XV-T550

SERVICE MANUAL

AEP Model
UK Model

SPECIFICATIONS

Power requirements
For AEP: 220 V AC, 50 Hz
For UK: 240 V AC, 50 Hz

Power consumption
20 W

Operating conditions
Temperature: 0°C-40°C
Humidity: 20%-80%

INPUT and OUTPUT connectors
VIDEO IN 1,2: Pin-jack
1 V p-p, 75 Ohm terminator
Sync negative, unbalanced
VIDEO OUT 1,2: Pin-jack
1 V p-p, 75 Ohm terminator
Sync negative, unbalanced
AUDIO IN 1,2: Pin-jack
Input level: −10 dBs (0 dBs = 0.775 Vrms)
Input impedance: more than 47 KOhms
AUDIO OUT 1,2: Pin-jack
Output impedance: less than 1K Ohm

Dimensions
Main unit: Approx. 430 × 55 × 305 mm (W/H/D)
(17 × 2 1/4 × 12 1/8 inches)
Controller: Approx. 212 × 35 × 150 mm (W/H/D)
(8 3/8 × 1 7/16 × 6 inches)

Weight
Main unit: Approx. 3.9 kg (8lb 10 oz)
Controller: Approx. 400g (14 oz)

Supplied accessories
Mouse (1)
Controller (1)
Operating instructions (1)

MICROFILM

MULTI VIDEO TITLER

SONY®

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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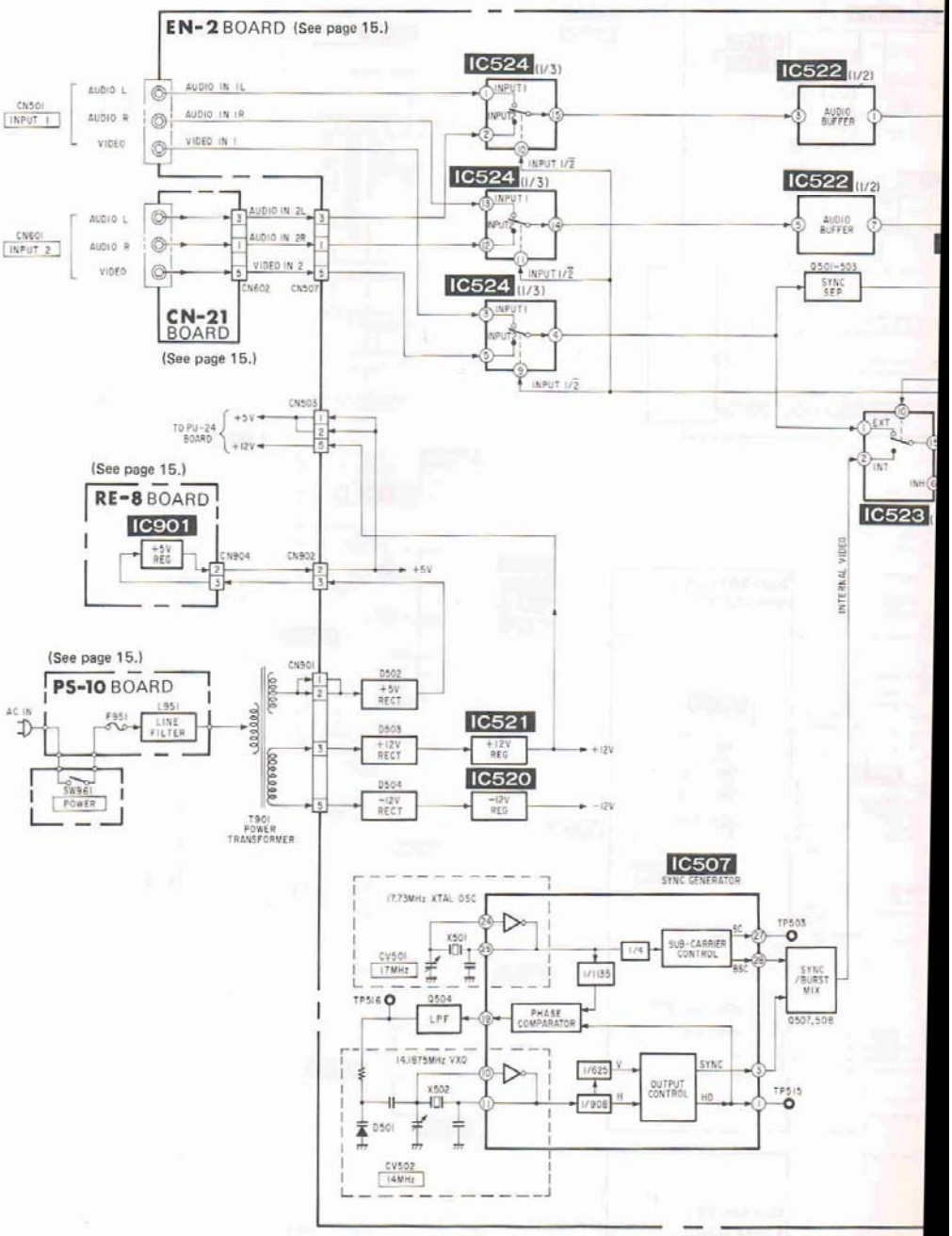
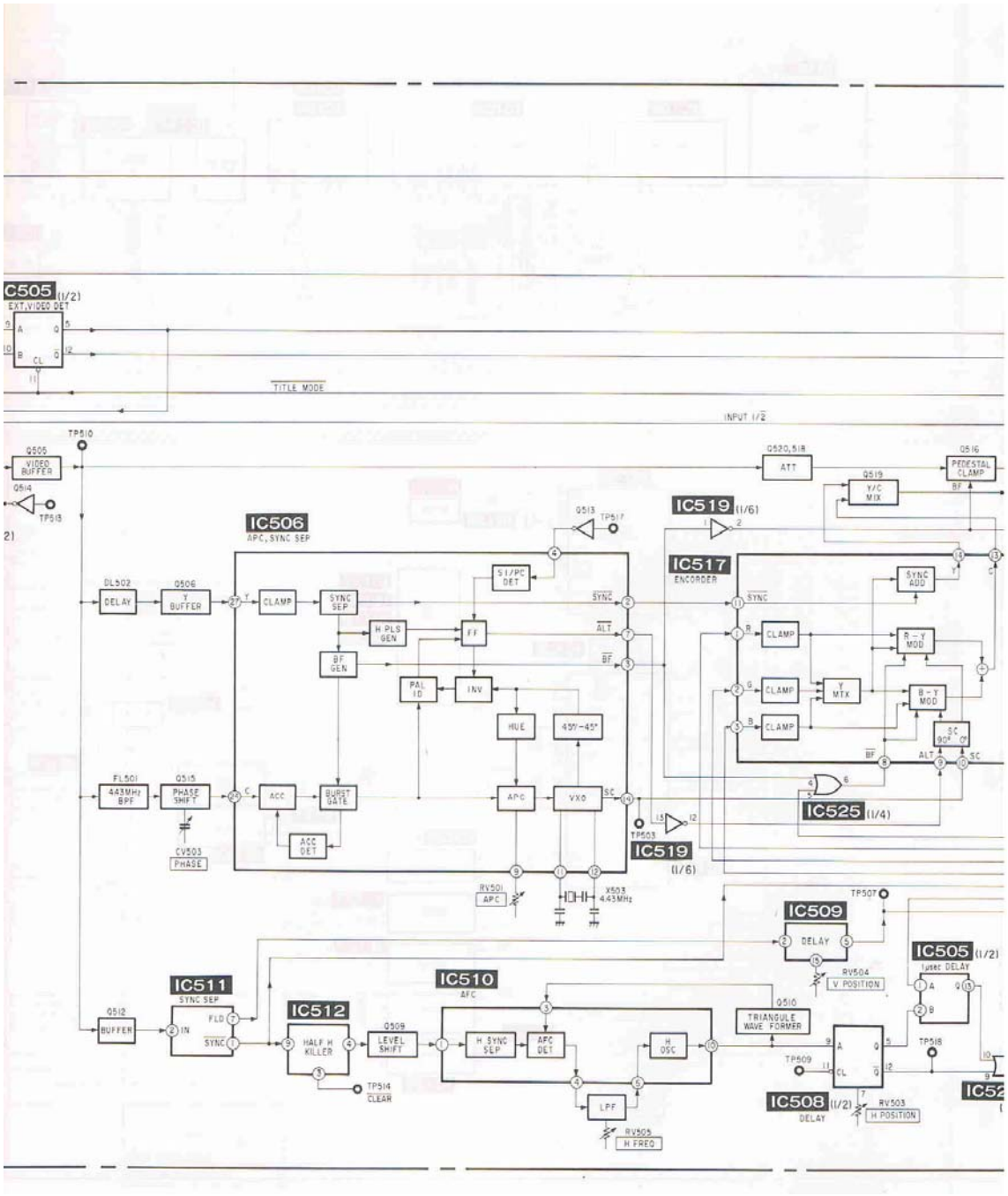
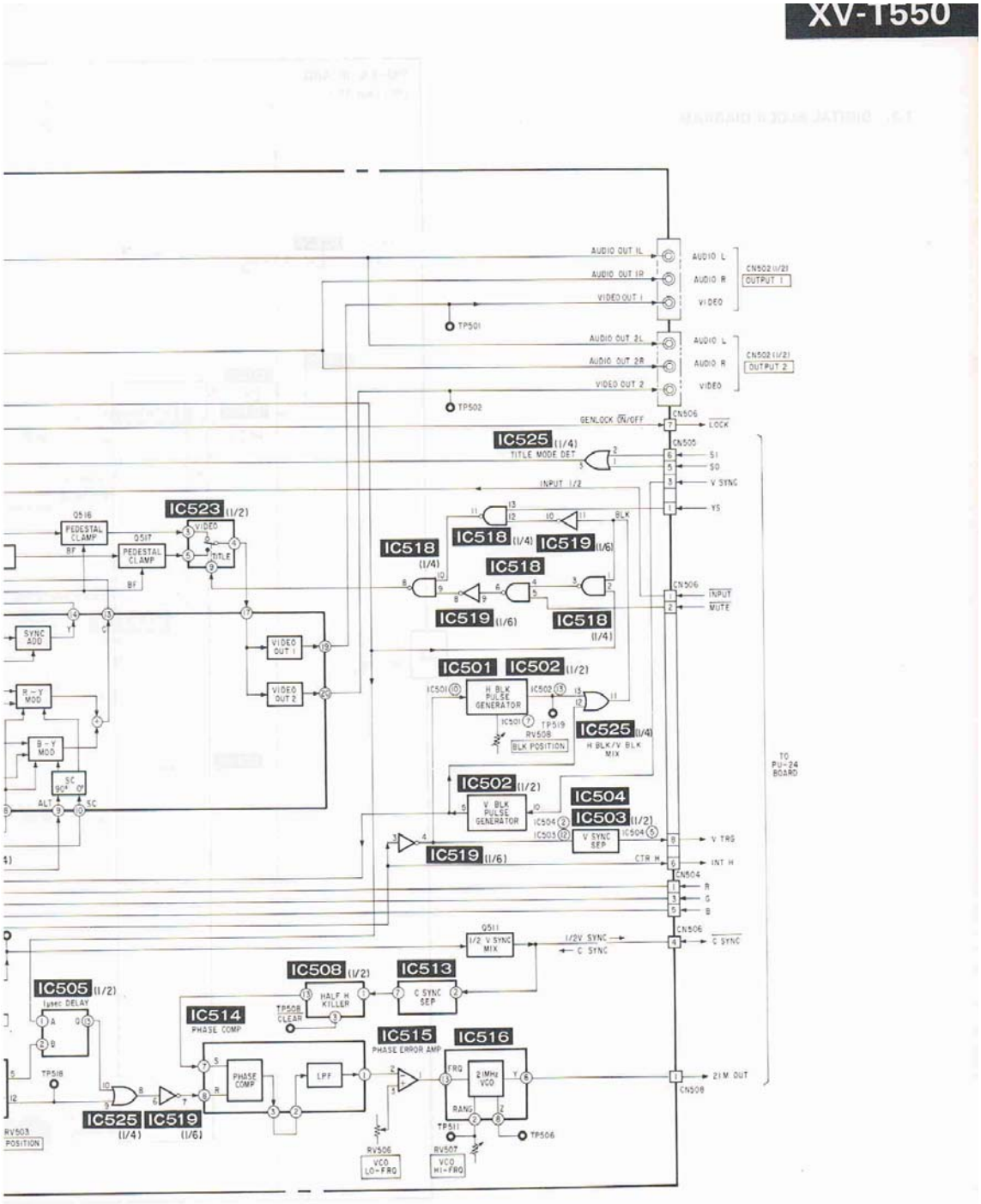
SECTION 1
DIAGRAMS

