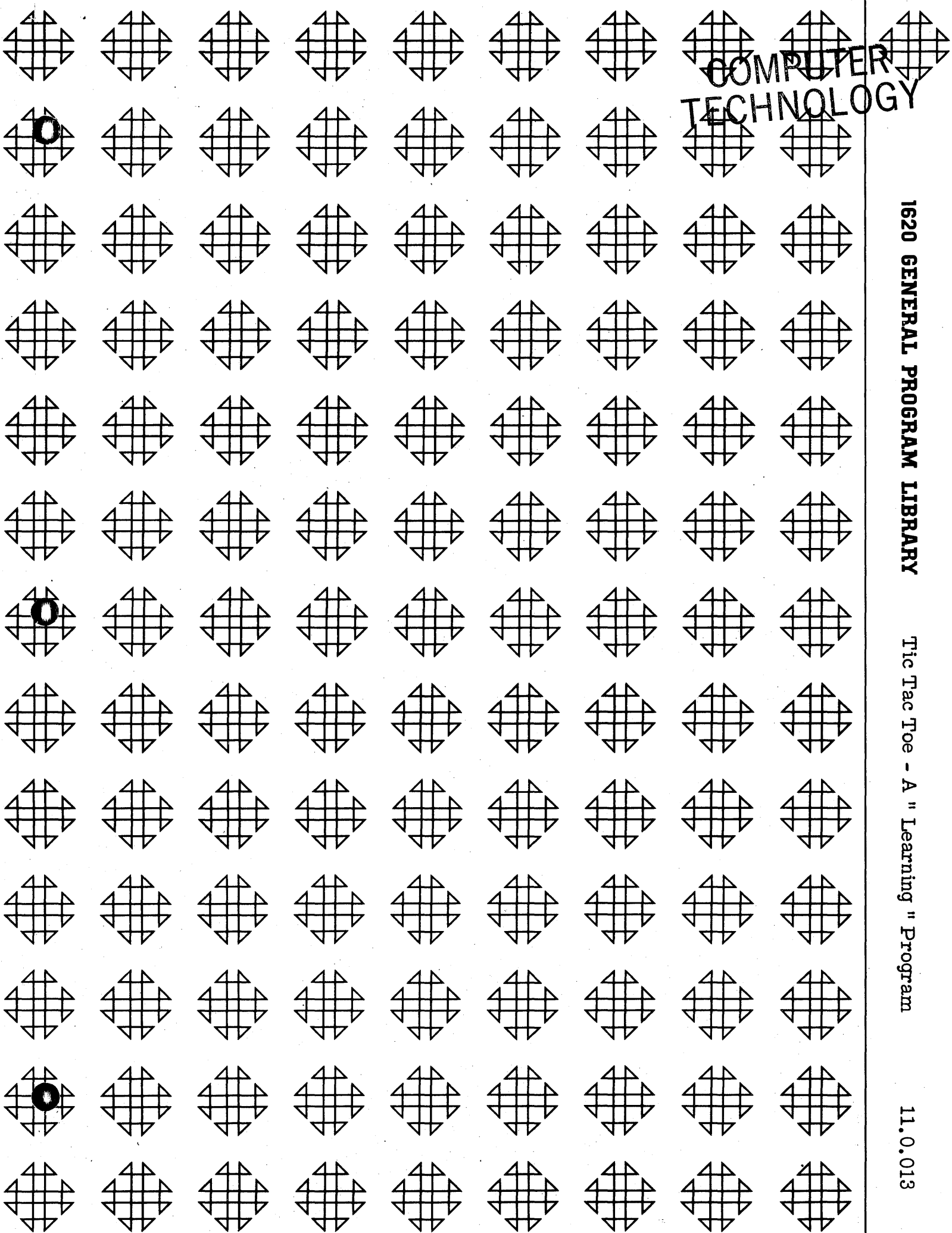


COMPUTER
TECHNOLOGY

1620 GENERAL PROGRAM LIBRARY

Tic Tac Toe - A " Learning " Program

11.0.013



Disclaimer

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Description of Program

The machine is initially endowed with some intelligence, but with no foresight. It will not make plays which are immediately disastrous, but must be trapped into defeat. The logical sequence which is followed in general is as follows:

1. Play center square if possible, otherwise upper left hand corner.
2. If possible to win on this play, do so.
3. If forced to play so as to prevent immediate defeat, do so.
4. Generate a random, legal play.

