energy systems
M-FS-23934 B78-10213 03
The economics of solar powered absorption cooling
M-FS-23908 B78-10214 03
Application of solar energy to air-conditioning
M-FS-23913 B78-10215 03
Solar-powered hot-water system
NPO-14270 B78-10324 03
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NPO-14047 B78-10325 03
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M-FS-23518 B78-10326 03
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M-FS-23974 B78-10331 03
Prototype solar-heating system design package
M-FS-23945 B78-10332 03
Prototype residential solar-energy system-design package
M-FS-23953 B78-10333 03
Prototype residential solar-energy system-installation package
M-FS-23956 B78-10334 03
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Solar simulator test facility
M-FS-23972 B78-10477 03
More efficient GaAs solar cells
LANGLEY-12216 B78-10479 03
Solar-powered hot-air system
M-FS-23976 B78-10481 03
Solar-heating system design data brochure
M-FS-23977 B78-10492 03
Solar-heating system performance tests
M-FS-25021 B78-10493 03
Solar-heating system
M-FS-25022 B78-10494 03
Solar hot-water system
M-FS-25043 B78-10495 03
Residential solar-heating system-design package
M-FS-25071 B78-10496 03
Development and testing of a hot-air solar collector
M-FS-23997 B78-10497 03
Design and installation of a flat-plate solar collector
M-FS-25010 B78-10498 03
Liquid solar collector-performance tests
M-FS-25082 B78-10499 03
Concentrating solar collector-installation package
M-FS-25068 B78-10500 03
Corrosion inhibitors for solar-heating and cooling
M-FS-25023 B78-10501 03
Absorptive coating for aluminum solar panels
M-FS-25033 B78-10507 04

SOLAR ENERGY ABSORBERS
Prototype air flat-plate solar collector
M-FS-23893 B78-10199 03
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M-FS-23891 B78-10202 03
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M-FS-23886 B78-10207 03
Thermal performance of a flat-plate liquid solar collector
M-FS-23890 B78-10208 03
Performance of black-nickel and black-chrome solar collectors
M-FS-23888 B78-10210 03

SOLAR ENERGY CONVERSION
High-temperature solar converter
GSFC-12234 B78-10032 03
Solar-energy bibliography
M-FS-23823 B78-10037 03
Solar photolysis of water
NPO-14126 B78-10049 04
Prototype solar-heating system
M-FS-23916 B78-10180 03
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M-FS-23909 B78-10181 03
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M-FS-23915 B78-10183 03
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NPO-13652 B78-10186 03
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M-FS-23932 B78-10191 03

Prototype residential solar-energy system-engineering analysis
M-FS-23929 B78-10192 03
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M-FS-23933 B78-10193 03
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M-FS-23913 B78-10215 03
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M-FS-23945 B78-10332 03
Prototype residential solar-energy system-design package
M-FS-23953 B78-10333 03
Prototype residential solar-energy system-installation package
M-FS-23956 B78-10334 03

SOLAR FLUX DENSITY
Terrestrial photovoltaic measurements
LEWIS-13057 B78-10310 01

SOLAR GENERATORS
Solar-energy bibliography
M-FS-23823 B78-10037 03
Voltage regulator for solar panels
NPO-13895 B78-10478 03

SOLAR HEATING
Solar-energy bibliography
M-FS-23823 B78-10037 03
Prototype solar-heating system
M-FS-23916 B78-10180 03
Residential solar-heating system
M-FS-23909 B78-10181 03
Multichannel temperature control for solar heating
M-FS-23775 B78-10182 03
Programmable controller for solar heating
M-FS-23915 B78-10183 03
Prototype residential solar-energy system
M-FS-23932 B78-10191 03
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M-FS-23929 B78-10192 03
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M-FS-23910 B78-10194 03
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M-FS-23925 B78-10196 03
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M-FS-23914 B78-10197 03
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M-FS-23934 B78-10213 03
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M-FS-23953 B78-10333 03
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M-FS-23956 B78-10334 03
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M-FS-23977 B78-10492 03
Solar-heating system performance tests
M-FS-25021 B78-10493 03
Solar hot-water system
M-FS-25043 B78-10495 03

SOLAR INSTRUMENTS
Cosine-corrected optical diffuser
NPO-14288 B78-10322 03

SOLAR RADIATION
Improved conical solar concentrator
NPO-13825 B78-10187 03

SOLAR REFLECTORS
High-temperature solar converter
GSFC-12234 B78-10032 03
Double-sided solar-cell package
NPO-14199 B78-10033 03
Improved conical solar concentrator
NPO-13825 B78-10187 03
Optics for natural lighting
LANGLEY-12333 B78-10189 03

SOLAR SIMULATORS
Accelerated-weathering test-system for solar cells
NPO-14061 B78-10185 03
Flat-plate liquid solar collector
M-FS-23912 B78-10205 03
Solar simulator test facility
M-FS-23972 B78-10477 03

SOLDERED JOINTS
Flicking-wire drag tensioner
MSC-16367 B78-10109 07

SOLDERING
Two braze alloys for thin-wall components
M-FS-19206 B78-10117 08
Bench-top soldering aid for PC boards
MSC-16274 B78-10121 08
High-vacuum, low-temperature bond for second-surface mirrors
M-FS-23405 B78-10124 08
'PC fabrication' for silicon solar-cell arrays
NPO-13991 B78-10131 08

SOLENOID VALVES
Latching solenoid for cryogenic valves
MSC-18106 B78-10418 07

SOLID PHASES
High-gradient continuous-casting furnace
LEWIS-12934 B78-10425 08

SOLID ROCKET PROPELLANTS
Predicting structures of cross-linked condensation polymers
NPO-14007 B78-10352 04

SOLID STATE DEVICES
CMOS-array design-automation techniques
M-FS-23762 B78-10311 01
Zone-refining encapsulated semiconductors
M-FS-23902 B78-10351 04

SOLIDIFICATION
Controlling the growth of silicon sheets
NPO-14295 B78-10581 08

SOLUBILITY
Positively charged membrane for urea dialysis
NPO-14101 B78-10241 05

SOLUTIONS
Electroplating and stripping copper on molybdenum and niobium
LEWIS-12151 B78-10055 04

SOLVENT EXTRACTION
Coal mining with a liquid solvent
NPO-14028 B78-10345 04
SOLVENTS
Low-temperature elastomer production and curing
NPO-13899 B78-10346 04
SOUND FIELDS
Hybrid random-sound test-control system
NPO-13900 B78-10025 02
SOUND TRANSMISSION
Airframe design for reducing cabin noise
LANGLEY-12097 B78-10257 06
SOUND WAVES
Implantable digital hearing aid
KSC-11009 B78-10373 05
Predicting rotor rotation noise
LANGLEY-12098 B78-10406 06
SPACE FLIGHT FEEDING
Automatic primate feeder
LANGLEY-11586 B78-10246 05
SPACE SHUTTLE ORBITERS
Fuseholders allow fast system checkout
MSC-16856 B78-10088 06
SPACECRAFT ELECTRONIC EQUIPMENT
Portable spark-gap arc generator
LEWIS-12886 B78-10008 01
SPACECRAFT STABILITY
Improved notation controller
GSFC-12273 B78-10383 06
SPACECRAFT TRAJECTORIES
Solar-electric geocentric transfer
LEWIS-12939 B78-10403 06
SPARE PARTS
Spares-optimized model
MSC-18015 B78-10446 09
Computation of spare parts requirements
MSC-16872 B78-10593 09
SPARK GAPS
Portable spark-gap arc generator
LEWIS-12886 B78-10008 01
SPECIFICATIONS
Evaluation of an air solar collector
M-FS-23978 B78-10336 03
SPECIMENS
Mounting procedure for geological samples
MSC-18206 B78-10327 03
Retainer for laboratory animals
LANGLEY-12353 B78-10371 05
Safe, durable soil sampler
MSC-18171 B78-10577 07
SPECTRA
Oxygen and nitrogen raman spectra
LEWIS-12849 B78-10361 04
SPECTRAL BANDS
Processing multispectral signals from a discrete-sensor array
NPO-14211 B78-10442 09
SPECTRAL EMISSION
Custom blending of lamp phosphors
MSC-16692 B78-10056 04
SPECTRAL SIGNATURES
Hybrid random-sound test-control system
NPO-13900 B78-10025 02
Measuring metallic concentrations in glycol solutions
M-FS-23894 B78-10211 03
Predicting crop production from satellite data
GSFC-12379 B78-10595 09
SPECTROMETERS
Automatic gain-balancing circuit
LANGLEY-12074 B78-10297 01
Improved fourier interference spectrometer
NPO-14025 B78-10485 03
SPECTROPHOTOMETERS
Instrument measures many optical properties in visible and IR
LANGLEY-12285 B78-10489 03
SPECTRORADIOMETERS
Cosine-corrected optical diffuser
NPO-14288 B78-10322 03
SPECTROSCOPY
Pulsed NMR spectroscopy
NPO-14023 B78-10175 03
SPECTRUM ANALYSIS
Automatic radio-transmission monitor
NPO-13941 B78-10165 02
Wideband digital spectrum analyzer
NPO-14394 B78-10468 02
Improved fourier interference spectrometer
NPO-14025 B78-10485 03
SPEED CONTROL
Shaft speed control
NPO-14170 B78-10416 07
SPEED INDICATORS
'Pseudobackscatter' laser velocimeter
ARC-10970 B78-10318 03
Shock-swallowing air sensor
FRC-10107 B78-10537 06
Measuring projectile speed
LANGLEY-12387 B78-10538 06
Miniature velocimeter
LANGLEY-12281 B78-10539 06
SPIN RESONANCE
Pulsed NMR spectroscopy
NPO-14023 B78-10175 03
SPIN-LATTICE RELAXATION
Pulsed NMR spectroscopy
NPO-14023 B78-10175 03
SPINDLES
Improved transformer-winding method
NPO-14243 B78-10282 08
SPINE
A probe for blood-vessel and spinal interiors
NPO-14132 B78-10242 05
SPIRAL WRAPPING
Nylon screws make inexpensive coil forms
MSC-16912 B78-10003 01
SPLICING
Splicing shielded cables
MSC-18297 B78-10453 01
SPLINES
'Nonfloating' universal joint
MSC-19546 B78-10108 07
SPOILER SLOT AILERONS
Aircraft trailing vortex hazard alleviators
LANGLEY-12034 B78-10272 07
SPONGES (MATERIALS)
No-warp potted circuits
MSC-19729 B78-10435 08
SPONTANEOUS COMBUSTION
Directory of fire research specialists
LEWIS-13123 B78-10399 06
SPRAYED COATINGS
Simplified tooling for spray masking
MSC-16927 B78-10136 08
SPRAYERS
Extension handle for spray cans
KSC-11083 B78-10576 07
SPRAYING
Simplified tooling for spray masking
MSC-16927 B78-10136 08
SPRINGS (ELASTIC)
Spring control of wire harness loops
MSC-18246 B78-10411 07
SPUTTERING
Ion-beam texturing of materials
LEWIS-12996 B78-10357 04
Biomedical applications of ion-beam technology
LEWIS-12807 B78-10363 05
STABILIZATION
Improved notation controller
GSFC-12273 B78-10383 06
STABILIZERS (AGENTS)
Fast-drying coating
MSC-16056 B78-10060 04
STAINLESS STEELS
Form die and glide plates for vacuum brazing
MSC-16549 B78-10113 08
Internal grid for release of brazing retorts
MSC-19472 B78-10114 08
Vacuum control for brazing stainless steel
MSC-19457 B78-10115 08
Mechanical properties of 18-2 Mn stainless steel
M-FS-23843 B78-10229 04
Nitronic 60: a new alloy
M-FS-23844 B78-10230 04
Embrittlement proof nickel-alloy bellows
M-FS-19331 B78-10349 04
STANDARDIZATION
Standardized gas-temperature probes
LEWIS-13059 B78-10392 06
STANDARDS
Mass spectrometer calibration standard
NPO-14097 B78-10249 06
Calibration standards for PIND tests
MSC-18169 B78-10388 06
STARK EFFECT
Improved 'spectrophone'
NPO-14143 B78-10167 03
STATIC DISCHARGERS
Portable spark-gap arc generator
LEWIS-12886 B78-10008 01
STATIC ELECTRICITY
Antistatic additive for polyimide films
NPO-14232 B78-10220 04
Antistatic coating for acrylics
NPO-13867 B78-10509 04
STATIC PRESSURE
Orifice calibration module
LANGLEY-12269 B78-10393 06
Static-pressure probe for small geometries
LANGLEY-11552 B78-10395 06
STATISTICAL DECISION THEORY
Model for redundant-sensor signal errors
MSC-16715 B78-10146 09
STATISTICAL TESTS
Real-time instrument averages 100 data sets
LEWIS-13093 B78-10534 06
STEAM
Easily installed insulation for steamfittings
MSC-18277 B78-10589 08
STEELS
Processing high-strength steel alloys
MSC-16172 B78-10441 08
STEERABLE ANTENNAS
Control of small phased-array antennas
MSC-14938 B78-10166 02

