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SPECIAL ISSUE

P.O. Box No 105
Marrickville NSW 2204.

6 issues per year 4 NORMAL 2 SPECIAL

8TH BIT VOL 9

TANDY & SYSTEM 80
NEWSLETTER

To celebrate 1 1/2 years
FREE CASSETTE is
enclosed for paid up subscribers.

1 Business

Cash Docket Control

2 Games

Golf & Kangaroo

To use the cassette first play it to determine which side has the programmes on. Next CLOAD to get the first programme then tpe "1" and enter. Then type "RUN" and enter. For the next programme CLOAD again and repeat the process. Proceed similarly for the third programme. Remember that just because the asterisks flash does not mean that you have a good load. If the load is bad then raise the volume of the tape recorder slightly and try again. If it still does not work return the cassette and we will send you a new copy.

The policy is that the newsletter should contain the following

1. Information on what is for sale & where.
2. Contributions from members
3. Problems encountered and hopefully solutions.
4. Any information of general significance.
 - i.e., Programmes & Programming hints.
 - Useful applications.
 - Inspirations.
 - Hardware & Hardware hints.

If you wish to offer programmes for sale, we suggest that you send them on a cassette to PITT ST MICROCOMPUTER Shop for evaluation & testing. They are presently paying 50% of sale price on all copies sold. There is a need at the moment for special programmes (i.e. Australian Farmers, Dentists)

There are four or five Tandy owner groups meeting in Sydney, and other groups in other states, and also in New Zealand & America, so we will attempt to pass the information around; since our subscribers are all over Australia, New Zealand- and even in America.

THIS ISSUE

This issue is concentrating on programmes descriptions following members requests.

There are two outstanding programmes, the ELECTRIC PENCIL, a machine language Word Processor without equal, and the Osborne McGRAWHILL Accounting System.

There are a number of very good programmes such as Adventure Land, the NEWDOS + System, Taipan, Porkbarrel, Fastgannon and GSF.

The NEWDOS + for disc systems, and the RSM Monitor for cassette.

DISC REBOOT PROBLEMS

A number of people have a range of problem symptoms due to dirty plug socket contacts. This is particularly noticeable where the ribbon cable connects onto the edge connector at the rear left of the keyboard. A solution is to clean edge connectors with metholated spirits weekly. A permanent solution is being investigated. More in next newsletter.

Level 11 Cassette
Programme Title and Description

Adventure(Land) *

Adventure(Pirate)*

Adventure is an incredibly complex, detailed and fascinating game. Unlike most available games, there is always a surprise around the corner. Winning is quite a challenge! In Adventure Land you wander through forests and caverns finding treasures. In Adventure Pirate, you become a pirate and sail off to Treasure Island. If you love a challenge, like to be baffled, and enjoy jokes (there are some very funny occurrences), I highly recommend these programs by Scott Adams, which have fast become classics.

Amaz'in Mazes

Off you go into the maze; but stop for a moment! the passageways are changing...find the fastest way out of this nightmare. The sooner you escape, the more points you'll score.

Atlantic Balloon Race

Ballast, gas volume, icing and wind control...this blend of fate and science will land you in Paris if you're good and lucky!

Backgammon

This version written in basic with graphical display. Instructions are contained in the programme which plays a very good game.

Baseball

Real time pitch and hit action with the computer acting as designated pitcher. Your skill at the plate and in the field determines the outcome in this action packed game for two players.

Bingo

Enjoy the excitement of the Bingo Hall! When the computer calls have your numbers ready and you might strike BINGO!

Batter Up

Breakaway

A challenging real time action game of skill and dexterity. All the excitement of the traditional Pinball machine without putting your money in! You control the speed and direction of the ball as you try to 'Breakaway' the playing field.

Bridge Challenger

Bridge Challenger is designed for all bridge players from novices to experts who would like to practice and improve their play. With Bridge Challenger you and the dummy play as the declaring team against the computer, which plays a skillful defense. You don't even need a deck of cards to practice your game with Bridge Challenger.

Cribbage

Invented by a British Poet in the early 1600's and now programmed for your computer. Plays a good game and you don't have to go down the pub to find a partner. Instructions included for those who have yet to master this great game.

Checkers

A surprisingly fast and competitive game obeying the International rules of the game.

Dogstar

You're trapped aboard an enemy battleship - can you rescue the princess, find the plans, retrieve the treasure and escape?

End Zone

Authentic football simulation, right down to the 2-minute warning. Complete with everything except the cheerleaders. Played in four 15-minute quarters.

Fastgammon

A machine language programme which plays a fast and smart game of backgammon. Both the novice and the expert will enjoy this game.

Galactic Blockade

You are the Captain of a Federation Starship battle cruiser. Your mission is to run an enemy blockade and deliver vital supplies to Federation forces under seige on Planet M5. You control your ship's course and speed along with the firing of weapons. You will have to fight battle successfully to reach your destination. In additon to the enemy you will also have to cope with ship malfunctions and Ion storms.

Hamurabi

A decision making programme. You are the Governor of Sumeria and for 10 years you must decide how much land to buy, which crops to sow and many other decisions upon which the welfare of your people depend.

Hangman

Two Player or Solitary. Computer version of age old game 'Guess my word' in X number of tries. Graphical display.

Kamikaze

You are in command of your ship which is being attacked by suicide planes. Good graphics and three levels of play.

Kentucky Derby

All the thrills of horse racing in your own home. Place your bets and urge your horse to win.

Lunar Lander

Your mission is from NASA - to deliver desperately needed supplies to occupants of an underground moon base. A dangerous and a difficult mission! Do you accept it? You have no choice!

Mastermind*

This version of the classic game lets you and the computer take turns at making and breaking the codes. A high speed machine language programme.

Mission Impossible*

Good Morning...your mission is ...and so it goes. Will you be able to complete your assignment in time, or is the world's first automated nuclear reactor doomed?