Whenever the machine is beaten, a record of the plays is kept (and punched). Later, these records are referred to whenever random plays are generated, so as not to repeat the mistake.

Externally, the positions are numbered the same as the keys on the typewriter. ie,

1	2	3
4	5	6
7	8	9

Internally, a different numbering scheme is used.

2	9	4
7	5	3
6	1	8

Modifications or revisions to this program, as they occur, will be announced in the appropriate Catalog of Programs for IBM Data Processing Systems. When such an announcement occurs, users should order a complete new program from the Program Information Department.

This is done in order to make bookkeeping easier, since the above is a so-called magic square. The sum of digits in any row, column, or diagonal is 15.

It is estimated that there are on the order of 100 ways to beat the machine.

Using the Program

Load the Tic Tac Toe deck in the read hopper, followed by data cards punched out in previous games, if desired. Load with the LOAD key and follow the typed out instructions. The punch should be READY.

Addresses for reference

Start of new game: 01446

To "Brainwash" machine: 01302

Maintenance

The program may be modified for use with paper tape making the following changes.

1. Add (In numerical sequence)

02195 TD OUTPUT + 1, RECMK

05135 SM COUNT, 6

2. Change the following statements to be as shown.

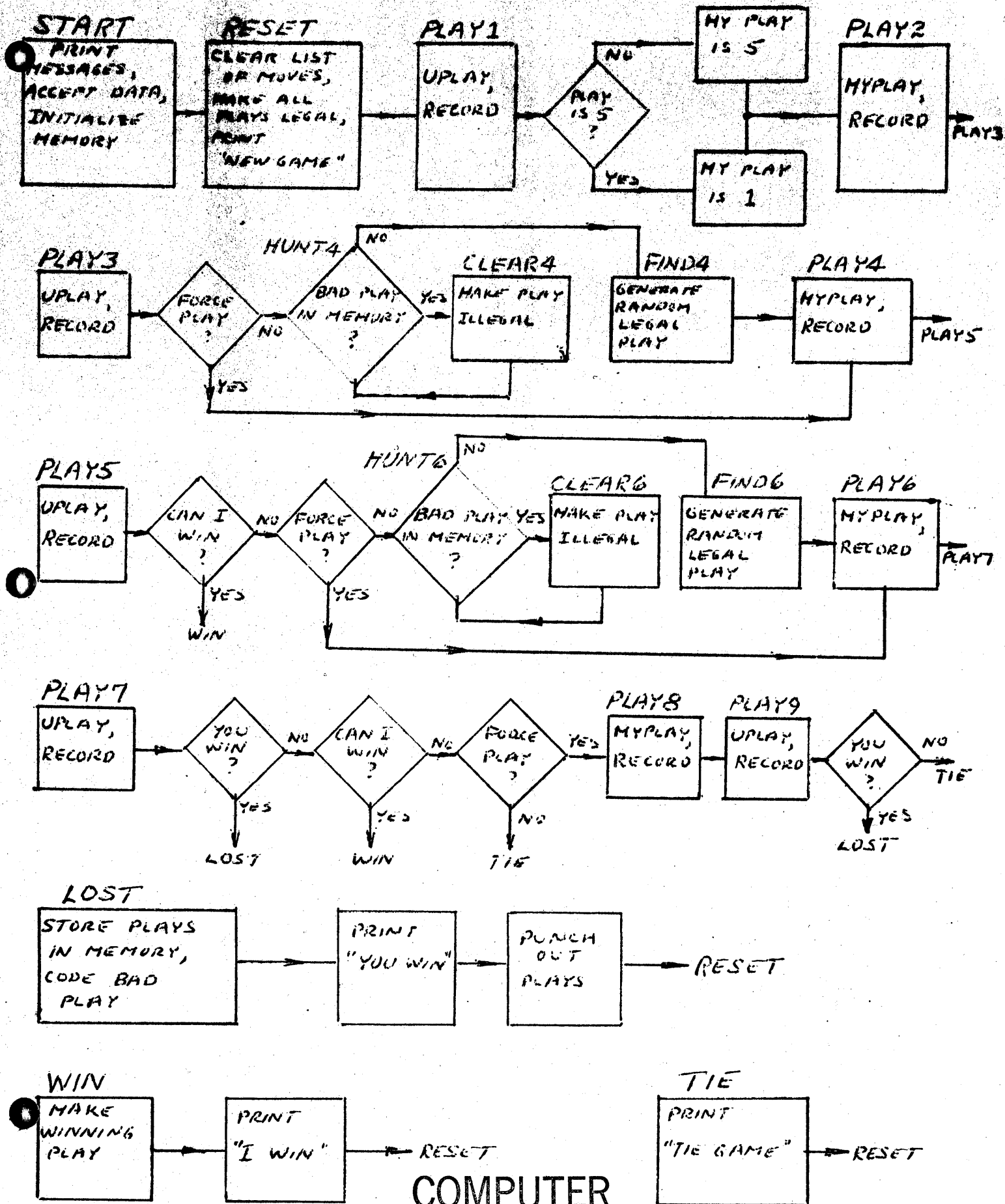
02200 WNPT OUTPUT-5

05100 RNPT

05130 BC1 READ

When a READER NO FEED occurs, turn off switch 1, push RELEASE, START.

TIC TAC TOE



COMPUTER
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00402				1010	DORG	402Z
00402	25	00425	00060	1020	MYPLAY	TD *+23,60Z
00414	25	00225	19987	1030		TD MESS2+23,TRANSOZ
00426	37	00297	00100	1040	WATY	MESS2Z
00438	42	00200	00000	1050	BB	Z
