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RC721/RC722 Keyboards
Technical Manual

Keywords: RC700, RC702, RC703, RC721, RC722, KTC401, KTC402, KTC403, technical data.

Abstract: This manual describes the technical data of the RC721 and RC722 keyboards.

(28 printed pages)

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PREFACE

First edition: RCSL No 44-RT1980.

Second edition: RCSL No 44-RT2066.

Up-date edition which includes new RC722 keyboard layouts. No changes in the technical issue; minor editorial changes.

Jens Peter Jacobsen

A/S REGNECENTRALEN af 1979, May 1983



1. INTRODUCTION

1.

This paper describes the RC721 and RC722 keyboards. The first is without a numeric block, and the later is with this block. Both keyboards contain the same microcomputer and the same program. The other circuits in the boards are almost identical.

This paper is divided in the following parts:

Keyboard description

Circuit diagrams

Cable CBL923

Alphabet

National variants.

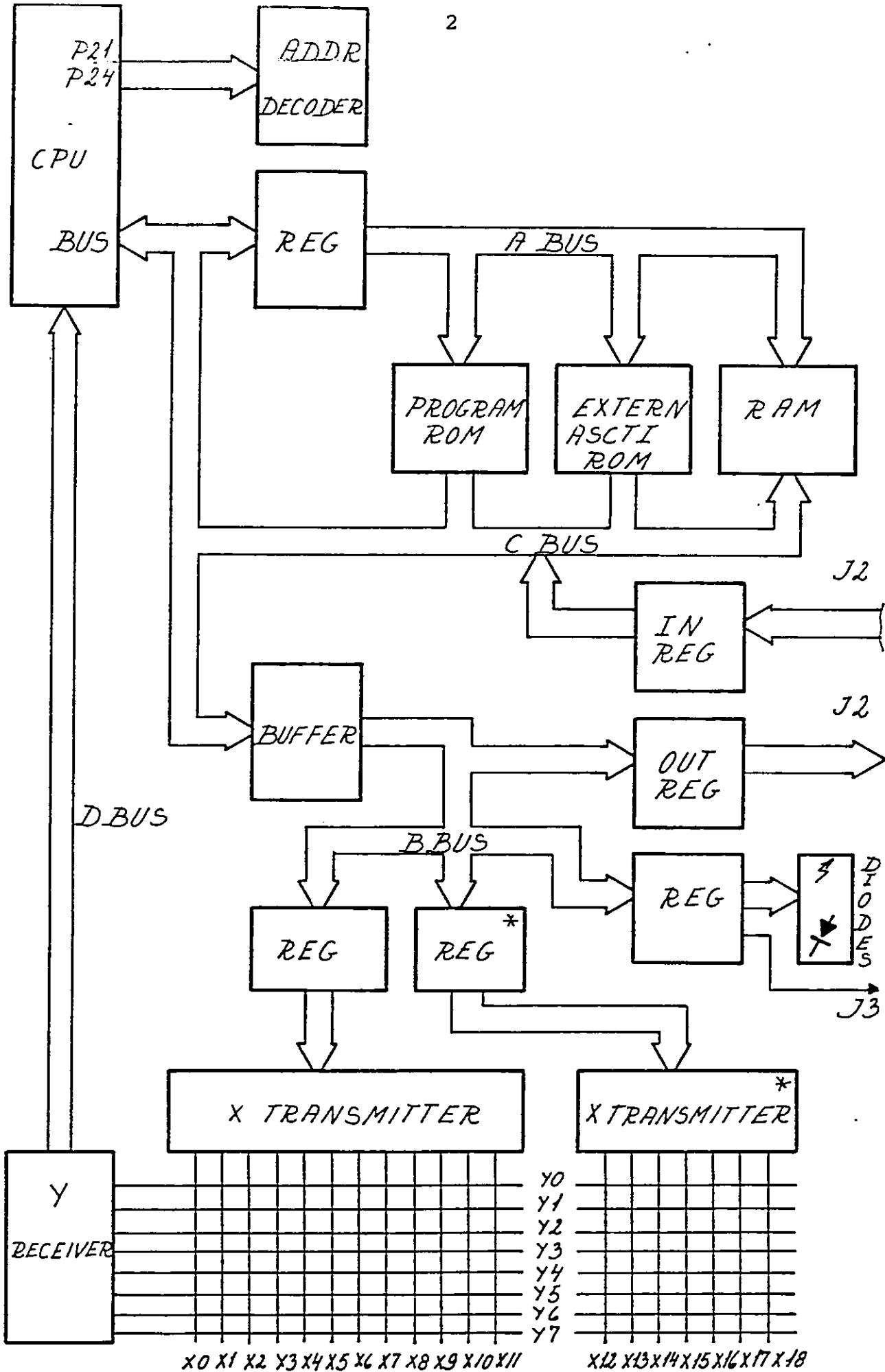
1.1 Keyboard Description

1.1

The technical name for RC721 is KTC401, and for RC722 it is KTC403. The block diagram is shown in fig. 1. The circuit is controlled by a CPU from the Intel 8048 family. The block diagram for the CPU is shown in fig. 2. A more detailed description of the CPU may be obtained from the Intel manual.

When a key is pressed the capacity between the X wire and the Y wire increases. The CPU sends an address to the X transmitter, which sends a pulse on the wire addressed. When a key is pressed the pulse is received on the Y wire and information about the position of the pressed key is received by the CPU. The program takes care of any jitter which may accrue, and also of the N-KEY roll-over function. The ASCII value of the key pressed is generated by the CPU and sent to the OUT REG together with a strobe signal.

The IN REG and the EXTERN ASCII ROM are not used in KTC401 and KTC403.



* Only in KTC 403

Fig. 1 BLOCK DIAGRAM KTC 401/KTC 403.