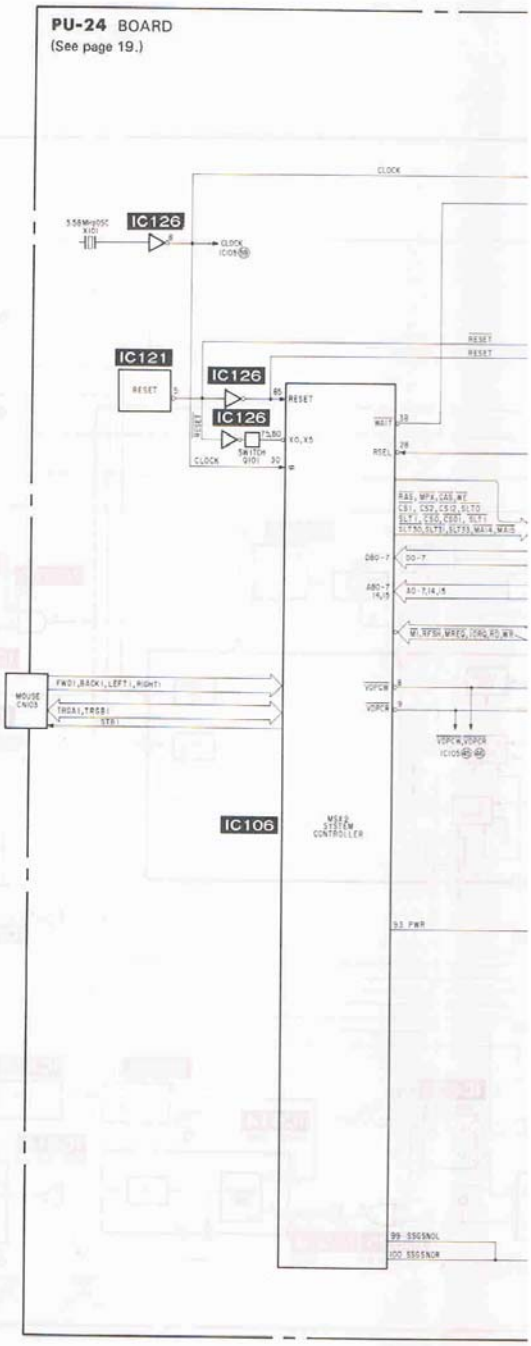
1-1. ENCODER/POWER BLOCK DIAGRAM

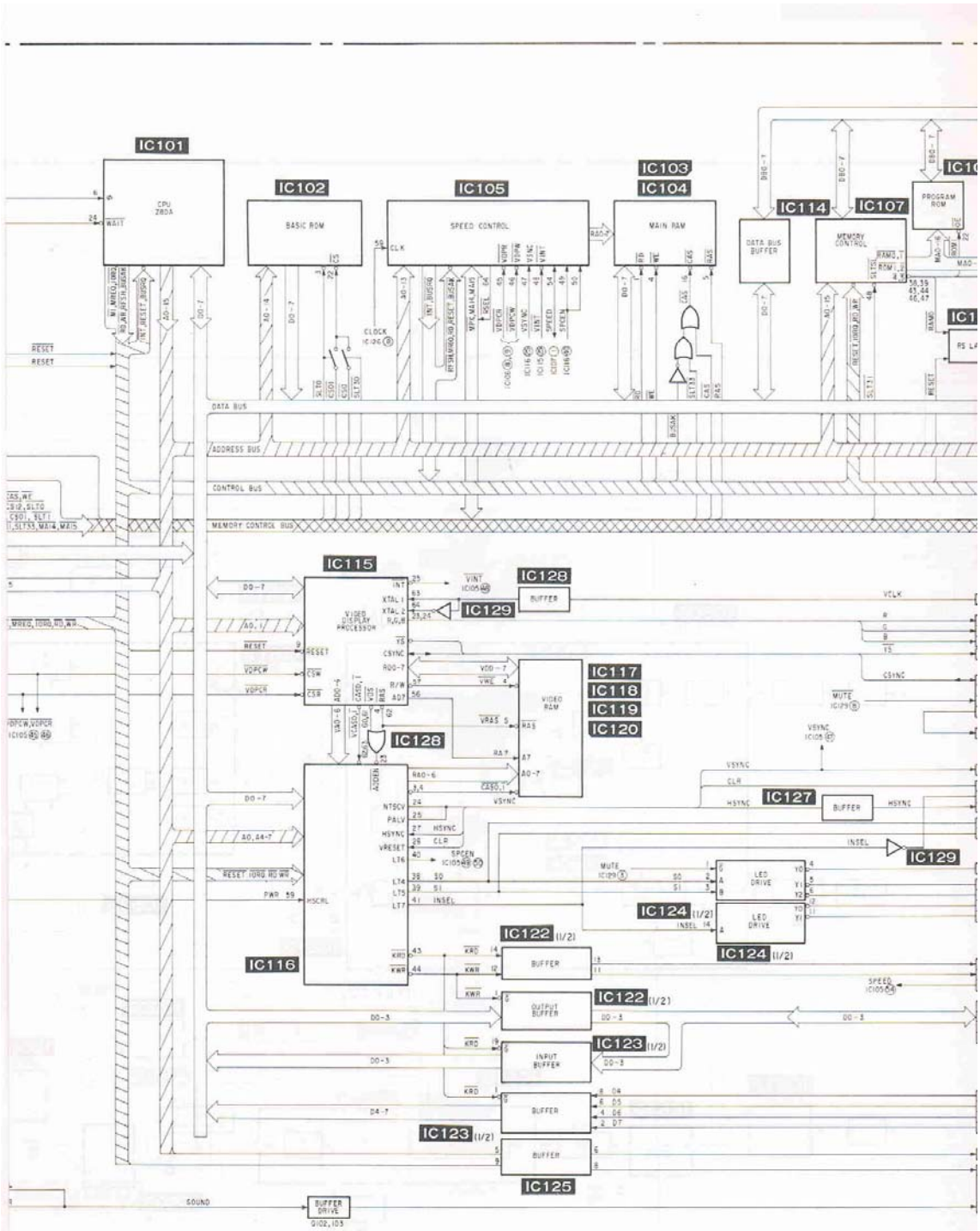


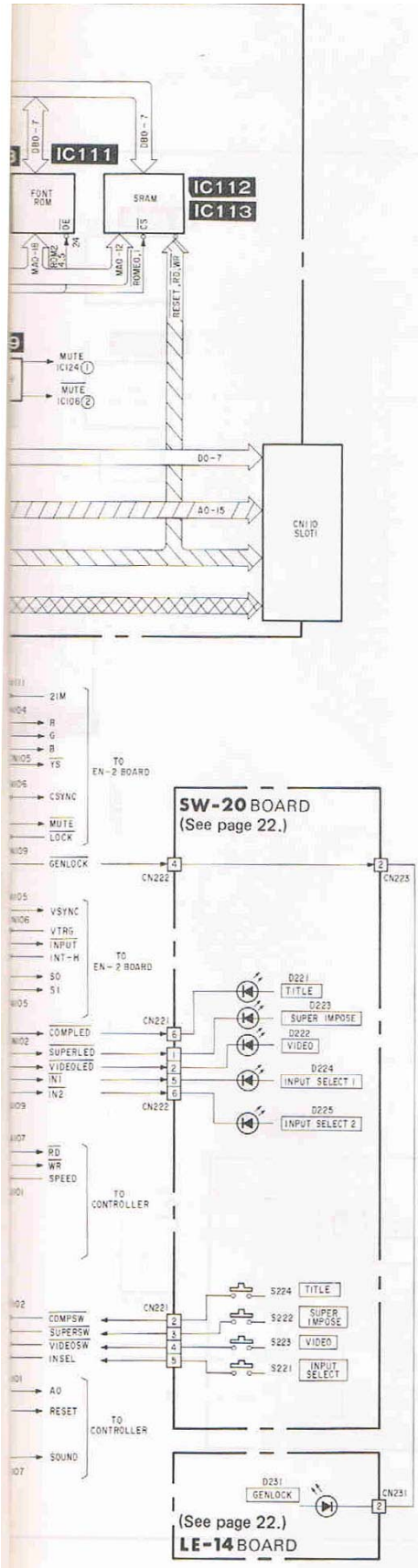

IC505 (1/2)
EXT.VIDEO DET
TITLE MODE
INPUT 1/2
TP510
Q505 VIDEO BUFFER
Q514
TP518
IC506
APC, SYNC SEP
Q513
TP517
DL502 DELAY
Q506 Y BUFFER
CLAMP
SYNC SEP
H PLS GEN
BF GEN
FF
SI/PC DET
PAL ID
INV
HUE
45°-45°
FL501 443MHz BPF
Q515 PHASE SHIFT
CV503 PHASE
ACC
BURST GATE
ACC DET
APC
VXO
TP503
IC519 (1/6)
RV501 APC
X503 4.43MHz
IC519 (1/6)
IC517 ENCODER
Q520,518 ATT
Q519 Y/C MIX
Q516 PEDESTAL CLAMP
SYNC ADD
CLAMP
R-Y MOD
Y MTX
B-Y MOD
SC 90° Ø
IC525 (1/4)
IC509 DELAY
TP507
RV504 V. POSITION
IC505 (1/2) 1µsec DELAY
IC511 SYNC SEP
Q512 BUFFER
IC512 HALF H KILLER
Q509 LEVEL SHIFT
TP514 CLEAR
IC510 AFC
H SYNC SEP
AFC DET
H OSC
LPF
RV505 H FREQ
Q510 TRIANGULE WAVE FORMER
TP509
IC508 (1/2) DELAY
RV503 H POSITION
TP518


AUDIO OUT 1L
AUDIO OUT 1R
VIDEO OUT 1
AUDIO L
AUDIO R
VIDEO
CN502 (I/2) OUTPUT 1
TP501
AUDIO OUT 2L
AUDIO OUT 2R
VIDEO OUT 2
CN502 (I/2) OUTPUT 2
TP502
GENLOCK ON/OFF
CN506
LOCK
IC525 (1/4)
TITLE MODE DET
CN500
S1
S0
V SYNC
YS
INPUT 1/2
IC523 (1/2)
Q516
PEDESTAL CLAMP
Q517
PEDESTAL CLAMP
VIDEO
TITLE
BF
IC518 (1/4)
IC519 (1/6)
IC518
IC519 (1/6)
IC518 (1/4)
BLK
INPUT
MUTE
SYNC ADD
R-Y MOD
B-Y MOD
SC 90° ϕ
ALT
SC
VIDEO OUT 1
VIDEO OUT 2
IC501
IC502 (1/2)
H BLK PULSE GENERATOR
TP519
RV508
BLK POSITION
IC525 (1/4)
H BLK/V BLK MIX
IC502 (1/2)
V BLK PULSE GENERATOR
IC504
IC503 (1/2)
V SYNC SEP
IC519 (1/6)
V TRG
CTR H
INT H
CN504
R
G
B
Q511
1/2 V SYNC MIX
1/2V SYNC
C SYNC
C SYNC
IC508 (1/2)
IC513
HALF H KILLER
C SYNC SEP
IC505 (1/2)
1μsec DELAY
IC514
PHASE COMP
TP508
CLEAR
IC515
PHASE ERROR AMP
IC516
PHASE COMP
LPF
2 (MHz VCO
FRQ
RANG
TP511
TP506
TP518
RV503
POSITION
IC525 (1/4)
IC519 (1/6)
RV506
VCO LO-FRQ
RV507
VCO HI-FRQ
21M OUT
CN508
TO PU-24 BOARD

1-2. DIGITAL BLOCK DIAGRAM

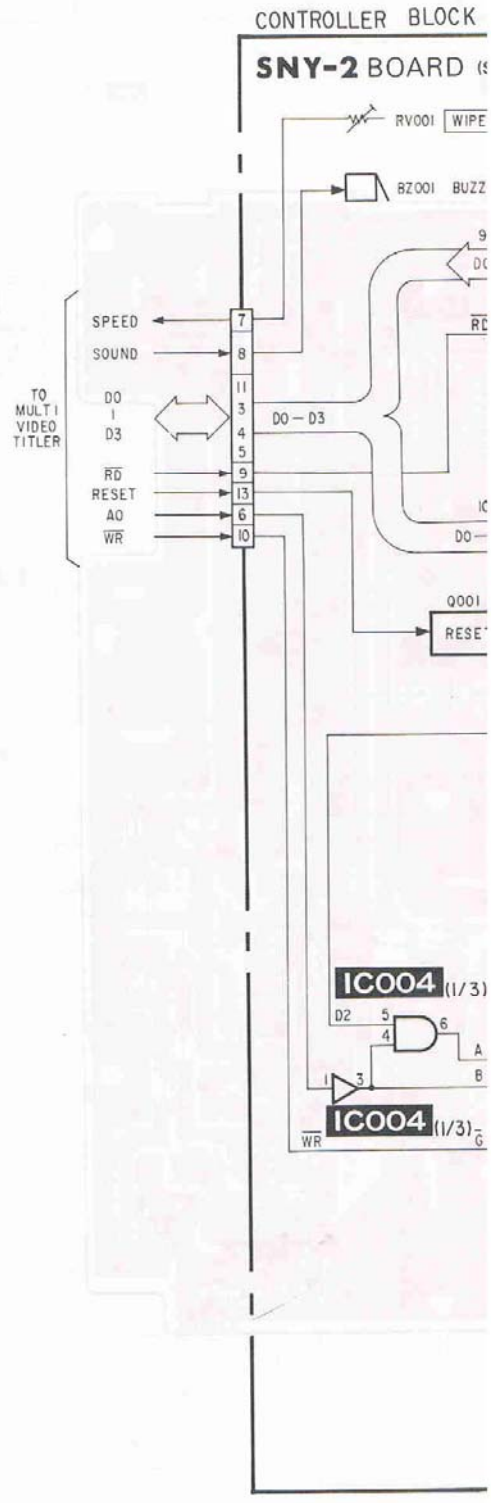



IC101
CPU Z80A
IC102
BASIC ROM
IC105
SPEED CONTROL
IC103
IC104
MAIN RAM
IC114
DATA BUS BUFFER
IC107
MEMORY CONTROL
PROGRAM ROM
DATA BUS
ADDRESS BUS
CONTROL BUS
MEMORY CONTROL BUS
IC115
VIDEO DISPLAY PROCESSOR
IC128
BUFFER
IC129
IC117
IC118
IC119
IC120
VIDEO RAM
IC116
IC122 (1/2)
IC123 (1/2)
IC124 (1/2)
IC125
IC127
LED DRIVE
OUTPUT BUFFER
INPUT BUFFER
BUFFER DRIVE
SOUND