00450	34	00200	00102	1060	UPLAY	RCTY Z
00462	37	00275	00100	1070	WATY	MESS1Z
00474	35	00260	00100	1080	RNTY	60Z
00406	42	00222	00060	1090	BD	*+35,60Z
00498	39	00229	00100	1100	ERROR	WATY MESS3Z
00510	49	00450	00000	1110	B	UPLAYZ
00522	45	00546	00060	1113	BNR	*+24,60Z
00534	49	00498	00000	1116	B	ERRORZ
00546	33	00060	00000	1120	CF	60Z
00558	25	00581	00060	1130	TD	*+23,60Z
00570	25	00060	19979	1140	TD	60,TRANSIZ
00582	25	00605	00060	1150	TD	*+23,60Z
00594	44	00498	19969	1160	BNF	ERROR,LEGALZ
00606	42	00000	00000	1170	BB	Z
00618	25	00636	00060	1180	RECORD	TD *+18,60Z
00630	33	19969	00000	1190	CF	LEGALZ
00642	25	00660	00617	1200	TD	*+18,RECORD-1Z
00654	25	19959	00060	2010	TD	PLAYS,60Z
00666	15	00060	00000	2015	TDM	60Z
00678	42	00000	00000	2020	BB	Z
00690	16	00699	0-0J5	2030	YOUWIN	TFM *+9,15,810Z
00702	25	00725	00689	2040	TD	*+23,YOUWIN-1Z
00714	25	00737	19959	2045	TD	*+23,PLAYSZ
00726	12	00699	000-0	2050	SM	YOUWIN+9,,10Z
00738	25	00761	00688	2060	TD	*+23,YOUWIN-2Z
00750	25	00773	19959	2065	TD	*+23,PLAYSZ
00762	12	00699	000-0	2070	SM	YOUWIN+9,,10Z
00774	25	00797	00687	2080	TD	*+23,YOUWIN-3Z
00786	25	00809	19959	2085	TD	*+23,PLAYSZ
00798	12	00699	000-0	2090	SM	YOUWIN+9,,10Z
00810	46	00834	01200	2100	BE	LOSTZ
00822	42	00000	00000	2110	BB	Z
00834	43	00858	19959	2120	LOST	BD *+24,PLAYSZ
00846	32	19956	00000	2130	SF	PLAYS-3Z
00858	32	19951	00000	2140	SF	PLAYS-8Z
00870	11	02921	-0006	2150	AM	COUNT,6Z
00882	26	0292J	19956	2160	TF	COUNT,PLAYS-3,6Z
00894	11	02001	-0001	2170	AM	SEQNO,1Z
00906	37	02665	00100	2180	WATY	MESS4Z
00918	26	02927	19956	2190	TF	OUTPUT,PLAYS-3Z
00930	38	02922	00400	2200	WNCD	OUTPUT-5Z
00942	49	01446	00000	3010	B	RESETZ
00954	16	00963	0-0J5	3020	FORCE	TFM FORCE+9,15,810Z
00966	25	00909	00953	3030	TD	*+23,FORCE-1Z
00978	25	01001	19959	3035	TD	*+23,PLAYSZ
00990	12	00963	000-0	3040	SM	FORCE+9,,10Z