STERILIZATION
Self-sterilizing canister
NPO-14237 B78-10064 05
Corona-discharge air-purification system
ARC-10975 B78-10350 04
resterilizable electrode for electrosurgery
HQN-10915 B78-10370 05
STIMULATED EMISSION
Vacuum-ultraviolet laser uses superfluid helium
NPO-13993 B78-10323 03
STIRLING CYCLE
Stirling-engine design manual
LEWIS-13098 B78-10580 07
STOMACH
Antihistamines reduce ulceration produced by indomethacin
ARC-11118 B78-10366 05
STOPPING
Device for pitching off metal tubes
GSFC-12274 B78-10410 07
STORAGE BATTERIES
Glass tubes for protecting solar cells
NPO-14200 B78-10031 03
STORAGE TANKS
Solar hot-water system
M-FS-25043 B78-10495 03
STRAIN GAGES
Improved strain-gage calibration
MSC-16852 B78-10074 06
Compact piston-position sensor
LEWIS-12392 B78-10102 07
Ultrathin films as photomechanical transducer
NPO-14363 B78-10491 03
STRANDS
Ultrafine PBI fibers and yarns
ARC-11221 B78-10504 04
STRAPS
Human arm may act as antenna
ARC-11195 B78-10161 02
Bend-absorbing clamp
MSC-16971 B78-10575 07
STRESS ANALYSIS
Stress analysis under component relative interference fit
LEWIS-12911 B78-10261 06
Structural performance analysis and redesign
LANGLEY-12213 B78-10264 06
Resizing algorithm for loaded structures
LANGLEY-12064 B78-10594 09
STRESS CONCENTRATION
Gear-tooth fatigue-strength estimates
MSC-18167 B78-10573 07
STRESS CORROSION
Mechanical properties of 18-2 Mn stainless steel
M-FS-23843 B78-10229 04
Nitronic 60: a new alloy
M-FS-23844 B78-10230 04
STRESSES
Stress analysis under component relative interference fit
LEWIS-12911 B78-10261 06
STRIP TRANSMISSION LINES
Microstrip backfire antenna
LANGLEY-12172 B78-10019 02
STRUCTURAL ANALYSIS
Stress analysis under component relative interference fit
LEWIS-12911 B78-10261 06
Structural performance analysis and redesign
LANGLEY-12213 B78-10264 06
Analysis of linear viscoelastic structures
NPO-13197 B78-10266 06
Calculation of planar-truss modal frequencies
LANGLEY-12137 B78-10382 06
Nacelle incremental drag
LEWIS-12786 B78-10400 06
Plotting max/min data envelopes
MSC-18016 B78-10597 09
STRUCTURAL DESIGN
Structural performance analysis and redesign
LANGLEY-12213 B78-10264 06
Calculation of planar-truss modal frequencies
LANGLEY-12137 B78-10382 06
Lattice panels with high structural efficiency
LANGLEY-11898 B78-10426 08
Low-cost graphite/epoxy structural panels
M-FS-23871 B78-10427 08
Lightweight conical antenna reflector
NPO-13552 B78-10472 02
Resizing algorithm for loaded structures
LANGLEY-12064 B78-10594 09
STRUCTURAL DESIGN CRITERIA
Design of transmission shafting
LEWIS-12965 B78-10107 07
STRUCTURAL FAILURE
Design of transmission shafting
LEWIS-12965 B78-10107 07
STRUCTURAL MEMBERS
Analysis of cracked orthotropic sheets
LANGLEY-12288 B78-10405 06
Lattice panels with high structural efficiency
LANGLEY-11898 B78-10426 08
Reducing weld peaking in aluminum
M-FS-23973 B78-10433 08
SUBMINIATURIZATION
Subminiature hydraulic actuator
LANGLEY-11522 B78-10269 07
SUBSONIC FLOW
Flow velocities and streamlines
LEWIS-12966 B78-10094 06
Flow in axisymmetric ducts with struts
LEWIS-12798 B78-10556 06
SUBSTITUTES
Spares-optimized model
MSC-18015 B78-10446 09
SUBSTRATES
Forming 'dynamic' membranes on stainless steel
MSC-18172 B78-10513 04
SUNLIGHT
Inexpensive, portable, integrating solar energy meter
LEWIS-12804 B78-10188 03
Optics for natural lighting
LANGLEY-12333 B78-10189 03
Solar simulator test facility
M-FS-23972 B78-10477 03
SUPERFLUIDITY
Vacuum-ultraviolet laser uses superfluid helium
NPO-13993 B78-10323 03
SUPERHIGH FREQUENCIES
Real-time monitoring of crustal deformations
NPO-14124 B78-10034 03
SUPERSONIC COMBUSTION RAMJET ENGINES
Convectively cooled structures
LANGLEY-12347 B78-10404 06
SUPERSONIC DRAG
Nacelle incremental drag
LEWIS-12786 B78-10400 06
SUPERSONICS
Shock-swallowing air sensor
FRC-10107 B78-10537 06
SUPPORTS
Vibration-free thermal link
GSFC-12297 B78-10169 03
Gentle support stands for fluid-line mockups
MSC-16479 B78-10291 08
Rigid 'Sling' for topheavy loads
GSFC-12359 B78-10574 07
SURFACE DISTORTION
Detecting surface deformations photographically
MSC-16156 B78-10547 06
SURFACE ENERGY
Biocompatibility of surgical implants
NPO-14291 B78-10368 05
SURFACE FINISHING
Boron triflouride coatings for plastics
ARC-11057 B78-10043 04
Surface examination of small particles
LEWIS-12842 B78-10075 06
Ion-beam texturing of materials
LEWIS-12996 B78-10357 04
Biomedical applications of ion-beam technology
LEWIS-12807 B78-10363 05
Holding fixture for variable-contour parts
MSC-16270 B78-10429 08
Process for growing thin polished silicon sheets
NPO-14172 B78-10434 08
Breather cloth for vacuum curing
MSC-18063 B78-10440 08
Coating for hot sliding seals
MSC-16529 B78-10562 07
Electroplated 'cold patch' for critical parts
M-FS-19401 B78-10584 08
SURFACE LAYERS
Applying uniform adhesive coatings
MSC-19462 B78-10583 08
SURFACE PROPERTIES
Ultra-high-strength boron fibers
LEWIS-12739 B78-10051 04
SURFACE TEMPERATURE
Predicting surface heat flux
MSC-16095 B78-10090 06
Orbital heat rate package
M-FS-23980 B78-10554 06
SURGERY
Biocompatibility of surgical implants
NPO-14291 B78-10368 05
Intraocular pressure reduction and regulation
LEWIS-12723 B78-10523 05
SURGICAL INSTRUMENTS
resterilizable electrode for electrosurgery
HQN-10915 B78-10370 05
Flow-compensating pressure regulator
LEWIS-12718 B78-10522 05
SURVEILLANCE RADAR
Air-traffic surveillance systems
NPO-14173 B78-10313 02
SWAGING
Riveting-force gage
NPO-13477 B78-10432 08
SWEAT
Sweat collection capsule
ARC-11031 B78-10367 05

SWITCHES
High-power RF switch
NPO-14229 B78-10151 01
Easily-wired toggle switch
MSC-18102 B78-10301 01
SWITCHING
Automatic circuit interrupter
MSC-16697 B78-10300 01
SWITCHING CIRCUITS
Symmetric voltage-controlled variable resistance
MSC-16685 B78-10148 01
IC implementation of crossbar switches
NPO-13837 B78-10153 01
High-Speed, high-power, switching transistor
LEWIS-13021 B78-10298 01
Improved driver for capacitive loads
LANGLEY-11609 B78-10304 01
Power-switch dV/dt sensing
MSC-16707 B78-10307 01
Phase-shift array, arbitrary and continuous through 360 deg
LANGLEY-12272 B78-10308 01
One-third selection for matrix-addressing ferroelectrics
LANGLEY-11993 B78-10456 01
Dynamic braking of bidirectional motors
ARC-11194 B78-10578 07
SWITCHING THEORY
Representation of multivalued logic functions
NPO-13760 B78-10596 09
SWIVELS
Rigid coupling is also flexible
MSC-16488 B78-10098 07
SYMMETRY
Compact antenna has symmetrical radiation pattern
ARC-11189 B78-10473 02
SYNCHRONISM
Synchronous transfer circuits for redundant systems
NPO-14162 B78-10157 01
Chopper-stabilized phase detector
MSC-16461 B78-10163 02
Simplified phase detector
NPO-13395 B78-10457 01
SYNCHRONIZED OSCILLATORS
Digital phase shifter synchronizes local oscillators
MSC-16695 B78-10011 01
Synchronous transfer circuits for redundant systems
NPO-14162 B78-10157 01
SYNTHESIZERS
Voice-output solar energy reporter
LEWIS-12947 B78-10022 02
SYNTHETIC FIBERS
Ultrafine PBI fibers and yarns
ARC-11221 B78-10504 04
SYNTHETIC FUELS
Hydrogen enrichment of synthetic fuel
M-FS-23279 B78-10039 04
SYSTEM FAILURES
Preventing radio-paging system tieup
MSC-19696 B78-10024 02
Synchronous transfer circuits for redundant systems
NPO-14162 B78-10157 01
Detecting servo failures with software
FRC-11003 B78-10396 06
SYSTEMS ANALYSIS
Hydraulic dynamic analysis
MSC-16795 B78-10095 06
Marshall system for aerospace simulation
M-FS-22672 B78-10296 09
Multipurpose system simulator
GSFC-12333 B78-10444 09

T

TAIL ASSEMBLIES
Spring control of wire harness loops
MSC-18246 B78-10411 07
TANKS (CONTAINERS)
Damage-detection system for LNG carriers
LANGLEY-11463 B78-10250 06
TANTALUM
Ion-beam texturing of materials
LEWIS-12996 B78-10357 04
TAPE RECORDERS
Portable data system
ARC-11136 B78-10316 02
TEFLON (TRADEMARK)
Selection standard for FEP films for solar energy
MSC-16999 B78-10190 03
High-pressure cryogenic cylinder seal
M-FS-19335 B78-10421 07
TELECOMMUNICATION
Adaptive polarization separation experiments
LANGLEY-12196 B78-10006 01
Simplified data compressor
NPO-14041 B78-10023 02
Lightweight conical antenna reflector
NPO-13552 B78-10472 02
Telecommunications network optimization
NPO-14486 B78-10476 02
TELEMETRY
Wideband EMG telemetry system
ARC-11209 B78-10375 05
Measuring radio-signal power accurately
NPO-13373 B78-10464 02
TELEPHONY
Voice-output solar energy reporter
LEWIS-12947 B78-10022 02
TELEPRINTERS
Portable data system
ARC-11136 B78-10316 02
TELEVISION CAMERAS
Infrared-enhanced TV for fire detection
M-FS-19380 B78-10172 03
Processing multispectral signals from a discrete-sensor array
NPO-14211 B78-10442 09
TELEVISION EQUIPMENT
Video scrambler/descrambler
MSC-16843 B78-10013 02
TELEVISION SYSTEMS
Simulator for training remote-manipulator operators
MSC-14921 B78-10415 07
TELEVISION TRANSMISSION
Video scrambler/descrambler
MSC-16843 B78-10013 02
TEMPERATURE
Low-chromium stainless steels
LEWIS-12543 B78-10046 04
High-temperature ca facitive pressure transducer
LEWIS-13078 B78-10398 06
TEMPERATURE CONTROL
Controlled freezing of biological samples
GSFC-12173 B78-10065 05
Thermal-control canister
GSFC-12253 B78-10079 06
Thermal compensator for helium refrigerators
GSFC-12168 B78-10082 06
Temperature stabilization of microwave ferrite devices
MSC-16833 B78-10152 01
Prototype solar-heating system
M-FS-23916 B78-10180 03
Residential solar-heating system
M-FS-23909 B78-10181 03
Multichannel temperature control for solar heating
M-FS-23775 B78-10182 03
Prototype residential solar-energy system
M-FS-23932 B78-10191 03
Prototype residential solar-energy system-engineering analysis
M-FS-23929 B78-10192 03
Residential solar-heating system - design brochure
M-FS-23933 B78-10193 03
Solar-heating module
M-FS-23925 B78-10196 03
Solar-powered hot-water system
NPO-14270 B78-10324 03
Modular heat-pipe-radiator panel
MSC-16625 B78-10328 03
Prototype solar-heating system design package
M-FS-23945 B78-10332 03
Prototype residential solar-energy system-design package
M-FS-23953 B78-10333 03
Prototype residential solar-energy system-installation package
M-FS-23956 B78-10334 03
Automated controller for liquid-cooled garments
MSC-18055 B78-10365 05
Temperature-gradient oven
M-FS-23919 B78-10390 06
Automated temperature-cycling apparatus
LANGLEY-12310 B78-10391 06
Infrared scanners detect thermal gradients in building walls
LANGLEY-12157 B78-10480 03
Solar-powered hot-air system
M-FS-23976 B78-10481 03
Thermoelectrically-cooled erature probe
MSC-18192 B78-10484 03
Solar-heating system design data brochure
M-FS-23977 B78-10492 03
Solar-heating system performance tests
M-FS-25021 B78-10493 03
Solar-heating system
M-FS-25022 B78-10494 03
Residential solar-heating system-design package
M-FS-25071 B78-10496 03
Development and testing of a hot-air solar collector
M-FS-23997 B78-10497 03
Design and installation of a flat-plate solar collector
M-FS-25010 B78-10498 03
Liquid solar collector-performance tests
M-FS-25082 B78-10499 03

Coated-felt thermal insulation
MSC-12737 B78-10510 04
Metallic thermal seal
MSC-18135 B78-10566 07
Localized cooling of electronic components
LANGLEY-11955 B78-10569 07

TEMPERATURE DISTRIBUTION
Wide-temperature corrosion-resistant pressure regulator
NPO-13776 B78-10274 07
Orbital heat rate package
M-FS-23980 B78-10554 06

TEMPERATURE EFFECTS
Testing composite sheets at high temperatures
MSC-16237 B78-10252 06
Effects of moisture on graphite/epoxy composites
MSC-18045 B78-10360 04
Automated temperature-cycling apparatus
LANGLEY-12310 B78-10391 06

TEMPERATURE GRADIENTS
Practical and efficient magnetic heat pump
LEWIS-12508 B78-10170 03
Temperature-gradient oven
M-FS-23919 B78-10390 06
High-gradient continuous-casting furnace
LEWIS-12934 B78-10425 08
Ocean thermal plant
KSC-11034 B78-10482 03

TEMPERATURE MEASUREMENT
Body/bone-marrow differential-temperature sensor
NPO-14121 B78-10066 05
Thermocouples measure very-hot gas temperatures
LEWIS-12843 B78-10076 06
Infrared scanners for temperature measurement in wind tunnels
LANGLEY-12171 B78-10077 06
Calibration target for temperature radiometer
LANGLEY-12239 B78-10083 06
Oxygen and nitrogen raman spectra
LEWIS-12849 B78-10361 04
Hybrid temperature-monitoring circuit
MSC-18231 B78-10525 05

TEMPERATURE MEASURING INSTRUMENTS
Standardized gas-temperature probes
LEWIS-13059 B78-10392 06
Miniature thermocouple disconnect
LANGLEY-12013 B78-10535 06

TEMPERATURE PROBES
Body/bone-marrow differential-temperature sensor
NPO-14121 B78-10066 05

TEMPERATURE SENSORS
Body/bone-marrow differential-temperature sensor
NPO-14121 B78-10066 05

TEMPLATES
Circuit-lead trimming template
MSC-16589 B78-10439 08

TENSILE PROPERTIES
Quick-and-easy shear-load testing
MSC-16765 B78-10073 06
Mechanical properties of 18-2 Mn stainless steel
M-FS-23843 B78-10229 04
Nitronic 60: a new alloy
M-FS-23844 B78-10230 04
Hydrogen embrittlement of nickel
ARC-10966 B78-10231 04

TENSILE STRENGTH
Wrought nickel-base superalloy
LEWIS-12844 B78-10045 04
Low-chromium stainless steels
LEWIS-12543 B78-10046 04
Partial interlaminar separation for composites
LANGLEY-12065 B78-10052 04
Quick-and-easy shear-load testing
MSC-16765 B78-10073 06

TENSILE TESTS
'Gentle' holder for brittle ceramics
MSC-19645 B78-10552 06

TENSION
Improved strain-gage calibration
MSC-16852 B78-10074 06

TERRESTRIAL RADIATION
Terrestrial photovoltaic measurements
LEWIS-13057 B78-10310 01
Estiuating regional heat flux from scanning radiometer data
LANGLEY-12158 B78-10329 03

