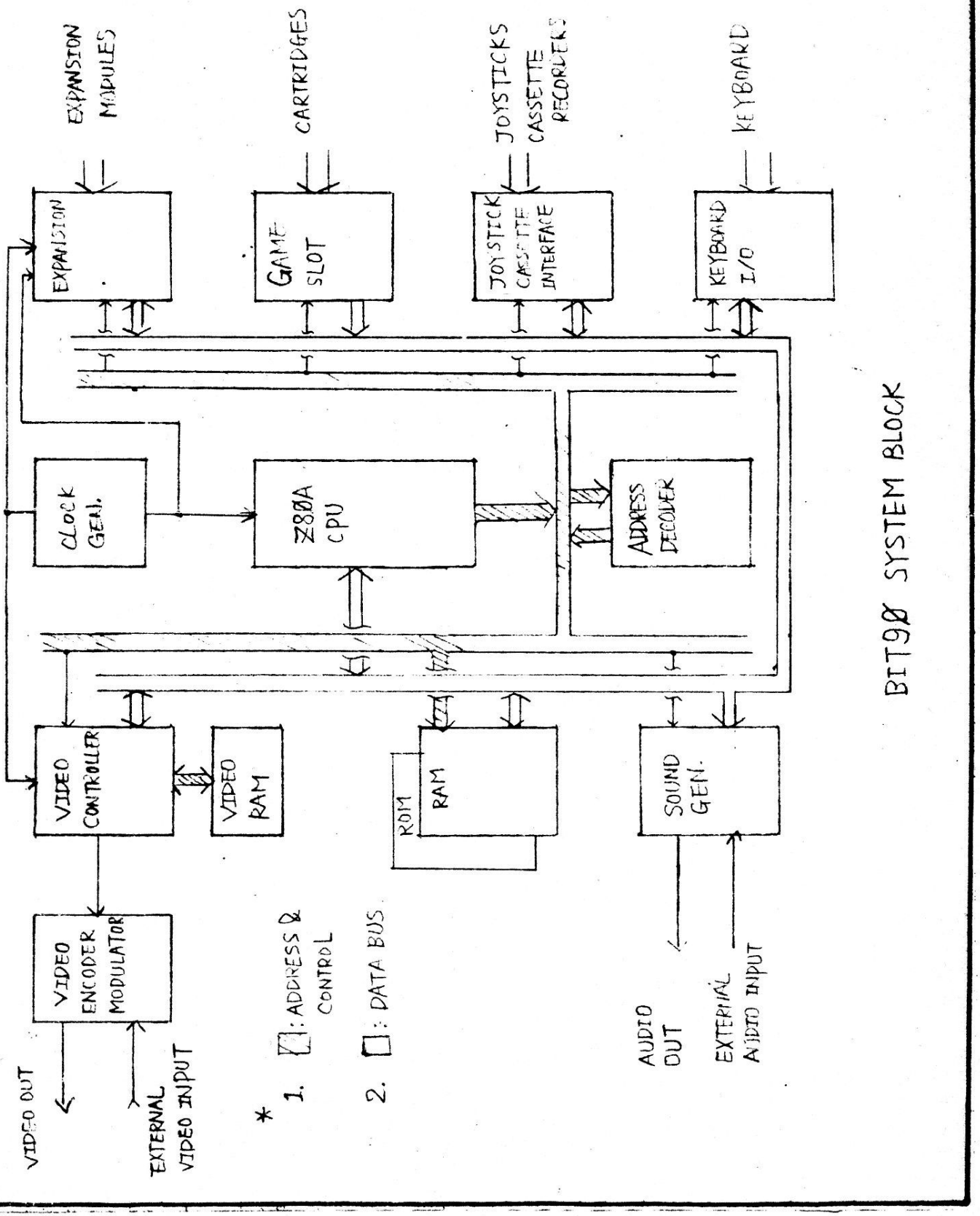
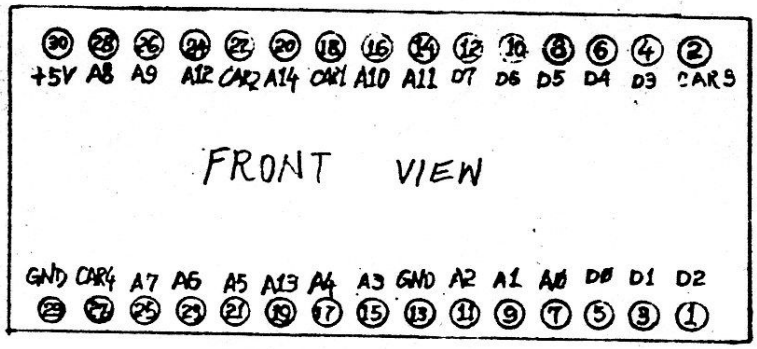
BIT CORPORATION