Othello

A strategic game played on an 8 x 8 board using graphics. You can play against the computer, a friend or watch the computer play against itself.

Pentominoes

A game requiring skill and more than a little imagination. You have twelve pentominoes, all of various shapes. The problem is to form a square with them. Not as easy as it sounds! A fun game which can leave your mind spinning!

Pork Barrell

The game that politicians never stop playing...re-election. Put yourself in the shoes of an aspiring politician. Given a breakdown of your constituents how would you handle sensitive issues? Put your vote where your mouth is and your constituents will leave uou in no doubt as to how they feel!

Remainder

It's a 'find my number' game for people with 64k of head space. Don't go away and leave this program running or you will soon have a crowd playing and you may gave difficulty getting your computer back!

Robots

In this version you'll struggle to keep your wits about you as an army of robots stalk you with mechanical precision through a seemingly endless maze. Its you against them as you seek to avoid, and at the same time trick them into their own trap.

Round The Horn

Ever fancied being in command of a clipper ship? Well heres your chance to have a go, New York to San Francisco. Plenty of problems including the straits of Magellan. Superb graphics.

Safari

You're in the running for a major film contract at a Hollywood studio. To capture the contract, photograph the largest number of wild animals in their natural surroundings...that's if your party isn't lost, or doesn't starve to death or lose all its cameras.

Santa Paravia

Simulation of economic life in a 15th century Italian State. Object of the game is to build your feudal holdings into a kingdom. Four levels of difficulty.

Sink 'um

Arcade type simulation of submarine warfare. Takes careful planning and good timing.

Space Battle

You are the commander of a small mercenary star-cruiser. You have hyperdrive or rockets to maneuver with, missiles or laser cannon to fight with, shields for defense, a computer for information to aid you, and a loyal crew to keep everything running. You have been hired to destroy a fleet of alien invaders. If you survive, you will be rewarded handsomely; if you lose, you're dead.

Startrek 111 3.3

One of the most advanced Startrek games ever written. Very challenging and takes about two hours to play at the end of which you are recalled to Star Fleet head-quarters where the data you have been collecting will be evaluated and your own performance will be scrutinised.

Taipan

Set on the wild and woolly China coast in the 1860's, bribes, pirates and underworld dealings in Hong Kong are all part of the quest to become a Taipan -a member of that exclusive club of opium moguls.

Ten Pin Bowling

Simulates a bowling alley with high speed graphics. Requires skill and co-ordination, computer keeps all scores for one or two players.

Tarot Cards

Probably the best future gazing type programme ever. An appealing combination of graphics and presentation.

Time Bomb

Somewhere inside a towering skyscraper a time bomb mechanism is ticking away. Your mission is to locate and disarm the explosive device before detonation...no easy feat in this structure!

Treasure Hunt

It is a challenge so don't cheat by reading the programme listing. When you first play you will make many mistakes but practice will improve your performance. Takes about one hour to find all 20 treasures. A map is included to assist your quest.

Tycoon

You take the reins of a small manufacturing enterprise...set up pay standards, review advertising budgets, etc. Your progress is well charted. Accommodates up to four would-be Wall Street wizards. Last one to make \$10 million is the janitor!

X-Wing Fighter 11

Put yourself in the cockpit of this high performance fighter. Extensive use of the INKEY function puts all the controls at your fingertips without hitting the ENTER key. Long range sensors warn of approaching aircraft prior to visual contact. After sighting their speed increases with proximity.

Program A Level 11 16K Programs

Sargon - 6 Level Chess Program

Adapted from the code published by Hayden (obviously before the TRS-80 version was released for \$20 US). The source is on the reverse side of the tape for EDTASM. It is in two parts (Sargn1, Sargn2) and each requires 34K RAM. No comments, so you'll need the book to decipher it.

(Hayden: ISBN0-8104-5155-8) The program

is organised at 4A00H so Tbug fits under it.

File name - Sargon

Starting up:-

Answer 'Care for a game etc.' -with 'Y'

If you hit 'N' you get 'Care to analyse etc.' -A 'N'

Answer to this one gets you back to BASIC (JP to 1A19H)

(Entry point of Sargon is 6400H).

Anacys Mode

'Enter' - Advance one square) Contents unchanged

'[-' - Go back one square) Contents Unchanged

'Space Bar' - Empty square

Or Enter X,Y,N

Where X = Piece code K,Q,R,B,N or P

Y = Color code B or W

N = Moved code I=moved, 0=on original square

When satisfied hit Escape (shift ' ') and answer 'Y'.

Playing

Use standard algebraic notation.

To number squares - hit ' ' (must remove numbers by hitting any key before entering move)

To escape - Hit escape (shift & ' ') - A wrong move may be recovered now by entering analysis mode.

Castling - Just enter King's Move

En Passant - Just enter Pawn's Move

Program B LIFE

Hybrid program

80 Generations/Min. on 62 x 46 cell array.

Loading Instructions.

1. Power up - Memory Size:29672
2. System - "Life"
3. 'I' and enter. (Sets up KBFIX routine)
4. Cload "L" and Run

Instructions given at start of program

To stop execution at any time - hold space bar down until 'continue' appears. Answer 'Y' or 'N' to questions.

The monitor functions are:-

1. S(filename) - save current formation on tape with filename up to 36 characters.
2. N - find and display filename of formation on tape
3. L - load formation from tape (1K Bytes)
4. D - display current formation
5. X - return to basic section of program

(Some samples on side 2 of the tape after 'Life' source.)

Program C Mastermind

Hybrid program. Loading instructions:-

1. Power up - memory size-32255
2. System - "CDBRKR"
3. 'I' and enter
4. Cload "M" and Run

Maximum of 9 colours in 6 positions (|500,000 permutations).

Maximum time required to solve: approx. 10 mins & 7 moves.

Program D Quest
Find your way through the maze - it usually takes a couple of hours.
From 'Byte' magazine.

program E Amortization
Can be useful if you're considering a loan etc.

program F Mean Variance & Standard Deviation
Try this for accuracy.