TEST CHAMBERS
Automated temperature-cycling apparatus
LANGLEY-12310 B78-10391 06
Compression testing of flammable liquids
MSC-16121 B78-10548 06
Low partial discharge vacuum feedthrough
GSFC-12347 B78-10559 07

TEST EQUIPMENT
Measuring oxide trapping parameters in MOS structure
NPO-14120 B78-10002 01
Quick-and-easy shear-load testing
MSC-16765 B78-10073 06
Calibration standards for PIND tests
MSC-18169 B78-10388 06

TEST FACILITIES
Strobe-margin test for plated memory systems
M-FS-23838 B78-10154 01
Universal test fixture for solar cells
NPO-14062 B78-10184 03
Accelerated-weathering test-system for solar cells
NPO-14061 B78-10185 03
Testing of three hot- air solar collectors
M-FS-23887 B78-10201 03
Flat-plate liquid solar collector
M-FS-23912 B78-10205 03
Testing composite sheets at high temperatures
MSC-16237 B78-10252 06
Photovoltaic systems test facility
LEWIS-13073 B78-10378 06
Testing integrated circuits by photoexcitation
M-FS-23943 B78-10451 01
Solar simulator test facility
M-FS-23972 B78-10477 03

TEST STANDS
Testing composite sheets at high temperatures
MSC-16237 B78-10252 06

TEST VEHICLES
Test-vehicle cycle programmer
LEWIS-12977 B78-10020 02

TETHERLINES
Modified pipe extension safely releases chain binders
MSC-16937 B78-10103 07

TEXTURES
Biomedical applications of ion-beam technology
LEWIS-12807 B78-10363 05
Ion-beam-textored graphite
LEWIS-12724 B78-10506 04

THERMAL CONDUCTIVITY
Predicting surface heat flux
MSC-16095 B78-10090 06
Vibration-free thermal link
GSFC-12297 B78-10169 03

THERMAL CONTROL COATINGS
Electrically-conducting thermal-control coating
GSFC-12207 B78-10044 04
Selection standard for FEP films for solar energy
MSC-16999 B78-10190 03
Breather cloth for vacuum curing
MSC-18063 B78-10440 08

THERMAL CYCLING TESTS
Temperature-gradient oven
M-FS-23919 B78-10390 06
Automated temperature-cycling apparatus
LANGLEY-12310 B78-10391 06
No-warp potted circuits
MSC-19729 B78-10435 08

THERMAL DEGRADATION
Brazed boron-silicon carbide/aluminum structural panels
LANGLEY-12244 B78-10221 04

THERMAL ENVIRONMENTS
Thermal-control canister
GSFC-12253 B78-10079 06
Orbital heat rate package
M-FS-23980 B78-10554 06

THERMAL INSULATION
Improved thermal-tile barrier
MSC-16929 B78-10133 08
Special weave for insulating fabrics
MSC-16380 B78-10288 08
Installing fiber insulation in tight spaces
MSC-16934 B78-10289 08
Infrared scanners detect thermal gradients in building walls
LANGLEY-12157 B78-10480 03
Coated-felt thermal insulation
MSC-12737 B78-10510 04
Metallic thermal seal
MSC-18135 B78-10566 07
Fastener for thermal insulation blankets
MSC-18253 B78-10571 07
Contouring pile-brush seals
MSC-16231 B78-10588 08
Easily installed insulation for steamfittings
MSC-18277 B78-10589 08

THERMAL MAPPING
Energy conservation, using remote thermal scanning
LEWIS-12812 B78-10178 03

THERMAL PROTECTION
Electrically-conducting thermal-control coating
GSFC-12207 B78-10044 04

THERMAL RESISTANCE
Flame-retardant adhesive tape
MSC-16721 B78-10041 04
New adhesive withstands temperature extremes
GSFC-12345 B78-10042 04
Coating for hot sliding seals
MSC-16529 B78-10562 07

THERMAL SHOCK
Vacuum leadthrough for hydrogen maser
NPO-14148 B78-10422 07
THERMAL STABILITY
Thermal-control canister
GSFC-12253 B78-10079 06
THERMAL STRESSES
Resizing algorithm for loaded structures
LANGLEY-12064 B78-10594 09
THERMOCOUPLES
Controlled freezing of biological samples
GSFC-12173 B78-10065 05
Thermocouples measure very-hot gas temperatures
LEWIS-12843 B78-10076 06
Calibration target for temperature radiometer
LANGLEY-12239 B78-10083 06
Predicting surface heat flux
MSC-16095 B78-10090 06
Internal grid for release of brazing retorts
MSC-19472 B78-10114 08
Standardized gas-temperature probes
LEWIS-13059 B78-10392 06
Miniature thermocouple disconnect
LANGLEY-12013 B78-10535 06
THERMODYNAMIC EFFICIENCY
Thermal performance of shaft bearing system
LEWIS-12761 B78-10263 06
THERMODYNAMIC PROPERTIES
Thermal hydraulic analyzer
MSC-18014 B78-10265 06
Graphics program for charts
LEWIS-12811 B78-10598 09
THERMOELECTRIC COOLING
Thermoelectrically-cooled variable-temperature probe
MSC-18192 B78-10484 03
THERMOELECTRIC GENERATORS
Ocean thermal plant
KSC-11034 B78-10482 03
THERMOPILES
Voice-output solar energy reporter
LEWIS-12947 B78-10022 02
THERMOSETTING RESINS
Cure-rate data for silicone adhesive
GSFC-12330 B78-10057 04
Response of graphite/epoxy composites to moisture
MSC-16899 B78-10228 04
THERMOSTATS
Multichannel temperature control for solar heating
M-FS-23775 B78-10182 03
THICKNESS
Calculating wire-bundle diameter
MSC-16378 B78-10119 08
Improved nucleonic coal-thickness monitor
M-FS-23725 B78-10344 04
Measurement of subcoat thickness by characteristic x-rays
MSC-16718 B78-10505 04
THIN FILMS
Mossbauer studies of bulk and thin-film FeTe
M-FS-23773 B78-10059 04
Control of dielectric film deposition
LEWIS-13092 B78-10430 08
Preparing thin aluminum films for adhesive bonding
NPO-14357 B78-10591 08
THIN PLATES
Process for growing thin polished silicon sheets
NPO-14172 B78-10434 08
Controlling the growth of silicon sheets
NPO-14295 B78-10581 08
THIN WALLED SHELLS
Wrench for thin-walled cylinders
LANGLEY-12286 B78-10579 07
THREADS
Nylon screws make inexpensive coil forms
MSC-16912 B78-10003 01
Antibackoff lock for nuts and bolts
MSC-16472 B78-10409 07
Quick-connect threaded attachment joint
LANGLEY-12232 B78-10414 07
THRUST BEARINGS
Dynamics of gas-thrust bearings
LEWIS-12754 B78-10097 06
Improved gas thrust bearings
LEWIS-12569 B78-10413 07
THUNDERSTORMS
System for monitoring lightning strikes
KSC-11018 B78-10475 02
THYRISTORS
Gate-assisted turn-off thyristor
LEWIS-12535 B78-10004 01
High-Speed, high-power, switching transistor
LEWIS-13021 B78-10298 01
TIDE POWERED GENERATORS
Wind/water energy converter
GSFC-12361 B78-10483 03
TILES
Improved thermal-tile barrier
MSC-16929 B78-10133 08
Tile-bonding tool
KSC-11053 B78-10134 08
High-temperature waterproofing for tiles
MSC-16773 B78-10135 08
TIME LAG
Preventing radio-paging system tieup
MSC-19696 B78-10024 02
TIME MEASUREMENT
Measuring projectile speed
LANGLEY-12387 B78-10538 06
TIMING DEVICES
Simple digital pulse-programing circuit
NPO-13747 B78-10299 01
Hybrid clock generator
MSC-18228 B78-10530 05
TIN ALLOYS
High-gradient continuous-casting furnace
LEWIS-12934 B78-10425 08
TISSUES (BIOLOGY)
Controlled freezing of biological samples
GSFC-12173 B78-10065 05
TOOLING
Simplified tooling for spray masking
MSC-16927 B78-10136 08
TOOLS
Simple tool removes IC flat packs
MSC-16058 B78-10010 01
Tool simplifies weld preparation of aluminum
MSC-16992 B78-10123 08
Improved thermal-tile barrier
MSC-16929 B78-10133 08
Compact ratchet wrench
M-FS-24252 B78-10273 07
Adhesive-removal tool
MSC-19498 B78-10279 07
Safe, durable soil sampler
MSC-18171 B78-10577 07
Wrench for thin-walled cylinders
LANGLEY-12286 B78-10579 07
TOPOGRAPHY
Ocean-wave ray or crest diagrams in shoaling waters
LANGLEY-12380 B78-10341 03
TORQUE
Design of transmission shafting
LEWIS-12965 B78-10107 07
Transmitting rotary motion at an angle
MSC-19483 B78-10561 07
TORQUEMETERS
Combination force and angular-deflection indicator
MSC-16155 B78-10070 06
Ultrasonic extensometer measures bolt preload
M-FS-19337 B78-10271 07
TORSIONAL STRESS
Noncontact measurement of angular deflection
LANGLEY-12178 B78-10071 06
TOUGHNESS
Partial interlaminar separation for composites
LANGLEY-12065 B78-10052 04
TOWED BODIES
Scale parachute fabrication
M-FS-23139 B78-10141 08
TOXIC HAZARDS
Cryostat safety tent
GSFC-12206 B78-10080 06
TOXICITY
Toxic substances handbook
LEWIS-13124 B78-10359 04
Directory of fire research specialists
LEWIS-13123 B78-10399 06
TRACE CONTAMINANTS
High-temperature brazing of stainless steel
MSC-19459 B78-10112 08
Multiple-sample holder for IC testing
NPO-14314 B78-10540 06
TRACE ELEMENTS
Improved epoxy adhesive with radiographic tracer
MSC-18020 B78-10225 04
TRACKING (POSITION)
Air-traffic surveillance systems
NPO-14173 B78-10313 02
TRACKING FILTERS
Chopper-stabilized phase detector
MSC-16461 B78-10163 02
TRACKING RADAR
Air-traffic surveillance systems
NPO-14173 B78-10313 02
TRACTORS
Aerodynamic design lowers truck fuel consumption
FRC-11015 B78-10069 06
TRAFFIC CONTROL
Optical traffic-sensing concept
NPO-13603 B78-10021 02
TRAILERS
Aerodynamic design lowers truck fuel consumption
FRC-11015 B78-10069 06
TRAINING DEVICES
Simulator for training remote-manipulator operators
MSC-14921 B78-10415 07
TRAINING SIMULATORS
Custom blending of lamp phosphors
MSC-16692 B78-10056 04

TRAJECTORY ANALYSIS
Solar-electric geocentric transfer
LEWIS-12939 B78-10403 06
TRANSDUCERS
Improved myocardium transducer
NPO-14107 B78-10372 05
Photovoltaic systems test facility
LEWIS-13073 B78-10378 06
High-temperature microphone system
LANGLEY-12375 B78-10384 06
A solid-state phase-insensitive ultrasonic transducer
LANGLEY-12304 B78-10385 06
Electronically-scanned pressure measurement system
LANGLEY-12386 B78-10394 06
High-temperature capacitive pressure transducer
LEWIS-13078 B78-10398 06
Noncontacting valve-position indicator
MSC-16048 B78-10412 07
Ultrathin films as photomechanical transducer
NPO-14363 B78-10491 03
High-sampling-rate pressure transducer has in situ calibration
LANGLEY-12230 B78-10536 06
TRANSFORMERS
Improved transformer-winding method
NPO-14243 B78-10282 08
Bonding core mating surfaces improves transformer
NPO-13855 B78-10283 08
TRANSIENT LOADS
Performance optimizing
LANGLEY-11930 B78-10096 06
TRANSISTOR CIRCUITS
Bench-top soldering aid for PC boards
MSC-16274 B78-10121 08
Symmetric voltage-controlled variable resistance
MSC-16685 B78-10148 01
TRANSISTORS
High-Speed, high-power, switching transistor
LEWIS-13021 B78-10298 01
All-ion-implantation process for integrated circuits
M-FS-23995 B78-10590 08
TRANSMISSION
Coaxial isolator has versatile interface
MSC-16908 B78-10009 01
TRANSMISSION EFFICIENCY
Selection standard for FEP films for solar energy
MSC-16999 B78-10190 03
TRANSMISSION LINES
Power-switch dV/dt sensing
MSC-16707 B78-10307 01
Splicing shielded cables
MSC-18297 B78-10453 01
TRANSMITTANCE
Selection standard for FEP films for solar energy
MSC-16999 B78-10190 03
TRANSMITTERS
Wideband EMG telemetry system
ARC-11209 B78-10375 05
Determining the response of an FM receiver
MSC-16751 B78-10465 02
TRANSONIC FLOW
Flow velocities and streamlines
LEWIS-12966 B78-10094 06
TRANSPARENCE
Abrasion-resistant antireflective coating for polycarbonate
ARC-11047 B78-10054 04
Fire-retardant epoxy polymers
ARC-11182 B78-10218 04
Scratch resistant plastic lenses
ARC-11039 B78-10519 04
TRANSPORT PROPERTIES
Graphics program for charts
LEWIS-12811 B78-10598 09
TRANSPORTATION
Portable data system
ARC-11136 B78-10316 02
TRAPPING
Measuring oxide trapping parameters in MOS structure
NPO-14120 B78-10002 01
TRIETHYL COMPOUNDS
Chemical agent boosts natural-rubber output
NPO-14185 B78-10358 04
TRUCKS
Aerodynamic design lowers truck fuel consumption
FRC-11015 B78-10069 06
Modified pipe extension safely releases chain binders
MSC-16937 B78-10103 07
TRUSSES
Calculation of planar-truss modal frequencies
LANGLEY-12137 B78-10382 06
Rigid 'Sling' for topheavy loads
GSFC-12359 B78-10574 07
TUMBLING MOTION
Tumbling-vehicle entry heating
M-FS-23712 B78-10555 06
TUNERS
Low-power tuner for lasers
M-FS-23863 B78-10486 03
TUNGSTEN
Vacuum leadthrough for hydrogen maser
NPO-14148 B78-10422 07
TURBIDITY
Compact turbidity meter
KSC-11063 B78-10545 06
TURBINE BLADES
Edge geometry of turbomachine blades
LEWIS-12979 B78-10262 06
TURBINE ENGINES
Oxygen and nitrogen raman spectra
LEWIS-12849 B78-10361 04
TURBINES
Edge geometry of turbomachine blades
LEWIS-12979 B78-10262 06
Energy conversion alternatives study
LEWIS-13096 B78-10330 03
TURBOGENERATORS
Ocean thermal plant
KSC-11034 B78-10482 03
TURBOMACHINE BLADES
Edge geometry of turbomachine blades
LEWIS-12979 B78-10262 06
TURBOMACHINERY
Flow velocities and streamlines
LEWIS-12966 B78-10094 06
TURBULENT BOUNDARY LAYER
Internal and external 2-d boundary layer flows
LEWIS-13009 B78-10260 06
TURBULENT FLOW
Flow in axisymmetric ducts with struts
LEWIS-12798 B78-10556 06
TURBULENT WAKES
Aircraft trailing vortex hazard alleviators
LANGLEY-12034 B78-10272 07
TWO DIMENSIONAL BOUNDARY LAYER
Internal and external 2-d boundary layer flows
LEWIS-13009 B78-10260 06