BIT90 SYSTEM BLOCK DIAGRAM			SHEET OF	
DRAWN	DATE	CHECKED	DATE	SCALE

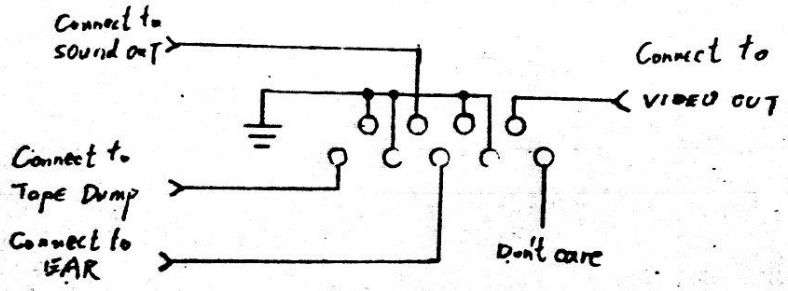


BIT90 SYSTEM BLOCK

CARTRIDGE CONNECTOR



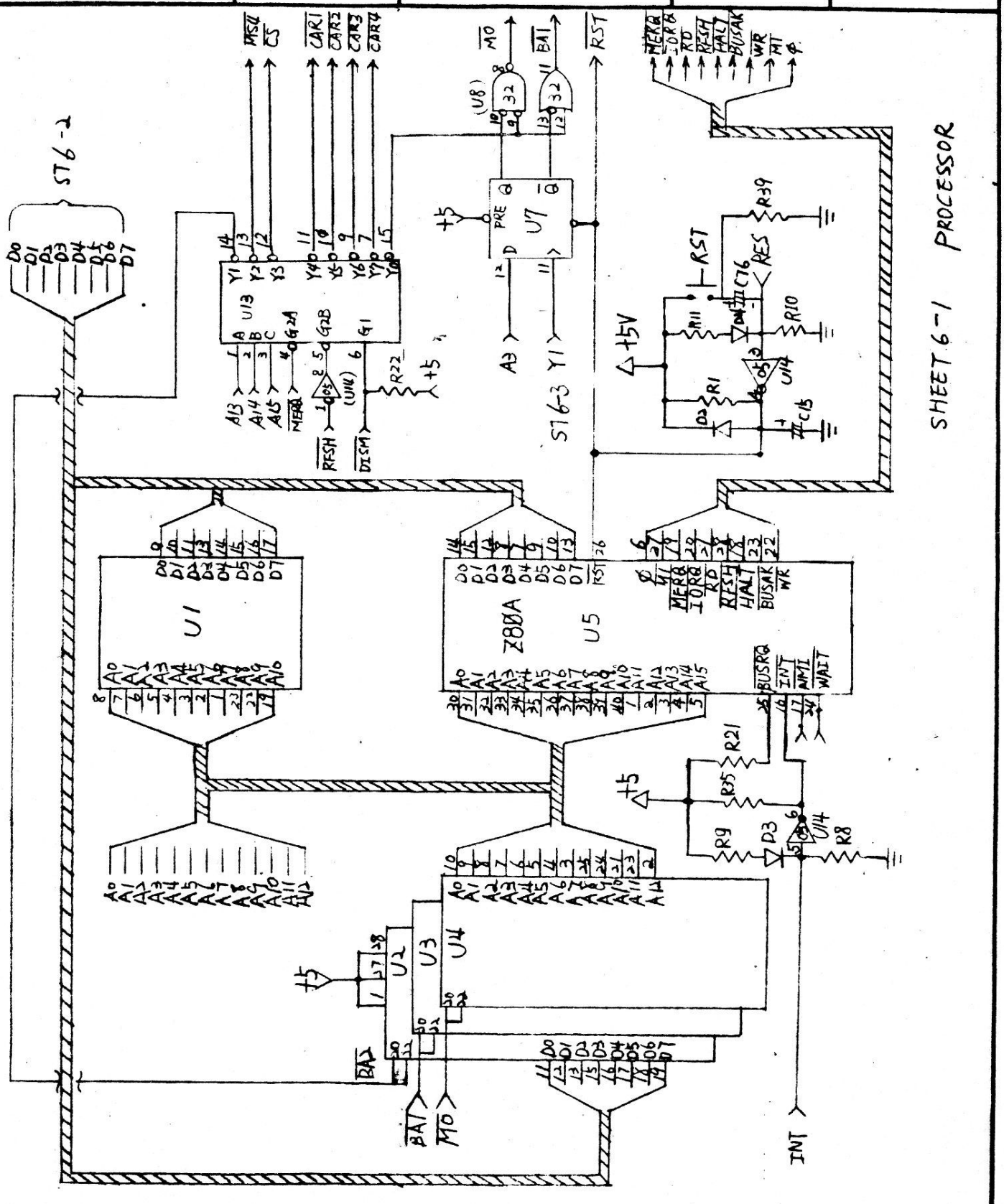
FOR MONITOR ANt RECORDER

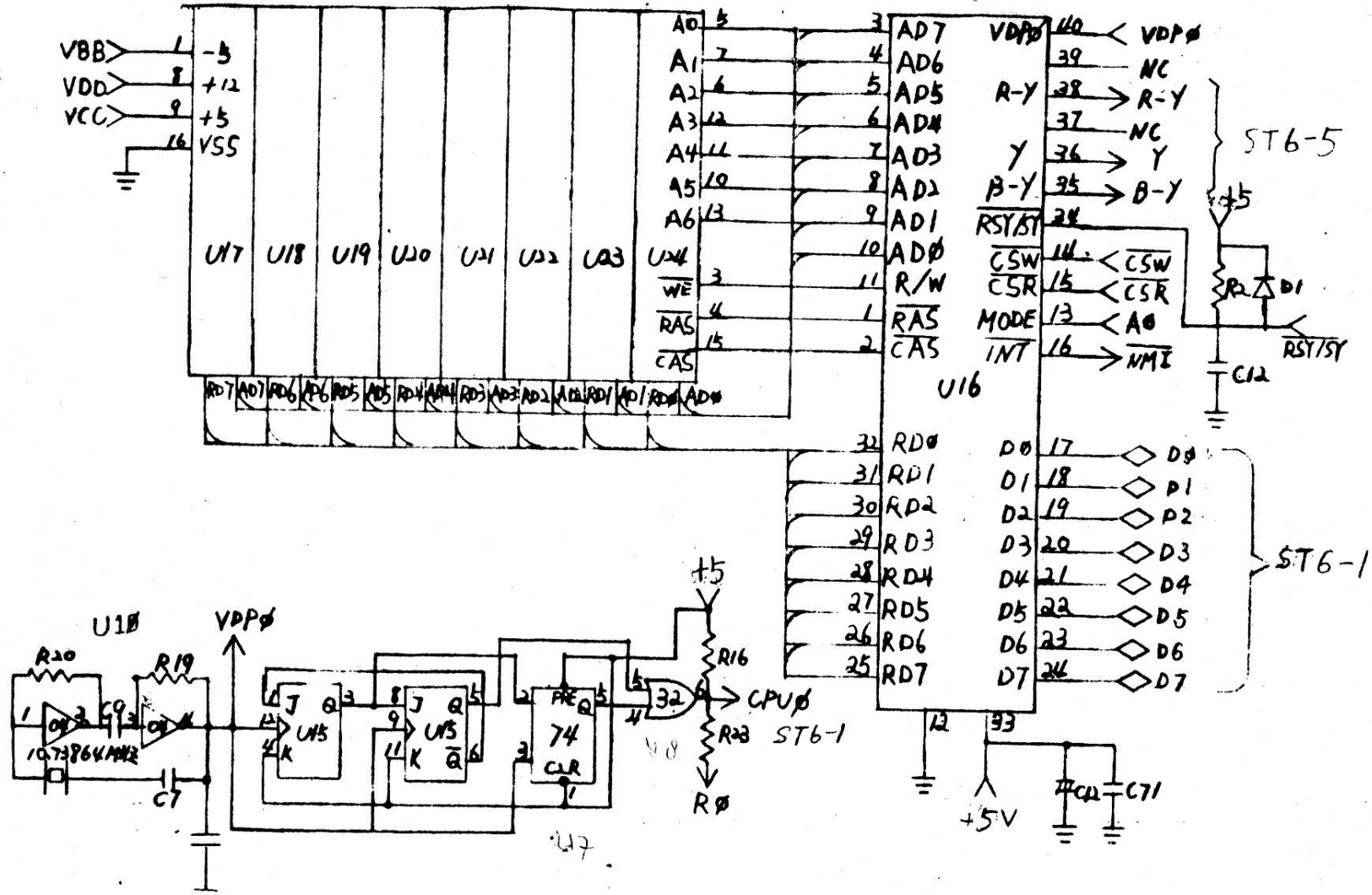


(USE 9 PIN JACK)