IC111
IC112
IC113
FONT ROM
SRAM
DB0-7
MA0-18
MA0-12
RESET, RD, WR
MUTE IC124 ①
MUTE IC106 ②
D0-7
A0-15
CN10 SLOT1

2IM
R
G
B
YS
CSYNC
MUTE
LOCK
GENLOCK
VSYNC
VTRG
INPUT
INT-H
S0
S1
COMPLED
SUPERLED
VIDEOLED
INT
IN2
RD
WR
SPEED
COMPSW
SUPERSW
VIDEOSW
INSEL
A0
RESET
SOUND
TO EN-2 BOARD
TO EN-2 BOARD
TO CONTROLLER
TO CONTROLLER
SW-20 BOARD
(See page 22.)
CN222
CN225
CN221
CN222
CN221
D221 TITLE
D223 SUPER IMPOSE
D222 VIDEO
D224 INPUT SELECT 1
D225 INPUT SELECT 2
S224 TITLE
S222 SUPER IMPOSE
S223 VIDEO
S221 INPUT SELECT
D231 GENLOCK
CN231
(See page 22.)
LE-14 BOARD

1-3. CONTROLLER BLOCK DIAGRAM



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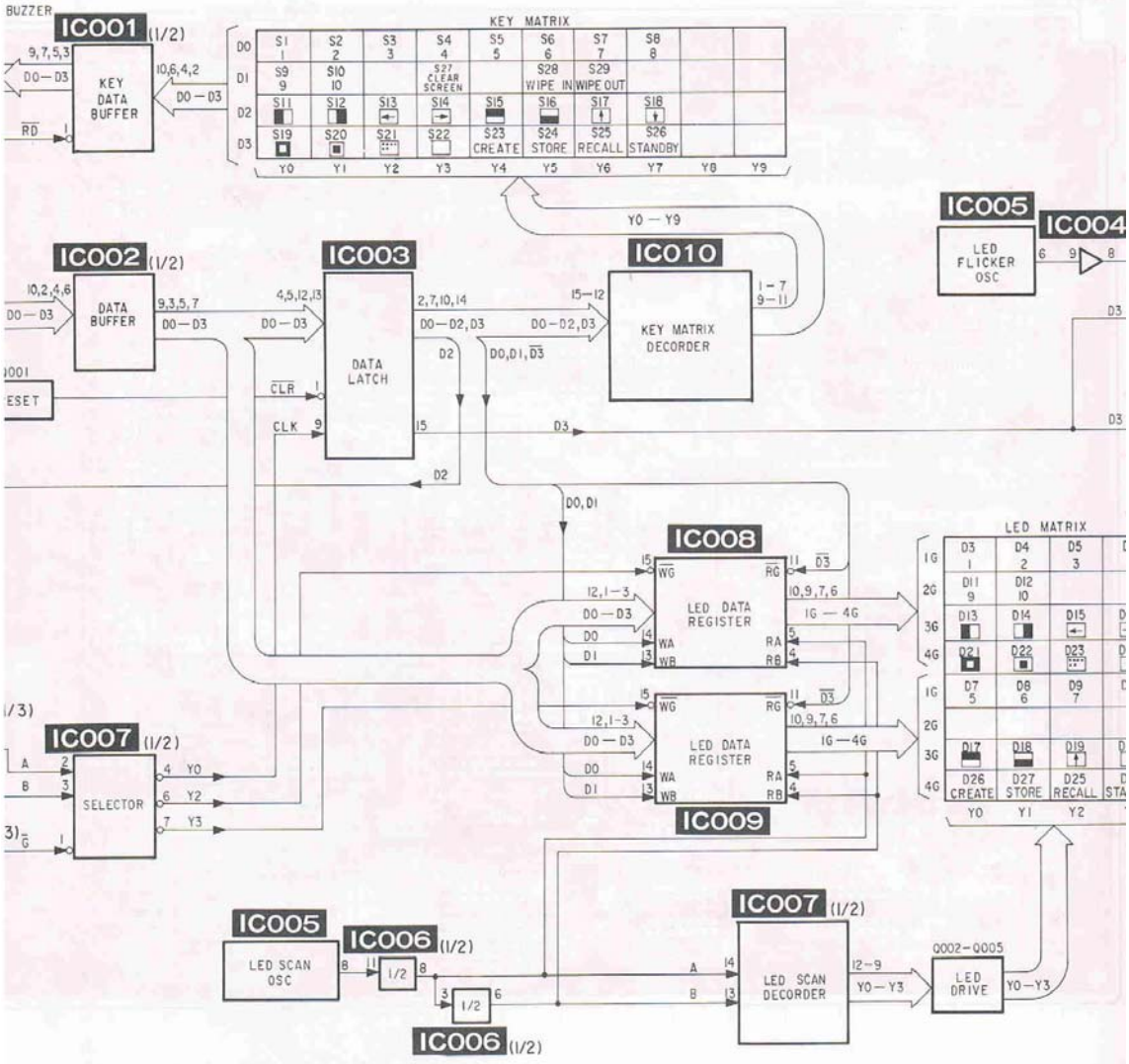
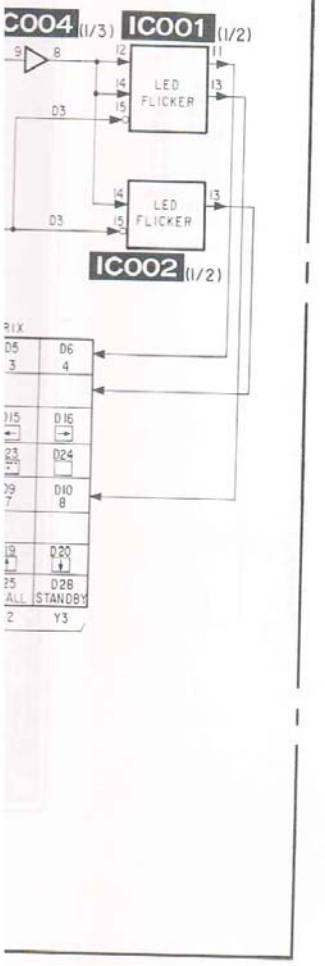
(See page 27.)

WIPE SPEED




IC004 (1/3)
IC001 (1/2)
LED FLICKER
LED FLICKER
IC002 (1/2)
D3
D3
D6
D16
D24
D10
D20
D28
STANDBY
Y3

SECTION 2
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

2-1. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block)

Note on Printed Wiring Board:

- ● : Through hole
- : conductor side.
- : component side.
- Circled numbers refer to waveforms.

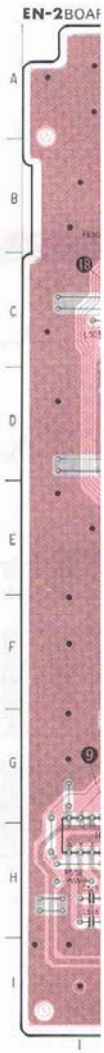
Note on Schematic Diagram:

- All resistors are in ohms, 1/4W unless otherwise noted. kΩ : 1000Ω, MΩ : 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF : μμF. 50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : nonflammable resistor.
- : fusible resistor.
- : panel designation.
- △ : internal component.
- : adjustment for repair.
- : B + Line
- : IN/OUT direction of (+, –) B line.
- Circled numbers refer to waveforms.
- Voltages are dc between ground and measurement points.
- Readings are taken with a color-bar signal input. (INPUT 1)
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.
- Voltage and waveform measuring conditions:
  INPUT SELECT switch : 1
  OUTPUT SELECT switch : TITLE
  CREATE switch : ON

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

CN501	A-3	Q512	F-10		
CN502	A-6	Q513	E-9		
CN503	A-9	Q514	G-3		
CN504	B-10	Q515	D-10		
CN505	C-5	Q516	C-8		
CN506	C-4	Q517	C-8		
CN507	A-2	Q518	C-9		
CN508	G-6	Q519	C-7		
CN901	F-12	Q520	C-9		
CN902	A-10				
		RV501	E-9		
CV501	C-2	RV503	I-6		
CV502	D-2	RV504	G-9		
CV503	D-10	RV505	H-10		
		RV506	H-4		
D501	D-3	RV507	G-7		
D502	F-12	RV508	I-2		
D503	H-12				
D504	I-12	TP501	B-6		
D505	I-9	TP503	C-2		
D506	F-8	TP505	D-7		
D507	E-8	TP506	F-6		
D508	E-6	TP507	H-8		
		TP508	I-6		
IC501	I-3	TP509	H-6		
IC502	H-1	TP511	G-7		
IC503	I-4	TP513	G-3		
IC504	H-3	TP515	D-2		
IC505	E-6	TP516	C-3		
IC506	D-9	TP517	E-10		
IC507	C-2	TP518	G-5		
IC508	I-6	TP519	G-1		
IC509	G-8				
IC510	G-10	TPE503	I-10		
IC511	F-9				
IC512	F-8				
IC513	J-8				
IC514	G-6				
IC515	H-5				
IC516	F-6				
IC517	B-8				
IC518	D-4				
IC519	D-5				
IC520	I-12				
IC521	H-12				
IC522	B-5				
IC523	F-3				
IC524	B-3				
IC525	E-4				
Q501	F-4				
Q502	F-5				
Q503	E-5				
Q504	C-3				
Q505	E-4				
Q506	C-10				
Q507	F-2				
Q508	F-3				
Q509	G-8				
Q510	H-9				
Q511	I-9				

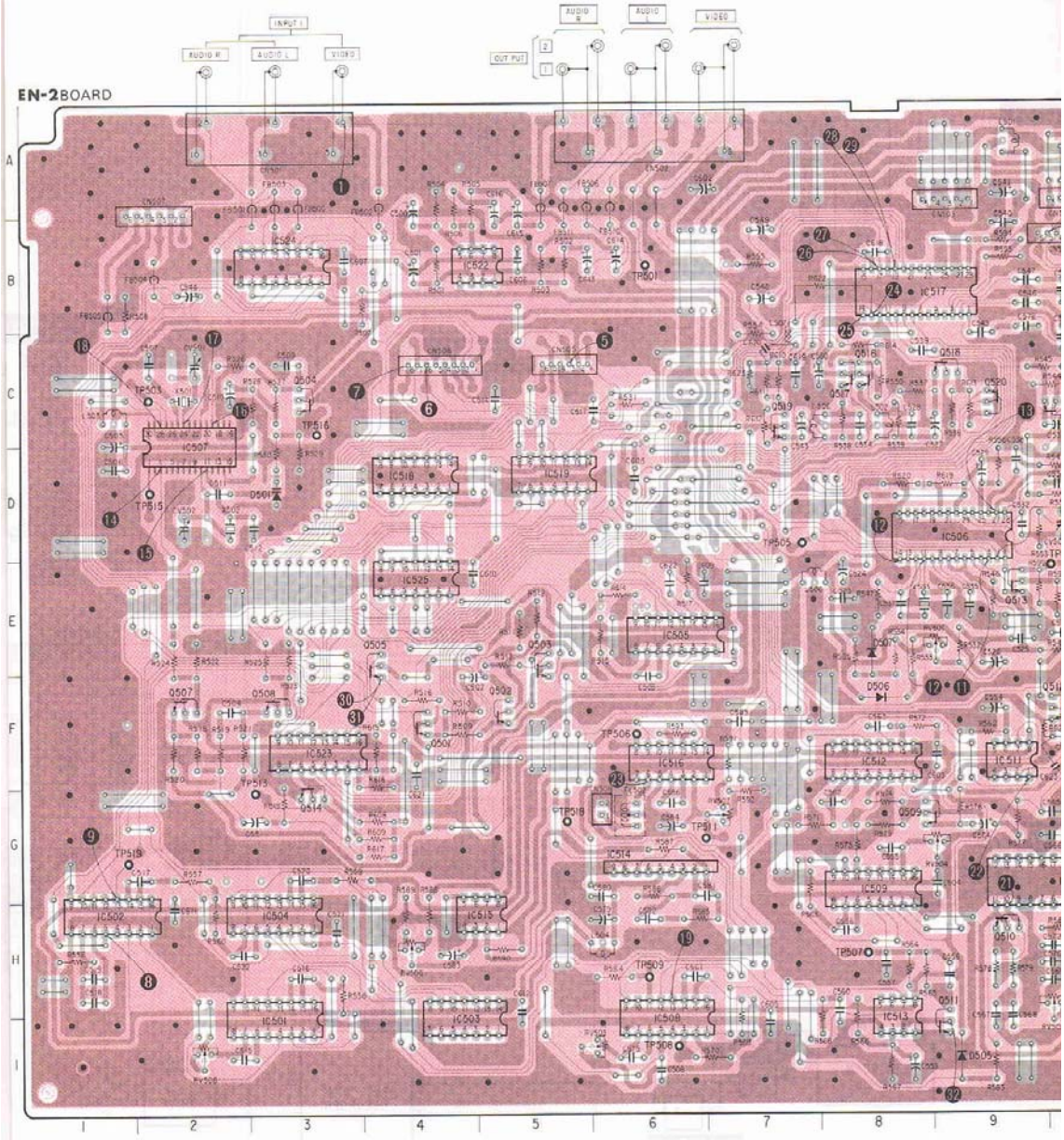


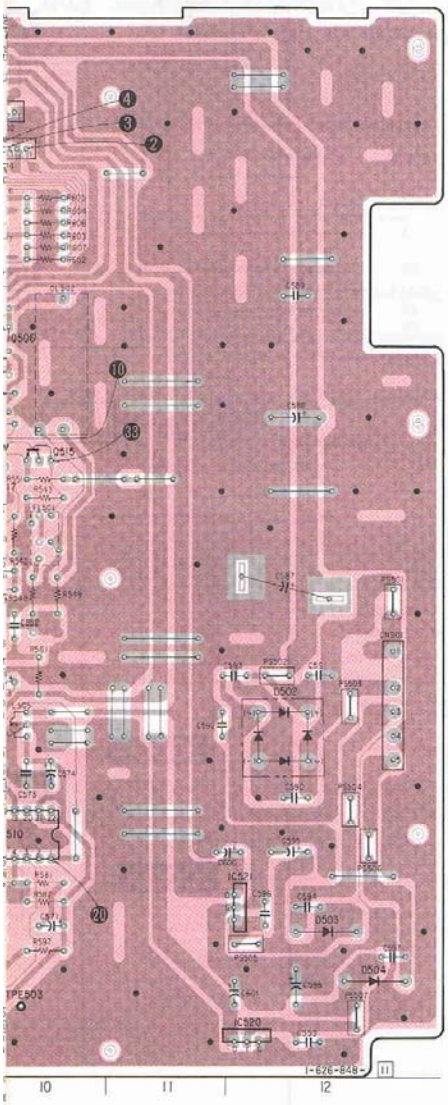
CN-21 (V
—Ref. No.