01002	25	01025	00952	3050	TD	*+23, FORCE-2Z
01014	25	01037	19959	3055	TD	*+23, PLAYSZ
01026	12	00963	000-0	3060	SM	FORCE+9,,10Z
01038	47	01158	01100	3070	BNH	NOFORSZ
01050	14	00963	000-9	3080	CM	FORCE+9,9,10Z
01062	43	01158	01100	3090	BH	NOFORSZ
01074	25	01097	00963	3100	TD	*+23, FORCE+9Z
01086	44	01158	19969	3110	BNF	NOFORS, LEGALZ
01098	25	00060	00963	3120	TD	60, FORCE+9Z
01110	43	01158	00951	3130	BD	NOFORS, FORCE-3Z
01122	17	00402	000-0	3140	WIN	STM MYPLAY,,10Z
01134	39	02683	00100	3150	WATY	MESS5Z
01146	40	01446	00000	3160	S	RESETZ
01158	42	00000	00000	3170	NOFORS	BB Z
01170	34	00000	00102	4010	START	RCTY Z
01182	39	02753	00100	4020	WATY	MESS8Z
01194	34	00000	00102	4030	RCTY	Z
01206	34	00000	00102	4040	RCTY	Z
01218	39	02509	00100	4050	WATY	MESS9Z
01230	34	00000	00102	4060	RCTY	Z
01242	34	00000	00102	4070	RCTY	Z
01254	39	02825	00100	4080	WATY	MESS10Z
01266	34	00000	00102	4090	RCTY	Z
01278	34	00000	00102	4100	RCTY	Z
01290	39	02841	00100	4110	WATY	MESS11Z
01302	34	00000	00102	4120	RCTY	Z
01314	16	02921	-3007	5010	TFM	COUNT, DATAZ
01326	34	00000	00102	5020	RCTY	Z
01338	39	02697	00100	5030	WATY	MESS6Z
01350	48	00000	00000	5040	H	Z
01362	47	01446	00100	5050	BNC1	RESETZ
01374	26	01404	02921	5080	READ	TF *+30, COUNTZ
01386	11	01404	-0001	5090	AM	*+18, 1Z
01398	36	00000	00500	5100	RNCD	Z
01410	11	03001	-0001	5110	AM	SEGNO, 1Z
01422	11	02921	-0006	5120	AM	COUNT, 6Z
01434	47	01374	00900	5130	BNLC	READZ
01446	34	00000	00102	5140	RESET	RCTY Z
01458	39	02877	00100	5142	WATY	MESS13Z
01470	31	19961	02907	5144	TR	LEGAL-8, FLAGS-8Z
01482	26	19959	02905	5150	TF	PLAYS, ZEROSZ
01494	17	00450	000-0	5160	PLAY1	BTM UPLAY,,10Z
01506	17	00618	000-1	5170	BTM	RECORD, 1, 10Z
01518	15	00060	00002	5180	TDM	60, 2Z
01530	44	01554	19965	5190	BNF	PLAY2, LEGAL-4Z
01542	15	00060	00005	5200	TDM	60, 5Z
01554	17	00402	000-0	6010	PLAY2	BTM MYPLAY,,10Z
01566	17	00618	000-2	6020	BTM	RECORD, 2, 10Z
01578	17	00450	000-0	6030	PLAY3	BTM UPLAY,,10Z
01590	17	00618	000-3	6040	BTM	RECORD, 3, 10Z
01602	17	00954	00J13	6050	BTM	FORCE, 113, 9Z
01614	43	01890	00060	6060	BD	PLAY4, 60Z
01626	31	19941	19961	6070	HUNT4	TR TEMP-8, LEGAL-8Z
01638	16	03006	-3007	6080	TFM	TEST, DATAZ