BIT CORPORATION

PROCESSOR		SHEET OF 6-1
DRAWN / DATE	CHECKED / DATE	SCALE





SHEET 6-2 VIDEO CONTROL

U16= TMS 9929A NL
DDU 8323
3472 PHILIPPINES

DRAWN
DATE
CHECKED
DATE
SCALE

VIDEO CONTROL

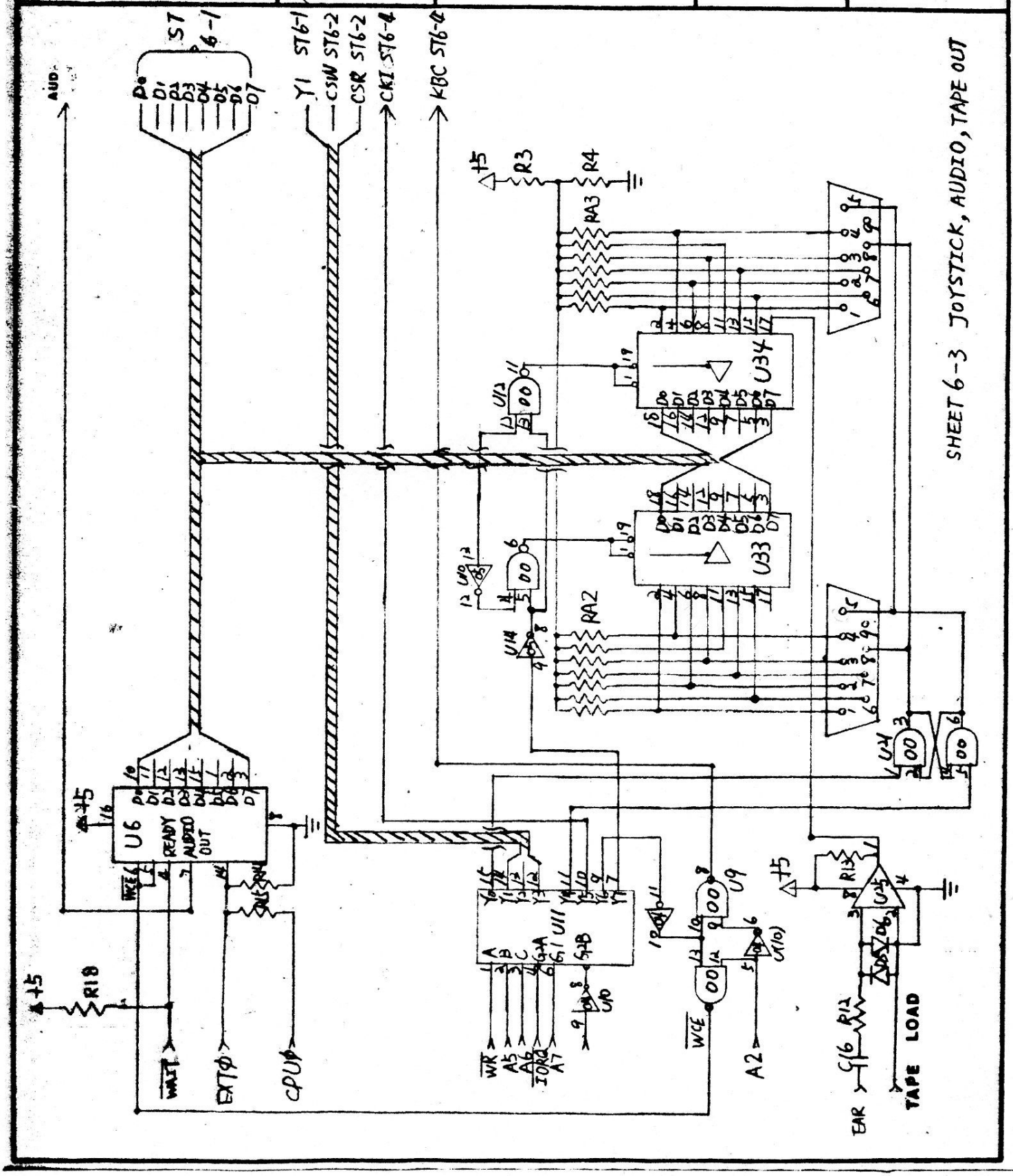
Bit

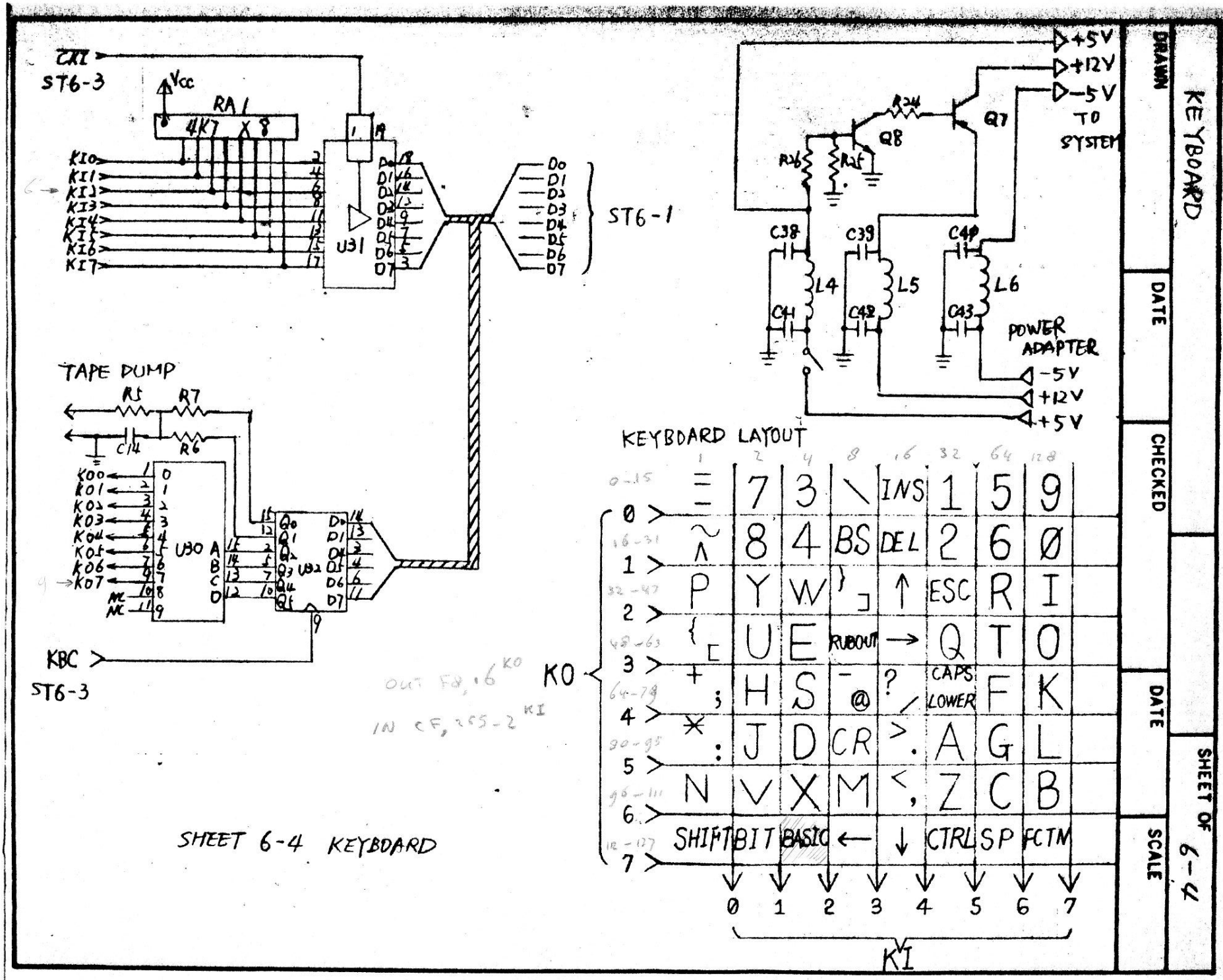
BIT CORPORATION

SHEET OF 6-2-

BIT CORPORATION

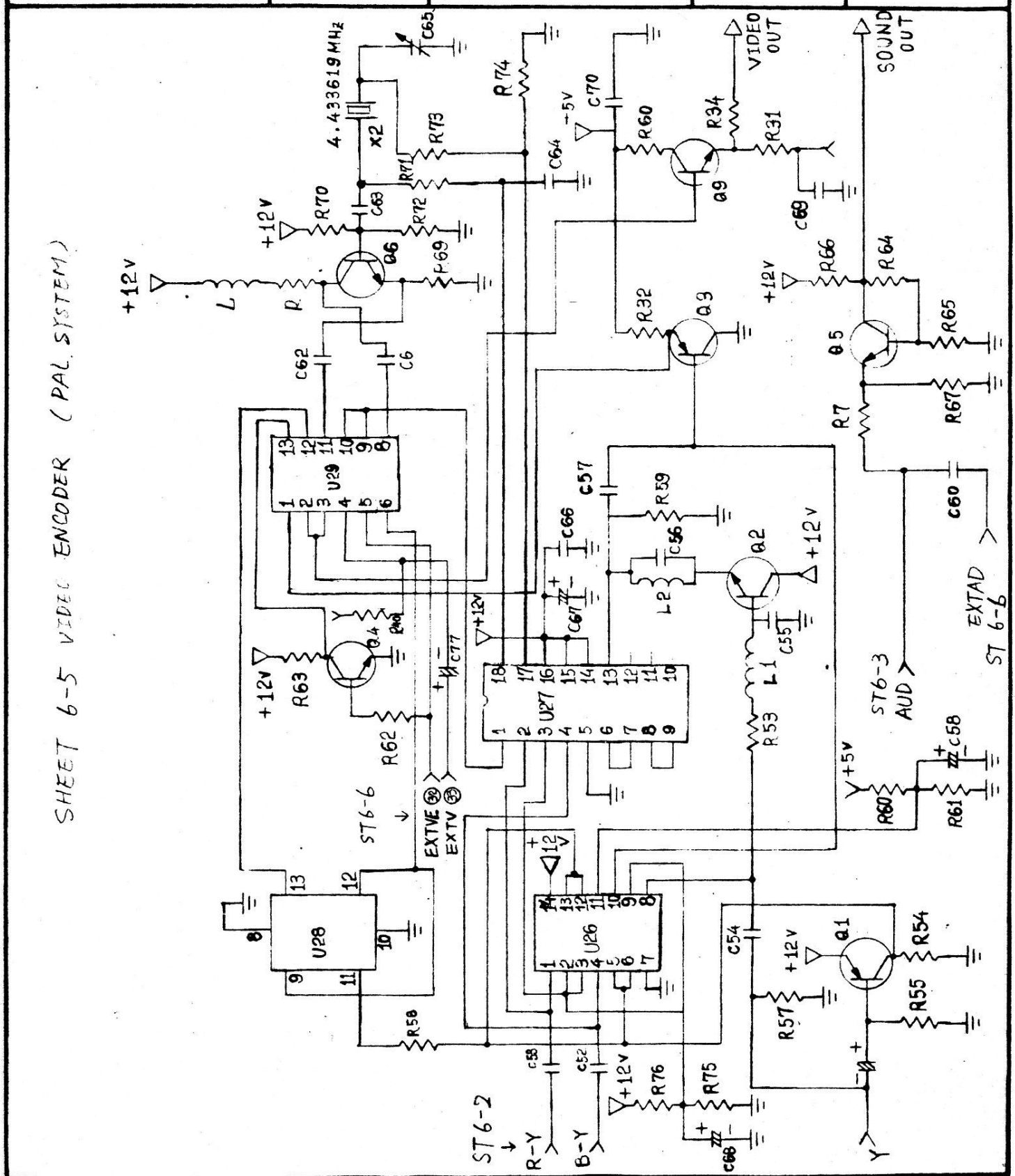
JOYSTICK, AUDIO, TAPE OUTPUT			SHEET OF 6-3
DRAWN	DATE	CHECKED	DATE	SCALE




CRT
ST6-3
Vcc
RA1
4K7 X 8
KI0
KI1
KI2
KI3
KI4
KI5
KI6
KI7
U31
D0
D1
D2
D3
D4
D5
D6
D7
ST6-1
+5V
+12V
-5V
TO SYSTEM
R24
Q8
Q7
R26
R25
C38
C39
C40
L4
L5
L6
C41
C42
C43
POWER ADAPTER
-5V
+12V
+5V
TAPE DUMP
R5
R7
C14
R6
KO0
KO1
KO2
KO3
KO4
KO5
KO6
KO7
U30
U32
KBC
ST6-3
KEYBOARD LAYOUT
KO
KI
SHIFT
BIT
BASIC
CTRL
SP
RUBOUT
CAPS LOWER
INS
DEL
ESC
CR
BS
OUT F8,16^KO
IN CF,255-2^KI
SHEET 6-4 KEYBOARD
DRAWN
DATE
CHECKED
DATE
SCALE
KEYBOARD
BIT CORPORATION
SHEET OF 6-4

BIT CORPORATION

VIDEO ENCODER				SHEET OF 6-5
DRAWN	DATE	CHECKED	DATE	SCALE