Program G Hex/Bin/Octal/Decimal Converter
Converts from any form to the other three.
Octal entries - Format- " " " " (16 Bit Figure)
" " " " (8 Bit Figure)
Binary entries- Format- " " " " " " " " (16 Bit Figure)
Hex entries - Format- " " " "

program F Renum (Source for EDTASM)
This is the standard version of Renum with an attempt to renumber
programs using ',' instead of 'Then'.
Modification also converts ',' to 'Then' but could have a bug of two
when dealing with on....goto, on....gosub etc.
Problem-(If A=B on XGo...) not (If A=B then on...) which is OK.
No comments on this listing - only for the dedicated.

Bug could be fixed by branching out of 'loop' routine to the
'on..goto' and 'on..gosub' routine when 'on' is encountered before a
,',.

Program G CDBRKR (Source)
Again - no comments (I wrote all the assembly programs with 16K Ram
and the comments occupied too much space.)
Method used:-
GENSTR generates a 6 digit string. Starting at 111111 and working to
base (no colours).
When maximum possible no. is exceeded it is obvious that
inconsistent information is present (assuming that the SCRBLK &
SCRWHT routines & associated logic is correct).
The current string is scored for black & white pegs against all
previous attempts & associated scores for consistency, one that
complies with them all will be the next guess. The pointers are
manipulated by the BASIC program. If you relocate CDBRKR, the peek &
poke instructions will also need adjustment.

Program H HBUG (source)
No comments.
The single step routine was adapted from "single stepping the 8080
processor" - Byte Jan. 1979
To handle all the special Z80 instructions.

Enhanced Commands

L Load tape.
Displays filename at start of load &
entry point when complete.
R Followed by 'enter'-displays all
registers.

Format:-AR' BC' DE' HL'
..F BC DE HL
IX IY SP PC

Followed by :- Shift & A,F,B,C,D,E,H or L- Examine/alter ALT. reg's.

No shift A,F,B,D,E,H or L- Examine/alter Main reg's.
X,Y,S,P -Examine/alter 16 Bit reg's.

To leave contents unchanged - hit enter. To alter 16 Bit Reg. - a 16
Bit (4 figure hex) value is repuired.
D XXXX YYYY Display contents of block XXXX YYYY on screen in 16
Bytes/line format.

program J Tcopy (source)

Program K Tcopy (object) 32K version
This program will copy any TRS-80 Tape regardless of format of location in RAM.

Eg. Basic, Data, Object files, Assembler source, Proprietary, software which overlays reserved Ram etc.

Method:-

After locating the Sync. Byte (A5H) the routine loads ALL subsequent Bytes up to a user specified No. (20K or 5000H max.). The Data may then be examined on the screen in Hex Format. When the end is found - the buffer may be dumped to another tape. (Any no. copies). When loading commences, the buffer is set to 0 (nops) so that the end may easily be recognised.

Using Tcopy

Loading - Filename - Tcopy
 Start - BD00H (48384)
 Top of stack - BFFFFH
 Memory size - 48383

'\$' - Prompt

Command

L No. Bytes? XXXX Load data - you must over estimate the no. bytes to be loaded and type this no. in Hex form. If estimate is sufficient - you will need to load part of another program (anything) [starting with a leader | in order to get another prompt. Using the cue or review on the CTR41 recorder is handy here to ensure that the last Bytes are all 00 or FF.

-Examine data

The data will scroll on the screen quite quickly. Hit any key to stop it. Hit 'C' to continue. Hit Shift ' ' to get another

prompt.

P end?

Dump data to tape. When end is located ;

answer 'end?' with the address of the last byte
(should still be on the screen) :-usually good to
add a couple to be sure. Upon entry of the address,
the dump will start.

A default indicates that an attempt was made to exceed the buffer's capacity and the current operation will involve the full 20K.

A loading meter is provided in the top right corner of the screen to allow fine adjustment of the cassette player's volume control. Set the volume just high enough to get smooth movement of the meter plus a little extra.

Sample use of Tcopy:-

Program to copy - Tcopy itself.

Set up tape & hit 'L'.

Tcopy occupies BD00-BF40 approx. (+ stack area not on tape). The object includes the filename, loading addresses & checksums so answer 'no. bytes' with 0300 (overestimate)

Loading now commences-if the meter is not smooth - increase the volume until it is but be careful with files bererated for a second or so. The meter stops indicating no data is present so load another tape (any) at its beginning to satisfy the 0300 bytes requested.

Prompt '\$' returns. Hit 'D' and when the 128 0'S (nops) of the second tape's leader appears, hit any key to stop. (Have to be quick).

In this case the program is seen to end at 466A in the buffer.

(Entry point of Tcopy is BF18 at the KBFIX routine) Hit shift & ' ' to get prompt.

Hit 'P' and answer 'end?' with 466B (end + 1) after (any no. of copies may be made).

If during the loading process, the meter is seen to jerk then increase the volume for smooth movement and repeat the loading exercise as the data will probably be faulty due to a missing Byte of two.

To get back to Basic - hit shift and ' ' after prompt. To escape mistyped address or no.-(before last figure is entered) -hit 'X'.

A tape with several K of nops (checksums) may be produced by hitting 'L' and then escaping load routine by hitting 'X'. The buffer will be filled with nops ad up to 20K may then be dumped with 'P' command. (Of course the 1st byte will be A5H). This is useful for filling the buffer after a load operation.

I have recorded 2K of nops immediately after Tcopy.

To estimate the length of a program:- at 500 baud and assuming your cassette runs at exactly 4.75 cm/sec (mine as well), you will load 62.5 bytes/sec.

No. bytes = 62.5 x time in secs. and convert this no. to hex (a 'Ti programmer' invaluable here).

Life (source)

I have made use of the bit set, reset and test. Instructions with indexed addressing to simplify the algorith for "Life" here. But the code is by no means in its most efficient form. It could probably run at least 10% faster if optimized.