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ULCERS
Antihistamines reduce ulceration produced by indomethacin
ARC-11118 B78-10366 05
ULTRAHIGH FREQUENCIES
Real-time monitoring of crustal deformations
NPO-14124 B78-10034 03
ULTRASONIC AGITATION
Surface examination of small particles
LEWIS-12842 B78-10075 06
ULTRASONIC TESTS
Calibration method for an ultrasonic gray-scale recorder
LEWIS-12782 B78-10016 02
High-resolution gray-scale recorder
LEWIS-12783 B78-10017 02
Ultrasonic evaluation of high-voltage circuit boards
LEWIS-12781 B78-10087 06
Ultrasonic extensometer measures bolt preload
M-FS-19337 B78-10271 07
Noncontacting electrokinetography system
MSC-18162 B78-10533 05
ULTRASONIC WAVE TRANSDUCERS
Low-cost ultrasonic lamb-wave transducer
MSC-16333 B78-10072 06
Damage-detection system for LNG carriers
LANGLEY-11463 B78-10250 06
A solid-state phase-insensitive ultrasonic transducer
LANGLEY-12304 B78-10385 06
ULTRAVIOLET ABSORPTION
Measurement of total organic concentration in water
MSC-16497 B78-10048 04
ULTRAVIOLET RADIATION
Vacuum-ultraviolet laser uses superfluid helium
NPO-13993 B78-10323 03
Diffractoid x-ray focusing
GSFC-12357 B78-10487 03
UMBILICAL CONNECTORS
Automatic circuit interrupter
MSC-16697 B78-10300 01
UNDERWATER ENGINEERING
Fabrication of sea-floor models
NPO-13554 B78-10295 09
UNIONS (CONNECTORS)
Compact pressure-line coupling
MSC-16893 B78-10099 07
Vacuum leadthrough for hydrogen maser
NPO-14148 B78-10422 07
URANIUM
Vacuum leadthrough for hydrogen maser
NPO-14148 B78-10422 07

UREAS
Positively charged membrane for urea dialysis
NPO-14101 B78-10241 05
URINALYSIS
Chemical measurement of urine volume
MSC-16585 B78-10238 05

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V/STOL AIRCRAFT
Potential flows in propulsion system inlets
LEWIS-13010 B78-10553 06
VACUUM APPARATUS
Rapid leak detection with liquid crystals
MSC-13804 B78-10084 06
Verifying the fit of mating contoured surfaces
LANGLEY-11731 B78-10290 08
VACUUM CHAMBERS
Housing protects laser in vacuum
GSFC-12241 B78-10028 03
Internal grid for release of brazing retorts
MSC-19472 B78-10114 08
Vacuum control for brazing stainless steel
MSC-19457 B78-10115 08
Vacuum leadthrough for hydrogen maser
NPO-14148 B78-10422 07
VACUUM SYSTEMS
Rapid leak detection with liquid crystals
MSC-13804 B78-10084 06
VACUUM TESTS
Rapid leak detection with liquid crystals
MSC-13804 B78-10084 06
Low partial discharge vacuum feedthrough
GSFC-12347 B78-10559 07
VALVES
Magnetostrictive valve
NPO-14235 B78-10104 07
Noncontacting valve-position indicator
MSC-16048 B78-10412 07
Stable hydraulic pressure regulator
LEWIS-13058 B78-10417 07
Latching solenoid for cryogenic valves
MSC-18106 B78-10418 07
Low-leakage low-temperature valve
MSC-18087 B78-10420 07
Automatic bypass valve
LANGLEY-12063 B78-10558 07
Reducing stickiness of elastomer valve seals
LANGLEY-11778 B78-10565 07
VAPOR DEPOSITION
High-temperature waterproofing for tiles
MSC-16773 B78-10135 08
Chemical-vapor deposition of silicon from silane
NPO-14403 B78-10502 03
VARIABILITY
Hydraulic dynamic analysis
MSC-16795 B78-10095 06
VECTORS (MATHEMATICS)
Algorithms for linear-systems control
LANGLEY-12313 B78-10443 09
VEHICLES
Coupler for moving vehicles
GSFC-12322 B78-10407 07
VELOCITY DISTRIBUTION
WAKE and WASH
LANGLEY-12262 B78-10093 06
VELOCITY ERRORS
Improved servo for a michaelson interferometer
NPO-14093 B78-10488 03
VELOCITY MEASUREMENT
In vivo blood-flow mapping
NPO-14133 B78-10244 05
Meter for very slow flows
MSC-18112 B78-10267 07
'Pseudobackscatter' laser velocimeter
ARC-10970 B78-10318 03
Shock-swallowing air sensor
FRC-10107 B78-10537 06
Measuring projectile speed
LANGLEY-12387 B78-10538 06
Miniature velocimeter
LANGLEY-12281 B78-10539 06
VENTILATION
Safe venting for electronic components
MSC-18007 B78-10155 01
VENTING
Safe venting for electronic components
MSC-18007 B78-10155 01
VENTS
High-rise foam-in-place process
MSC-16931 B78-10128 08
VERY HIGH FREQUENCIES
Human arm may act as antenna
ARC-11195 B78-10161 02
VIBRATION DAMPING
Low-frequency vibration isolation
NPO-13915 B78-10275 07
VIBRATION ISOLATORS
Vibration-free thermal link
GSFC-12297 B78-10169 03
Low-frequency vibration isolation
NPO-13915 B78-10275 07
VIBRATION MODE
Calculation of planar-truss modal frequencies
LANGLEY-12137 B78-10382 06
VIDEO COMMUNICATION
Video scrambler/descrambler
MSC-16843 B78-10013 02
VIDEO DATA
Accurate positioning of characters on CRT displays
MSC-16505 B78-10014 02
Simplified data compressor
NPO-14041 B78-10023 02
Data reformatting with less hardware
NPO-13676 B78-10470 02
VIDEO EQUIPMENT
Video method for studying optical fields
M-FS-23103 B78-10036 03
Processing multispectral signals from a discrete-sensor array
NPO-14211 B78-10442 09
Measurement of subcoat thickness by characteristic x-rays
MSC-16718 B78-10505 04
VIDICONS
Video method for studying optical fields
M-FS-23103 B78-10036 03
Infrared-enhanced TV for fire detection
M-FS-19380 B78-10172 03
VINYLIDENE
Fast-drying coating
MSC-16056 B78-10060 04
VISCOELASTICITY
Analysis of linear viscoelastic structures
NPO-13197 B78-10266 06
VISCOUS DAMPING
Low-frequency vibration isolation
NPO-13915 B78-10275 07
VOIDS
Void-free bends in laminated structures
MSC-16998 B78-10285 08
VOLTAGE CONVERTERS (DC TO DC)
Efficient dc-to-dc converter
FRC-11014 B78-10012 01
VOLTAGE GENERATORS
Three-function signal generator
MSC-16672 B78-10306 01
VOLTAGE REGULATORS
Power-switch dV/dt sensing
MSC-16707 B78-10307 01
Voltage regulator for solar panels
NPO-13895 B78-10478 03
VOLTMETERS
Automated tester for MOS devices
NPO-14088 B78-10001 01
VOLUMETRIC ANALYSIS
Chemical measurement of urine volume
MSC-16585 B78-10238 05
VORTICES
Noise calculation on the basis of vortex flow models
LANGLEY-12271 B78-10078 06
Aircraft trailing vortex hazard alleviators
LANGLEY-12034 B78-10272 07

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WAFERS
Double-sided solar-cell package
NPO-14199 B78-10033 03
WALKING
Artificial leg with natural gait
M-FS-23225 B78-10239 05
WARNING SYSTEMS
Electrical-ground monitor
MSC-18281 B78-10455 01
System for monitoring lightning strikes
KSC-11018 B78-10475 02
WARPAGE
No-warp potted circuits
MSC-19729 B78-10435 08
Detecting surface deformations photographically
MSC-16156 B78-10547 06
WASHERS (SPACERS)
Antibackoff lock for nuts and bolts
MSC-16472 B78-10409 07
WASHING
Biological sampling and cleaning device
NPO-14010 B78-10245 05
WATER
Data processing for water monitoring system
MSC-16842 B78-10234 05
WATER POLLUTION
Rapid measurement of bacteria in water
GSFC-12158 B78-10232 05
Compact turbidity meter
KSC-11063 B78-10545 06
WATER QUALITY
Measurement of total organic concentration in water
MSC-16497 B78-10048 04
Data processing for water monitoring system
MSC-16842 B78-10234 05
Water sample-collection and distribution system
MSC-16841 B78-10235 05

Automated electrochemical selection of coliforms
MSC-16777 B78-10236 05
Chemiluminescence and bioluminescence microbe detection
MSC-16779 B78-10237 05
Automated syringe sampler
LANGLEY-12308 B78-10374 05

WATER RECLAMATION
Monitoring systems for community water supplies
MSC-16778 B78-10233 05
Data processing for water monitoring system
MSC-16842 B78-10234 05

WATER TEMPERATURE
Solar hot-water system
M-FS-25043 B78-10495 03

WATER TREATMENT
Monitoring systems for community water supplies
MSC-16778 B78-10233 05

WATER WAVES
Ocean-wave ray or crest diagrams in shoaling waters
LANGLEY-12380 B78-10341 03

WATERPROOFING
High-temperature waterproofing for tiles
MSC-16773 B78-10135 08

WATERWAVE ENERGY CONVERSION
Wind/water energy converter
GSFC-12361 B78-10483 03

WAVEFORMS
Three-function signal generator
MSC-16672 B78-10306 01

WAVELENGTHS
Laser beam color separator
LANGLEY-11806 B78-10174 03

WEATHER DATA RECORDERS
Portable data system
ARC-11136 B78-10316 02

WEATHERING
Accelerated-weathering test-system for solar cells
NPO-14061 B78-10185 03

WEAVING
Special weave for insulating fabrics
MSC-16380 B78-10288 08

WEBS (SHEETS)
'Space slitter' for film or tape
KSC-10894 B78-10138 08

WEIGHT MEASUREMENT
Chemical measurement of urine volume
MSC-16585 B78-10238 05

WEIGHT REDUCTION
Lattice panels with high structural efficiency
LANGLEY-11898 B78-10426 08

WEIGHTLESSNESS
Separating biological cells
M-FS-23883 B78-10521 05

WELDED JOINTS
Compatibility of Au-Cu-Ni braze alloy with NH3
MSC-16864 B78-10219 04
Welding fixture for thin metal parts
GSFC-12318 B78-10428 08
Detecting overpenetration of electron-beam welds
M-FS-19396 B78-10586 08

WELDING
Welding fixture for thin metal parts
GSFC-12318 B78-10428 08
Reducing weld peaking in aluminum
M-FS-23973 B78-10433 08
Brazing dissimilar aluminum alloys
MSC-16340 B78-10587 08

WELDING MACHINES
Improved electron-beam welder
M-FS-23772 B78-10143 08

WHEAT
Predicting crop production from satellite data
GSFC-12379 B78-10595 09

WICKS
Improved heat-pipe wick
NPO-13391 B78-10381 06

WIDE ANGLE LENSES
Wide angle pinhole camera
LANGLEY-11905 B78-10173 03

WIDEBAND COMMUNICATION
Adaptive polarization separation experiments
LANGLEY-12196 B78-10006 01

WINCHES
Emergency escape device
M-FS-23235 B78-10270 07

WIND TUNNEL APPARATUS
High-sampling-rate pressure transducer has in situ calibration
LANGLEY-12230 B78-10536 06

WIND TUNNEL CALIBRATION
Orifice calibration module
LANGLEY-12269 B78-10393 06

WIND TUNNEL DRIVES
Automatic bypass valve
LANGLEY-12063 B78-10558 07

WIND TUNNEL MODELS
Detection of boundary-layer transitions in wind tunnels
LANGLEY-12261 B78-10255 06

WIND TUNNEL TESTS
Infrared scanners for temperature measurement in wind tunnels
LANGLEY-12171 B78-10077 06
Subminiature hydraulic actuator
LANGLEY-11522 B78-10269 07
Aircraft trailing vortex hazard alleviators
LANGLEY-12034 B78-10272 07

WIND TUNNELS
Infrared scanners for temperature measurement in wind tunnels
LANGLEY-12171 B78-10077 06
Electronically-scanned pressure measurement system
LANGLEY-12386 B78-10394 06
Wing aerodynamics under blowing jets
LANGLEY-12256 B78-10401 06
Miniature thermocouple disconnect
LANGLEY-12013 B78-10535 06

WINDING
Improved transformer-winding method
NPO-14243 B78-10282 08

WINDMILLS (WINDPOWERED MACHINES)
Wind-wheel electric power generator
M-FS-23515 B78-10268 07

WINDPOWERED GENERATORS
Wind-wheel electric power generator
M-FS-23515 B78-10268 07
Wind/water energy converter
GSFC-12361 B78-10483 03

WINDSHIELDS
Window flaw detection by backscatter lighting
MSC-16605 B78-10089 06

WINGS
Wing aerodynamics under blowing jets
LANGLEY-12256 B78-10401 06

WIRE
Nylon screws make inexpensive coil forms
MSC-16912 B78-10003 01
Calibration target for temperature radiometer
LANGLEY-12239 B78-10083 06
Wire selector/calculator
MSC-16632 B78-10120 08
Modular ground-wire connector
MSC-16633 B78-10454 01

WIRE CLOTH
Automated inspection of wire-frame assemblies
GSFC-12321 B78-10546 06

WIRE WINDING
Nylon screws make inexpensive coil forms
MSC-16912 B78-10003 01
Improved transformer-winding method
NPO-14243 B78-10282 08

WIRING
Flicking-wire drag tensioner
MSC-16367 B78-10109 07
Laser wire stripping
MSC-18000 B78-10118 08
Calculating wire-bundle diameter
MSC-16378 B78-10119 08
Wire selector/calculator
MSC-16632 B78-10120 08
Easily-wired toggle switch
MSC-18102 B78-10301 01
Spring control of wire harness loops
MSC-18246 B78-10411 07
Circuit-lead trimming template
MSC-16589 B78-10439 08
Splicing shielded cables
MSC-18297 B78-10453 01