BIT CORPORATION

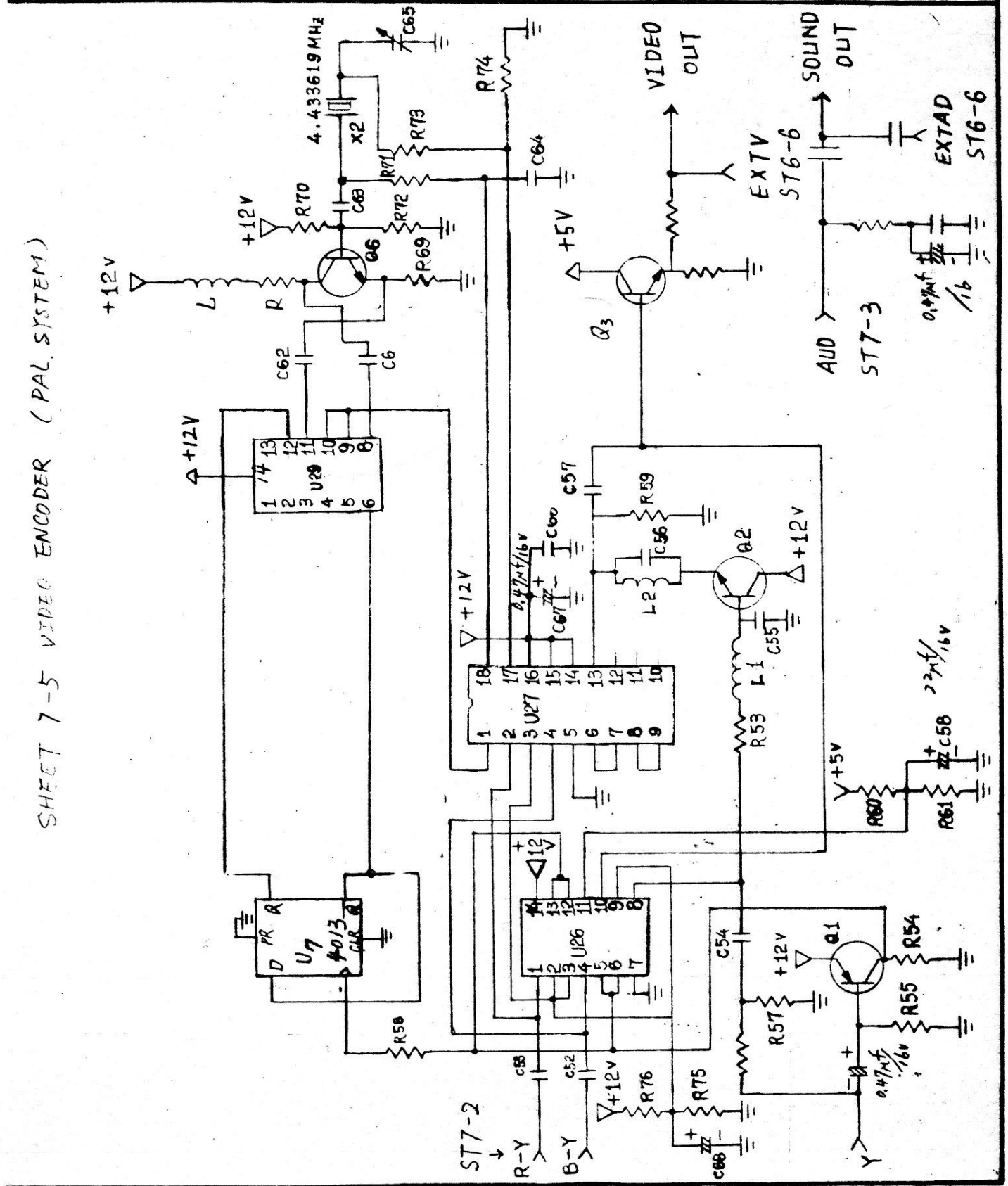
EXPANSION EDGE DEFINITION		SHEET OF 6-6
DRAWN	DATE	CHECKED	DATE	SCALE

30 DISIO	31 EXTAD		
29 $\overline{\text{DISM}}$	32 EXTVE		
28 A10	33 EXTV		
27 A9	34 $\overline{\text{RST}}$		
26 A8	35 EXTØ		
25 A7	36 RES		
24 A6	37 A11		
23 A5	38 A12		
22 A13	39 $\overline{\text{RST/SY}}$		
21 A4	40 RØ		
20 A2	41 NC		
19 D4	42 NC		
18 A1	43 A15		
17 D6	44 A3		
16 D7	45 CPUØ		
15 $\overline{\text{M1}}$	46 D2		
14 D0	47 A0		
13 $\overline{\text{RST}}$	48 D5		
12 D1	49 $\overline{\text{RFSH}}$		
11 $\overline{\text{BUSRQ}}$	50 $\overline{\text{WAIT}}$		
10 $\overline{\text{INT}}$	51 $\overline{\text{INT}}$		
9 $\overline{\text{NMI}}$	52 $\overline{\text{BUSAK}}$		
8 $\overline{\text{WR}}$	53 $\overline{\text{RD}}$		
7 $\overline{\text{HALT}}$	54 $\overline{\text{MERQ}}$		
6 $\overline{\text{NC}}$	55 $\overline{\text{IORQ}}$		
5 $\overline{\text{MS4}}$	56 AUDIO OUT		
4 A14	57 +12 V		
3 D3	58 +5 V		
2 GND	59 +5 V		
1 GND	60 -5 V		