Two 1K areas of Ram are used - one for the current generation and the other to generate the next generation. When complete the new generation is moved to the current generation area which is moved to the screen via 'LDIR' instructions.

I tried a version with twice the resolution of this one (5796 as opposed to 2852) which was somewhat slower and the appearance of the display with 1:2 aspect blocks was difficult to interpret. Here two adjacent (horizontally) blocks are set or reset together (although only one need be tested) resulting in square blocks. W. Giles

If you would like a listing of any of Mr Giles programmes please contact us.

Comments on Newdos+.

Fantastic.

This has got to be the dos for just about all applications.If I were a betting man I'd bet that Tandy had drawn all (I do mean all)their ideas for the 2.2 & 2.3 Trsdos from this version of dos.

To quote Harry Pennington author of 'Trs-80 disk and other mysteries' (an excellent book) "a case in point is the apparat corporation.Here two guys in Denver, without the resources or the staff have single handedly revised, corrected and enhanced the operating system (trsdos 2.1)"

It is worth noting that the mod's that apparat have added such as basic *, renum ,method of granule allocation ,etc have all been implemented in trsdos 2.2.

Over 50 corrections ,improvements and utilities have been added and an incredible improvement in control has been made.Programes load faster ,disc op's are 1000% safer ,all dos commands and files and routines are accesible from basic as a command or program line and ,the programmer can now ,by using the 'ref' command get a list of variables ,their current values and the lines which contain them ,also there is a "jkl" option which allows the user to print the contents of the screen to the lineprinter without any control characters appearing on the screen.

Additional programmes included in Newdos+

Superzap:- this is the program that does it all reads those lost files ,restores clobbered directories ,reads and alters all password protected files ,regardless of the level of protecion.

Edtasm:- now writes to disc.

Dissasem:- machine code assembler.

Lmofset:- allows the loading of those machine language files that overlay dos.

Levell & Lvlldskl:- these two programs give you a levell basic that loads to and from disk!!!!!!

This review was written by Richard White for "the tandy newsletter".

Appointment Log

Perfect for the busy professional. Accepts names addresses, meeting times, record subject matter, derives elapsed time, gives reports.

Astronomy 1

This interactive programme will calculate the Greenwich hour angle and right ascension of Aries. Declination, GHA and right ascension of the sun. Equation of Time, Sunset and sunrise at any location.

Biorythms

This programme gives a graphical representation of the various cycles reputed to affect our daily lives.

Infinite Basic

Infinite Basic is an extraordinary advancement on the Radio Shack BASIC system. It expands the power of your TRS-80, increases the speed of your applications, optimizes the use of memory, provides a modular approach to your computing requirements. It will operate with either TAPE or DISK orientated systems.

Accounts Receivable

Allows for the creation and maintenance of up to 200 files with account name, invoice number, payment date and balance. Updates files and stores to tape. Offers complete ageing data and reveals delinquent accounts. Supplied on two cassettes.

General Accounting

A complete accounting programme for the small business. Accounts payable, receivable, summary to date, record update, checkbook activity and journal report.

Personal Finance

A very comprehensive two programme package. Keeps a check on your cheques. Has 33 different headings in which to record your expenditure. Self checking to prevent errors and uses a bubble sort to keep the records in order.

Mortgage Calculator

Will enable you to keep a check on your Building Society and give you the options when they change the rates.

Inventory Control

A comprehensive inventory programme including minimum stock level control and cost information. Display and sort routines and the ability to update are included. Information is stored on a data tape separately from the programme.

Basic Statistics

A power packed set of procedures particularly helpful to anyone using random order, central tendency, Pearson product-movement correlation coefficient Chi-square, Fisher T-test, Z-scores, standard scores, sample analysis of variance. Random number generator built in to simulate data.

Ham Radio

A simplified but nevertheless comprehensive programme similar to AMATEUR RADIO.

Electronics Assistants

A group of eight subprograms designed to solve problems such as tuned circuits and active and passive filters.

Available Now On DISC.

Final Approach & Space Battle

This programme makes you the pilot of a large multi-engined aircraft flying a ground controlled approach (GCA). The object is to control the aircraft by selecting speed and rate of descent. Don't forget to lower the undercarriage! SPACE BATTLE is a real time space war simulation. Probably the most comprehensive of all space games.

Advanced Personal Finance

This version includes all the features of personal Finance PLUS an advanced analysis routine. Supports Disk Files.

Amateur Radio System

Comprehensive package which includes Output/input for call sign, time/date contact, frequency, mode, location, name, signal report, QSO end time, QSL sent/received confirmation. DX prefix file, Q signal file, Special net log routine. Operating frequency schedule, Propagation forecast and Memo/message pad.

Inventory 2.2

Allows for creation, maintenance and review of over 2,000 items per clean disk. Operates under Radio Shack Disk BASIC, DOS 2.1. Utilizes random files with 6 subrecords per random file buffer, allowing maximum utilization of diskette space.

Inventory 2.3

Allows for creation, maintenance and review of over 2,000 items per clean disk. Utilizes random files with 6 subrecords per random file buffer, allowing maximum utilization of diskette space.

KVP Extender

Correcting keyboard bounce is only one of the many problems this versatile program addresses. Also corrects upper case lock, permits use as a terminal and more.

Mail List 11

Complete mail list package for 32K, dual disk systems. Enter, update, merge, sort, print, mailing labels.

Newdos + 35/40/or77 Track

Apparat have been through TANDY's DOS 2.1 (by Randy Cook), and rectified a large number of mistakes and weaknesses to produce NEWDOS, which is generally considered superior to Tandy's DOS 2.2 and DOS 2.3. They have also produced additional facilities i.e. SUPERZAP and LMOFFSET and this is called NEWDOS +. SUPERZAP enables you to read EVERYTHING on a DISC, and to change ANYTHING you wish, i.e. recover lost data, mend discs and even use ELECTRIC PENCIL to write & edit programmes.