WOODEN STRUCTURES
Fire-resistant wood composites
ARC-11174 B78-10508 04

WORK-REST CYCLE
Test-vehicle cycle programmer
LEWIS-12977 B78-10020 02

WRENCHES
Compact ratchet wrench
M-FS-24252 B78-10273 07
Wrench for thin-walled cylinders
LANGLEY-12286 B78-10579 07

WROUGHT ALLOYS
Wrought nickel-base superalloy
LEWIS-12844 B78-10045 04

X

X RAY ANALYSIS
Improved control of medical x-ray film exposure
NPO-13808 B78-10063 05

X RAY APPARATUS
Low-intensity x-ray and gamma-ray imaging device
GSFC-12263 B78-10061 05
Improved control of medical x-ray film exposure
NPO-13808 B78-10063 05

X RAY DIFFRACTION
Diffractoid x-ray focusing
GSFC-12357 B78-10487 03

X RAY INSPECTION
Improved epoxy adhesive with radiographic tracer
MSC-18020 B78-10225 04

Measurement of subcoat thickness by characteristic x-rays
MSC-16718 B78-10505 04
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FINNEGAN, E. J.
Arc detector uses fiber optics
NPO-13377 B78-10449 01
FISCHER, C. W.
Safe venting for electronic components
MSC-18007 B78-10155 01
FISCHER, J. R.
Signal-interleaving device
GSFC-12111 B78-10319 03
FISH, R. B.
Air cushion landing system
LANGLEY-12303 B78-10259 06
FISHER, A.
Cure-rate data for silicone adhesive
GSFC-12330 B78-10057 04
FITZGERALD, D. J.
Plasma igniter for internal-combustion engines
NPO-13828 B78-10100 07
FLAMM, D. L.
Corona-discharge air-purification system
ARC-10975 B78-10350 04
FLEISCHMAN, G. L.
Flat-plate heat pipe
GSFC-11998 B78-10035 03
FLEMINGS, M. C.
High-gradient continuous-casting furnace
LEWIS-12934 B78-10425 08
FORD, A. G.
Shaft speed control
NPO-14170 B78-10416 07
FORESTIERI, A. F.
Improved method of solar-cell assembly
LEWIS-12729 B78-10438 08
FORMAN, R.
Ion-beam-textored graphite
LEWIS-12724 B78-10506 04
FOX, C. H., JR.
Wing aerodynamics under blowing jets
LANGLEY-12256 B78-10401 06
FRALICK, G. C.
Oxygen and nitrogen raman spectra
LEWIS-12849 B78-10361 04
FRANK, H. A.
Multiplexed battery-bypass control system
NPO-14414 B78-10474 02
FRANKE, J. M.
Directional laser velocimeter with doppler velocity simulator
LANGLEY-12176 B78-10029 03
Wide angle pinhole camera
LANGLEY-11905 B78-10173 03
Laser beam color separator
LANGLEY-11806 B78-10174 03
Miniature velocimeter
LANGLEY-12281 B78-10539 06
FRANT, M. S.
Meter for very slow flows
MSC-18112 B78-10267 07
FRAZER, R. E.
A probe for blood-vessel and spinal interiors
NPO-14132 B78-10242 05
In vivo blood-flow mapping
NPO-14133 B78-10244 05
Improved probe for rectal-cancer detection
NPO-14247 B78-10531 05
FREEMAN, L. M.
Handbook for estimating fabrication costs
M-FS-23795 B78-10140 08
FRIEDEN, H. J.
Automated chromosome analysis
NPO-13913 B78-10364 05
FRIEDMAN, C. A.
Medical Information Management System
GSFC-12078 B78-10376 05
FRYE, J. A.
Special weave for insulating fabrics
MSC-16380 B78-10288 08
FRYER, T. B.
Remotely-powered intracranial pressure monitor
ARC-11120 B78-10362 05
FUCAS, J. C.
System for monitoring lightning strikes
KSC-11018 B78-10475 02
FUHRMAN, J. R.
Wire selector/calculator
MSC-16632 B78-10120 08
FURUIKE, T.
Plotting shear-flow forces
MSC-18013 B78-10445 09
Plotting max/min data envelopes
MSC-18016 B78-10597 09

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GABRIEL, R. W.
Deaerating high-viscosity silicon rubber
MSC-16694 B78-10514 04
GADDIE, J. C.
Human arm may act as antenna
ARC-11195 B78-10161 02
GADDIS, J. L.
Forming 'dynamic' membranes on stainless steel
MSC-18172 B78-10513 04
GAGLIANI, J.
Fire-retardant foams
MSC-16222 B78-10053 04
GALE, R. L.
Hydraulic dynamic analysis
MSC-16795 B78-10095 06
GANDY, A. R.
Automatic primate feeder
LANGLEY-11586 B78-10246 05
GANGULI, P. S.
Low-temperature refining of coal
NPO-14210 B78-10511 04
GARCIA, E. E.
Thermal hydraulic analyzer
MSC-18014 B78-10265 06
GARGUS, S.
Solar-energy bibliography
M-FS-23823 B78-10037 03
GAROFALINI, S.
Accelerated purification of colloidal silica sols
MSC-16793 B78-10512 04
GATES, R. M.
Calculation of planar-truss modal frequencies
LANGLEY-12137 B78-10382 06
GAUDIANO, S.
Calibration standards for PIND tests
MSC-18169 B78-10388 06
GAUTHIER, M. K.
SEM probe of IC radiation sensitivity
NPO-14350 B78-10541 06
GELDERLOOS, H. C.
Verification of redundancy management design
MSC-16713 B78-10145 09
GETLINE, G. L.
Airframe design for reducing cabin noise
LANGLEY-12097 B78-10257 06
GIANATASIO, A. J.
S-Band complex-weight module for adaptive processing
LANGLEY-12197 B78-10005 01
Adaptive polarization separation experiments
LANGLEY-12196 B78-10006 01
GIANTS, T. W.
Fire-retardant epoxy polymers
ARC-11182 B78-10218 04
GIBBONS, D. F.
Biomedical applications of ion-beam technology
LEWIS-12807 B78-10363 05
GILWRE, W. J., JR.
Fire-retardant lightweight composite
ARC-10918 B78-10355 04
GLASGOW, T. K.
Surface examination of small particles
LEWIS-12842 B78-10075 06
GLAWE, G. E.
Thermocouples measure very-hot gas temperatures
LEWIS-12843 B78-10076 06
Standardized gas-temperature probes
LEWIS-13059 B78-10392 06
GOLD, H.
Stable hydraulic pressure regulator
LEWIS-13058 B78-10417 07
GOLDSTEIN, R. M.
Optical gyroscope
NPO-14258 B78-10176 03
Automatic acquisition and ranging system
NPO-13982 B78-10312 02
Measuring radio-signal power accurately
NPO-13373 B78-10464 02
GORDON, L. H.
Electrolysis cell stimulation
LEWIS-12740 B78-10179 03
GOSS, W. C.
Optical gyroscope
NPO-14258 B78-10176 03
GRAEBNER, E. C.
Control of dielectric film deposition
LEWIS-13092 B78-10430 08
GRANDLE, R. E.
Phase-shift array, arbitrary and continuous through 360 deg
LANGLEY-12272 B78-10308 01
GRAY, N. C.
Penetrating fire extinguisher
KSC-11064 B78-10397 06
GREENLEAF, J. E.
Sweat collection capsule
ARC-11031 B78-10367 05
GRIFFITH, J. S.
Improved conical solar concentrator
NPO-13825 B78-10187 03
GRIMES, H. H.
Ultra-high-strength boron fibers
LEWIS-12739 B78-10051 04
GROSS, C.
Electronically-scanned pressure measurement system
LANGLEY-12386 B78-10394 06
High-sampling-rate pressure transducer has in situ calibration
LANGLEY-12230 B78-10536 06
GROSSBARD, H.
Reclaiming hybrid integrated circuits
MSC-16463 B78-10129 08
GRUNBAUM, B. W.
Improvements in microelectrophoresis apparatus
ARC-11121 B78-10247 05

GUEST, J. W.
Compact pressure-line coupling
MSC-16893 B78-10099 07
GUIDRY, L. I.
Analysis of beam columns
MSC-18009 B78-10402 06
GUM, G. R.
Free-air content in fluid systems
MSC-16703 B78-10251 06
GUNTHER, W. D.
'Pseudobackscatter' laser velocimeter
ARC-10970 B78-10318 03
GUPTA, K. K.
Analysis of linear viscoelastic structures
NPO-13197 B78-10266 06
GUSTAFSON, J. A.
Quick-and-easy shear-load testing
MSC-16765 B78-10073 06
GYORGAK, C. A.
Low-chromium stainless steels
LEWIS-12543 B78-10046 04

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HAACK, R. F.
Multiple-sample holder for IC testing
NPO-14314 B78-10540 06
HABEN, R. L.
Topping pressure for gas-storage cylinders
MSC-18186 B78-10542 06
HADEK, V.
Antistatic coating for acrylics
NPO-13867 B78-10509 04
HAEUSSERMANN, W.
Hall devices improve electric motor efficiency
M-FS-23828 B78-10303 01
HALE, G. L.
Fabrication of sea-floor models
NPO-13554 B78-10295 09
HALL, J. R.
Infrared-enhanced TV for fire detection
M-FS-19380 B78-10172 03
HALLBERG, F.
Precision cleaver for 'soft' crystals
GSFC-12291 B78-10348 04
HAMILTON, B. J.
Noncontact optical communication between moving stations
LANGLEY-12283 B78-10377 06
HAMMONS, R. E.
Simplified tooling for spray masking
MSC-16927 B78-10136 08
HAMROCK, B. J.
Self-centering stepped piston
LEWIS-12997 B78-10101 07
Elastic deformation of ball bearings, gears, and cams
LEWIS-13076 B78-10544 06
HARDIN, J. C.
Noise calculation on the basis of vortex flow models
LANGLEY-12271 B78-10078 06
HARF, F. H.
Wrought nickel-base superalloy
LEWIS-12844 B78-10045 04
HARRIS, W. J.
Measurement of subcoat thickness by characteristic x-rays
MSC-16718 B78-10505 04
HARSTAD, A. J.
Application of solar energy to air-conditioning
M-FS-23913 B78-10215 03
HATCH, A.
Automated control of crystal growth
NPO-14420 B78-10582 08
HAW, D. W.
Modified pipe extension safely releases chain binders
MSC-16937 B78-10103 07
HAWKINSON, E. L.
Insulator for cryogenic joints
M-FS-19361 B78-10419 07
HAYNES, B. W.
Bacillus cereus strain MCN as a debriding agent
LANGLEY-12287 B78-10067 05
HAYNIE, C. C.
Tile-bonding tool
KSC-11053 B78-10134 08
Adhesive-removal tool
MSC-19498 B78-10279 07
Holding fixture for variable-contour parts
MSC-16270 B78-10429 08
HEER, E.
Analysis of linear viscoelastic structures
NPO-13197 B78-10266 06
HEIER, W. C.
Wrench for thin-walled cylinders
LANGLEY-12286 B78-10579 07
HEISMAN, R. M.
Rapid leak detection with liquid crystals
MSC-13804 B78-10084 06
Thermal-leak analyzer for vacuum-jacketed lines
MSC-16802 B78-10085 06
High-temperature brazing of stainless steel
MSC-19459 B78-10112 08
Process fabricates flat panels at high temperatures
MSC-16969 B78-10116 08
Laser wire stripping
MSC-18000 B78-10118 08
A sharp knife for high temperatures
MSC-16932 B78-10278 07
HENDRICKS, R. C.
Graphics program for charts
LEWIS-12811 B78-10598 09
HENKE, D.
Scale parachute fabrication
M-FS-23139 B78-10141 08
HERSHEY, L. M.
Simplified phase detector
NPO-13395 B78-10457 01
HEYMAN, J. S.
Pseudo-continuous-wave acoustic instrument
LANGLEY-12260 B78-10248 06
A solid-state phase-insensitive ultrasonic transducer
LANGLEY-12304 B78-10385 06
HICKMAN, D. M.
Noncontacting electrokinetography system
MSC-18162 B78-10533 05
HILLMAN, J. J.
Thermal compensator for helium refrigerators
GSFC-12168 B78-10082 06
HIPKINS, K. R.
Medical Information Management System
GSFC-12078 B78-10376 05
HIRSCHBERG, J. G.
Compact turbidity meter
KSC-11063 B78-10545 06
HOFFMAN, H. C.
Improved notation controller
GSFC-12273 B78-10383 06
HOLANDA, R.
Standardized gas-temperature probes
LEWIS-13059 B78-10392 06
HOLCOMB, J. M.
Automated electrophoresis apparatus
M-FS-23983 B78-10516 04
HOLLAND, L. R.
Zone-refining encapsulated semiconductors
M-FS-23902 B78-10351 04
HOLLENBAUGH, R. P.
Compression testing of flammable liquids
MSC-16121 B78-10548 06
HOLT, J. W.
Tile-bonding tool
KSC-11053 B78-10134 08
HOLZMAN, R. E.
Processor for the UNIVAC 1100 series
NPO-13469 B78-10600 09
HOPKINS, P. M.
Chopper-stabilized phase detector
MSC-16461 B78-10163 02
HOSIER, R. N.
Predicting rotor rotation noise
LANGLEY-12098 B78-10406 06
HOUGE, J. C.
resterilizable electrode for electrosurgery
HQN-10915 B78-10370 05
HOUSEMAN, J.
Boosting the power of two-stage engines
NPO-14057 B78-10105 07
HOWER, P. L.
High-Speed, high-power, switching transistor
LEWIS-13021 B78-10298 01
HSU, G. C.
Coal desulfurization with iron pentacarbonyl
NPO-14272 B78-10342 04
Chemical-vapor deposition of silicon from silane
NPO-14403 B78-10502 03
Model of silicon production in a fluidized-bed reactor
NPO-14404 B78-10520 04
HUBBARD, W. P.
Automatic acquisition and ranging system
NPO-13982 B78-10312 02
HUDSON, W. R.
Ion-beam texturing of materials
LEWIS-12996 B78-10357 04
Ion-beam-textored graphite
LEWIS-12724 B78-10506 04
HUEY, D. C.
Bit-synchronizer lock detector
MSC-16744 B78-10164 02
HUMPHRIES, T. S.
Corrosion inhibitors for solar-heating and cooling
M-FS-25023 B78-10501 03
HUMPHRIES, W. R.
Solar simulator test facility
M-FS-23972 B78-10477 03
HUNTER, W. W., JR.
Miniature velocimeter
LANGLEY-12281 B78-10539 06