R 21330

MCS - 48 MICROPROCESSORS

- I 8048 8-BIT microcomputer with ROM.
- I 8748 - - - - EPROM
- I 8035 - - - - ext. MEMORY

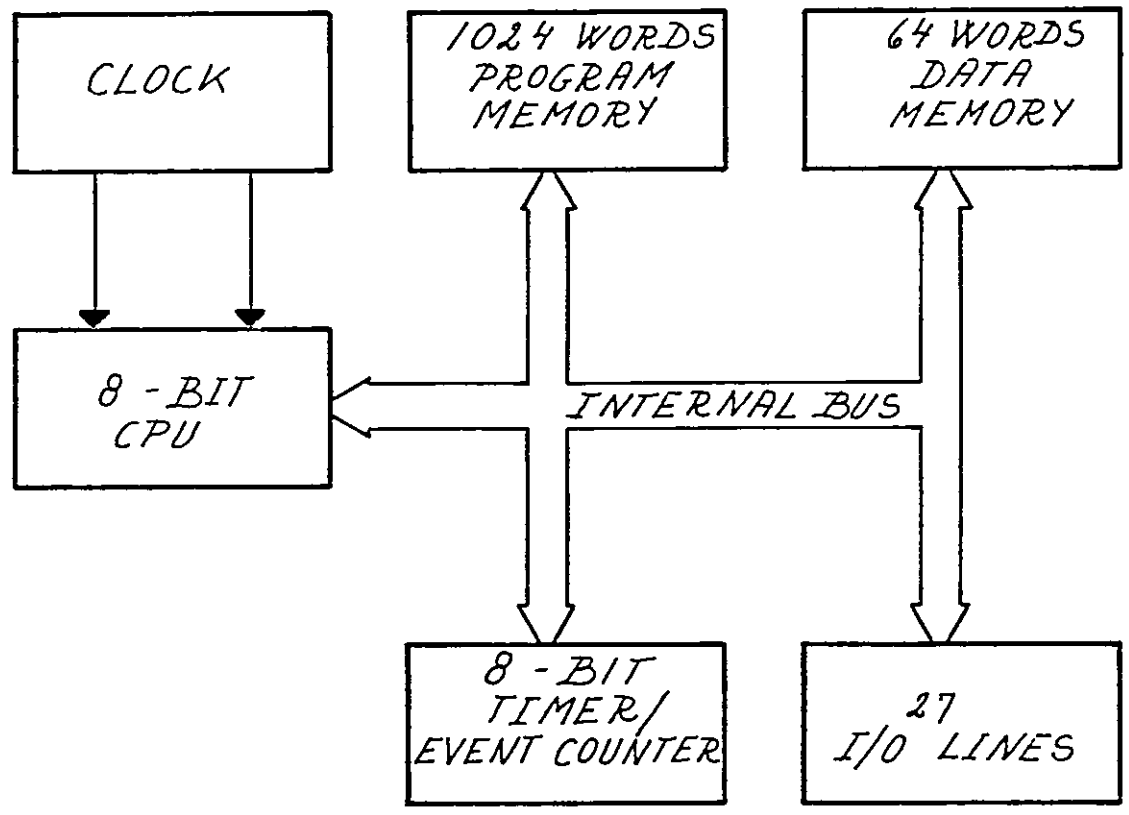
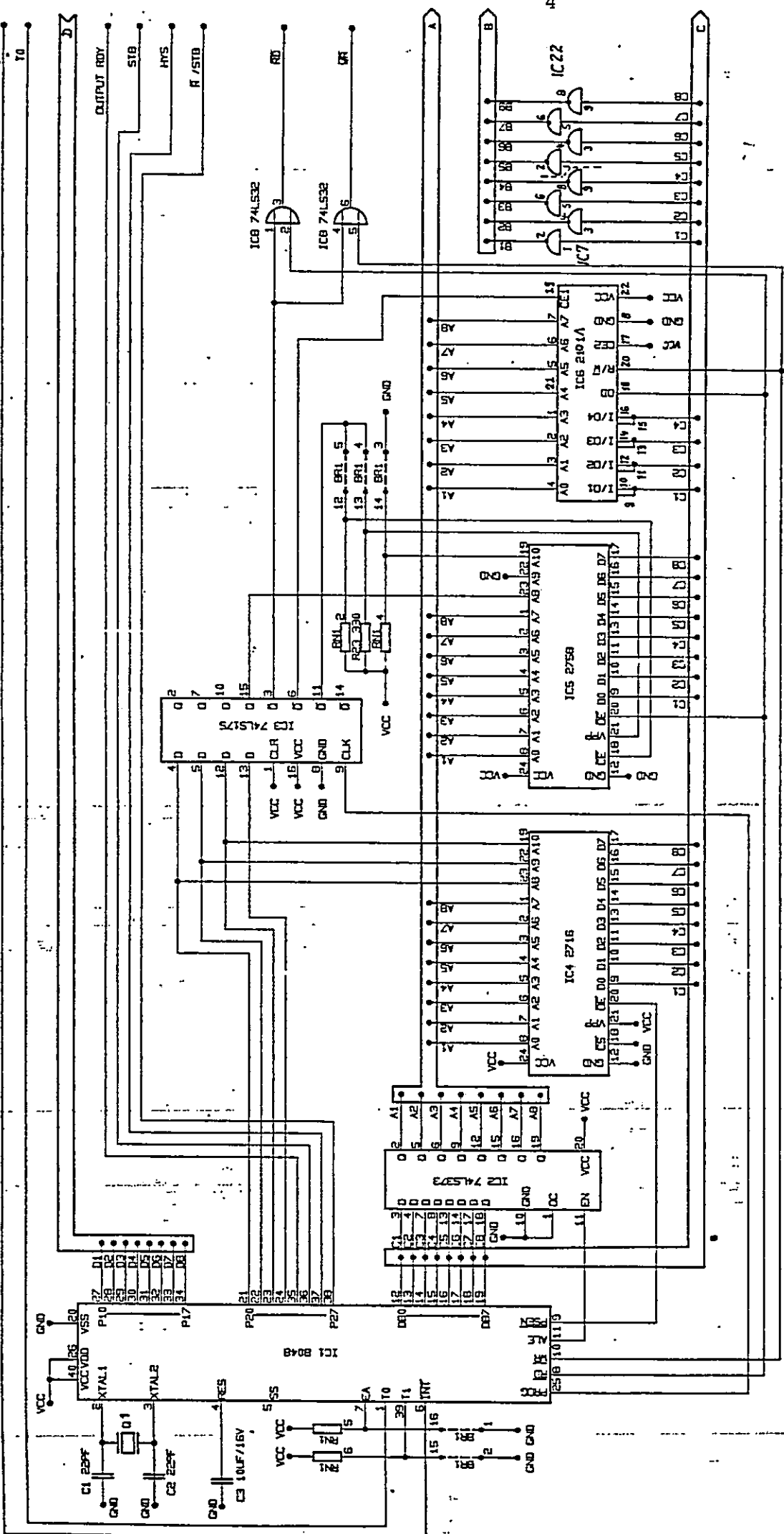