01650	24	03006	02921	6090		C	TEST,COUNTZ
01662	46	01818	01200	6100		BE	FIND4Z
01674	11	03006	-0003	6110		AM	TEST,3Z
01686	24	03000	19953	6120		C	TEST,PLAYS-6,6Z
01698	46	01734	01200	6130		BE	CLEAR4Z
01710	11	03006	-0003	6140		AM	TEST,3Z
01722	49	01850	00000	6150		B	HUNT4+24Z
01734	11	03006	-0003	6160	CLEAR4	AM	TEST,3Z
01746	44	01650	03000	6170		BNF	HUNT4+24,TEST,11Z
01758	12	03006	-0002	6180		SM	TEST,2Z
01770	25	01788	03000	6190		TD	*+18,TEST,11Z
01782	33	19949	00000	6200		CF	TEMPZ
01794	11	03006	-0002	7010		AM	TEST,2Z
01806	49	01650	00000	7020		B	HUNT4+24Z
01818	21	02896	02896	7030	FIND4	A	NUMB,NUMBZ
01830	43	01854	02895	7033		BD	*+24,NUMB-1Z
01842	49	01818	00000	7036		B	FIND4Z
01854	25	01877	02895	7040		TD	*+23,NUMB-1Z
01866	44	01818	19949	7050		BNF	FIND4,TEMPZ
01878	25	00060	02895	7060		TD	60,NUMB-1Z
01890	17	00402	000-0	7070	PLAY4	BTM	MYPLAY,,10Z
01902	17	00618	000-4	7080		BTM	RECORD,4,10Z
01914	17	00450	000-0	7090	PLAY5	BTM	UPLAY,,10Z
01926	17	00618	000-5	7100		BTM	RECORD,5,10Z
01938	17	00954	00-24	7110		BTM	FORCE,24,9Z
01950	17	00954	00J15	7120		BTM	FORCE,115,9Z
01962	43	02238	00060	7130		BD	PLAY6,60Z
01974	17	00954	00J35	7140		BTM	FORCE,135,9Z
01986	43	02238	00060	7150		BD	PLAY6,60Z
01998	31	19941	19961	7160	HUNT6	TR	TEMP-8,LEGAL-8Z
02010	16	03006	-3007	7170		TFM	TEST,DATAZ
02022	24	03006	02921	7180		C	TEST,COUNTZ
02034	46	02166	01200	7190		BE	FIND6Z
02046	11	03006	-0005	7200		AM	TEST,5Z
02058	24	03000	19955	8010		C	TEST,PLAYS-4,6Z
02070	46	02106	01200	8020		BE	CLEAR6Z
02082	11	03006	-0001	8030		AM	TEST,1Z
02094	49	02022	00000	8040		B	HUNT6+24Z
02106	11	03006	-0001	8050	CLEAR6	AM	TEST,1Z
02118	25	02148	03000	8060		TD	*+30,TEST,11Z
02130	33	02148	00000	8070		CF	*+18Z
02142	33	19949	00000	8080		CF	TEMPZ
02154	49	02022	00000	8090		B	HUNT6+24Z
02166	21	02896	02896	8100	FIND6	A	NUMB,NUMBZ
02178	43	02202	02895	8103		BD	*+24,NUMB-1Z
02190	49	02166	00000	8106		B	FIND6Z
02202	25	02225	02895	8110		TD	*+23,NUMB-1Z
02214	44	02166	19949	8120		BNF	FIND6,TEMPZ
02226	25	00060	02895	8130		TD	60,NUMB-1Z
02238	17	00402	000-0	8140	PLAY6	BTM	MYPLAY,,10Z
02250	17	00618	000-6	8150		BTM	RECORD,6,10Z
02262	17	00450	000-0	8160	PLAY7	BTM	UPLAY,,10Z
02274	17	00618	000-7	8170		BTM	RECORD,7,10Z
02286	17	00690	0-137	8180		BTM	YOUWIN,137,8Z