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ICELAND, W. F.
Rapid leak detection with liquid crystals
MSC-13804 B78-10084 06
Thermal-leak analyzer for vacuum-jacketed lines
MSC-16802 B78-10085 06
Laser wire stripping
MSC-18000 B78-10118 08
A sharp knife for high temperatures
MSC-16932 B78-10278 07
IGNACZAK, L. R.
Portable spark-gap arc generator
LEWIS-12886 B78-10008 01
INGHAM, J. D.
Fire-and smoke-retardant polyesters and elastomers
NPO-14053 B78-10058 04
Low-temperature elastomer production and curing
NPO-13899 B78-10346 04
IPRI, A. C.
Analyzing CMOS/SOS fabrication for LSI arrays
M-FS-23788 B78-10158 01
ITRI, B. A.
Bit-synchronizer lock detector
MSC-16744 B78-10164 02
IZU, Y. D.
High-temperature waterproofing for tiles
MSC-16773 B78-10135 08

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JACK, J. R.
Energy conservation, using remote thermal scanning
LEWIS-12812 B78-10178 03
JACKSON, L. R.
High-strength blind rivet
LANGLEY-12154 B78-10287 08
JANSEN, J. F.
Slurry-powder sintering furnace
LANGLEY-11423 B78-10293 08
JASMIN, J. P.
Preventing radio-paging system tieup
MSC-19696 B78-10024 02
JASON, A.
Absorptive coating for aluminum solar panels
M-FS-25033 B78-10507 04
JASON, N. H.
Directory of fire research specialists
LEWIS-13123 B78-10399 06
JAY, C. G.
Hydrogen enrichment of synthetic fuel
M-FS-23279 B78-10039 04
JAYROE, R. R., JR.
Multidimensional histograms
M-FS-23855 B78-10503 03
JEFFERS, E. L.
Rapid measurement of bacteria in water
GSFC-12158 B78-10232 05
Monitoring systems for community water supplies
MSC-16778 B78-10233 05
Automated electrochemical selection of coliforms
MSC-16777 B78-10236 05
Chemiluminescence and bioluminescence microbe detection
MSC-16779 B78-10237 05
JENKIN, K. R.
Helicopter position stabilizing system
LANGLEY-11670 B78-10256 06
JENNINGS, D. E.
Thermal compensator for helium refrigerators
GSFC-12168 B78-10082 06
Vibration-free thermal link
GSFC-12297 B78-10169 03
JEZEK, D. I.
Mounting procedure for geological samples
MSC-18206 B78-10327 03
JOHNSON, E. T.
Automated chromosome analysis
NPO-13913 B78-10364 05
JOHNSON, R. L.
Gas-path seal material
LEWIS-12623 B78-10347 04
JOHNSON, W. H.
'Space slitter' for film or tape
KSC-10894 B78-10138 08
JOHNSTON, A. R.
Optical traffic-sensing concept
NPO-13603 B78-10021 02
JONES, E. W.
Improved nucleonic coal-thickness monitor
M-FS-23725 B78-10344 04
JONES, J. S.
Testing composite sheets at high temperatures
MSC-16237 B78-10252 06
JONES, R. L.
Power-switch dV/dt sensing
MSC-16707 B78-10307 01
JORDAN, J. E.
Measuring projectile speed
LANGLEY-12387 B78-10538 06
JOSEPH, G. M.
Pneumatic servomechanisms
M-FS-23295 B78-10144 08
JUANARENA, D. B.
Electronically-scanned pressure measurement system
LANGLEY-12386 B78-10394 06
JUE, S.
Temperature-gradient oven
M-FS-23919 B78-10390 06
JUNOD, T. L.
Toxic substances handbook
LEWIS-13124 B78-10359 04
Directory of fire research specialists
LEWIS-13123 B78-10399 06

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KAELBLE, D. H.
Biocompatibility of surgical implants
NPO-14291 B78-10368 05
KALVINSKAS, J. J.
Microbial desulfurization of coal
NPO-14227 B78-10038 04
KAMDAR, M. H.
Hydrogen embrittlement of nickel
ARC-10966 B78-10231 04
KAMINSKY, R.
Temperature stabilization of microwave ferrite devices
MSC-16833 B78-10152 01
KAMMERER, C. C.
Low-cost ultrasonic lamb-wave transducer
MSC-16333 B78-10072 06
Corrosion detection and evaluation
M-FS-24436 B78-10227 04
KAN, E. P.
Postprocessing classification images
MSC-18238 B78-10601 09
KANE, J. O.
Metallic thermal seal
MSC-18135 B78-10566 07
KANTSIOS, A. G.
Infrared scanners for temperature measurement in wind tunnels
LANGLEY-12171 B78-10077 06
Infrared scanners detect thermal gradients in building walls
LANGLEY-12157 B78-10480 03
KAPUR, V. K.
Low-cost high purity production
NPO-14198 B78-10050 04
KARNS, J. R.
Dual relief-valve system
LANGLEY-12267 B78-10111 07
KASSEL, P. C., JR.
Measuring projectile speed
LANGLEY-12387 B78-10538 06
KASTNER, S. O.
Diffractoid x-ray focusing
GSFC-12357 B78-10487 03
KATSANIS, T.
Flow velocities and streamlines
LEWIS-12966 B78-10094 06
KAUFMAN, J. W.
Wind-wheel electric power generator
M-FS-23515 B78-10268 07
KAUPPI, J. F.
Combination force and angular-deflection indicator
MSC-16155 B78-10070 06
KAYS, W. M.
Internal and external 2-d boundary layer flows
LEWIS-13009 B78-10260 06
KEIR, A. R.
Laser wire stripping
MSC-18000 B78-10118 08
KEISTER, F. Z.
Shock during PIND test frees particles
M-FS-23829 B78-10389 06
KELSO, R. M.
Thermoelectrically-cooled erature probe
MSC-18192 B78-10484 03
KENT, W. B.
Wrought nickel-base superalloy
LEWIS-12844 B78-10045 04
KIM, K.
Model of silicon production in .a fluidized-bed reactor
NPO-14404 B78-10520 04
KISSIAH, A. M., JR.
Implantable digital hearing aid
KSC-11009 B78-10373 05
KIZER, F.
Curve tracer checks CMOS IC's
GSFC-12209 B78-10007 01
KLEMM, R. E.
Custom blending of lamp phosphors
MSC-16692 B78-10056 04
KLIMA, S. J.
Ultrasonic evaluation of high-voltage circuit boards
LEWIS-12781 B78-10087 06
KNUDSEN, A. W.
Nacelle incremental drag
LEWIS-12786 B78-10400 06
KOEPF, G. A.
Common-cavity pumped laser
GSFC-12237 B78-10320 03

KOLYER, J. M.
Universal test fixture for solar cells
NPO-14062 B78-10184 03
Accelerated-weathering test-system for solar cells
NPO-14061 B78-10185 03
KOPP, G. F.
Three-function signal generator
MSC-16672 B78-10306 01
KOURTIDES, D. A.
Heat resistant nontoxic laminate
ARC-11040 B78-10356 04
KRAUSE, L. N.
Thermocouples measure very-hot gas temperatures
LEWIS-12843 B78-10076 06
Standardized gas-temperature probes
LEWIS-13059 B78-10392 06
KRUPNICK, A. C.
Natural-oxide solar-collector coatings
M-FS-23518 B78-10326 03
KUBACKI, R. M.
Boron triflouride coatings for plastics
ARC-11057 B78-10043 04
Scratch resistant plastic lenses
ARC-11039 B78-10519 04
KUHLMAN, E. A.
Compact antenna has symmetrical radiation pattern
ARC-11189 B78-10473 02
KULESZ, J. J.
Predicting damage from exploding vessels
LEWIS-13042 B78-10258 06
KUZNETZ, L. H.
Automated controller for liquid-cooled garments
MSC-18055 B78-10365 05

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LADANY, I.
Protective coating for laser diodes
LANGLEY-11746 B78-10171 03
LAGER, J. R.
Low-cost graphite/epoxy structural panels
M-FS-23871 B78-10427 08
LAN, C. E.
Wing aerodynamics under blowing jets
LANGLEY-12256 B78-10401 06
LANGSTON, J. L.
Simple digital pulse-programing circuit
NPO-13747 B78-10299 01
LARUE, H. C.
Tool simplifies weld preparation of aluminum
MSC-16992 B78-10123 08
LATTA, W. R.
Dual relief-valve system
LANGLEY-12267 B78-10111 07
LAWSON, A. G.
Brazed boron-silicon carbide/aluminum structural panels
LANGLEY-12244 B78-10221 04
LAWSON, D. D.
Fire-and smoke-retardant polyesters and elastomers
NPO-14053 B78-10058 04
Long-lasting solid-polymer electrolytic hygrometer
NPO-13948 B78-10086 06
Coal mining with a liquid solvent
NPO-14028 B78-10345 04
LAYLAND, J. W.
Automatic acquisition and ranging system
NPO-13982 B78-10312 02
LEAL, J. R.
Ultrafine PBI fibers and yarns
ARC-11221 B78-10504 04
LECROY, S. R.
Ocean-wave ray or crest diagrams in shoaling waters
LANGLEY-12380 B78-10341 03
LEE, J.
Telecommunications network optimization
NPO-14486 B78-10476 02
LEE, R. W.
Retainer for laboratory animals
LANGLEY-12353 B78-10371 05
LEECH, R. A.
Arc detector uses fiber optics
NPO-13377 B78-10449 01
LEONARD, W. D.
Verifying the fit of mating contoured surfaces
LANGLEY-11731 B78-10290 08
LEPISTO, J.
Multiplexed battery-bypass control system
NPO-14414 B78-10474 02
LESCO, D. J.
Test-vehicle cycle programmer
LEWIS-12977 B78-10020 02
LEVINSON, S.
Low-power tuner for lasers
M-FS-23863 B78-10486 03
LEVOE, C. E.
Fabrication of sea-floor models
NPO-13554 B78-10295 09
LEVY, M. E.
Testing integrated circuits by photoexcitation
M-FS-23943 B78-10451 01
LEW, D.
Detecting servo failures with software
FRC-11003 B78-10396 06
LEWIS, D. I.
Processor for the UNIVAC 1100 series
NPO-13469 B78-10600 09
LEWIS, G. W.
Improved myocardium transducer
NPO-14107 B78-10372 05
LICARI, J. J.
Sealing microcircuits with adhesives
M-FS-23869 B78-10592 08
LIND, W. P.
Splicing shielded cables
MSC-18297 B78-10453 01
LINDMAYER, J.
Thin silicon-solar cell fabrication
NPO-14047 B78-10325 03
LINTON, A. T.
Monitoring systems for community water supplies
MSC-16778 B78-10233 05
Data processing for water monitoring system
MSC-16842 B78-10234 05
LIPOMA, P. C.
Video scrambler/descrambler
MSC-16843 B78-10013 02
LISKAY, G. G.
Match-mold process for foam insulation
MSC-16631 B78-10126 08
Void-free foam insulation
MSC-16805 B78-10127 08
High-rise foam-in-place process
MSC-16931 B78-10128 08
LIU, H.
Acoustic-optical imaging without immersion
M-FS-23876 B78-10549 06
LOCKARD, M. L.
Automated temperature-cycling apparatus
LANGLEY-12310 B78-10391 06
LOEWENTHAL, S. H.
Design of transmission shafting
LEWIS-12965 B78-10107 07
LOMBARDT, T.
CMOS-array design-automation techniques
M-FS-23762 B78-10311 01
LONG, J. C.
Plotting shear-flow forces
MSC-18013 B78-10445 09
Plotting max/min data envelopes
MSC-18016 B78-10597 09
LOSEY, R.
Testing of three hot- air solar collectors
M-FS-23887 B78-10201 03
Indoor and outdoor tests of a liquid solar collector
M-FS-23886 B78-10207 03
Performance of black-nickel and black-chrome solar collectors
M-FS-23888 B78-10210 03
LOVIN, J. K.
Orbital heat rate package
M-FS-23980 B78-10554 06
LOWRY, L. R.
Gate-assisted turn-off thyristor
LEWIS-12535 B78-10004 01
LUCAS, W. G.
Extension handle for spray cans
KSC-11083 B78-10576 07
LUCY, M. H.
Quick-connect threaded attachment joint
LANGLEY-12232 B78-10414 07
LUDWIG, L. P.
Gas-path seal material
LEWIS-12623 B78-10347 04
LUTWACK, R.
Chemical-vapor deposition of silicon from silane
NPO-14403 B78-10502 03
Model of silicon production in a fluidized-bed reactor
NPO-14404 B78-10520 04
LYONS, T. D.
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MSC-18281 B78-10455 01