ST6-6 EXPANSION EDGE DEFINITION

BIT CORPORATION

VIDEO ENCODER 132K		PAL		SHEET OF 7-5
DRAWN	DATE	CHECKED	DATE	SCALE



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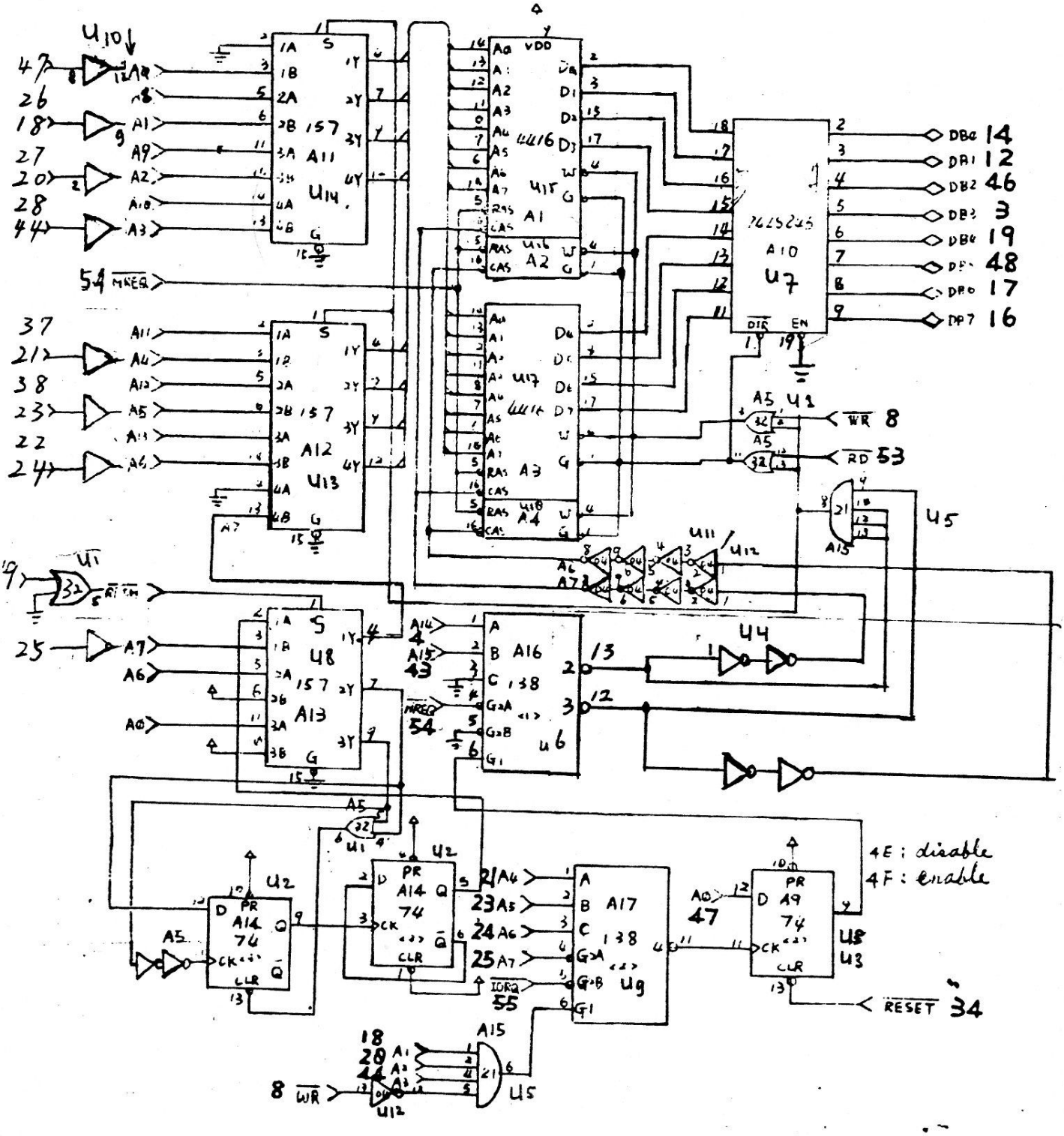
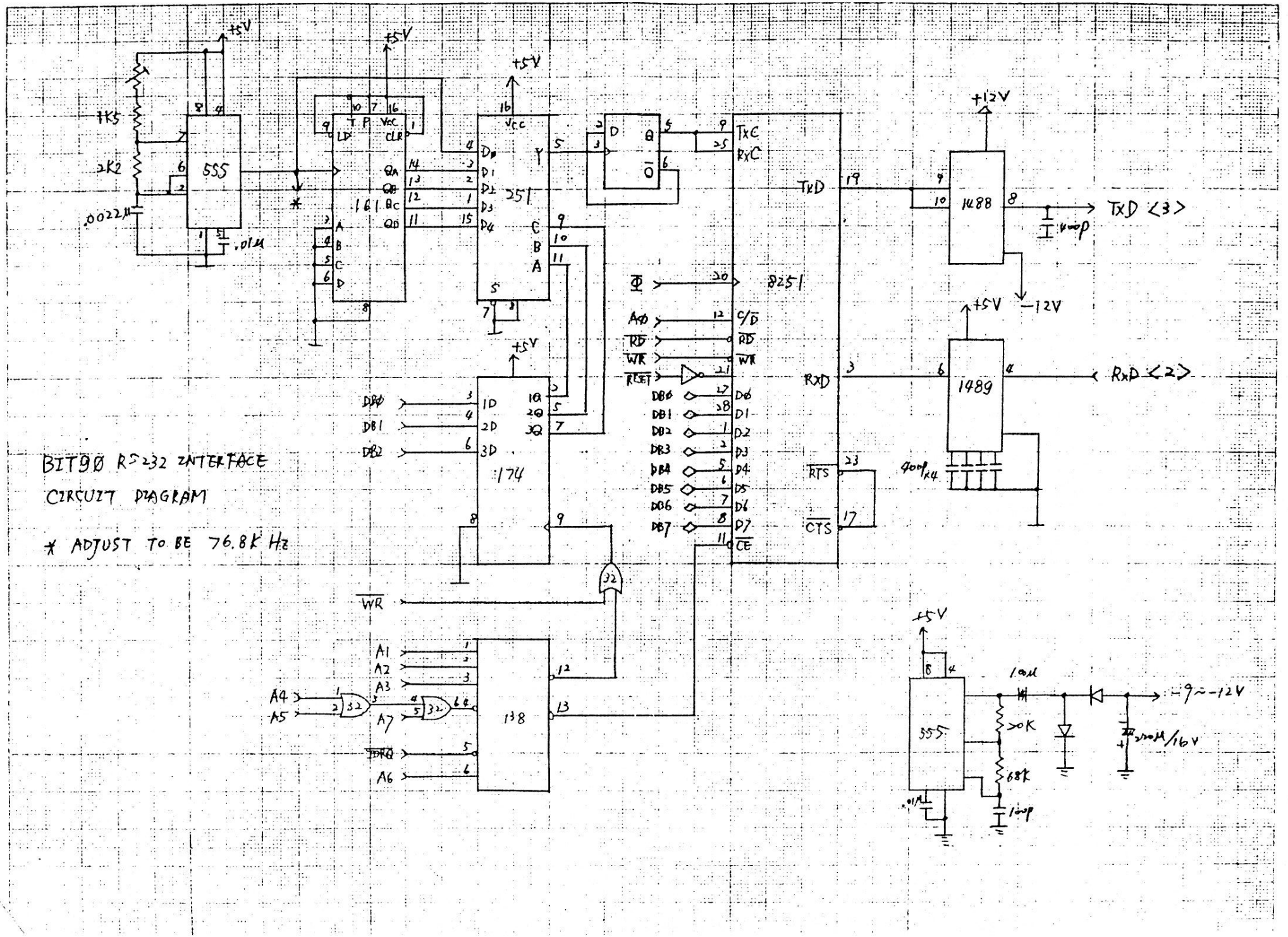
BIT CORPORATION