CN-21 (VIDEO/AUDIO INPUT), EN-2 (ENCODER, RECT) PS-10 (LINE FILTER), RE-8 (+5V REG), SW-19 (POWER SW) PRINT

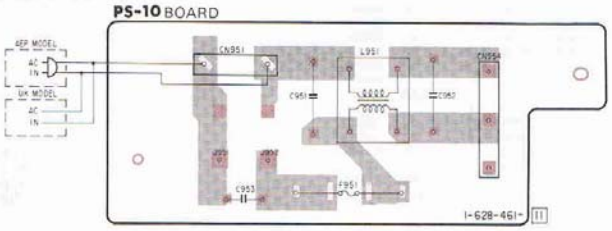
—Ref. No. CN-21, EN-2, PS-10, RE-8 and SW-19 BOARDS : 1000 series—

EN-2 BOARD

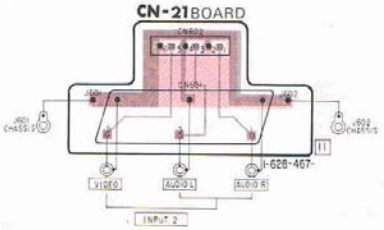




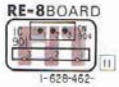
PS-10 BOARD



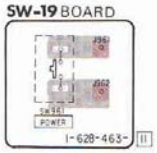
CN-21 BOARD



RE-8 BOARD



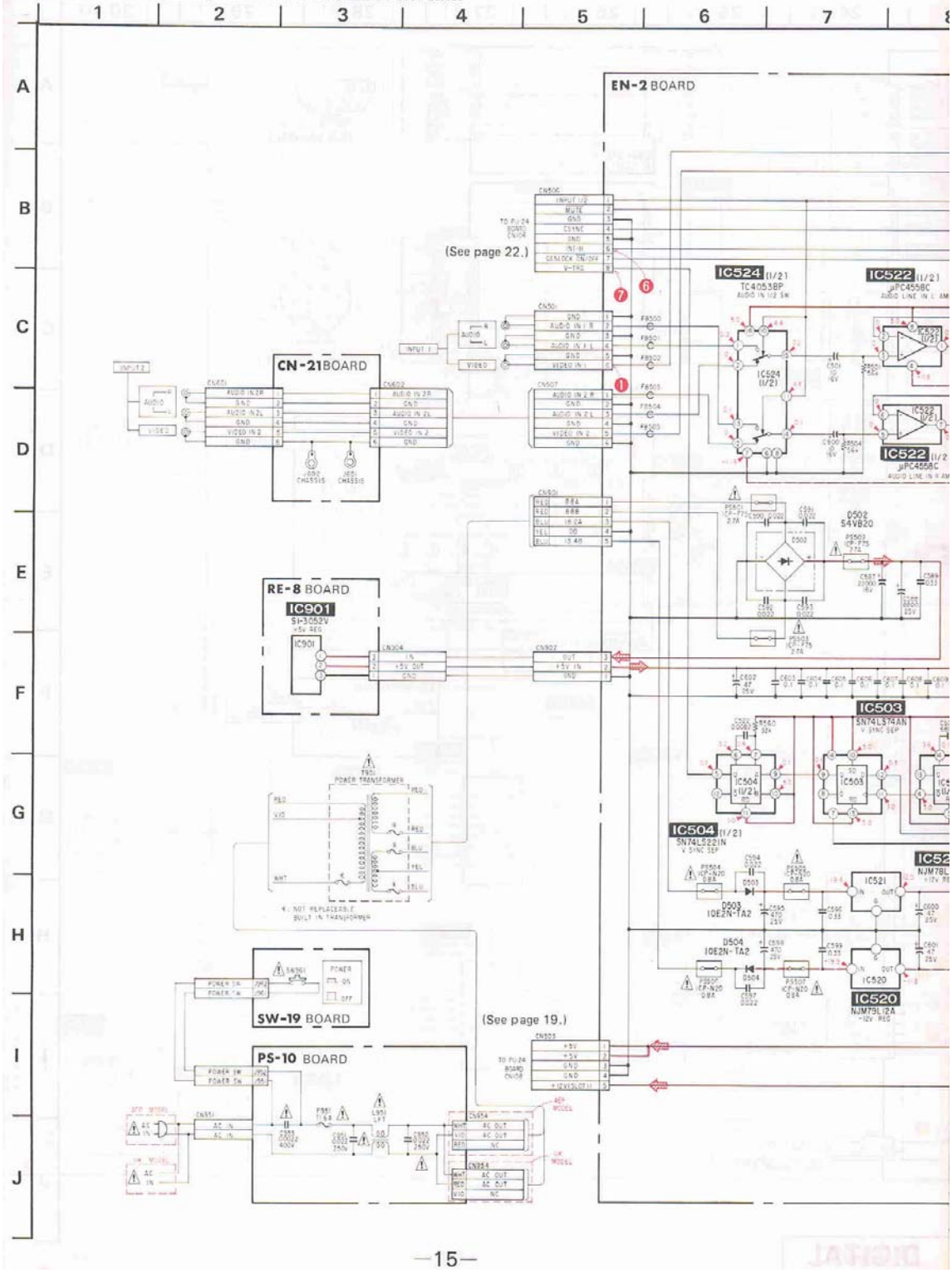
SW-19 BOARD

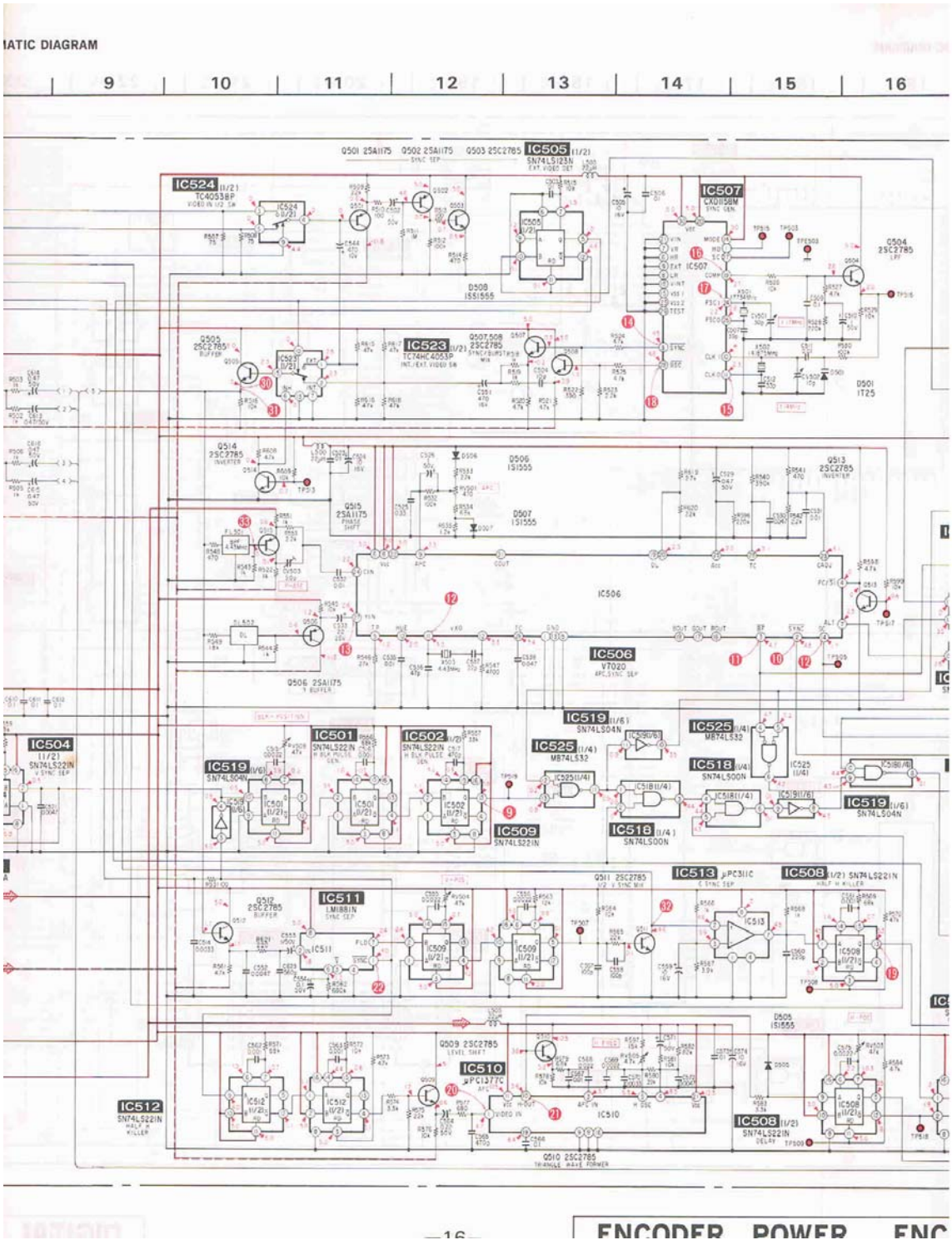


ENCODER, POWER

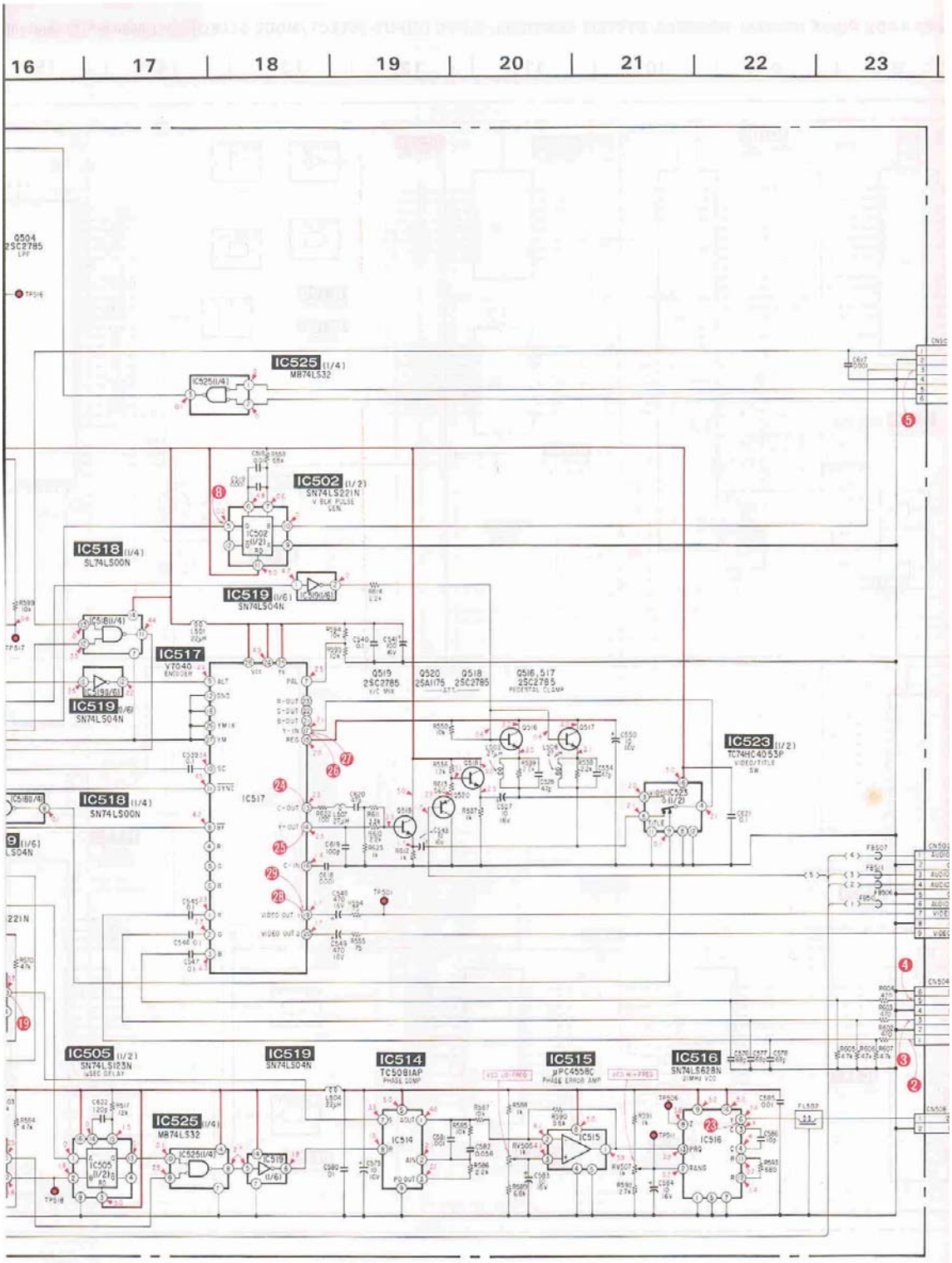
CN-21 (VIDEO/AUDIO INPUT), EN-2 (ENCODER, RECT) PS-10 (LINE FILTER), RE-8 (+5V REG), SW-19 (POWER SW) SCHE