ST-80 D

ST80 SMART TERMINAL

Turns your TRS 80 into an intelligent computer terminal. Features include CONTROL key, REPEAT key, ESC key, RUN key and a functioning BREAK key. Also permits listing of incoming data on lineprinter. You can reprogram the RS232C switches from the keyboard, making baud rate changes simple.

- 80

Turn your TRS-80 into a word processing system. Includes features such as cut and paste, delete/inert by character or line, local/global change options, variable tabulation, full cursor control, upper and lower case (with proper hardware) and more... Fully supports disk and line printer. Use in conjunction with KVP and a letter-quality printer for personalized form letters.
Level 1 Relocated in Level 11

This machine language programme converts your computer so that it operates as though it were a level 1 Basic Machine, thus enabling you to run programmes written on level 1 Basic. You may also write programmes in level 1 Basic.

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Turns your TRS 80 into an intelligent computer terminal. Features include CONTROL key, REPEAT key, ESC key, RUN key and a functioning BREAK key. Also permits listing of incoming data on lineprinter. You can reprogram the RS232C switches from the keyboard, making baud rate changes simple.

- 80

Turn your TRS-80 into a word processing system. Includes features such as cut and paste, delete/inert by character or line, local/global change options, variable tabulation, full cursor control, upper and lower case (with proper hardware) and more... Fully supports disk and line printer. Use in conjunction with KVP and a letter-quality printer for personalized form letters.
Level 1 Relocated in Level 11

This machine language programme converts your computer so that it operates as though it were a level 1 Basic Machine, thus enabling you to run programmes written on level 1 Basic. You may also write programmes in level 1 Basic.

Calendar Functions

Finds day of year, day of week of Julian date from Gregorian date.
Finds number of days between dates. Interactive.

Calculator

Allows the TRS-80 to function as a calculator with one key function codes and the ability to carry totals. The four basic arithmetic functions are included along with the reciprocal, memory storage and retrieval, and reverse sign.

Cash Register

Can cope with up to twelve differing types of merchandise and stores up to 300 sale events by department and amount. Gives a daily sales report and can be linked to a printer to provide invoices.

Complex Mathematics

Computes complex addition, subtraction, multiplication and division. Natural logarithm, Absolute value, square, square root, inverses, exponentiation, N root, W root inverse sines, cosines and tangents. Polynomial evaluation, rectangular to polar and reverse, Hyperbolic sines and cosines.

ESP Tester

This one runs a series of extrasensory perception tests and keeps a percentage score to enable you to decide whether you have extraordinary powers or are just lucky.

File Handling

Will list/search and edit files. Useful to record telephone numbers and names either one could be called by the other.

Finance (loans & invest.)

2 programmes - menu style that will solve most financial problems - on paper at least. Future value of an investment, Future value of regular deposits, Regular deposits, Regular withdrawals from an investment, Initial investment, Minimum investment for withdrawals, Nominal interest rate on investments, Effective interest rate on investments, Principal on a loan, Regular payment on a loan, Last payment on a loan, Remaining balance on a loan, Term of a loan, Annual interest rate on a loan.

Fourier Transforms

This programme will perform both forward and reverse Fourier transformations on real imaginary or complex data. Extremely useful for time series analysis.

Home Finance

A complete home management financial package consisting of 10 routines which will assist in the financial management of your personal and domestic affairs.

Inventory (Mod)

Allows for the inclusion of alpha information and data index code in the form of data statements within the programme. 240 stock items can be contained using the full 6 data areas and 2 pieces of alpha information.

Inventory (FP)

Handles up to 100 stock items with primary and backup vendor. All information is recorded separately from the programme. Two programmes (initialisation & Maintenance) are included on one Cassette.

Keyboard 80*

Play music on your TRS-80 keyboard with this machine language programme. Three-octave diatonic scale organ now includes sharps, flats. Play your favorites right on the computer. Load program, plug AUX line into any audio amp and bang away!

KVP Extender

Correcting keyboard bounce is only one of the many problems this versatile program addresses. Also corrects upper case lock, permits use as a terminal and more.

TORANTO & ASSOC. CONVERSION OF OSBOURNE & ASSOC. COMPLETE BUSINESS SYSTEM.

Written to conform exactly with the two Osborne Textbooks describing their successful Wang Computer System. Books included .

Accounts Receivable

Invoice linked system, it can keep track of billed and unbilled invoices, open and closed items and aging. It can print a statement and link to the general ledger. Handles 200 Accounts.

Accounts Payable

Invoice linked system that can calculate and print checks, make reports, and link fully to the general ledger.

General Ledger

Handles more than 1750 transactions on 200 different accounts and keeps track of them by month, quarter, year and the previous three quarters. Available with or without Cash Journal option.

Invoicing

Prints invoices. Links with other programmes.

Air Raid

A machine language programme. A real time shooting gallery which makes use of the TRS-80 high speed graphics. Probably the best action game available and can easily become an obsession.

Barricade*

Break through the 5-wall barricade with the high speed ball and keyboard controlled paddle! Trap the ball among the walls and watch the action as the ball destroys the 100 blocks, one by one! Barricade is similar to several popular video games, but we've added more. There are 3 different scoring methods, and the best of each is saved for challenge by later players. 8 speeds, 4 paddle sizes and 3 limits on ball rebounds angle may be chosen to make the game as hard or easy as you wish (yes, that's 96 different options), and a WEIGHTED SCORE rewards you for making the game more difficult! We believe it is impossible to achieve the maximum score in all categories. BARRICADE exploits the machine language capabilities of your TRS-80 to provide one of the most exciting games you can buy!