32K DRAM (4416 X4)		SHEET OF
RAWN	DATE	CHECKED	DATE	SCALE



普澤有限公司


BIT90 RS232 INTERFACE
CIRCUIT DIAGRAM
* ADJUST TO BE 76.8K Hz
+5V
1K5
2K2
555
.0022μ
.01μ
161
LD
CLR
QA
QB
QC
QD
A
B
C
D
251
Y
Vcc
GND
D
Q
TxC
RxC
TxD
RxD
RTS
CTS
8251
Φ
A0
RD
WR
RESET
C/D
DB0
DB1
DB2
DB3
DB4
DB5
DB6
DB7
174
1D
2D
3D
1Q
2Q
3Q
32
WR
A1
A2
A3
A4
A5
A7
IORQ
A6
138
+12V
-12V
1488
1489
TxD <3>
RxD <2>
400pF
555
10μ
20K
68K
.01μ
100p
-9~-12V
220μ/16V

BIT CORPORATION

BIT90 PARTS LIST (PAL SYSTEM)

SHEET OF

DRAWN | DATE | CHECKED | DATE | SCALE

PAL

R

1	10 K
2	1 K
3	270 Ω
4	470 Ω
5	10 K
6	22 K
7	56 K
8	1 K
9	100 K
10	1 K
11	100 K
12	15 K
13	1 K
14	10 K
15	1.2 K
16	330 Ω
17	220 Ω
18	4.7 K
19	470 Ω
20	470 Ω
21	3.3 K
22	3.3 K
23	470 Ω
24	1 K
25	100 K
26	10 K
30	220 Ω
40	27 K
32	47 Ω
33	4.7 K
34	10 Ω
35	3.3 K
36	3.3 K
37	3.3 K
38	3.3 K
39	3.3 K
51	390 Ω
52	390 Ω
53	3.3 K
54	2.7 K
55	120 K
57	100 Ω
58	27 K
59	1.8 K
60	1.2 K
61	330 Ω
62	10 K
63	10 K
64	22 K
65	10 K
66	6.8 K
67	330 Ω
68	390 Ω
69	330 Ω
70	2.7 K
71	1.5 K
72	1 K
73	4.7 K
74	2.7 K
75	1 K
76	1 K

D

1	
2	
3	
4	1N4148
5	
6	

Q

1	2N2907
2	2N2222
3	2N2907
4	2N2222
5	2N2222
6	2N2222
7	A 684
8	2N2222
9	2N2222
X1	10.738635 MHZ
X2	4.433619 MHZ

R

RA 1	4.7K
2	10 K
3	10 K

C

1	
2	
3	0.1
4	
5	
6	
7	56 P
8	0.1
9	103
10	0.1
11	104
12	10uH/16V
13	0.1
14	.0022 K
15	0.47uH/50V
16	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	0.1
28	
29	
30	
31	
32	
33	
34	
35	
36	
37	
38	
39	
40	
41	
42	
51	0.47uH/50V
52	0.1
53	0.1
54	0.1
55	33P
56	47P
57	0.1
58	10uH/16V
60	107
61	0.1
62	0.1
63	33P
64	33P
65	5~30PVC
66	473P
67	0.47uH/50V
68	10uH/16V
69	
70	
71	
72	0.1
73	
74	
75	
76	0.47uH/50V
77	10uH/16V
TC1	33P

L

1	39 uH
2	15 uH
3	4.7 uH
4	12 uH
5	12 uH
6	6 uH

U

1	TC 5517
2	2764
3	2764
4	2764
5	Z80A CPU
6	76489
7	74LS74
8	74LS32
9	74LS00
10	74LS04
11	74LS138
12	74LS00
13	74LS138
14	74LS05
15	74LS107
16	(VDP)
17	
18	
19	
20	4116
21	
22	
23	
24	
25	LM393.
26	CD4066
27	LM1889
28	CD4013
29	CD4066
30	74LS145
31	74LS244
32	74LS174
33	74LS244
34	74LS244

CA1	18 PIN MOLEX (MALE)
CN2	30PIN CONNECTOR (FEMALE)
TM1	9 PIN JACK
TM2	9 PIN JACK
TM3	9 PIN JACK
PJ1	5PIN POWER JACK
PS W1	power switch
RF J1	RCA JACK

HENT SINK (FOR VDP)

RS232C INTERFACE CARD

BIT90 computer has an expansion module for communication with any other computers or terminals. This module can be set four speeds and two operation modes. When you connect BIT90 computer with RS232C interface card; first, you should select the transmission or receive mode, next, set the baud rate for communication. It is very important to set the same speed between your BIT90 computer and the other side device. Of course, the program built in cassette must be loaded into computer and executed by BIT90. The following steps tell you how to set up this module.

Step 1: Load the cassette tape from recorder to computer. You may type a command "LOAD:RUN", then computer will execute the program automatically.

Step 2: When the program has been executed, the screen will display the message as shown below:

1. TRANSMISSION
2. RECEIVE

(PRESS FCNT 1 TO RESTART)
SELECT MODE:

Step 3: If you have selected the communication mode then the screen will display the following message:

1. 2400 BPS
2. 1200 BPS
3. 600 BPS
4. 300 BPS

SELECT SPEED?

Step 4. In step 3, you should set the BAUD RATE for communication speed. Generally 300 BPS low speed is used to communicate with TTY or telephone modem. Once you have set the speed, you may begin to communicate with other terminals or computers. Be sure that the speed you have set must be the same as the others when you are talking to each other.

SPECIFICATION

After connecting BIT 90 home computer with RS232C Interface, please key in a program as next page indicated.

PROCESS

STEP 1. Select mode (1. Transmission 2. Receive)

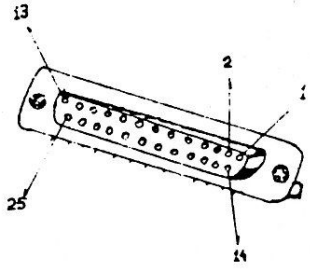
STEP 2. Select speed (Notice: It is very important to set the same speed between your BIT 90 computer and the other side device.)

In this program, Line 30 initialize the Baud Rate and RS232C Interface module; "WAIT" statement in Line 45 is used to await 'Transmission' and in Line 56 is used to await 'Receive'.