—Ref. No. CN-21, EN-2, PS-10, RE-8 and SW-19 BOARDS : 1000 series—

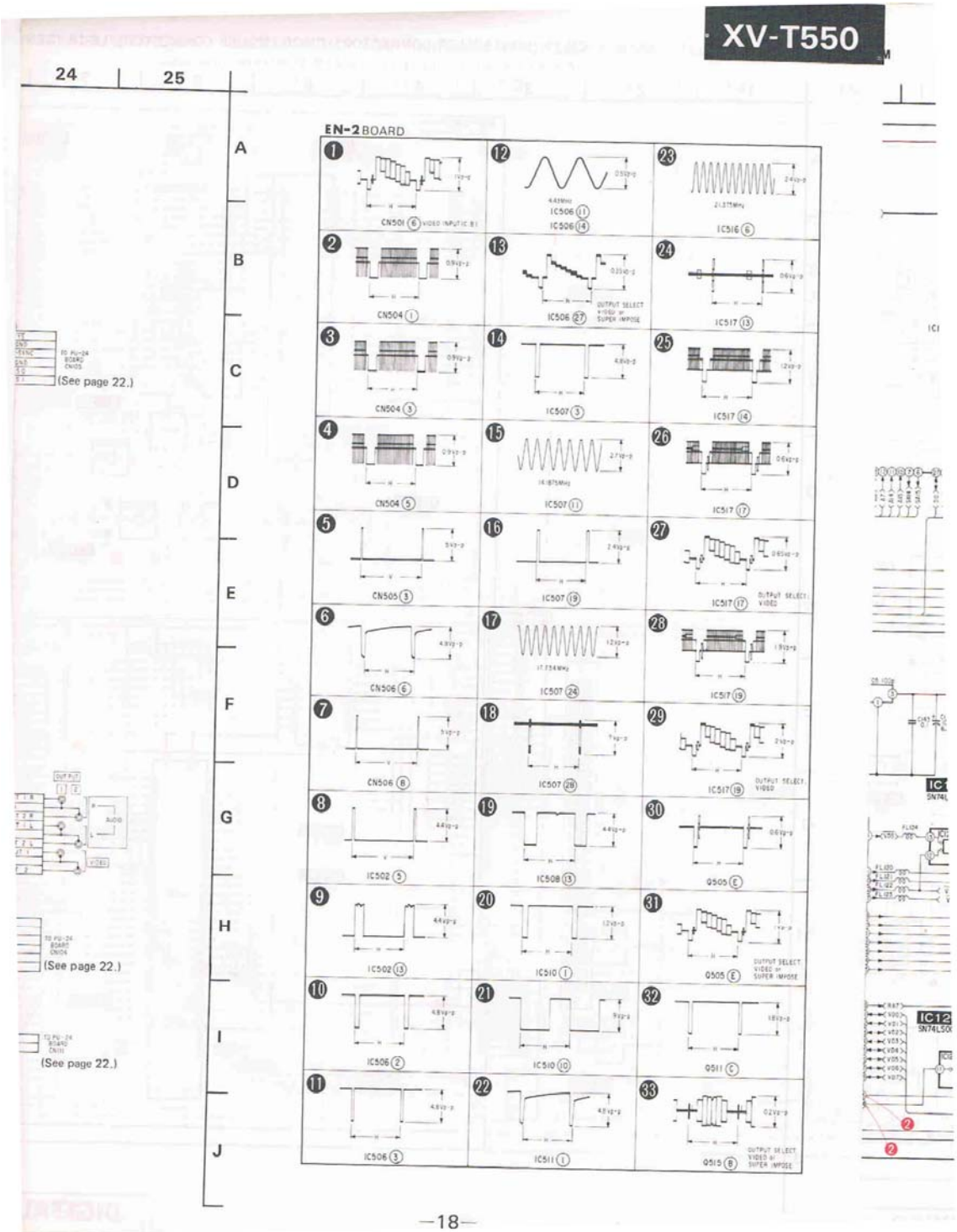




ENCODER POWER ENC

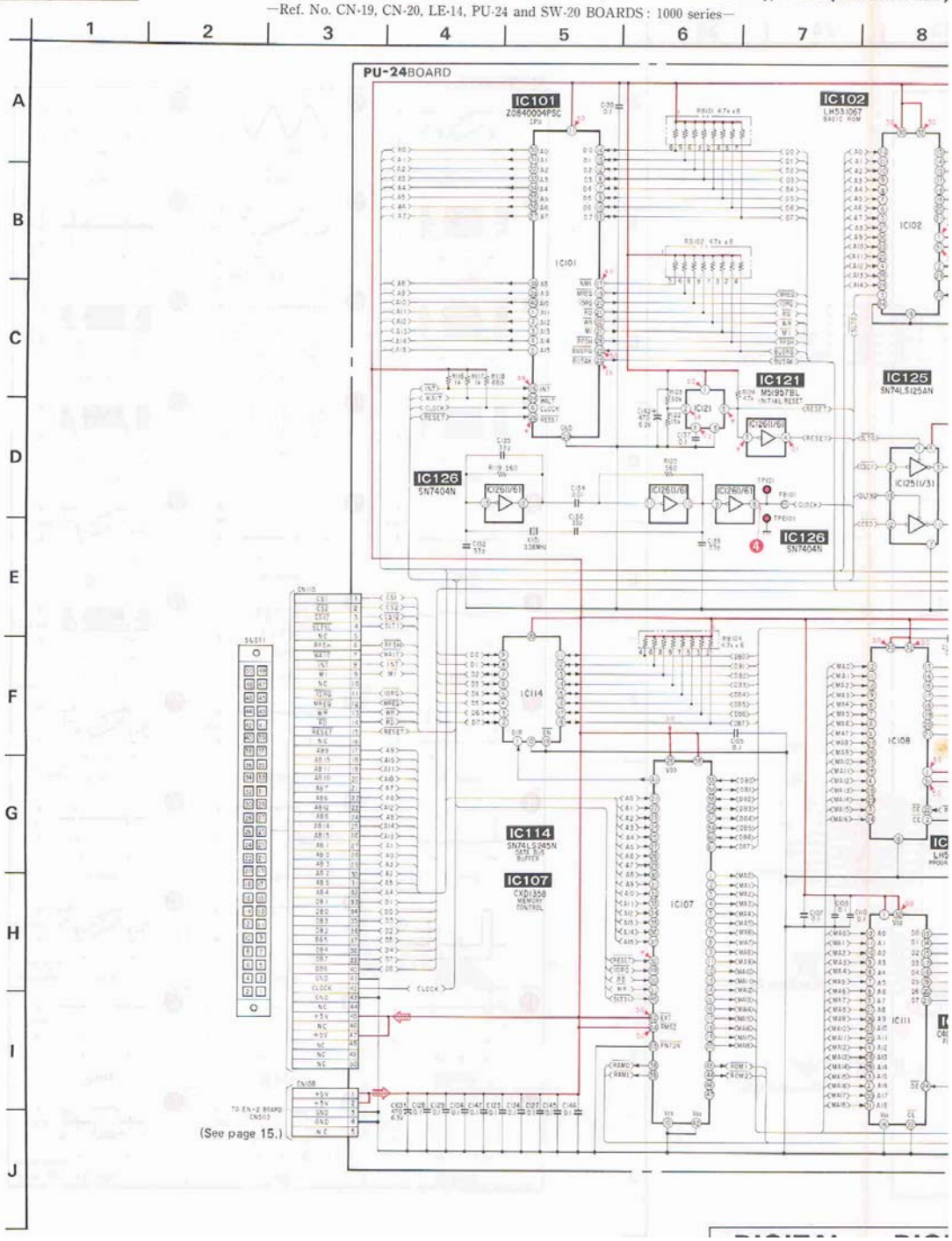


ENCODER, POWER

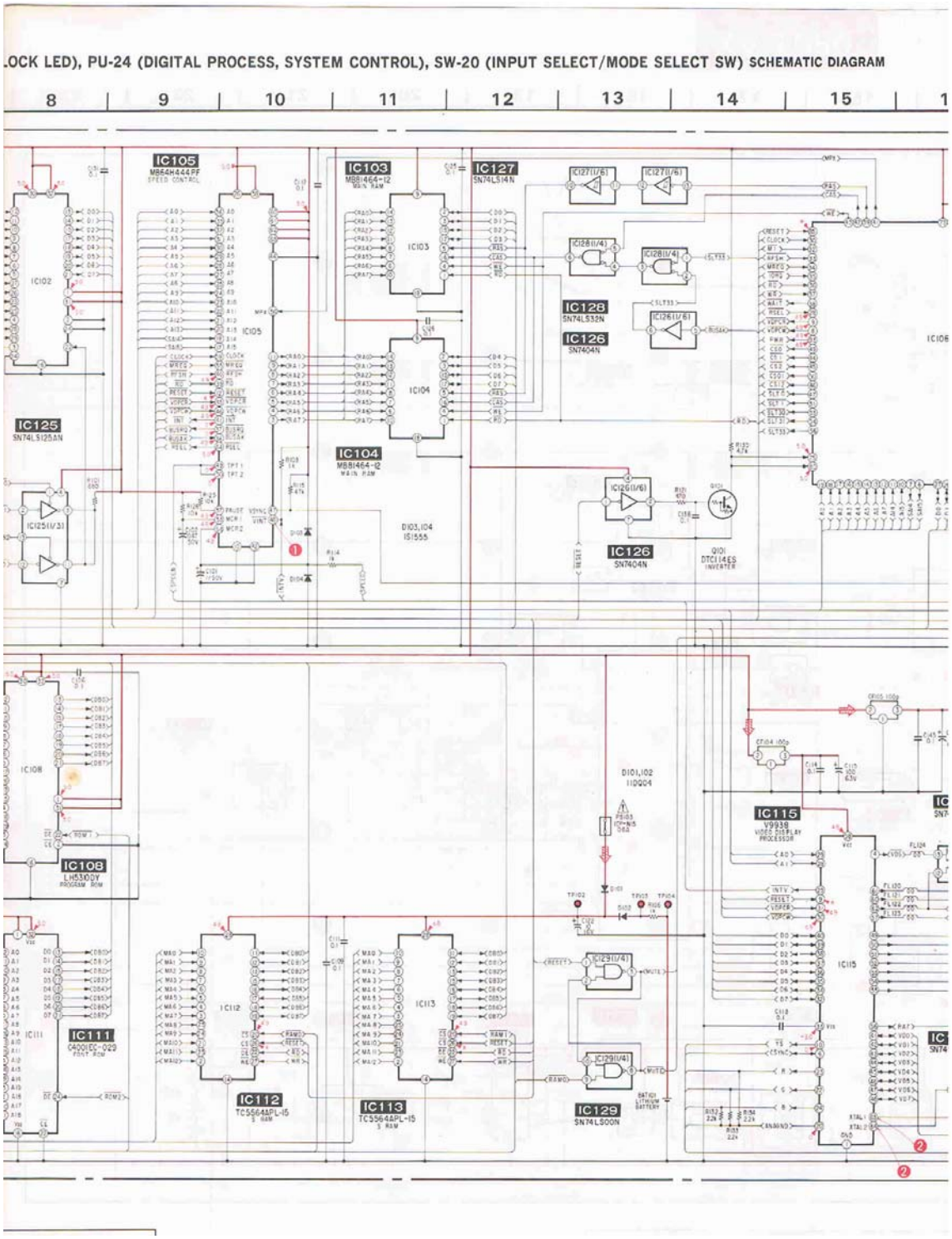

24
25
A
B
C
D
E
F
G
H
I
J
EN-2 BOARD
(See page 22.)
(See page 22.)
(See page 22.)