RSM-2 Monitor*:

Based on a machine language program the RSM-M-2 Monitor allows you to interact directly with your TRS-80 at the machine language level. You may examine your Basic ROM's, test your RAM, enter and execute machine language programs, read and write machine language tapes. You can set BREAKPOINTS in your programs, write SYSTEM tapes, READ SYSTEM tapes and display their name and starting address, and PRINT any command with the TRS232 printer interface or the Radio Shack expansion interface! Disk commands are included for future expansion of your system. RSM-2 loads from cassette into the top 5k of memory in Level 1 or Level 11 16k computers so that it can reside in memory with other programs!

Basic IP Converts L11 to L1*

OSBOURNE/McGRAW HILL Accounting by TORANTO

TO the PROGRAMME USER:

In the Accounts Payable and Accounts Receivable text book are all necessary instructions to successfully run the programme.

The following are some courteous hints to help you in the initial steps of getting your programme going.

1. place the master disc-protected-in drive zero.
2. place the blank disc-unprotected-in drive one.
3. Format the blank disc.
- 4a. Initialize the disc by running the programme ARINI.
- 4b. Only run initialization once, as it clears data discs of data, as well as setting up formatted discs to receive data.
5. Run the programme AR000 to bring up the MENU.
- 6a. Load from menu General Information and enter appropriate information. It is important to change "Today's Date" prior to daily use of the programme.

6b. Today's date must lie between the beginning and end of the period specified. NOTE dates are American style i.e., month then day then year.

7. Return to MENU and proceed with use of programme.

8. You must enter some accounts before you can enter invoices, in accounts receivable or accounts payable.

9. You must set up and enter your chart of accounts before you can fully operate the General Ledger.

10. 30, 60, and 90 day ageing is carried out according to dates specified, so you must get dates correct.

11. Don't forget to backup data discs, just in case of problems.

12. Always come back to original menu before removing data discs, or switching off.

13. Run through MENU in numeric order to get the hang of the system.

Linear Programming

This programme uses the simplex method and the variables are entered as DATA statements prior to running the programme.

Micro-text Editor

Versatility in text composition and editing through the use of a non-destructible cursor, graphics capability and interface option with cassette tape or either TRS-80 printer. Commands include: Delete, Insert, ASCII Code, Repeat, Print, Save, Load, Clear, End.

Math Drill

Flash card drilling without the tears! If you've had to suffer comments that home computers were fancy toys, use this program to quell your friend's remarks. Of course, you should subtly set the time delay at the minimum to be sure your friend fully appreciates the challenge. However you use it, your youngsters will surely benefit from the practice.

Numerical Intergration

Routines included are Trapezoidal, Simpson, Quartic and Gaussian.

Pre Flight

For use by private pilots. Flight planning, fuel consumption checks, speed and distance calculations to determine ETA's. Rates of climb and distance to altitude.

Renumber *4,16,32, OR 48

Can renumber a 12K program in only thirty-two seconds! Offers complete user control with respect to which lines are renumbered and how, including all GOSUB's and GOTO's. Runs in 1300 bytes of high memory regardless of program size. Loads from add operates on either disk-or tape-based programs. Specify 4,16,32 or 48 K version when ordering.

Root Finder

Finds roots of polynomials of degree 4 or less. This is not an approximation routine and accuracy is limited only by the TR S-80 maths function.

Statistics 11 & 111

Statistics 11-Mean, Variance and standard deviation of grouped or ungrouped single samples. Calculates regression and correlation co-efficients of an un-weighted or weighted dependent variable versus an independent variable. Also finds co-efficient errors will smooth data with either a running mean or with binomial smoothing. Statistics 111-Mann-Whitney U test, Binomial distribution, Poisson distribution, Normal distribution, Student's t- distribution and test, F distribution.

Star Finder

Calculates the position of a star, given the date, time and observers position.

Trig Package

This package will find the centre and radius of a circle specified by the co-ordinates of three points. The area of a polygon specified by the co-ordinates of its vertices. All plane and spherical triangle solutions and distance between two points specified by latitude and longitude.

8800-280 Conversion

Permits you to enter 8080 codings and then returns with the 280 equivalent. Also stores equivalents in the order entered, for review at later time.

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Extremely easy to use, The Electric Pencil is your word processing system. It means you have maximum freedom and simplicity in the handling of text. No carriage returns or word hyphenations are necessary. Line-formatting is done automatically by The Electric Pencil.

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The Electric Pencil combines features found in more expensive systems with many capabilities you won't find anywhere else. Right margin justification, page numbering and tracking, and many combinations of line length, page length, and line and page spacing are always under your control. Text editing capabilities eliminate guesswork when inputting. The text appears on the video monitor as you insert it, and you can view text whenever you wish using the bidirectional variable speed scrolling feature. You can insert, delete, or relocate any text using simple keyboard commands.

The Electric Pencil has been designed to work with both Level I (16K system) and Level II models of the TRS-80, and with virtually any printer you choose. Level II

owners will want the TRS-80 disk version, which is supplied on cassette. Transfer of the Electric Pencil to your own disk is as simple as entering a command.

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The Electric Pencil TRS-80 disk version is fully interactive with the DISK READ, WRITE, DIR, and other routines of TRSDOS 2.0. Any version of The Electric Pencil may be upgraded to accommodate new equipment. For instance, if you are already using the Electric Pencil and have added a floppy disk to your TRS-80 system, simply return the original cassette to Michael Shroyer Software, along with the price difference between your present Electric Pencil and the upgraded version, plus \$15 for handling.