Fig. 2. BLOCK DIAGRAM for CPU-8048.

MVP 810202

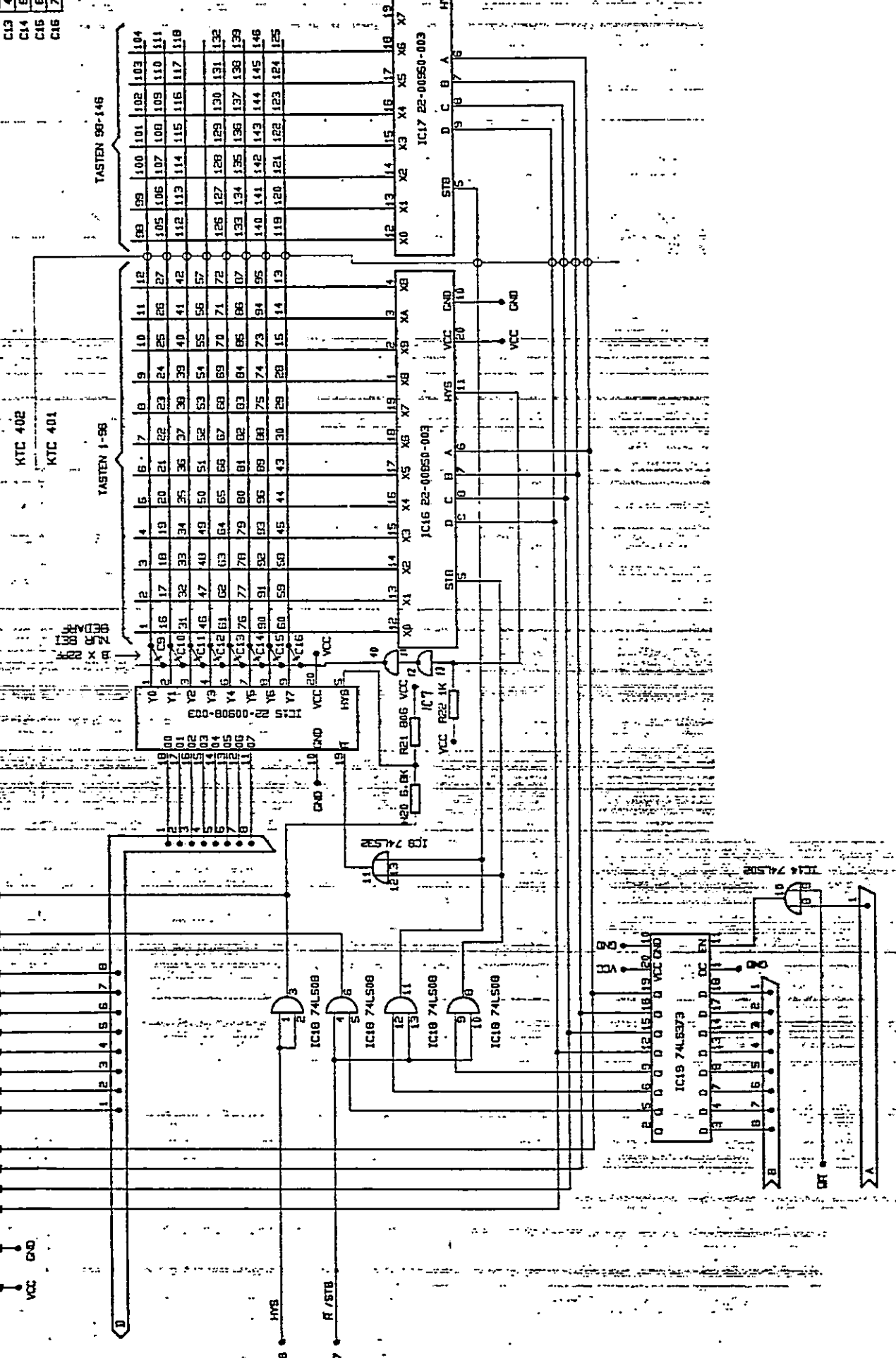


Connection BR 1 to 16 for 8048

- BR 3 to 14 } ASCII TABLE from ext 2758
- BR 5 to 12 }
- BR 4 to 13 } ASCII TABLE from ext 7641