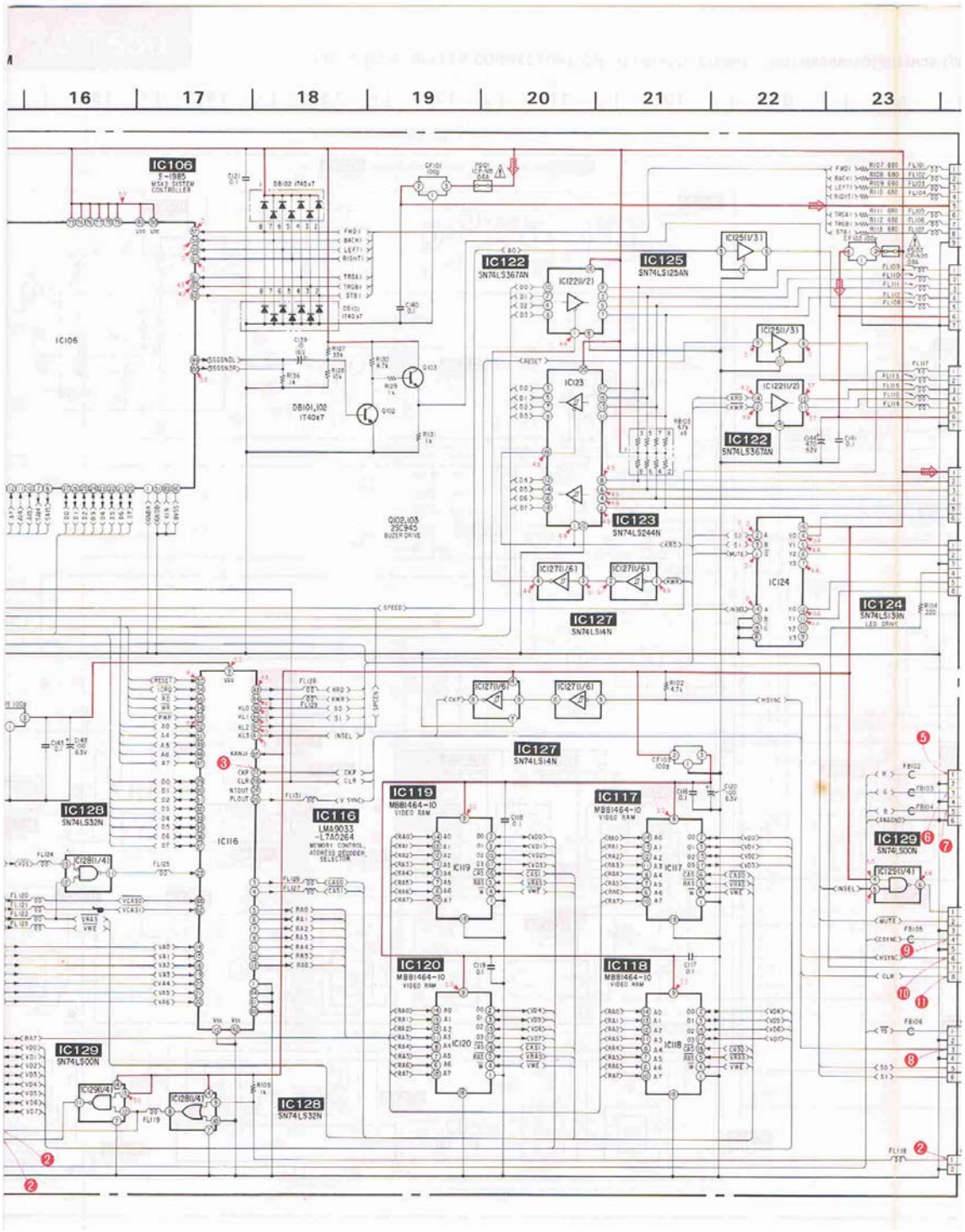
CN-19 (CONTROLLER CONNECTOR), CN-20 (MOUSE CONNECTOR), LE-14 (GENLOCK LED)

—Ref. No. CN-19, CN-20, LE-14, PU-24 and SW-20 BOARDS : 1000 series—



LOCK LED), PU-24 (DIGITAL PROCESS, SYSTEM CONTROL), SW-20 (INPUT SELECT/MODE SELECT SW) SCHEMATIC DIAGRAM




16
17
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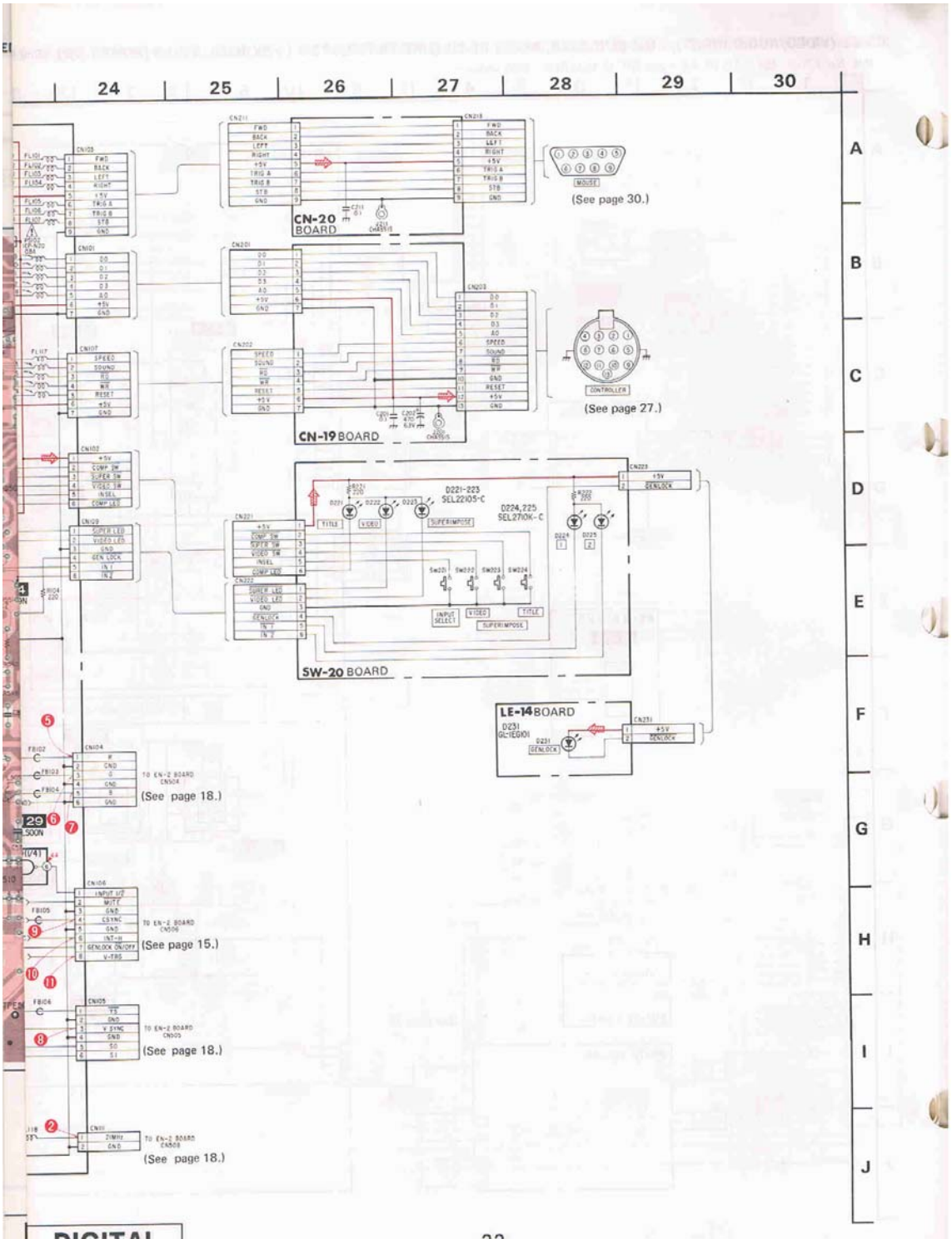
22
23
IC106
IC122
SN74LS367AN
IC125
SN74LS125AN
IC123
SN74LS244N
IC127
SN74LS14N
IC124
SN74LS139N
IC128
SN74LS32N
IC116
LMA9033
-LTA0264
IC119
MBB1464-10
IC120
MBB1464-10
IC117
MBB1464-10
IC118
MBB1464-10
IC129
SN74LS00N
Q102,103
2SC945
BUZZER DRIVE

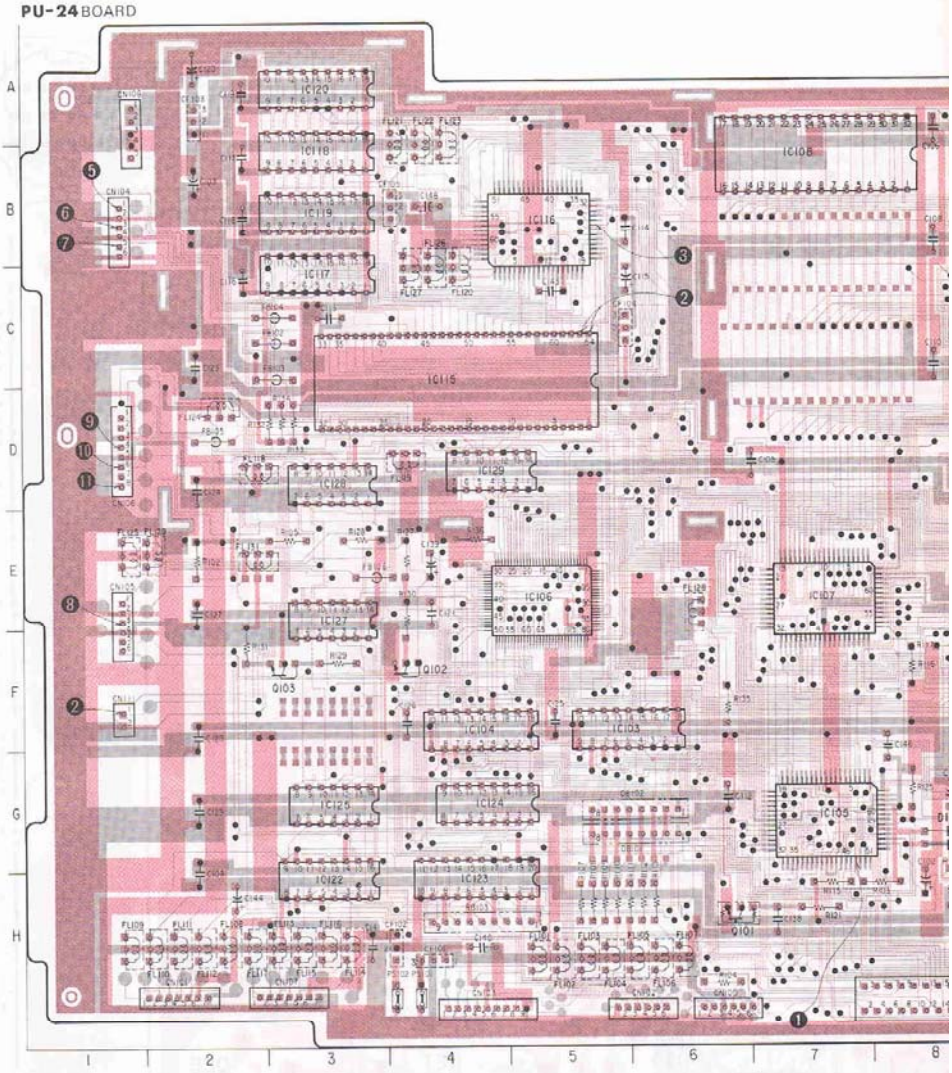

24
25
26
27
28
29
30
A
B
C
D
E
F
G
H
I
J
CN-20 BOARD
CN-19 BOARD
SW-20 BOARD
LE-14 BOARD
(See page 30.)
(See page 27.)
(See page 18.)
(See page 15.)
(See page 18.)
(See page 18.)
MOUSE
CONTROLLER
D221-223 SEL2210S-C
D224,225 SEL2710K-C
D231 GL-1EG101
TO EN-2 BOARD CN504
TO EN-2 BOARD CN506
TO EN-2 BOARD CN505
TO EN-2 BOARD CN508

CN-19 (CONTROLLER CONNECTOR), CN-20 (MOUSE CONNECTOR), LE-14 (GENLOCK LED), PU-24 (DIGITAL PROCESS, S

—Ref. No. CN-19, CN-20, LE-14, PU-24 and SW-20 BOARDS : 1000 series—

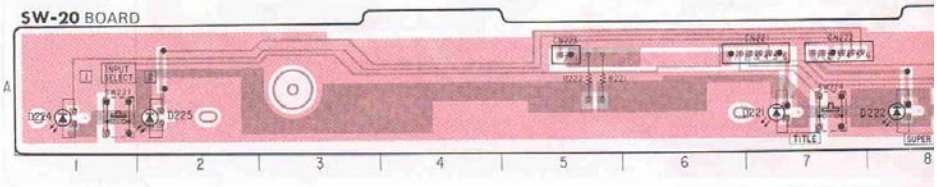
PU-24 BOARD

CN101	H-2
CN102	H-6
CN103	H-4
CN104	B-1
CN105	E-1
CN106	D-1
CN107	H-3
CN108	A-1
CN109	H-6
CN110	H-9
CN111	F-1
D101	B-10
D102	B-10
D103	G-8
D104	G-8
IC101	E-9
IC102	F-9
IC103	F-5
IC104	F-4
IC105	G-7
IC106	E-5
IC107	E-7
IC108	B-7
IC111	C-9
IC112	B-9
IC113	B-9
IC114	D-9
IC115	C-4
IC116	B-5
IC117	C-3
IC118	B-3
IC119	B-3
IC120	A-3
IC121	G-10
IC122	H-3
IC123	H-4
IC124	G-4
IC125	G-3
IC126	H-9
IC127	E-3
IC128	D-3
IC129	D-4
Q101	H-6
Q102	F-4
Q103	F-3
TP101	G-9
TP102	B-10
TP103	C-10
TP104	D-10
TPE101	H-9