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Your dealer will have a manual and descriptive literature for you to see, and can demonstrate The Electric Pencil to you, on one or more of his demonstration microcomputers. Look the manual over carefully, and note the explicit instructions which lead you easily through The Electric Pencil operation. The manual was produced using The Electric Pencil which will enable you to see its many capabilities for yourself. Then try it out on your dealer's demo unit . . . most any microcomputer will do. If, for some incredible reason, he's unprepared, demand it! or write:

**m
ss**

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STRING FUNCTIONS

- **String Sort Functions.**
 - SRTC Character String Multi-key Sort.
 - SRTV Multi-variable Sort.
- **String Manipulation Functions.**
 - SBJS Justify Both Sides of String.
 - SDS\$ Delete substring.
 - SIV\$ Invert (reverse) string.
 - SLJ\$ Left justify string.
 - SLR\$ Left rotate string.
 - SLS\$ Left shift string.
 - SLT\$ Left truncate string.
 - SRR\$ Right rotate string.
 - SRT\$ Right truncate string.
 - SRV\$ Generate random string.
 - SSI\$ Insert substring.
 - STC\$ Center string text.
 - STJ\$ Justify string text.
 - STP\$ Pack string text.
- **String Data Compression/Decompression.**
 - SC4\$ Compress bytes to 4-bit format.
 - SC5\$ Compress bytes to 5-bit format.
 - SC6\$ Compress bytes to 6-bit format.
 - SC7\$ Compress bytes to 7-bit format.
 - SCL\$ Convert to lower case.
 - SCU\$ Convert to upper case.
 - SD4\$ Decompress 4-bit format to bytes.
 - SD5\$ Decompress 5-bit format to bytes.
 - SD6\$ Decompress 6-bit format to bytes.
 - SD7\$ Decompress 7-bit format to bytes.
 - SCP\$ Compress string by removing multiple characters.
 - SDP\$ Decompress string packed by SCP\$.
 - SCPM Compress memory bytes by removing multiple characters.
 - SDPM Decompress memory packed by SCPM.
- **Display Screen Functions.**
 - SDHL Draw Horizontal line.
 - SDVL Draw Vertical line.
 - SEHL Erase horizontal line.
 - SEVL Erase vertical line.
 - SSCL Scroll screen left.
 - SSCR Scroll screen right.
 - SSDN Scroll screen down.
 - SSUP Scroll screen up.
- **String Translation/search/copy.**
 - STL\$ String translate function.
 - SVER String verify function.
 - SMSK String search under mask.
 - SCPY String matrix copy (in order by index).
 - SEQU String matrix copy (in sequential order with source repeated).
 - SABP Create absolute string pointer.
 - SAP\$ Propagate byte consecutively in memory.
 - SVP\$ Create String Value.

MATRIX FUNCTIONS

- **Matrix Mathematical Functions.**
 - MEQN Solution of simultaneous linear equations.
 - MINV Matrix inversion.
 - MIDT Matrix identity.
 - MMPY Matrix multiply.
 - MTRN Matrix transpose.
- **Matrix scalar arithmetic functions.**
 - MSAD Add scalar to array.
 - MSMP Multiply array by scalar.
 - MSDV Divide array elements by scalar.
 - MSSD Subtract scalar from array elements.

MATRIX FUNCTIONS (cont.)

- **Matrix array arithmetic functions.**
(Operations performed in order by corresponding index values)
 - MAAD Add array elements.
 - MADV Divide array elements.
 - MAMP Multiply array elements.
 - MASB Subtract array elements.
 - MCPY Copy array elements.
- **Matrix array arithmetic functions.**
(Operations performed sequentially, with repeating source array elements)
 - MELA Add array elements.
 - MELC Copy array elements.
 - MELD Divide array elements.
 - MELM Multiply array elements.
 - MELS Subtract array elements.
- **Matrix input/output functions.**
 - MELR Matrix element read (corresponds to BASIC READ statement)
 - MRDT Matrix read tape.
 - MRST Restore READ DATA statement number location.
 - MWRT Matrix write tape.
- **Subroutine Call functions.**
 - MCAL Subroutine call - passes arguments to BASIC subroutine.
 - MRTN Subroutine return - returns arguments from BASIC subroutine.
- **General purpose functions.**
 - MSHP Dynamically reshapes or deletes arrays.
 - MEQU Copies arrays (sequentially without repeating).
 - PLUK Pluck (Peek) a word from memory.
 - PLUG Plug (Poke) a word into memory.
 - NOIB Deactivate INFINITE BASIC.

BUSINESS FUNCTIONS

- **Search, Insert, and Hash Functions.**
 - BHSH Hash number generation.
 - BINS Insert string into sorted array.
 - BNUL Set null character compare byte.
 - BSSA Search sorted string array for matching element.
 - BSUA Search unsorted string array for matching element.
- **Printer Functions.**
 - BCLN Find current printer line number.
 - BCPN Find current page number.
 - BHDR Define/activate page headings and footings.
 - BHDX Deactivate pagination system.
 - BPGN Initialize pagination.
 - BRLN Reset current line number.
 - BVTB Tab to a given line number.
- **Packed Decimal Functions.**
 - BAP\$ Add packed decimal.
 - BCP\$ Convert to packed decimal.
 - BDP\$ Divide packed decimal.
 - BMP\$ Multiply packed decimal.
 - BPC\$ Convert from packed decimal to character.
 - BPRC Set packed decimal floating point precision.
 - BSP\$ Subtract packed decimal.

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∞ INFINITE BASIC ∞_{TM} FOR THE TRS-80 LEVEL-II TAPE AND DISK SYSTEMS

∞ INFINITE BASIC EXPANDS THE POWER OF YOUR TRS-80

Over 80 features have been added to the existing Radio Shack BASIC system. Now, a single BASIC statement can perform such complex operations as:

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systems

∞ INFINITE BASIC INCREASES THE SPEED OF YOUR APPLICATIONS

The use of INFINITE BASIC will often dramatically increase the
speed of your applications. For example, the SORT function is
30-50 times FASTER than possible when written in BASIC. In
addition, having a large selection of complex functions readily
available will increase your programming productivity.

∞ INFINITE BASIC OPTIMIZES THE USE OF MEMORY

The user selects only those functions required for loading into
memory. A loader program is included with INFINITE BASIC
which automatically builds a load module of functions selected
by the user.

The load module can be RELOCATED anywhere within protected
memory. This provides for compatibility with existing machine
language user programs.