DEFINITION

PIN	DESCRIPTION
2	RxD(Receive Data)
3	TxD(Transmission Data)
7	Signal Ground

ILLUSTRATION



25 PIN D TYPE CONNECTOR

I/O Port	DESCRIPTION
68	Data I/O
69	Command or Read status
70	Select Baud Rate

BIT 90 TEST PROGRAM FOR RS232 INTERFACE MODULE

```
READY

>LIST
    5   HOME :PRINT :PRINT "    RS232C INTERFACE"
   10   PRINT :PRINT :PRINT " 1.TRANSMISSION":PRINT " 2.RECEIVE":PRINT :PRINT "
  (PRESS FCTN 1 TO RESTART)"
   15   PRINT :INPUT "  SELECT MODE: ",K:PRINT :PRINT
   20   PRINT " 1. 2400 BPS":PRINT " 2. 1200 BPS":PRINT " 3.  600 BPS":PRINT " 4
.  300 BPS":PRINT
   25   INPUT " SELECT SPEED?",S
   30   OUT 70,S-1:OUT 69,0:OUT 69,0:OUT 69,0:OUT 69,64:OUT 69,206:OUT 69,55
   35   HOME :IF K=2GOTO 50
   40   PRINT " MESSAGE FOR TRANSMISSION";CHR$( 13)
   42   IF ASC( INKEY$ )=255GOTO 42ELSE IF ASC( INKEY$ )=225GOTO 5
   43   A$=INKEY$ :PRINT A$;:IF ASC( A$)=13PRINT
   45   WAIT 69,1,0:OUT 68,ASC( A$):CLEAR
   46   IF ASC( INKEY$ )<> 255GOTO 46ELSE GOTO 42
   50   PRINT " RECEIVED DATA:"
   55   IF ASC( INKEY$ )=225GOTO 5
   56   WAIT 69,2,0:A=IN( 68):IF A>128THEN A=A-128
   57   A$=CHR$( A):PRINT A$;:OUT 68,ASC( A$):IF ASC( A$)=13PRINT
   58   CLEAR :GOTO 55

READY

>

READY

>
```

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BIT CORPORATION
台北市復興北路1號亞細亞大樓8F
台北郵政信箱74之17號
電話：(02)731-2838～9・731-1368～9
954-0854

Control Byte for BIT90 RS232 Interface DATE: PG

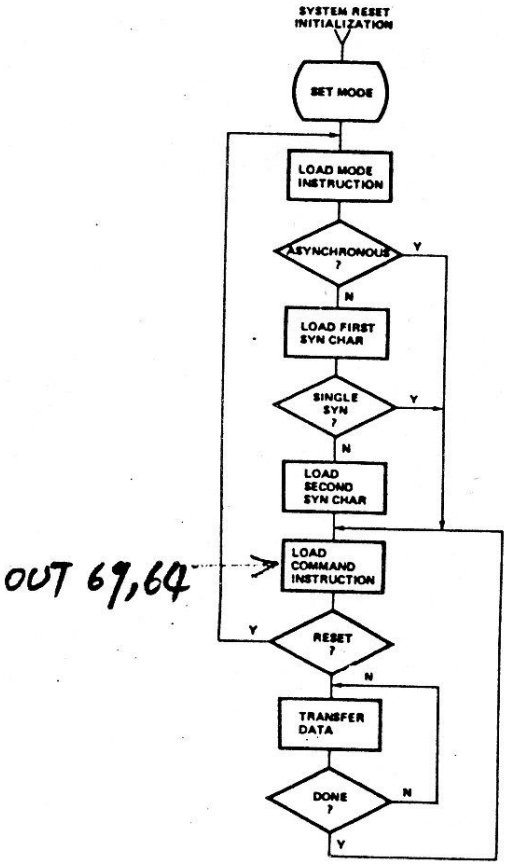
1. PORT 70 IS used for speed selection:

	SPEED		
S-1	MODE = 206	MODE = 207	MODE = 205
0	2400 Baud	600 Baud	38400 Baud
1	1200 "	300 "	19200 "
2	600 "	150 "	9600 "
3	300 "	75 "	4800 "
~~4~~	~~150~~		~~2400~~ "

2. LINE 30 ILLUSTRATION:

```
OUT 70, S-1 : REM SPEED SELECTION
OUT 69, 0   : REM 3 NULL 'OUT' FOR INITIALIZATION
OUT 69, 0
OUT 69, 0
OUT 69, 64  : REM SOFTWARE RESET USART
OUT 69, 206 : REM MODE INSTRUCTION
OUT 69, 55  : REM COMMAND INSTRUCTION
```

USART-8251 PROGRAMING MODEL



OUT 69,64

Figure 4. Initialization Flowchart

register. The mode control register is loaded by the first control output (C/$\overline{D}$=1, $\overline{RD}$=1, $\overline{WR}$=0, $\overline{CS}$=0) following a reset. The format of the mode control instruction is shown in Figure 5. The instruction can be considered as four 2-bit fields. The first 2-bit field (D_1 D_0) determines whether the USART is to operate in the synchronous (00) or asynchronous mode. In the asynchronous mode this field also controls the clock scaling factor. As an example, if D_1 and D_0 are both ones, the $\overline{RxC}$ and $\overline{TxC}$ will be divided by 64 to establish the baud rate. The second field, D_3–D_2, determines the number of data bits in the character and the third, D_5–D_4, controls parity generation. Note that the parity bit (if enabled) is added to the data bits and is not considered as part of them when setting up the character length. As an example, standard ASCII transmission, which is seven data bits plus even parity, would be specified as:

X X 1 1 1 0 X X

PORT 69

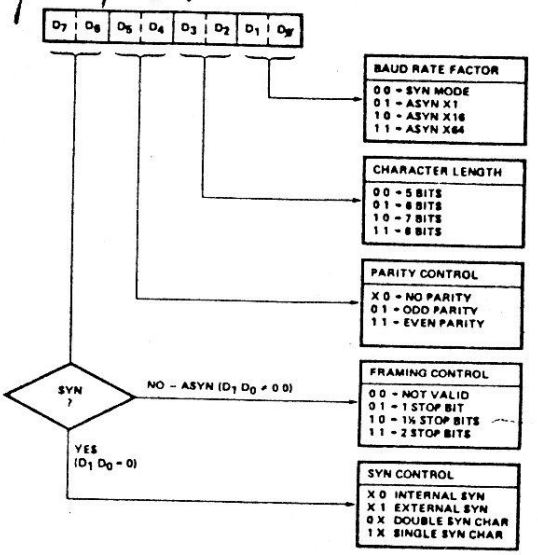


Figure 5. Mode Instruction Format

The last field, D_7–D_6, has two meanings, depending on whether operation is to be in the synchronous or asynchronous mode. For the asynchronous mode (i.e., D_1 $D_0 \neq 00$), it controls the number of STOP bits to be transmitted with the character. Since the receiver will always operate with only one STOP bit, D_7 and D_6 only control the transmitter. In the synchronous mode (D_1 $D_0 = 00$), this field controls the synchronizing process. Note that the choice of single or double SYN characters is independent of the choice of internal or external synchronization. This is because even though the receiver may operate with external synchronization logic, the transmitter must still know whether to send one or two SYN characters should the CPU fail to supply a character in time.

Following the loading of the mode instruction the appropriate SYN character (or characters) must be loaded if synchronous mode has been specified. The SYN character(s) are loaded by the same control output instruction used to load the mode instruction. The USART determines from the mode instruction whether no, one, or two SYN characters are required and uses the control output to load SYN characters until the required number are loaded.

At completion of the load of SYN characters (or after the mode instruction in the asynchronous mode), a command character is issued to the USART. The command instruction controls the operation of the USART within the basic framework established by the mode instruction. The format of the command instruction is shown in

USART-8251 PROGRAMING MODEL

Figure 6. Note that if, as an example, the USART is waiting for a SYN character load and instead is issued an internal reset command, it will accept the command as a SYN character instead of resetting. This situation, which should only occur if two independent programs control the USART, can be avoided by outputting three all zero characters as commands before issuing the internal reset command. The USART indicates its state in a status register which can be read under program control. The format of the status register read is shown in Figure 7.

When operating the receiver it is important to realize that RxE (bit 2 of the command instruction) only inhibits the assertion of RxRDY; it does not inhibit the actual reception of characters. Because the receiver is constantly running, it is possible for it to contain extraneous data when it is enabled. To avoid problems this data should be read from the USART and discarded. The read should be done immediately following the setting of Receive Enable in the asynchronous mode, and following the setting of Enter Hunt in the synchronous mode. It is not necessary to wait for RxRDY before executing the dummy read.