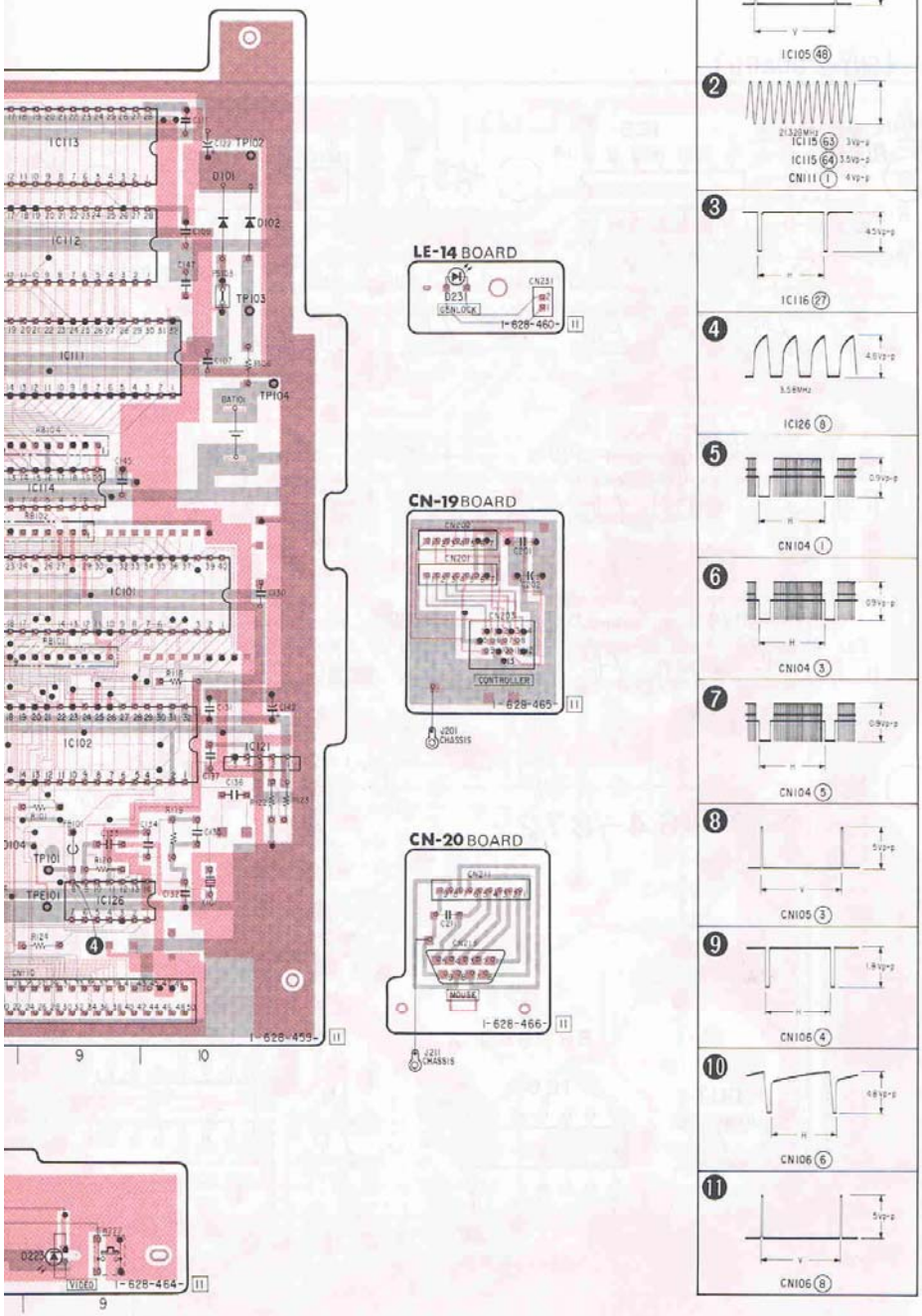
SW-20 BOARD

CN221	A-7
CN222	A-7
CN223	A-5
D221	A-7
D222	A-8
D223	A-9
D224	A-1
D225	A-2



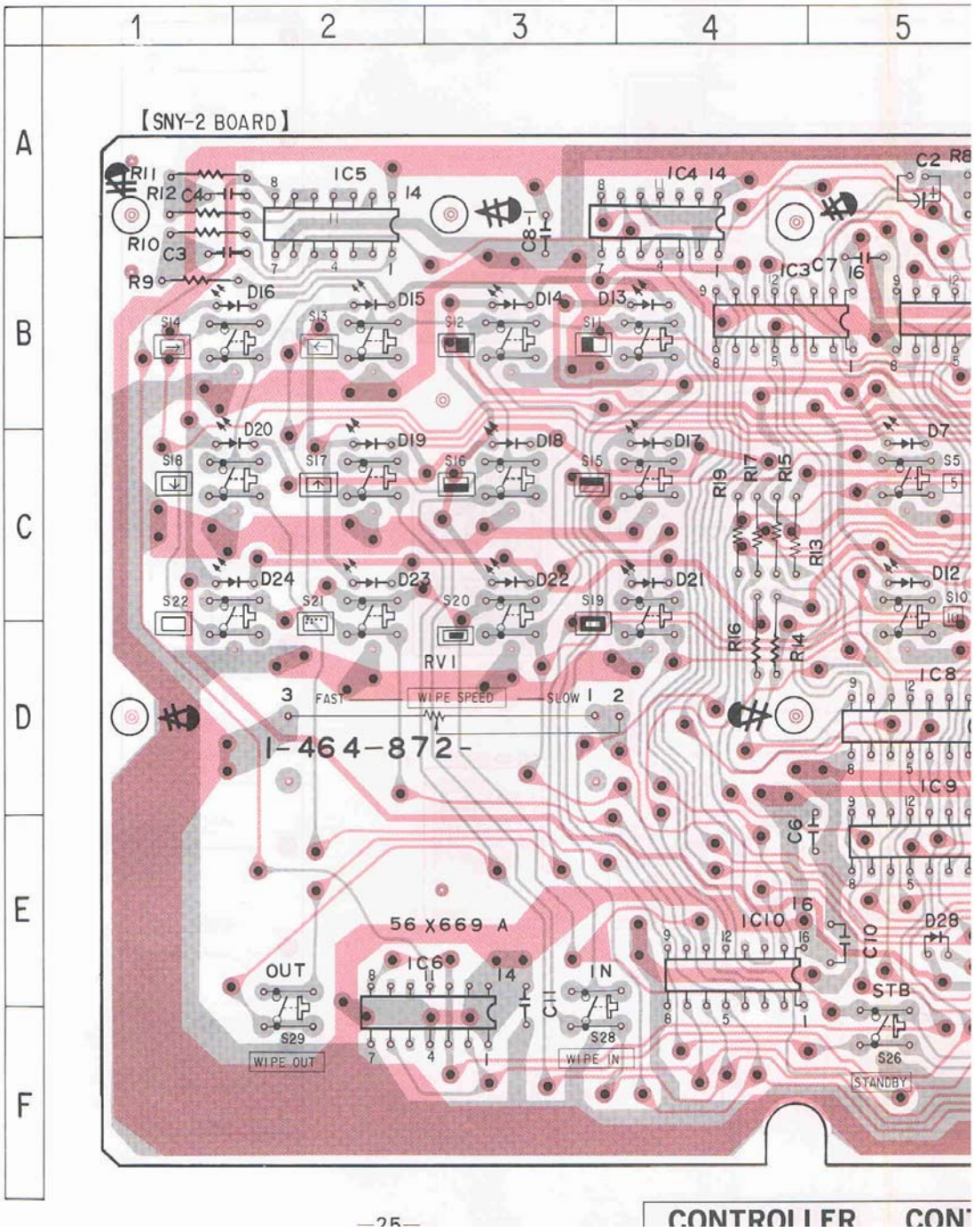
DIGITAL

STEM CONTROL), SW-20 (INPUT SELECT/MODE SELECT SW) PRINTED WIRING BOARDS



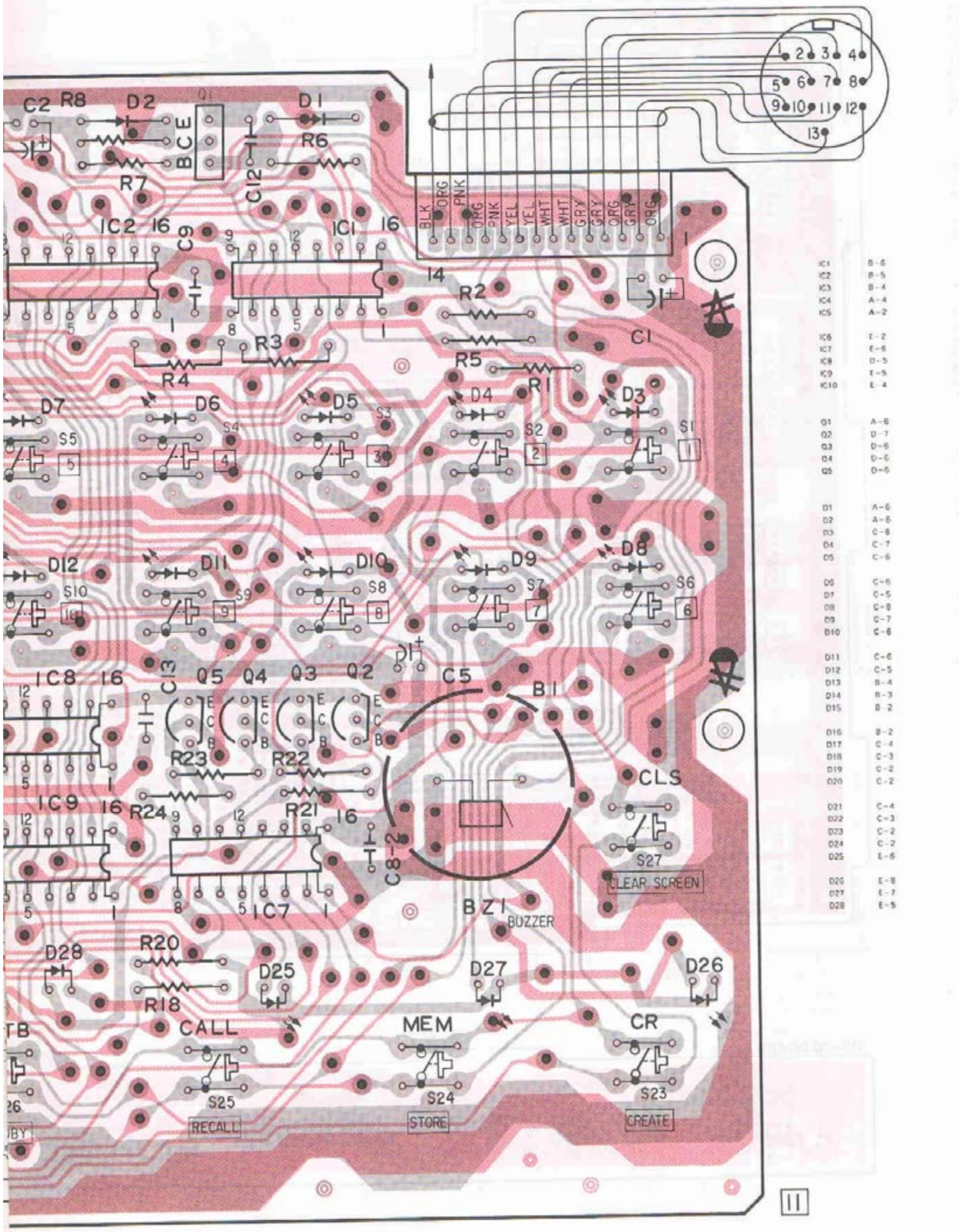
SNY-2 (CONTROLLER) PRINTED WIRING BOARD

—Ref. No. SNY-2 BOARD : 2000 series—



CONTROLLER CON

5	6	7	8	9

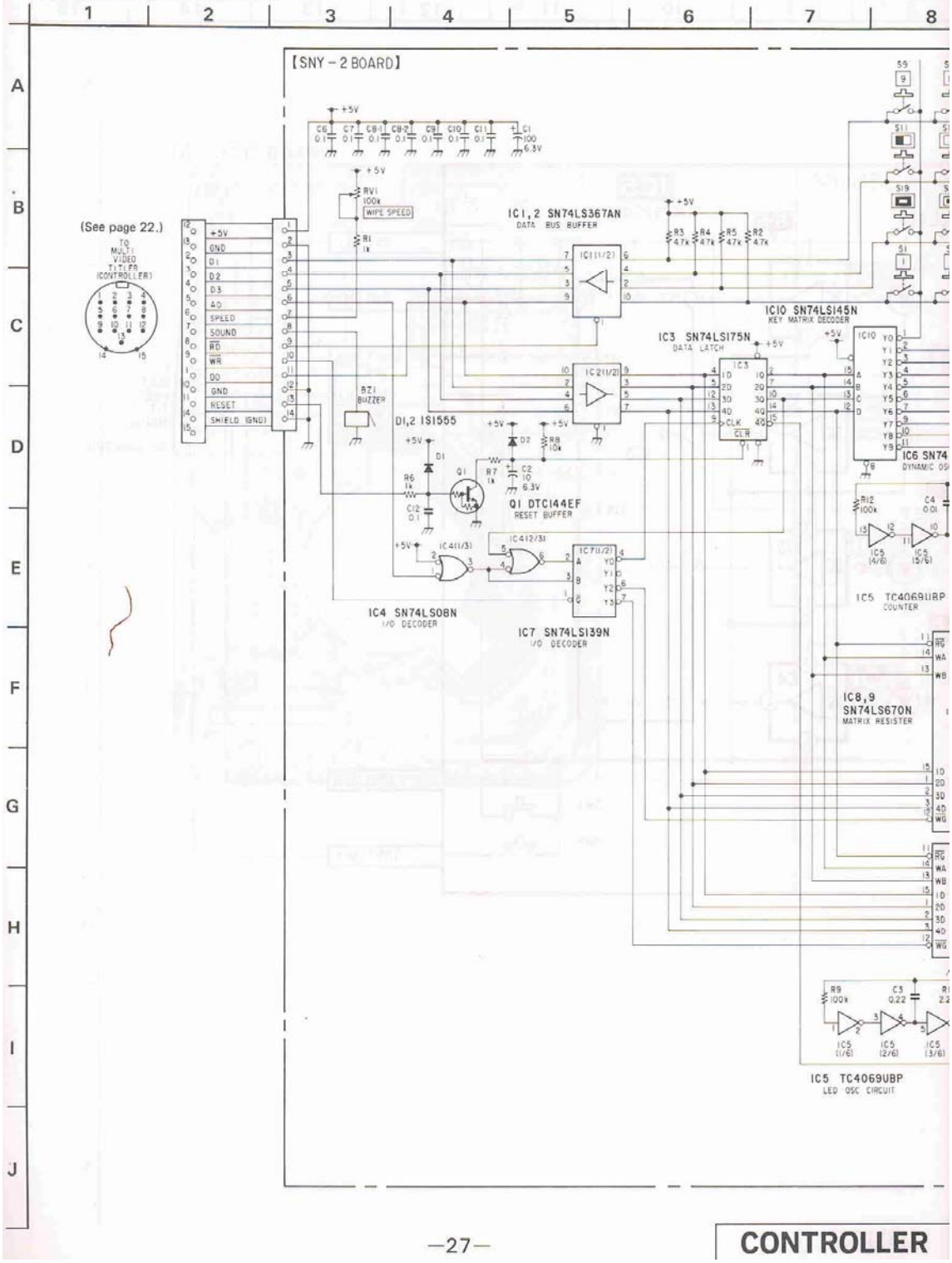


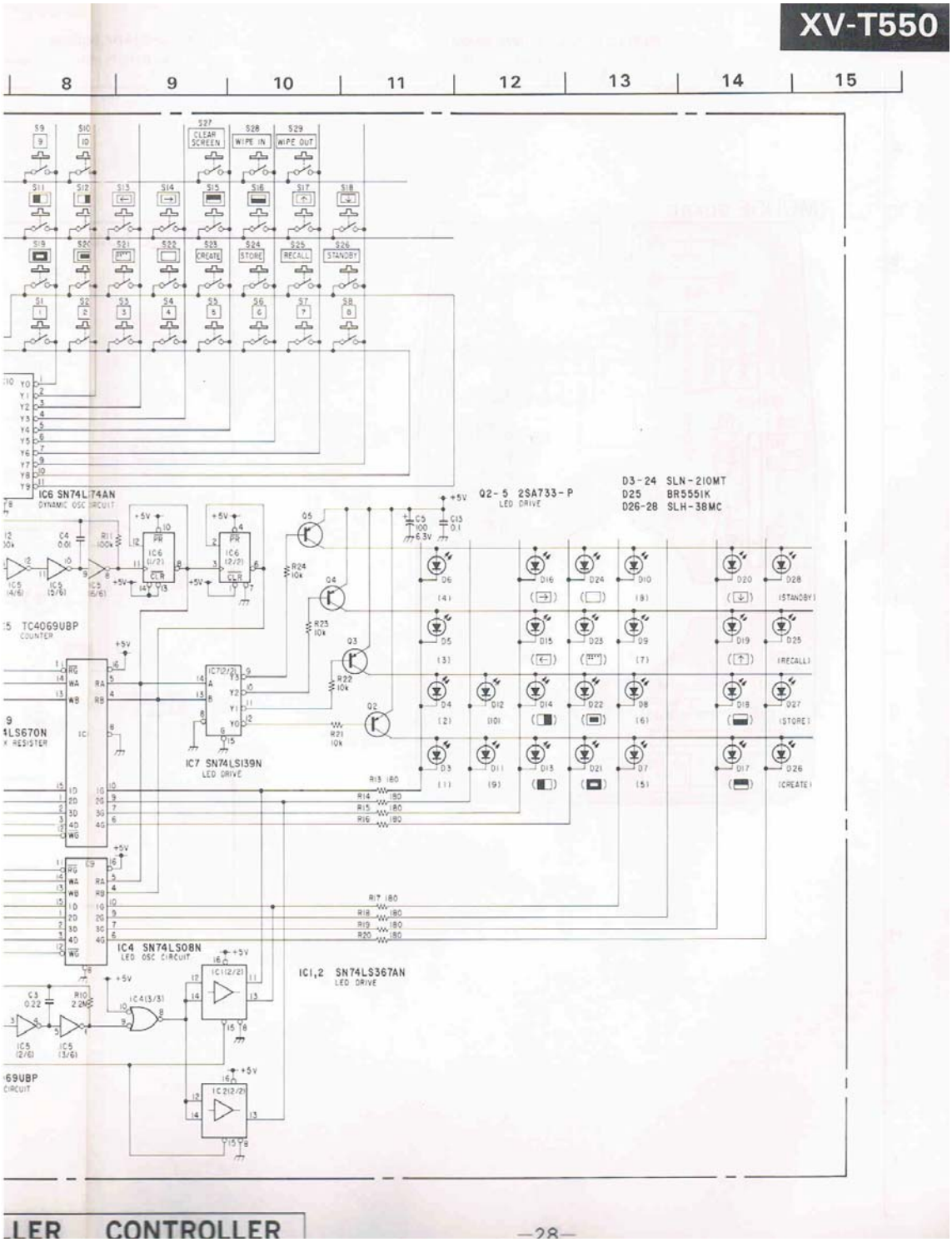
IC1	B-6
IC2	B-5
IC3	B-4
IC4	A-4
IC5	A-2
IC6	E-2
IC7	E-6
IC8	D-5
IC9	E-5
IC10	E-4
Q1	A-6
Q2	D-7
Q3	D-6
Q4	D-6
Q5	D-6
D1	A-6
D2	A-6
D3	C-8
D4	C-7
D5	C-6
D6	C-6
D7	C-5
D8	C-8
D9	C-7
D10	C-6
D11	C-6
D12	C-5
D13	B-4
D14	B-3
D15	B-2
D16	B-2
D17	C-4
D18	C-3
D19	C-2
D20	C-2
D21	C-4
D22	C-3
D23	C-2
D24	C-2
D25	E-6
D26	E-8
D27	E-7
D28	E-5

CONTROLLER

SNY-2 (CONTROLLER) SCHEMATIC DIAGRAM