18 POL. IC-FASSUNG (VERBUNDIG ZUR TASTATURWEITERUNG)

- ASCII VERSION
SERIELL, VERSION
ASCII-TABELLE EXT
- | | | | | | | | |
|------|-----|-----|-----|-----|-----|------|------|
| C9 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| C10 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| C11 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| C12 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| C13 | 29 | 30 | 31 | 32 | 33 | 34 | 35 |
| C14 | 36 | 37 | 38 | 39 | 40 | 41 | 42 |
| C15 | 43 | 44 | 45 | 46 | 47 | 48 | 49 |
| C16 | 50 | 51 | 52 | 53 | 54 | 55 | 56 |
| C17 | 57 | 58 | 59 | 60 | 61 | 62 | 63 |
| C18 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| C19 | 71 | 72 | 73 | 74 | 75 | 76 | 77 |
| C20 | 78 | 79 | 80 | 81 | 82 | 83 | 84 |
| C21 | 85 | 86 | 87 | 88 | 89 | 90 | 91 |
| C22 | 92 | 93 | 94 | 95 | 96 | 97 | 98 |
| C23 | 99 | 100 | 101 | 102 | 103 | 104 | 105 |
| C24 | 106 | 107 | 108 | 109 | 110 | 111 | 112 |
| C25 | 113 | 114 | 115 | 116 | 117 | 118 | 119 |
| C26 | 120 | 121 | 122 | 123 | 124 | 125 | 126 |
| C27 | 127 | 128 | 129 | 130 | 131 | 132 | 133 |
| C28 | 134 | 135 | 136 | 137 | 138 | 139 | 140 |
| C29 | 141 | 142 | 143 | 144 | 145 | 146 | 147 |
| C30 | 148 | 149 | 150 | 151 | 152 | 153 | 154 |
| C31 | 155 | 156 | 157 | 158 | 159 | 160 | 161 |
| C32 | 162 | 163 | 164 | 165 | 166 | 167 | 168 |
| C33 | 169 | 170 | 171 | 172 | 173 | 174 | 175 |
| C34 | 176 | 177 | 178 | 179 | 180 | 181 | 182 |
| C35 | 183 | 184 | 185 | 186 | 187 | 188 | 189 |
| C36 | 190 | 191 | 192 | 193 | 194 | 195 | 196 |
| C37 | 197 | 198 | 199 | 200 | 201 | 202 | 203 |
| C38 | 204 | 205 | 206 | 207 | 208 | 209 | 210 |
| C39 | 211 | 212 | 213 | 214 | 215 | 216 | 217 |
| C40 | 218 | 219 | 220 | 221 | 222 | 223 | 224 |
| C41 | 225 | 226 | 227 | 228 | 229 | 230 | 231 |
| C42 | 232 | 233 | 234 | 235 | 236 | 237 | 238 |
| C43 | 239 | 240 | 241 | 242 | 243 | 244 | 245 |
| C44 | 246 | 247 | 248 | 249 | 250 | 251 | 252 |
| C45 | 253 | 254 | 255 | 256 | 257 | 258 | 259 |
| C46 | 260 | 261 | 262 | 263 | 264 | 265 | 266 |
| C47 | 267 | 268 | 269 | 270 | 271 | 272 | 273 |
| C48 | 274 | 275 | 276 | 277 | 278 | 279 | 280 |
| C49 | 281 | 282 | 283 | 284 | 285 | 286 | 287 |
| C50 | 288 | 289 | 290 | 291 | 292 | 293 | 294 |
| C51 | 295 | 296 | 297 | 298 | 299 | 300 | 301 |
| C52 | 302 | 303 | 304 | 305 | 306 | 307 | 308 |
| C53 | 309 | 310 | 311 | 312 | 313 | 314 | 315 |
| C54 | 316 | 317 | 318 | 319 | 320 | 321 | 322 |
| C55 | 323 | 324 | 325 | 326 | 327 | 328 | 329 |
| C56 | 330 | 331 | 332 | 333 | 334 | 335 | 336 |
| C57 | 337 | 338 | 339 | 340 | 341 | 342 | 343 |
| C58 | 344 | 345 | 346 | 347 | 348 | 349 | 350 |
| C59 | 351 | 352 | 353 | 354 | 355 | 356 | 357 |
| C60 | 358 | 359 | 360 | 361 | 362 | 363 | 364 |
| C61 | 365 | 366 | 367 | 368 | 369 | 370 | 371 |
| C62 | 372 | 373 | 374 | 375 | 376 | 377 | 378 |
| C63 | 379 | 380 | 381 | 382 | 383 | 384 | 385 |
| C64 | 386 | 387 | 388 | 389 | 390 | 391 | 392 |
| C65 | 393 | 394 | 395 | 396 | 397 | 398 | 399 |
| C66 | 400 | 401 | 402 | 403 | 404 | 405 | 406 |
| C67 | 407 | 408 | 409 | 410 | 411 | 412 | 413 |
| C68 | 414 | 415 | 416 | 417 | 418 | 419 | 420 |
| C69 | 421 | 422 | 423 | 424 | 425 | 426 | 427 |
| C70 | 428 | 429 | 430 | 431 | 432 | 433 | 434 |
| C71 | 435 | 436 | 437 | 438 | 439 | 440 | 441 |
| C72 | 442 | 443 | 444 | 445 | 446 | 447 | 448 |
| C73 | 449 | 450 | 451 | 452 | 453 | 454 | 455 |
| C74 | 456 | 457 | 458 | 459 | 460 | 461 | 462 |
| C75 | 463 | 464 | 465 | 466 | 467 | 468 | 469 |
| C76 | 470 | 471 | 472 | 473 | 474 | 475 | 476 |
| C77 | 477 | 478 | 479 | 480 | 481 | 482 | 483 |
| C78 | 484 | 485 | 486 | 487 | 488 | 489 | 490 |