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MACCONNELL, J. W.
Pulse-width-modulated attenuator for AGC
NPO-14127 B78-10459 01
MACDORAN, P. F.
Real-time monitoring of crustal deformations
NPO-14124 B78-10034 03
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M-FS-19396 B78-10586 08
MAIRS, R. Y.
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MALCHOW, H. L.
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MANATT, S. L.
Boosting production yield of biomedical peptides
NPO-14142 B78-10240 05
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LEWIS-13123 B78-10399 06
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Improved method of solar-cell assembly
LEWIS-12729 B78-10438 08
MANTON, N. R.
Bench-top soldering aid for PC boards
MSC-16274 B78-10121 08
MANUS, E. A.
Narrow-bandwidth receiver
GSFC-12142 B78-10463 02
MARAIA, B. J.
Coated-felt thermal insulation
MSC-12737 B78-10510 04
MARCUS, B. D.
Flat-plate heat pipe
GSFC-11998 B78-10035 03
MARGOLIS, J. S.
Improved 'spectrophone'
NPO-14143 B78-10167 03
MARKE, M. L.
Fastener for thermal insulation blankets
MSC-18253 B78-10571 07
MARSH, H. E.
Predicting structures of cross-linked condensation polymers
NPO-14007 B78-10352 04
MARTIN, J. W.
Reducing stickiness of elastomer valve seals
LANGLEY-11778 B78-10565 07
MARTIN, W. L.
Automatic acquisition and ranging system
NPO-13982 B78-10312 02
MARTINI, W. R.
Stirling-engine design manual
LEWIS-13098 B78-10580 07
MASERJIAN, J.
Measuring oxide trapping parameters in MOS structure
NPO-14120 B78-10002 01
MASSON, R. K.
Multichannel VCO needs only one reference
MSC-18225 B78-10448 01
MASTANDREA, J. R.
Damage-detection system for LNG carriers
LANGLEY-11463 B78-10250 06
MASTERS, R. M.
Inexpensive, portable, integrating solar energy meter
LEWIS-12804 B78-10188 03
MASTIN, C. W.
Body-fitted coordinates systems transformations
LANGLEY-12307 B78-10147 09
MATSUMOTO, R. T.
Improved driver for capacitive loads
LANGLEY-11609 B78-10304 01
MAULDIN, D. G.
Microprocessor-based cardiopulmonary monitor
MSC-18235 B78-10369 05
MAYO, R. F.
Automatic bypass valve
LANGLEY-12063 B78-10558 07
MCCLURE, S. R.
Welding fixture for thin metal parts
GSFC-12318 B78-10428 08
MCCOLLUM, W. L.
Marshall system for aerospace simulation
M-FS-22672 B78-10296 09
MCCREA, F. E.
Ruby c-axis alignment system
NPO-14252 B78-10379 06
MCDOUGAL, A. R.
Precision fluid-pressure regulator
NPO-13370 B78-10106 07
Collapsible module extends tenfold in height
NPO-13371 B78-10280 07
MCGANNON, W. J.
Intraocular pressure reduction and regulation
LEWIS-12723 B78-10523 05
MCGOUGAN, W. R.
Splicing shielded cables
MSC-18297 B78-10453 01
MCKEE, E. D.
Compact antenna has symmetrical radiation pattern
ARC-11189 B78-10473 02
MCKEOWN, D.
High-vacuum, low-temperature bond for second-surface mirrors
M-FS-23405 B78-10124 08
MCKNIGHT, L. E.
Processing high-strength steel alloys
MSC-16172 B78-10441 08
MCKOWN, R. D.
Two braze alloys for thin-wall components
M-FS-19206 B78-10117 08
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Improved transformer-winding method
NPO-14243 B78-10282 08
Bonding core mating surfaces improves transformer
NPO-13855 B78-10283 08
Precise matching of diodes
NPO-14293 B78-10452 01
Load balancing multimodule switching power converters
NPO-13832 B78-10461 01
MCNALLY, W. D.
Flow velocities and streamlines
LEWIS-12966 B78-10094 06
MCRONALD, A. D.
Improved electron-beam probe for hypersonic flows
NPO-13793 B78-10254 06
MENDIRATTA, R. G.
Mossbauer studies of bulk and thin-film FeTe
M-FS-23773 B78-10059 04
MESSICK, W. R.
Quick-connect threaded attachment joint
LANGLEY-12232 B78-10414 07
MEYERS, J. F.
Miniature velocimeter
LANGLEY-12281 B78-10539 06
MEZRICH, R. S.
Video method for studying optical fields
M-FS-23103 B78-10036 03
MEZZACAPPA, M. A.
Computation of spare parts requirements
MSC-16872 B78-10593 09
MICKELSEN, R. A.
High-temperature capacitive pressure transducer
LEWIS-13078 B78-10398 06
MIKULAS, M. M., JR.
Lattice panels with high structural efficiency
LANGLEY-11898 B78-10426 08
MILLER, C. G.
Coal mining with a liquid solvent
NPO-14028 B78-10345 04
MILLER, D. C.
Low-frequency vibration isolation
NPO-13915 B78-10275 07
MILLER, R. L.
Voice-output solar energy reporter
LEWIS-12947 B78-10022 02
MILLET, A. U.
Gentle support stands for fluid-line mockups
MSC-16479 B78-10291 08
MILLMAN, J. L.
Cryostat safety tent
GSFC-12206 B78-10080 06
MINER, R. V.
Wrought nickel-base superalloy
LEWIS-12844 B78-10045 04
MINTON, F. R.
Window flaw detection by backscatter lighting
MSC-16605 B78-10089 06
MITCHELL, M. J.
High-temperature brazing of stainless steel
MSC-19459 B78-10112 08
Form die and glide plates for vacuum brazing
MSC-16549 B78-10113 08
Internal grid for release of brazing retorts
MSC-19472 B78-10114 08
Vacuum control for brazing stainless steel
MSC-19457 B78-10115 08
Process fabricates flat panels at high temperatures
MSC-16969 B78-10116 08
MITCHELL, P. D.
Brazed boron-silicon carbide/aluminum structural panels
LANGLEY-12244 B78-10221 04
MOACANIN, J.
Dip-molded t-shaped cannula
NPO-14073 B78-10062 05
MONFORD, L.
Data processing for water monitoring system
MSC-16842 B78-10234 05
MONTANO, J. W.
Mechanical properties of 18-2 Mn stainless steel
M-FS-23843 B78-10229 04
Nitronic 60: a new alloy
M-FS-23844 B78-10230 04
MOORE, D. M.
Lightweight conical antenna reflector
NPO-13552 B78-10472 02
MOORHEAD, P. E.
Calibration method for an ultrasonic gray-scale recorder
LEWIS-12782 B78-10016 02
High-resolution gray-scale recorder
LEWIS-12783 B78-10017 02
MORENC, N. P.
Multichannel VCO needs only one reference
MSC-18225 B78-10448 01

MORRIS, G. A., JR.
Wideband digital spectrum analyzer
NPO-14394 B78-10468 02
MORRIS, W. D.
Ocean-wave ray or crest diagrams in shoaling waters
LANGLEY-12380 B78-10341 03
MOSESMAN, M.
Fire-and smoke-retardant polyesters and elastomers
NPO-14053 B78-10058 04
MSU, G. C.
Low-temperature refining of coal
NPO-14210 B78-10511 04
MUELLER, R. L.
Automated solar-cell-array assembly machine
NPO-13652 B78-10186 03
MUELLER, W. A.
Positively charged membrane for urea dialysis
NPO-14101 B78-10241 05
MUNFORD, J. A.
Automated inspection of wire-frame assemblies
GSFC-12321 B78-10546 06
MURPHY, C. R.
Eliminating gold migration in microcircuits
MSC-18213 B78-10462 01

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NAGANO, S.
Synchronous transfer circuits for redundant systems
NPO-14162 B78-10157 01
Automatic load sharing in inverter modules
NPO-14056 B78-10302 01
Overload protection system
NPO-13872 B78-10460 01
NALEPKA, R. F.
Predicting crop production from satellite data
GSFC-12379 B78-10595 09
NARASIMHAN, K. Y.
Pulse-echo probe of rock permeability near oil wells
NPO-14192 B78-10222 04
NARAYANASWAMI, R.
Resizing algorithm for loaded structures
LANGLEY-12064 B78-10594 09
NASH, J. M.
Application of solar energy to air-conditioning
M-FS-23913 B78-10215 03
NEAD, M. W.
A parameter-estimation subroutine package
NPO-14263 B78-10447 09
NEARY, J. K.
Quick-and-easy shear-load testing
MSC-16765 B78-10073 06
NEASE, A. W.
Hydraulic dynamic analysis
MSC-16795 B78-10095 06
NEFF, M. A.
High-gradient continuous-casting furnace
LEWIS-12934 B78-10425 08
NELSON, D. J.
Hydraulic dynamic analysis
MSC-16795 B78-10095 06
NELSON, D. W.
High-temperature capacitive pressure transducer
LEWIS-13078 B78-10398 06
NELSON, E. J.
High-temperature capacitive pressure transducer
LEWIS-13078 B78-10398 06
NEWTON, J. W.
Measuring radio-signal power accurately
NPO-13373 B78-10464 02
NICHOLS, R. L.
Glass solar collector - materials assessment
M-FS-23926 B78-10212 03
NORBURY, D. A.
Minature Ku-Band down converter
MSC-18313 B78-10450 01
NORRIS, D. A.
Vacuum leadthrough for hydrogen maser
NPO-14148 B78-10422 07
NORWOOD, L. B.
Contouring pile-brush seals
MSC-16231 B78-10588 08
NUGENT, J.
Shock-swallowing air sensor
FRC-10107 B78-10537 06
NYLAND, T. W.
Simple air-piston gas-sampling system
LEWIS-12922 B78-10110 07

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OBRIEN, D. E., III
Efficient digital encoding scheme
MSC-18267 B78-10467 02
OCHELTREE, S. L.
Miniature velocimeter
LANGLEY-12281 B78-10539 06
OFARRELL, K.
Circuit-lead trimming template
MSC-16589 B78-10439 08
OHU, C. K.
High-Speed, high-power, switching transistor
LEWIS-13021 B78-10298 01
OKAMOTO, G.
Quick locking/unlocking retainer
MSC-18048 B78-10408 07
OLLENDORF, S.
Thermal-control canister
GSFC-12253 B78-10079 06
OLOHAM, G. A.
Predicting damage from exploding vessels
LEWIS-13042 B78-10258 06
OLSSON, D. L.
Coaxial isolator has versatile interface
MSC-16908 B78-10009 01
ORR, D. H.
Simulator for training remote-manipulator operators
MSC-14921 B78-10415 07
OSTROFF, A. J.
Approach and landing simulation
LANGLEY-12060 B78-10091 06
OTTH, D. H.
Low-frequency vibration isolation
NPO-13915 B78-10275 07
OWEN, R. B.
Measuring surface displacements optically
M-FS-23861 B78-10321 03
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Easily installed insulation for steamfittings
MSC-18277 B78-10589 08
OWENS, L. J.
Ocean thermal plant
KSC-11034 B78-10482 03

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PACKARD, C. A.
Multipurpose system simulator
GSFC-12333 B78-10444 09
PACKER, P. N.
Holding fixture for variable-contour parts
MSC-16270 B78-10429 08
PADILLA, D.
Low-cost graphite/epoxy structural panels
M-FS-23871 B78-10427 08
PAGE, D. J.
Gate-assisted turn-off thyristor
LEWIS-12535 B78-10004 01
PARK, J. J.
New adhesive withstands temperature extremes
GSFC-12345 B78-10042 04
PARKER, J. A.
Heat resistant nontoxic laminate
ARC-11040 B78-10356 04
PARKER, L. W.
Power loss for high-voltage solar-cell arrays
LEWIS-12865 B78-10340 03
PARR, A.
Absorptive coating for aluminum solar panels
M-FS-25033 B78-10507 04
PARR, V. B.
Predicting damage from exploding vessels
LEWIS-13042 B78-10258 06
PARTHASARATHY, S. P.
Pulse-echo probe of rock permeability near oil wells
NPO-14192 B78-10222 04
PATEL, B. C.
Installing fiber insulation in tight spaces
MSC-16934 B78-10289 08
PAULIN, R. E.
Spares-optimized model
MSC-18015 B78-10446 09
PAULKOVICH, J.
Wind/water energy converter
GSFC-12361 B78-10483 03
PAYNE, B. J.
Testing composite sheets at high temperatures
MSC-16237 B78-10252 06
PECHMAN, A.
Accelerated purification of colloidal silica sols
MSC-16793 B78-10512 04
PECK, S. R.
Low partial discharge vacuum feedthrough
GSFC-12347 B78-10559 07
PELCHAT, G. M.
Adaptive polarization separation experiments
LANGLEY-12196 B78-10006 01
PERKINS, K. L.
Sealing microcircuits with adhesives
M-FS-23869 B78-10592 08

PERLMAN, M.
Detecting and correcting bit errors on magnetic tape
NPO-13842 B78-10294 09
PERRY, J. C.
Determining the response of an FM receiver
MSC-16751 B78-10465 02
PERSON, J. K.
Automated solar-cell-array assembly machine
NPO-13652 B78-10186 03
PHILLIPS, B. R.
Electrolysis cell stimulation
LEWIS-12740 B78-10179 03
PHILLIPS, E. C., JR.
Improved heat-pipe wick
NPO-13391 B78-10381 06
PICCIOLO, G. L.
Rapid measurement of bacteria in water
GSFC-12158 B78-10232 05
Chemiluminescence and bioluminescence microbe detection
MSC-16779 B78-10237 05
PILKEY, W. D.
Performance optimizing
LANGLEY-11930 B78-10096 06
PINCKNEY, S. Z.
Static-pressure probe for small geometries
LANGLEY-11552 B78-10395 06
POEL, G. D.
Monitoring systems for community water supplies
MSC-16778 B78-10233 05
POLLOCK, G. E.
Porous bead packings for gas chromatography
ARC-11222 B78-10518 04
POOLE, L. R.
Ocean-wave ray or crest diagrams in shoaling waters
LANGLEY-12380 B78-10341 03
POORMAN, R.
Reducing weld peaking in aluminum
M-FS-23973 B78-10433 08
POSEY, D. L.
Orifice calibration module
LANGLEY-12269 B78-10393 06
POUZAR, J. E.
Easily installed insulation for steamfittings
MSC-18277 B78-10589 08
POWELL, H.
Response of graphite/epoxy composites to moisture
MSC-16899 B78-10228 04
POWER, J. L.
Electroplating and stripping copper on molybdenum and niobium
LEWIS-12151 B78-10055 04
PRATURI, A. K.
Chemical-vapor deposition of silicon from silane
NPO-14403 B78-10502 03
Model of silicon production in a fluidized-bed reactor
NPO-14404 B78-10520 04
PURGOLD, G. C.
Automated syringe sampler
LANGLEY-12308 B78-10374 05
PUSCH, R. M.
Special weave for insulating fabrics
MSC-16380 B78-10288 08

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QUAM, R.
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FRC-11003 B78-10396 06
QUINN, K. L.
Miniature thermocouple disconnect
LANGLEY-12013 B78-10535 06
QUINN, R. A.
Measurement of subcoat thickness by characteristic x-rays
MSC-16718 B78-10505 04