02298	17	00690	0-157	8190		BTM	YOUWIN,157,8Z
02310	17	00690	0-357	8200		BTM	YOUWIN,357,8Z
02322	17	00954	00-26	9010		BTM	FORCE,26,9Z
02334	17	00954	00-46	9020		BTM	FORCE,46,9Z
02346	17	00954	00J17	9030		BTM	FORCE,117,9Z
02358	43	02430	00060	9040		BD	PLAY8,60Z
02370	17	00954	00J37	9050		BTM	FORCE,137,9Z
02382	43	02430	00060	9060		BD	PLAY8,60Z
02394	17	00954	00J57	9070		BTM	FORCE,157,9Z
02406	43	02430	00060	9080		BD	PLAY8,60Z
02418	49	02550	00000	9090		B	TIEZ
02430	17	00402	000-0	9100	PLAY8	BTM	MYPLAY,,10Z
02442	17	00618	000-6	9110		BTM	RECORD,8,10Z
02454	17	00450	000-0	9120	PLAY9	BTM	UPLAY,,10Z
02466	17	00618	000-9	9130		BTM	RECORD,9,10Z
02478	17	00690	0-139	9140		BTM	YOUWIN,139,8Z
02490	17	00690	0-159	9150		BTM	YOUWIN,159,8Z
02502	17	00690	0-179	9160		BTM	YOUWIN,179,8Z
02514	17	00690	0-359	9170		BTM	YOUWIN,359,8Z
02526	17	00690	0-379	9180		BTM	YOUWIN,379,8Z
02538	17	00690	0-579	9190		BTM	YOUWIN,579,8Z
02550	39	02857	00100	9200	TIE	WATY	MESS12Z
02562	49	01446	00000	10010		B	RESETZ
02575		11		10020	MESS1	DAC	11, YOUR PLAY -Z
02597		16		10030	MESS2	DAC	16, MY PLAY IS 5-Z
02629		18		10040	MESS3	DAC	18, ILLEGAL, TRY AGAIN-Z
02665		9		10050	MESS4	DAC	9, YOU WIN-Z
02683		7		10060	MESS5	DAC	7, I WIN-Z
02697		28		10070	MESS6	DAC	28, SW 1 ON FOR DATA, PUSH START-Z
02753		28		10090	MESS8	DAC	28, SQUARES NUMBERED AS FOLLOWS-Z
02809		8		10100	MESS9	DAC	8, 1 2 3-Z
02825		8		10110	MESS10	DAC	8, 4 5 6-Z
02841		8		10120	MESS11	DAC	8, 7 8 9-Z
02857		10		10130	MESS12	DAC	10, TIE GAME-Z
02877		9		10140	MESS13	DAC	9, NEW GAME-Z
02896		3		10150	NUMB	DC	3, 561Z
02905		9		10160	ZEROS	DC	9, 0Z
02907		2		11010		DC	2, -1Z
02909		2		11020		DC	2, -23Z
02911		2		11030		DC	2, -45Z
02913		2		11040		DC	2, -67Z
02915		2		11050	FLAGS	DC	2, -89Z
02916		1		11060	RECMK	DC	1, -Z
02921		5		11070	COUNT	DS	5Z
02927		6		11071	OUTPUT	DS	6Z
02928		1		11072		DC	1, -Z
02962		34		11073		DNB	34Z
02996		34		11074		DNB	34Z
03001		5		11075	SEQNO	DC	5, 0Z
03006		5		11080	TEST	DS	5Z
03007		1		11090	DATA	DS	1Z
19949		9		11100	TEMP	DS	9, 19949Z
19959		9		11110	PLAYS	DS	9, 19959Z
19969		9		11120	LEGAL	DS	9, 19969Z