| C79 | 491 | 492 | 493 | 494 | 495 | 496 | 497 |
| C80 | 498 | 499 | 500 | 501 | 502 | 503 | 504 |
| C81 | 505 | 506 | 507 | 508 | 509 | 510 | 511 |
| C82 | 512 | 513 | 514 | 515 | 516 | 517 | 518 |
| C83 | 519 | 520 | 521 | 522 | 523 | 524 | 525 |
| C84 | 526 | 527 | 528 | 529 | 530 | 531 | 532 |
| C85 | 533 | 534 | 535 | 536 | 537 | 538 | 539 |
| C86 | 540 | 541 | 542 | 543 | 544 | 545 | 546 |
| C87 | 547 | 548 | 549 | 550 | 551 | 552 | 553 |
| C88 | 554 | 555 | 556 | 557 | 558 | 559 | 560 |
| C89 | 561 | 562 | 563 | 564 | 565 | 566 | 567 |
| C90 | 568 | 569 | 570 | 571 | 572 | 573 | 574 |
| C91 | 575 | 576 | 577 | 578 | 579 | 580 | 581 |
| C92 | 582 | 583 | 584 | 585 | 586 | 587 | 588 |
| C93 | 589 | 590 | 591 | 592 | 593 | 594 | 595 |
| C94 | 596 | 597 | 598 | 599 | 600 | 601 | 602 |
| C95 | 603 | 604 | 605 | 606 | 607 | 608 | 609 |
| C96 | 610 | 611 | 612 | 613 | 614 | 615 | 616 |
| C97 | 617 | 618 | 619 | 620 | 621 | 622 | 623 |
| C98 | 624 | 625 | 626 | 627 | 628 | 629 | 630 |
| C99 | 631 | 632 | 633 | 634 | 635 | 636 | 637 |
| C100 | 638 | 639 | 640 | 641 | 642 | 643 | 644 |
| C101 | 645 | 646 | 647 | 648 | 649 | 650 | 651 |
| C102 | 652 | 653 | 654 | 655 | 656 | 657 | 658 |
| C103 | 659 | 660 | 661 | 662 | 663 | 664 | 665 |
| C104 | 666 | 667 | 668 | 669 | 670 | 671 | 672 |
| C105 | 673 | 674 | 675 | 676 | 677 | 678 | 679 |
| C106 | 680 | 681 | 682 | 683 | 684 | 685 | 686 |
| C107 | 687 | 688 | 689 | 690 | 691 | 692 | 693 |
| C108 | 694 | 695 | 696 | 697 | 698 | 699 | 700 |
| C109 | 701 | 702 | 703 | 704 | 705 | 706 | 707 |
| C110 | 708 | 709 | 710 | 711 | 712 | 713 | 714 |
| C111 | 715 | 716 | 717 | 718 | 719 | 720 | 721 |
| C112 | 722 | 723 | 724 | 725 | 726 | 727 | 728 |
| C113 | 729 | 730 | 731 | 732 | 733 | 734 | 735 |
| C114 | 736 | 737 | 738 | 739 | 740 | 741 | 742 |
| C115 | 743 | 744 | 745 | 746 | 747 | 748 | 749 |
| C116 | 750 | 751 | 752 | 753 | 754 | 755 | 756 |
| C117 | 757 | 758 | 759 | 760 | 761 | 762 | 763 |
| C118 | 764 | 765 | 766 | 767 | 768 | 769 | 770 |
| C119 | 771 | 772 | 773 | 774 | 775 | 776 | 777 |
| C120 | 778 | 779 | 780 | 781 | 782 | 783 | 784 |
| C121 | 785 | 786 | 787 | 788 | 789 | 790 | 791 |
| C122 | 792 | 793 | 794 | 795 | 796 | 797 | 798 |
| C123 | 799 | 800 | 801 | 802 | 803 | 804 | 805 |
| C124 | 806 | 807 | 808 | 809 | 810 | 811 | 812 |
| C125 | 813 | 814 | 815 | 816 | 817 | 818 | 819 |
| C126 | 820 | 821 | 822 | 823 | 824 | 825 | 826 |
| C127 | 827 | 828 | 829 | 830 | 831 | 832 | 833 |
| C128 | 834 | 835 | 836 | 837 | 838 | 839 | 840 |
| C129 | 841 | 842 | 843 | 844 | 845 | 846 | 847 |
| C130 | 848 | 849 | 850 | 851 | 852 | 853 | 854 |
| C131 | 855 | 856 | 857 | 858 | 859 | 860 | 861 |
| C132 | 862 | 863 | 864 | 865 | 866 | 867 | 868 |
| C133 | 869 | 870 | 871 | 872 | 873 | 874 | 875 |
| C134 | 876 | 877 | 878 | 879 | 880 | 881 | 882 |
| C135 | 883 | 884 | 885 | 886 | 887 | 888 | 889 |
| C136 | 890 | 891 | 892 | 893 | 894 | 895 | 896 |
| C137 | 897 | 898 | 899 | 900 | 901 | 902 | 903 |
| C138 | 904 | 905 | 906 | 907 | 908 | 909 | 910 |
| C139 | 911 | 912 | 913 | 914 | 915 | 916 | 917 |
| C140 | 918 | 919 | 920 | 921 | 922 | 923 | 924 |
| C141 | 925 | 926 | 927 | 928 | 929 | 930 | 931 |
| C142 | 932 | 933 | 934 | 935 | 936 | 937 | 938 |
| C143 | 939 | 940 | 941 | 942 | 943 | 944 | 945 |
| C144 | 946 | 947 | 948 | 949 | 950 | 951 | 952 |
| C145 | 953 | 954 | 955 | 956 | 957 | 958 | 959 |
| C146 | 960 | 961 | 962 | 963 | 964 | 965 | 966 |
| C147 | 967 | 968 | 969 | 970 | 971 | 972 | 973 |
| C148 | 974 | 975 | 976 | 977 | 978 | 979 | 980 |
| C149 | 981 | 982 | 983 | 984 | 985 | 986 | 987 |
| C150 | 988 | 989 | 990 | 991 | 992 | 993 | 994 |
| C151 | 995 | 996 | 997 | 998 | 999 | 1000 | 1001 |