PORT 69

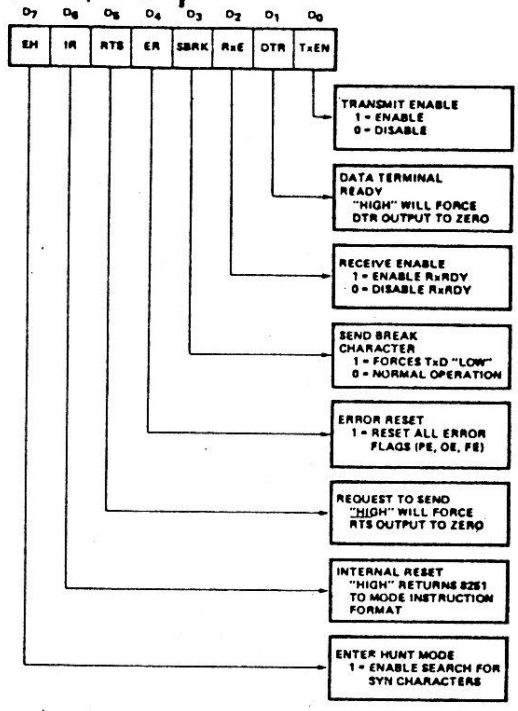
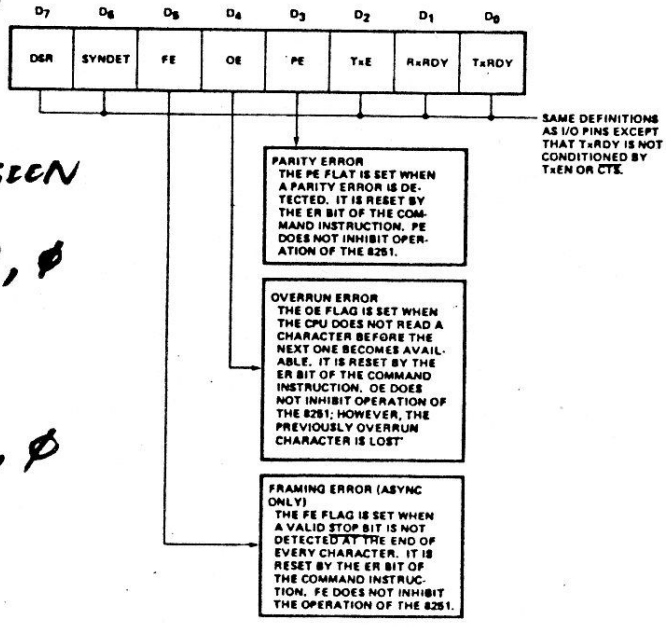


Figure 6. Command Instruction Format

PORT 69



- FOR TRANSMISSION

  WAIT 69, 1, 0

- FOR RECEIVE

  WAIT 69, 2, 0

Figure 7. Status Register Format

INSTRUCTION MANUAL FOR

BIT90

DOT MATRIX PRINTER

BIT CORPORATION

Instruction Manual for 40-column Printer

For the purpose of recording the screen of BIT90 computer there is a printer designed specially for BIT90. You are requested to read this booklet very carefully before using this printer.

1. SPECIFICATIONS

Printing method:	Serial Impact Dot MATRIX.
Printing fromat:	5×7 Dot MATRIX.
Printing speed:	40 CPS
Printing direction:	Single direction. left to right.
Columns/line:	40 columns
Paper feed:	Friction Feed only
Paper type:	Common paper. 69mm ± 1mm.
Ribbon:	Standard typewriter ribbon black & red
Print head life:	Approximately 40 million characters (replaceable)

2. PREPARATION FOR USE.

2-1 Unpacking, counting the parts.

Before you unpack your printer inspect the carton for sign of damage. If it appears to be damaged, be especially careful when you inspect its contents. The package should contain following.

1. This user's manual.
2. Printer unit with ribbon, paper and flat cable.
3. Interface module.

If any of this three is missing or damaged, notify your dealer immediately.

2-2. Setting up

Before starting to use your printer, you should make sure that it is in good connect with your computer.
So follow this procedure

1. Lift and remove the plastic top cover to expose print head and mechanism.
2. Remove shipping tape.
3. Plug the interface module into the expansion slot of BIT90, and make sure the interface module's edge connector is fixed with slot's pin. Before you do this, you must turn BIT90 power off otherwise computer or interface module will get damaged.
4. Turn on the power of computer & printer, see if the printer's power LED is on or not. If not, check your power system, and if it still not work, notify your dealer immediately.

3. FUNCTION DESCRIPTION

The BIT90 printer module supports 4 modes of printing, namely TEXT, HI-RESOLUTION, LO-RESOLUTION, BIT-IMAGE. The TEXT, HI-RES, LO-RES are all Hard Copy mode; but the BIT-IMAGE

mode will not show pattern on screen. To switch between these 4 modes, simply send their coutrol code (control code is not echoed on screen), and the control code can be redefired by POKEing in BASIC.

4. OPERATION

4-1. TEXT MODE.

Turn off the power of BIT90, then connect printer correctly, turn on power, after a moment when computer is in BASIC, type "CALL 30720", from now on, the printer is ready to print. After the procedure described above, printer is now in TEXT mode.
(EXAMPLE) CALL 30720 (CR)

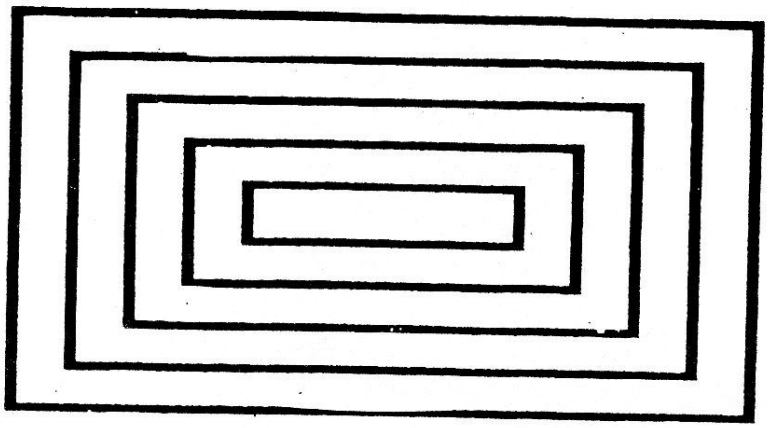
BIT90
Graphic & Text PRINTER

READY

4-2. LO-RES MODE

While in TEXT mode, sent a control code 05H (by means of "PRINT CHR$(5)" as in BASIC), as soon as printer receives the code, the full screen of low resolution (48 * 64) will be dumped.

```
10 REM LO-RESOLUTION
20 CALL SCREEN(1,2)
30 OX=0:OY=0
40 BS=5
50 FOR SP=47TO 0STEP -BS-BS
60 PLOT OY,OX,15TO OY,OX+SP+16TO OY+SP,OX+SP+16TO OY+SP,OXTO OY,OX
70 OX=OX+BS:OY=OY+BS
80 NEXT
90 PRINT CHR$( 5):REM LO-RESOLUTION
00 PRINT CHR$(27):TURN OFF PRINTER
```



4-3. HI-RES MODE

As described in LO-RES, except the code is 02H and the high resolution screen is dumped.

```
 10 REM HI-RESOLUTION
 20 CALL SCREEN(1,1)
 30 PLOT 0,0,15
 40 FOR X=0TO 255STEP 10
 50 PLOTO,X TO 191,X
 60 NEXT X
 70 FOR Y=0TO 191STEP 10
 80 PLOT Y,OTO Y,255
 90 NEXT Y
100 PRINT CHR$( 2);:REM HI-RESOLUTION
```