∞ INFINITE BASIC PROVIDES A MODULAR APPROACH TO YOUR COMPUTING REQUIREMENTS

INFINITE BASIC is a MODULAR system providing a wide range of
capabilities. TWO application modules are contained in the core
package distributed - the STRING and MATRIX modules. The
contents of these modules are summarized in the attached list of
INFINITE BASIC FUNCTIONS.

INFINITE BASIC provides a path for upward mobility. Additional
modules will be available to further expand the power and ease
of use of the TRS-80.

Currently available is the BUSINESS module. This module provides
the following facilities which are especially useful in business
applications:

- Automatic printer pagination header/footer system. This allows the user to specify heading and footing lines for output page printers. The user just prints the data desired, INFINITE BASIC will automatically print the specified headers, footers, along with page numbers if requested.
- Powerful search and insert commands. This allows the user to rapidly locate an element in either a sorted or unsorted array, or to insert an element into a sorted array.
- Packed decimal floating point functions. This package of functions provides increased precision as well as reduces round-off errors required for business applications. Arithmetic operations may be performed on numbers up to 500 significant digits of precision.
- Hash number encoding function. This function provides a convenient method for generating disk index numbers for a hash encoded information retrieval system.

Additional modules will be available soon. All add-on modules require prior purchase of INFINITE BASIC which contains the loader.

∞ EXAMPLE USE OF INFINITE BASIC

The short example below illustrates one use of INFINITE BASIC. In this example four arrays are generated (NM\$, SX\$, IG, and WT), sorted, and printed. The use of the INFINITE BASIC functions SRV\$, SRTV, and STC\$ are explained below

Line #	Description
30	SRV\$ generates a string of random characters. In this case the length of the string is controlled by RND(10), i.e. a random length string of 1 to 10 characters will be generated. The characters generated will be randomly selected from the range of 65-91 (ASCII for letters A-Z).
40	SRV\$ again is used to generate a fixed length string containing only one character (F or M).
80	SRTV\$ is used to sort elements 2-4 of the array. The first argument specifies which arrays are to be connected in the sort, and the sort order. In this case SX\$ is the primary sort variable with the "+" sign indicating ascending sort order. The secondary sort key will be IG, with the "-" sign indicating descending sort order. Similarly WT will be the third key in ascending order. NM\$, containing no "+" or "-" sign will be carried along in the sort. The last two arguments specify that only elements 2-4 are to be included in the sort.
100	STC\$ is used to center the character string in a field 20 characters wide for printing.

The sample BASIC program is shown below. Note that each INFINITE BASIC FUNCTION is preceded by an "&"

```

1  CLEAR 1000: DEFUSR = &HEFAC: PRINT USR(1)
10  DIM NM$(7),SX$(7),IG(7),WT(7)
20  FOR I = 0 TO 5
30  NM$(I) = &SRV$(RND(10),65,91)
40  SX$(I) = &SRV$(1,"FM")
50  IG(I) = RND(100)
60  WT(I) = RND(0)*300.0
70  NEXT
80  IC = &SRTV(" + SX$, - IG, + WT,NM$",2,4)
90  FOR I = 2 TO 4
100 PRINT &STC$(NM$(I),20):SX$(I):IG(I):WT(I)
110 NEXT

```

To use INFINITE BASIC, as in the above example, the required functions must first be loaded into memory. Given below is the load procedure required to create the three functions used above. Note that each function selected below is preceded by two "@" characters. User input is shown underlined.

IBLOAD

```

IBLOAD · DISK VERSION 2.0 · COPYRIGHT 1979, RACET COMPUTES
ENTER SUBROUTINE NAMES REQUIRED? @ @SRTV
? @ @SRV$
? @ @STC$
?
HIGH/LOW MEMORY ALLOCATION(H/L)? H
ENTER STARTING ADDRESS? FA00H
DISK/TAPE INPUT (D/T)? D
ENTER INPUT DISK FILESPEC? SREL
FOLLOWING SUBROUTINE(S) NOT YET FOUND
@AESYA @ARGN @ARGV @CPTH @TA$ @ACMOD @AT @BALS
@RETS @SKIP @T$
ENTER INPUT DISK FILESPEC? XREL
MEMORY START = X'EF9A',END = X'FA00',TRA = X'402D'
DEFUSR = &HEFAC
DUMP MEMORY TO TAPE (Y/N)? N
XE PROCESSING COMPLETED
DOS READY

```

∞ INFINITE BASIC ∞
\$49.95

∞ BUSINESS ∞
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Computer Courses

Introduction to Computers	(TRS-80)	\$	100
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Advanced BASIC programming	(" ")	\$	150
Microprocessor Design	(Intel, Motorola)	\$	150

Machine Hire

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TIMSER is a Time Series Analysis program that fits data to nine different 1st, 2nd, and 3rd order curves. Goodness of fit data, tables, including projected data and confidence limits, and graphical displays of curve fit and variance are included. The program provides for correction factors and functions to test seasonal variations, inflation corrections, or cyclical variations. A detailed Users Manual is included complete with illustrated examples.

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A review of Printers, plus comments on Hard Disk, Laser Video Recorders, and Rubble Memories. (or C.C.D.) Also adjustments of Cassette players. Please send in any comments for inclusion.

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WITH COPSYS YOU CAN:

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REMODEL eliminates manual restructuring and renumbering of program lines. This allows the user to rapidly create working and well organized programs. Blocks of lines may be moved from one location to another thus enhancing program readability and ease of documentation.

PROLOAD allows creation of a library of BASIC programs which can then be loaded individually or in combination with other programs. This greatly enhances the users programming productivity by avoiding re-creation of commonly used routines. Also, a library of DATA statements can be selectively saved and loaded, which is a more effective method of storing and retrieving fixed data than using data tape facilities. Complete with Users Manuals - specify 16, 32, or 48K versions.

COPSYS is designed to copy system tapes (machine language object code) generated from the Radio Shack Editor/Assembler program. COPSYS can be used to duplicate those valuable system tapes before they become damaged.

Order TS24C at \$14.95