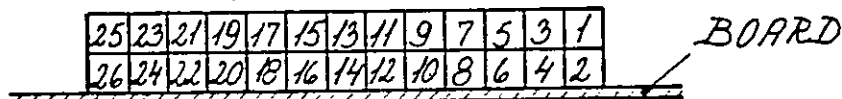
2. CABLE CBL923

2.

Fig. 3 shows the cable CBL923 which connects the keyboard to the computer. Power to the keyboard is supplied from the computer using CBL923.

CONNECTOR 1 TO KEYBOARD		CONNECTOR 2 TO COMPUTER	
PIN NO.	SIGN. NAME KEYBOARD	SIGN. NAME RC 702	PIN No.
1	OUT 0	KEY 0	22
2	OUT 1	KEY 1	23
3	OUT 2	KEY 2	24
4	OUT 3	KEY 3	21
5	OUT 4	KEY 4	17
6	OUT 5	KEY 5	18
7	OUT 6	KEY 6	19
8	OUT 7	KEY 7	20
21	\overline{STB}	KEY STROBE	12
9	0V	0V	13
18	0V	0V	3
22	+5V	+5V	25

25 POL CANNO
CONNECTOR



PIN LAY OUT FOR CONNECTION
TO KEYBOARD.

Fig. 3. CABLE TO KEYBOARD CBL 923.

3. ALPHABET

3.

Fig. 4 shows the ASCII Alphabet supplied from the keyboard.
Note that 8 bits are used, i.e. an 'extended' ASCII alphabet is
supplied from the keyboard.

ASCII - Codes (HEX)

<i>RC721</i>													<i>RC722</i>																																																																																																																																																																																																																																																																																																																																													
00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	10	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F	20	21	22	23	24	25	26	27	28	29	2A	2B	2C	2D	2E	2F	30	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D	3E	3F	40	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F	50	51	52	53	54	55	56	57	58	59	5A	5B	5C	5D	5E	5F	60	61	62	63	64	65	66	67	68	69	6A	6B	6C	6D	6E	6F	70	71	72	73	74	75	76	77	78	79	7A	7B	7C	7D	7E	7F	80	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F	AA	AB	AC	AD	AE	AF	B0	B1	B2	B3	B4	B5	B6	B7	B8	B9	BA	BB	BC	BD	BE	BF	C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF	D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	DA	DB	DC	DD	DE	DF	E0	E1	E2	E3	E4	E5	E6	E7	E8	E9	EA	EB	EC	ED	EE	EF	F0	F1	F2	F3	F4	F5	F6	F7	F8	F9	FA	FB	FC	FD	FE	FF	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200

Position
ALPHA LOCK can be used.
SHIFT
Normal

Figure 4: RC721/RC722 Keyboards; ASCII-code output and position numbers.

4. NATIONAL VERSIONS

4.

The RC721/RC722 Keyboards are available in a number of national versions. On the keyboards only a number of keytops are changed, accordingly. The same changes are made to both RC721 and RC722 to obtain the national version in question. Other changes required are made in the software of the microcomputer. Layout of the following national versions is shown:

<u>Figure</u>	<u>RC72x,xxx</u>	<u>National version</u>
5	RC72x,001	Danish (standard)
6	RC72x,002	Swedish
7	RC72x,003	US-ASCII
8	RC72x,004	German
9	RC72x,005	UK-ASCII
10	RC722,006	Danish (special)
11	RC72x,007	French
12	RC722,008	Danish (modified std.)

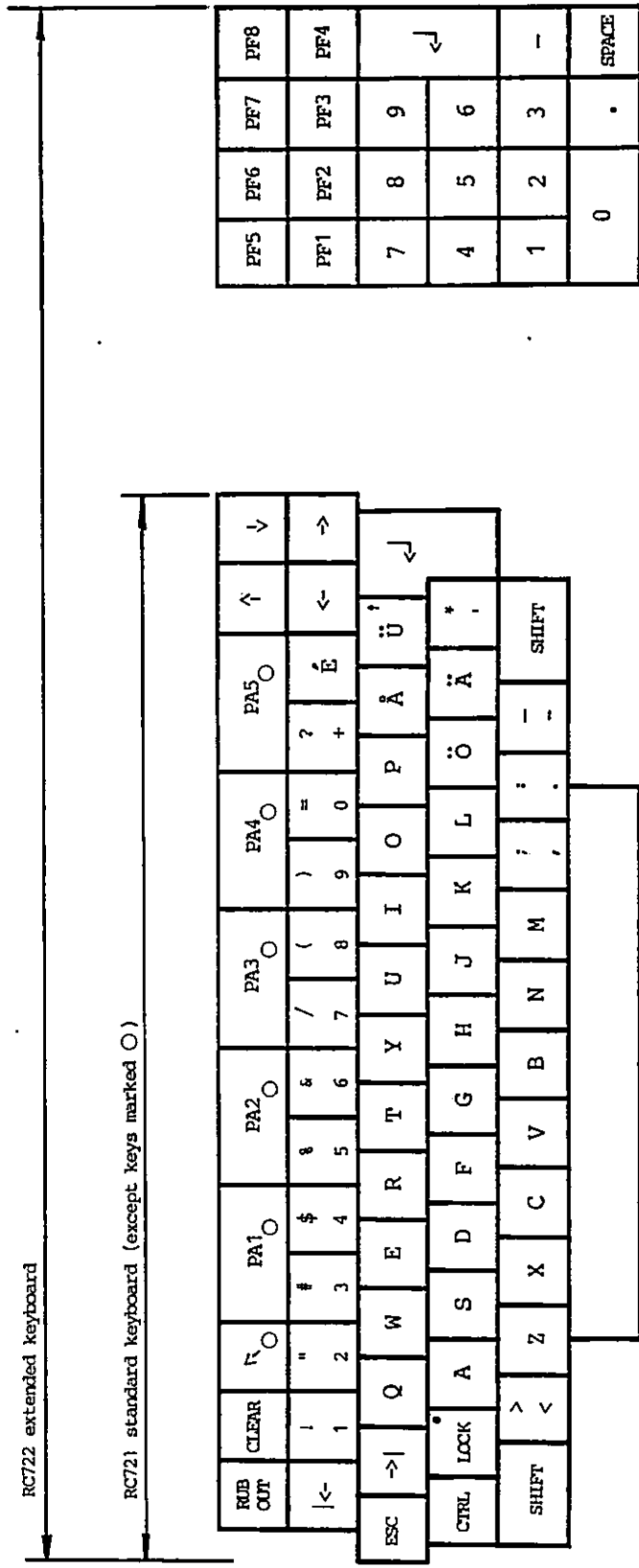


Figure 6: RC72x,002 Swedish keyboard.