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RADICS, C. C.
Process for growing thin polished silicon sheets
NPO-14172 B78-10434 08
RAMAKRISHNAN, R.
Predicting rotor rotation noise
LANGLEY-12098 B78-10406 06
RANDALL, D.
Predicting rotor rotation noise
LANGLEY-12098 B78-10406 06
RASSWEILER, G. G.
Adaptive polarization separation experiments
LANGLEY-12196 B78-10006 01
RATHZ, T. J.
Interactive data-processing system for metallurgy
M-FS-23774 B78-10217 04
RAY, A. J., JR.
Z-axis control loop for cathode-ray tubes
NPO-13775 B78-10305 01
REED, I. S.
Representation of multivalued logic functions
NPO-13760 B78-10596 09
REED, M. W.
Film adhesive enhances neutron radiographic images
MSC-18061 B78-10081 06
Inspection of adhesive-bonded radiators
MSC-18062 B78-10125 08
Selection standard for FEP films for solar energy
MSC-16999 B78-10190 03
Breather cloth for vacuum curing
MSC-18063 B78-10440 08
REINHARDT, V.
Femtosecond time-domain phase comparator
GSFC-12228 B78-10162 02
Hydrogen-maser frequency standard
GSFC-12334 B78-10490 03
REMBAUM, A.
Fluorescent microspheres
NPO-13946 B78-10068 05
Antistatic coating for acrylics
NPO-13867 B78-10509 04
RENNER, R. E.
Fabrication of sea-floor models
NPO-13554 B78-10295 09
RENNIE, P. A.
Automated chromosome analysis
NPO-13913 B78-10364 05
RHEIN, R. A.
Low-temperature elastomer production and curing
NPO-13899 B78-10346 04
RHIM, W.
Pulsed NMR spectroscopy
NPO-14023 B78-10175 03
RHODES, M. D.
Lattice panels with high structural efficiency
LANGLEY-11898 B78-10426 08
RICCITIELLO, S. R.
Fire-retardant covering for small containers
ARC-11104 B78-10354 04
Improved imide polymerization catalyst
ARC-11107 B78-10517 04
RICE, D. T.
Predicting crop production from satellite data
GSFC-12379 B78-10595 09
RICE, R. F.
Simplified data compressor
NPO-14041 B78-10023 02
RICE, S. W.
Void-free bends in laminated structures
MSC-16998 B78-10285 08
RICE, W. J.
Fast differential analog-to-digital conversion
LEWIS-12909 B78-10149 01
Real-time instrument averages 100 data sets
LEWIS-13093 B78-10534 06
RICHARDS, R. R.
NO2 measurement by chemiluminescence
LANGLEY-11378 B78-10386 06
RICHMOND, R. G.
Thermoelectrically-cooled erature probe
MSC-18192 B78-10484 03
RICKER, R. E.
Predicting damage from exploding vessels
LEWIS-13042 B78-10258 06
RICKINSON, B. A.
High-gradient continuous-casting furnace
LEWIS-12934 B78-10425 08
RILEY, T. J.
Ultrasonic evaluation of high-voltage circuit boards
LEWIS-12781 B78-10087 06
Control of dielectric film deposition
LEWIS-13092 B78-10430 08
RINARD, G. A.
Hand-held vital-signals monitor
MSC-18232 B78-10524 05
Hybrid temperature-monitoring circuit
MSC-18231 B78-10525 05
Hybrid ECG signal conditioner
MSC-18230 B78-10526 05
Hybrid respiration-signal conditioner
MSC-18226 B78-10527 05
Hybrid heart/breath-rate processor
MSC-18227 B78-10528 05
Hybrid LCD driver
MSC-18229 B78-10529 05
Hybrid clock generator
MSC-18228 B78-10530 05
ROBERTS, M. L.
Natural-oxide solar-collector coatings
M-FS-23518 B78-10326 03
ROBINSON, W. W.
Microcircuit-cleaning machine
MSC-16060 B78-10292 08
No-warp potted circuits
MSC-19729 B78-10435 08

ROBSON, J. R.
Detecting surface deformations photographically
MSC-16156 B78-10547 06
ROGOWSKI, R. S.
NO2 measurement by chemiluminescence
LANGLEY-11378 B78-10386 06
ROSATINO, S. A.
Wideband EMG telemetry system
ARC-11209 B78-10375 05
ROSE, S. D.
Improved nucleonic coal-thickness monitor
M-FS-23725 B78-10344 04
ROSENGREN, L.
Low-background trace-gas detector
NPO-13683 B78-10168 03
ROSENTHAL, C.
Nylon screws make inexpensive coil forms
MSC-16912 B78-10003 01
ROSS, D. S.
Mass spectrometer calibration standard
NPO-14097 B78-10249 06
ROTTA, J. W., JR.
Riveting-force gage
NPO-13477 B78-10432 08
ROYSTER, D. M.
Brazed boron-silicon carbide/aluminum structural panels
LANGLEY-12244 B78-10221 04
RUBIN, L.
Digital correlator with fewer IC's
MSC-16743 B78-10458 01
RUDMANN, A. A.
Coupler for moving vehicles
GSFC-12322 B78-10407 07
RUMENAPP, H. E.
Match-mold process for foam insulation
MSC-16631 B78-10126 08
RUMMEL, J. A.
Microprocessor-based cardiopulmonary monitor
MSC-18235 B78-10369 05
RUPPE, E. P.
Rapid leak detection with liquid crystals
MSC-13804 B78-10084 06
Thermal-leak analyzer for vacuum-jacketed lines
MSC-16802 B78-10085 06
Ladle for pouring hot melt
MSC-16974 B78-10137 08
Repairing pin-fin cold plates
MSC-16424 B78-10431 08
RYASON, P. R.
Solar photolysis of water
NPO-14126 B78-10049 04

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SACKERLOTZKY, O. H.
Ceramic-to-metal vacuum seal
NPO-13803 B78-10437 08
SACKETT, L. L.
Solar-electric geocentric transfer
LEWIS-12939 B78-10403 06
SADHUKHAN, P.
Economical synthesis of potassium superoxide
ARC-10992 B78-10353 04
SAKAMOTO, G. M.
Shock-swallowing air sensor
FRC-10107 B78-10537 06
SANDEFUR, P. G., JR.
Verifying the fit of mating contoured surfaces
LANGLEY-11731 B78-10290 08
SANTEN, R. W.
Thermal hydraulic analyzer
MSC-18014 B78-10265 06
SAPP, J. W., JR.
Detecting moisture in composite honeycomb panels
MSC-16750 B78-10550 06
SARBOLOUKI, M. N.
Antistatic additive for polyimide films
NPO-14232 B78-10220 04
Ultrathin films as photomechanical transducer
NPO-14363 B78-10491 03
SAUER, R. L.
Chemical measurement of urine volume
MSC-16585 B78-10238 05
SAWIN, C. F.
Microprocessor-based cardiopulmonary monitor
MSC-18235 B78-10369 05
SAWKO, P. M.
Fire-retardant covering for small containers
ARC-11104 B78-10354 04
Fire-resistant wood composites
ARC-11174 B78-10508 04
Improved imide polymerization catalyst
ARC-11107 B78-10517 04
SCHAFFER, G. J.
Finding radiant-energy sources
GSFC-12147 B78-10159 02
SCHANSMAN, R. R.
Modulation improves electro-optic object detector
M-FS-23776 B78-10380 06
SCHAPPACHER, J. B.
S-Band complex-weight module for adaptive processing
LANGLEY-12197 B78-10005 01
SCHEIDER, H. W.
Biological sampling and cleaning device
NPO-14010 B78-10245 05
SCHERB, M. V.
Damage-detection system for LNG carriers
LANGLEY-11463 B78-10250 06
SCHEUERMANN, C. M.
High-gradient continuous-casting furnace
LEWIS-12934 B78-10425 08
SCHINDLER, R. A.
Improved double-pass michelson interferometer
NPO-13999 B78-10177 03
Improved fourier interference spectrometer
NPO-14025 B78-10485 03
Improved servo for a michaelson interferometer
NPO-14093 B78-10488 03
SCHLEGEL, E. S.
Gate-assisted turn-off thyristor
LEWIS-12535 B78-10004 01
SCHROFF, R. A.
Bench-top soldering aid for PC boards
MSC-16274 B78-10121 08
SCHUMANN, L. F.
Edge geometry of turbomachine blades
LEWIS-12979 B78-10262 06
SCHUTT, J.
Improved alkali-metal/silicate binders
GSFC-12303 B78-10224 04
SCHWIND, F. A.
Void-free bends in laminated structures
MSC-16998 B78-10285 08
SCOTT, D. G.
S-Band complex-weight module for adaptive processing
LANGLEY-12197 B78-10005 01
Adaptive polarization separation experiments
LANGLEY-12196 B78-10006 01
SEIDENBERG, B.
New adhesive withstands temperature extremes
GSFC-12345 B78-10042 04
SEIGER, H. N.
Slurry-powder sintering furnace
LANGLEY-11423 B78-10293 08
SENSENY, R. M.
Penetrating fire extinguisher
KSC-11064 B78-10397 06
SEVART, F. D.
Subminiature hydraulic actuator
LANGLEY-11522 B78-10269 07
SEVIGNY, R.
Marshall system for aerospace simulation
M-FS-22672 B78-10296 09
SEXTON, J.
Reducing weld peaking in aluminum
M-FS-23973 B78-10433 08
SHAI, M. C.
Electrically-conducting thermal-control coating
GSFC-12207 B78-10044 04
SHARPE, M. H.
Natural-oxide solar-collector coatings
M-FS-23518 B78-10326 03
SHELPUK, B.
Glass tubes for protecting solar cells
NPO-14200 B78-10031 03
Double-sided solar-cell package
NPO-14199 B78-10033 03
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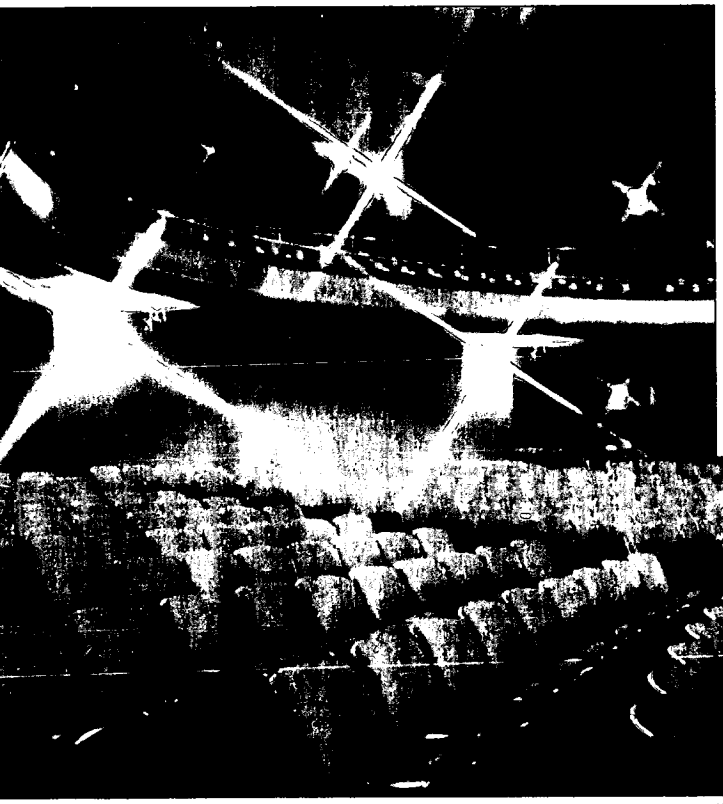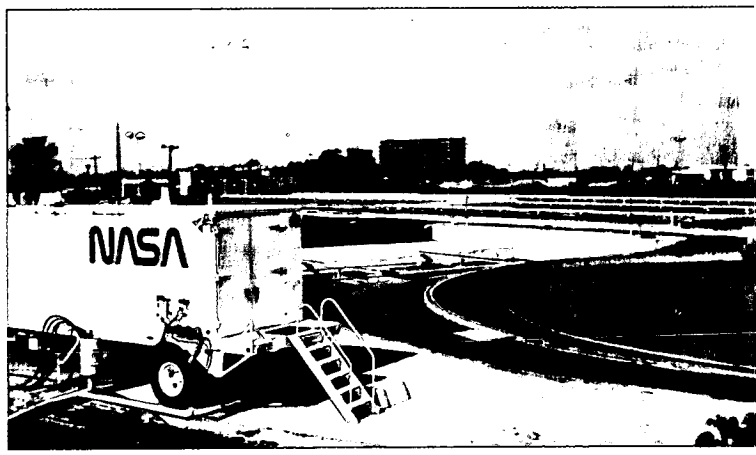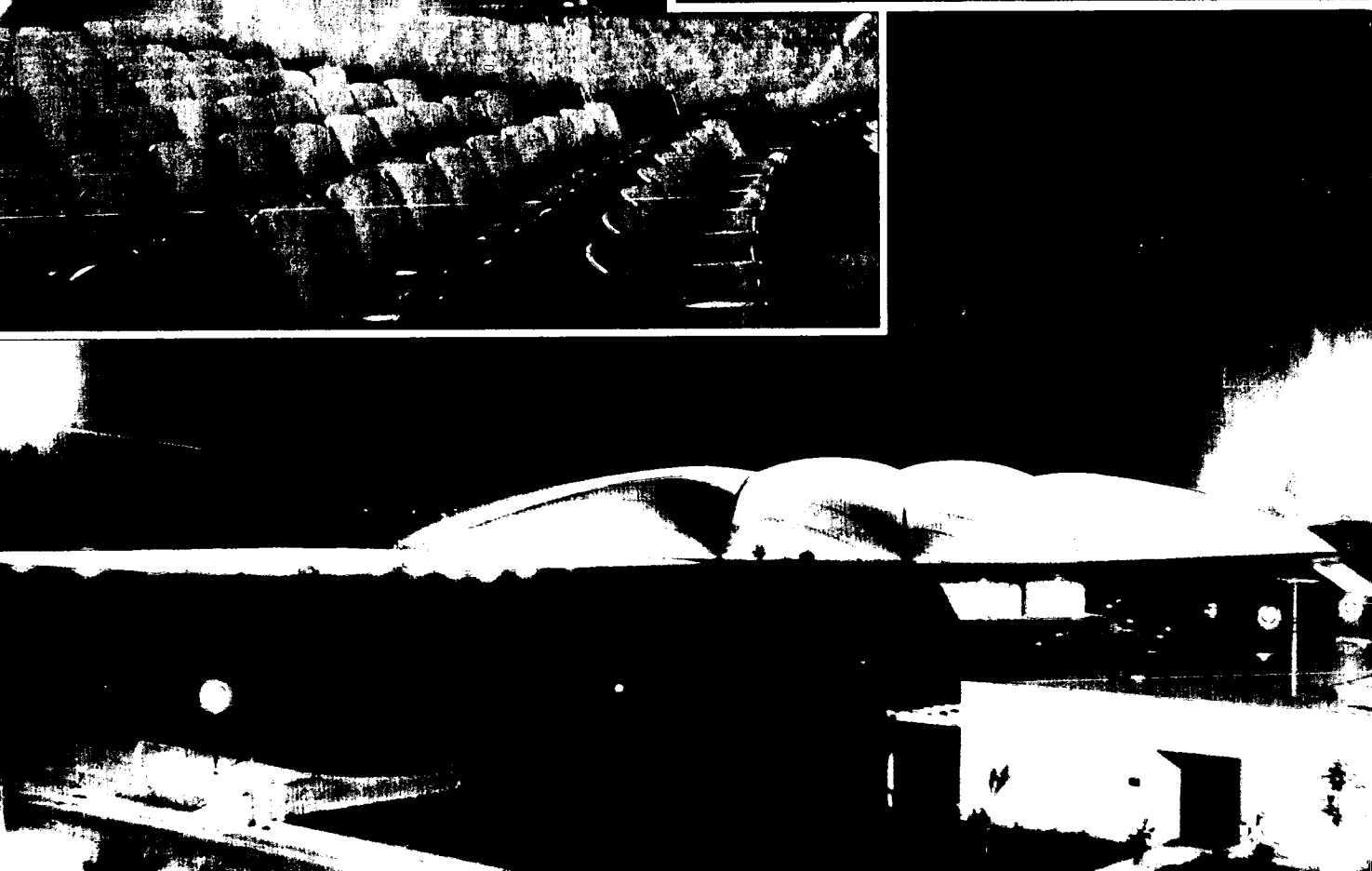
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