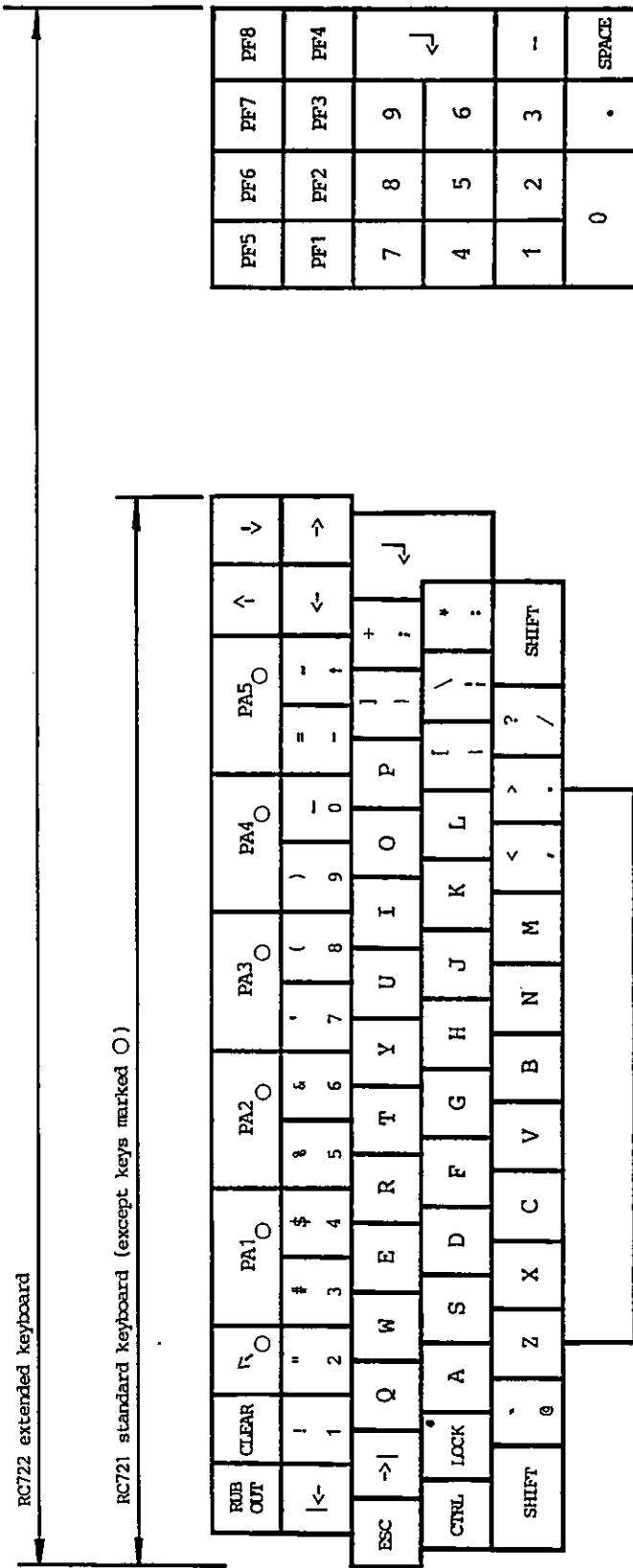


Figure 7: RC72x,003 US-ASCII keyboard.

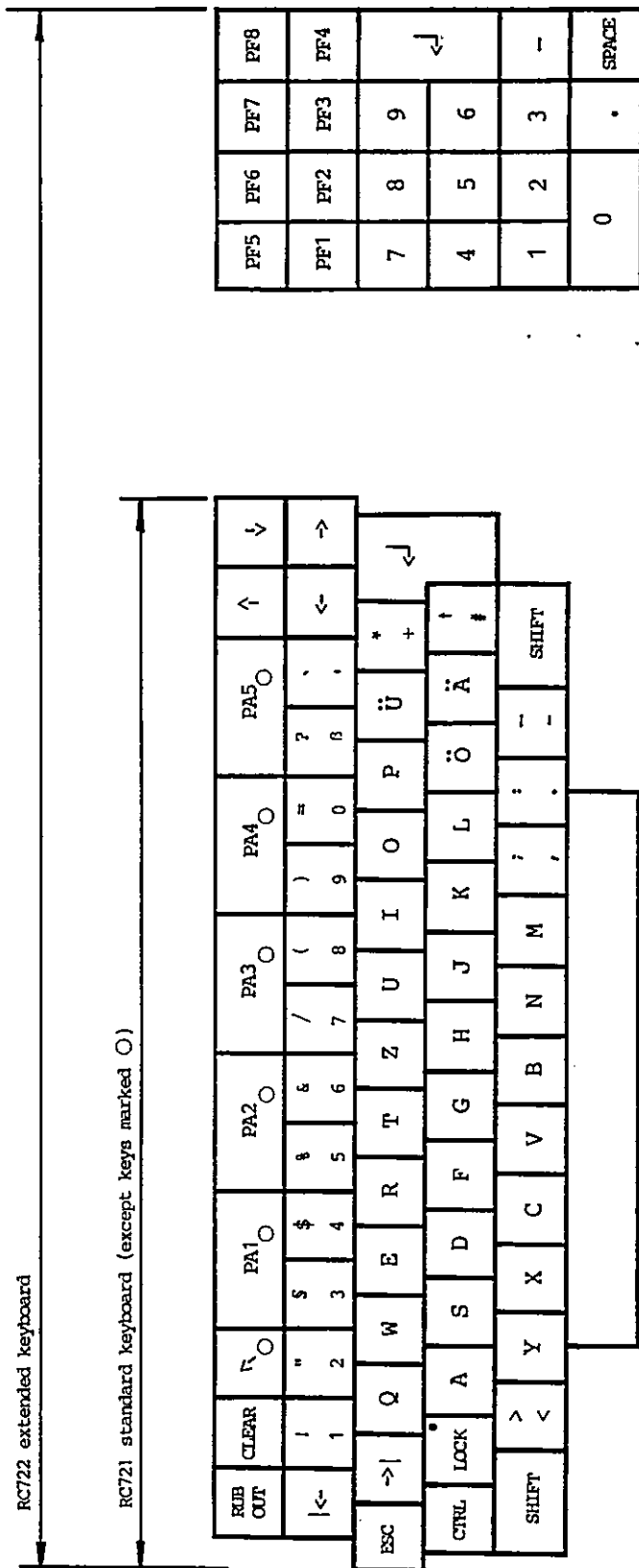


Figure 8: RC72x,004 German keyboard.

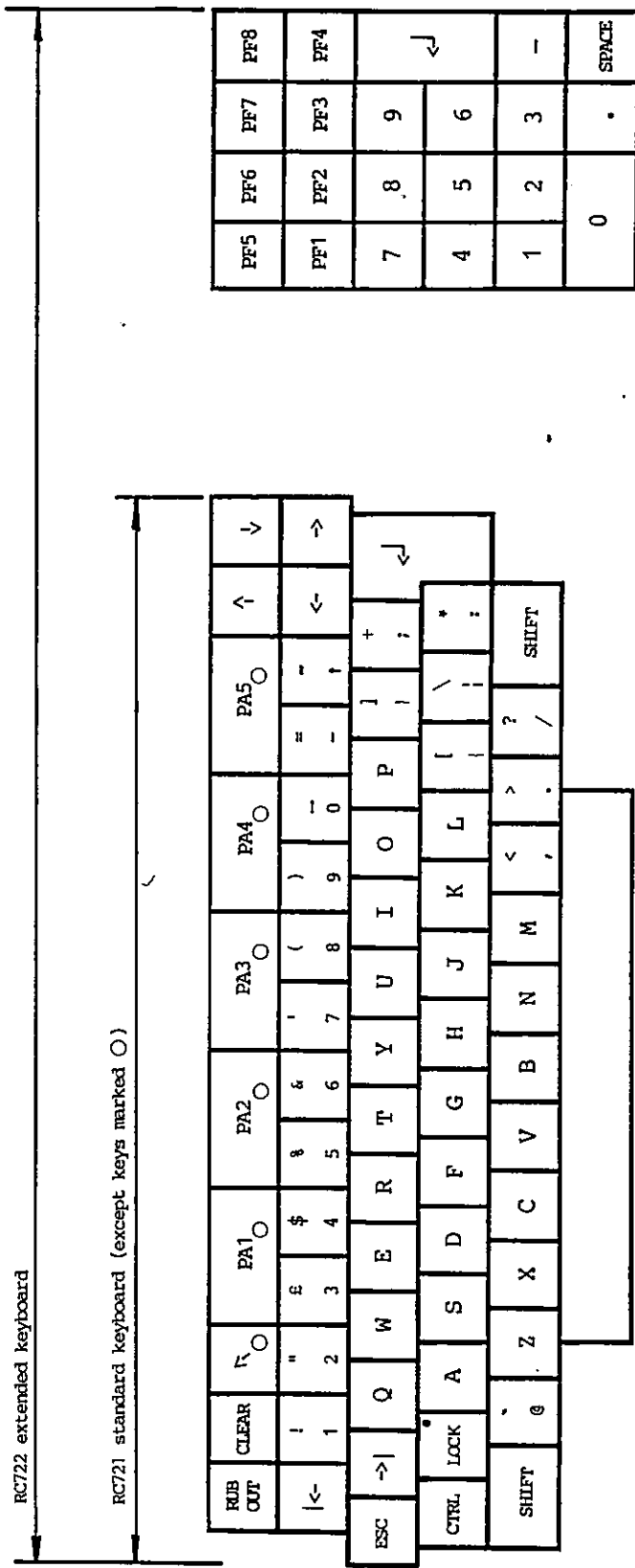


Figure 9: RC72x,005 UK-ASCII keyboard.

PF5	PF6	PF7	PF8
PF1	PF2	PF3	PF4
7	8	9	↵
4	5	6	
1	2	3	-
0			SPACE

ROB OUT	CLEAR	PA1	PA2	PA3	PA4	PA5	↵
←	! .	1 2	3 4	5 6	7 8	9 0	→
ESC	>	Q	W	E	R	T	Y
		U	I	O	P	Å	↵
CTRL	LOCK	A	S	D	F	G	H
		J	K	L	Ø	!	*
SHIFT	[Z	X	C	V	B	N
]					:	.
						-	-
							SHIFT

Figure 10: RC722,006 Danish (special) keyboard.

PF5	PF6	PF7	PF8
PF1	PF2	PF3	PF4
7	8	9	↵
4	5	6	
1	2	3	-
0			•
			SPACE

RUB OUT	CLEAR	↵	↑	↓
←	1	2	3	4
!	"	#	\$	%
6	7	8	9	0
PA1	PA2	PA3	PA4	PA5
Q	W	E	R	T
Y	U	I	O	P
Å	+	;	↵	
CTRL LOCK	A	S	D	F
G	H	J	K	L
Æ	Ø	+	:	
SHIFT	Ü	Z	X	C
V	B	N	M	.
>	<	,	/	?
SHIFT				

Figure 12: RC722,008 Danish (modified std.) keyboard.

1000

1000

1000

1000

RETURN LETTER

Title: RC721/RC722 Keyboards,
Technical Manual

RCSL No.: 44-RT2066

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Do you find errors in this manual? If so, specify by page.

How can this manual be improved?

Other comments?

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Thank you

..... **Fold here**

..... **Do not tear - Fold here and staple**

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