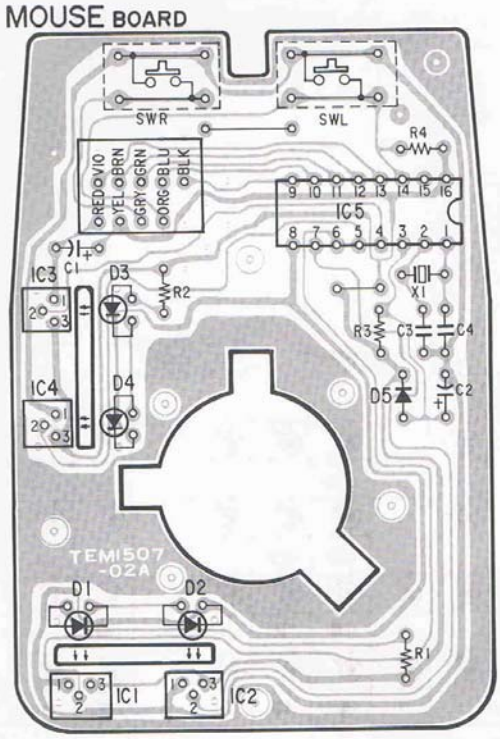
—Ref. No. SNY-2 BOARD : 2000 series—

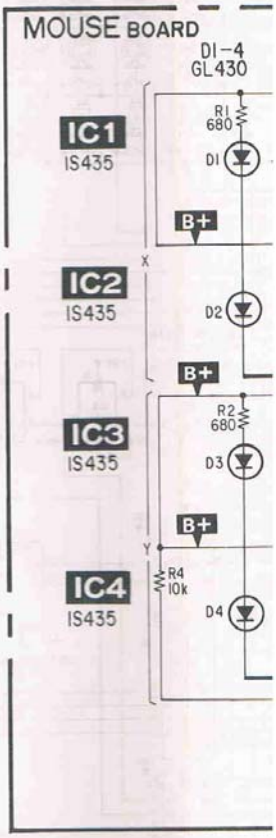



8
9
10
11
12
13
14
15
S27 CLEAR SCREEN
S28 WIPE IN
S29 WIPE OUT
S25 RECALL
S26 STANDBY
S23 CREATE
S24 STORE
IC6 SN74LS74AN
DYNAMIC OSC CIRCUIT
IC7 SN74LS139N
LED DRIVE
IC4 SN74LS08N
LED OSC CIRCUIT
IC1,2 SN74LS367AN
LED DRIVE
Q2-5 2SA733-P
LED DRIVE
D3-24 SLN-210MT
D25 BR5551K
D26-28 SLH-38MC
(STANDBY)
(RECALL)
(STORE)
(CREATE)

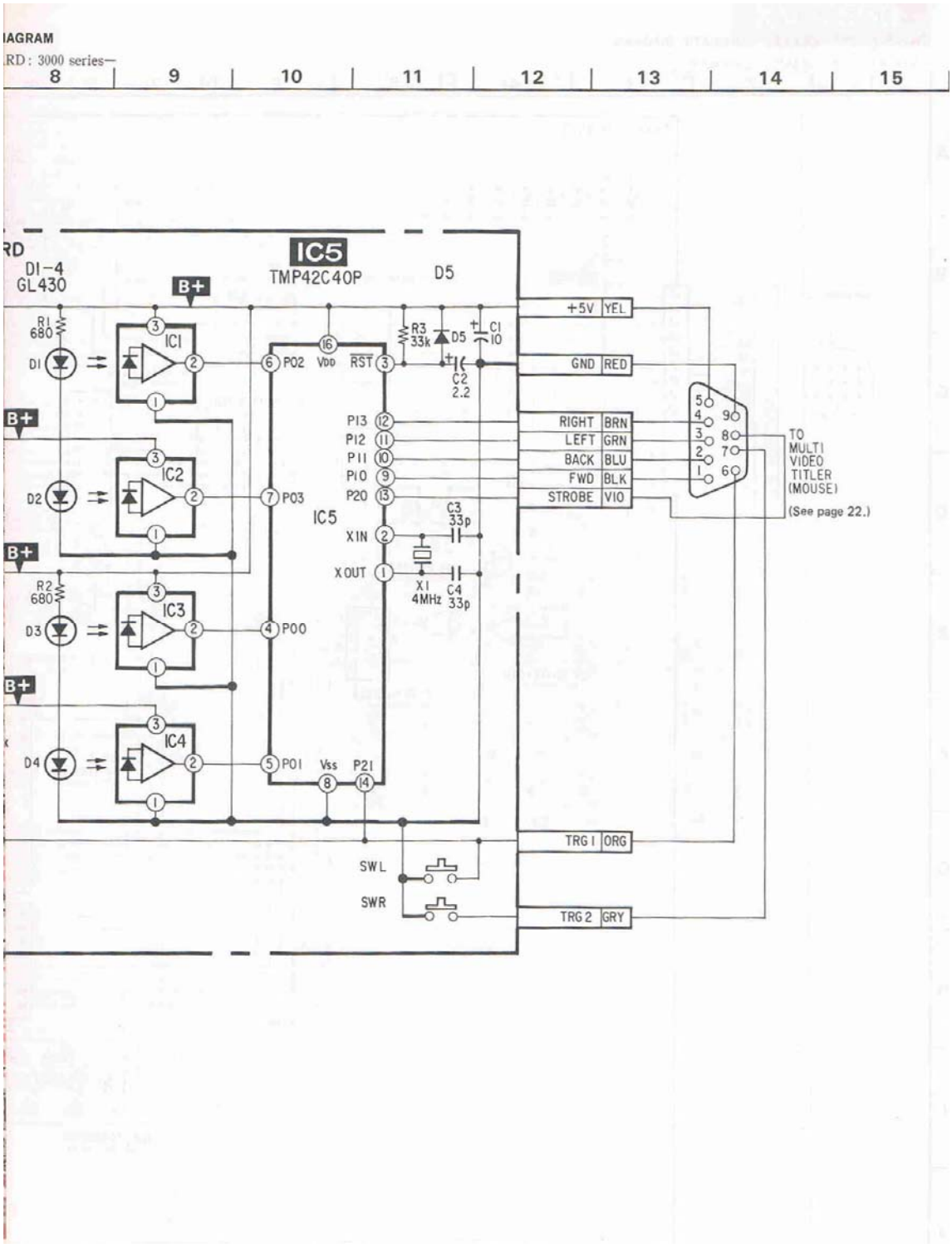
MOUSE PRINTED WIRING BOARD
—Ref. No. MOUSE BOARD : 3000 series—

MOUSE SCHEMATIC DIAGRAM
—Ref. No. MOUSE BOARD : 3000 seri



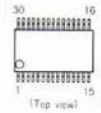


MOUSE MO


8
9
10
11
12
13
14
15
RD
DI-4
GL430
IC5
TMP42C40P
D5
B+
R1
680
D1
IC1
R2
680
D2
IC2
D3
IC3
D4
IC4
P02
P03
P00
P01
Vss
P21
Vdd
RST
R3
33k
D5
C1
10
C2
2.2
P13
P12
P11
P10
P20
IC5
C3
33p
XIN
XOUT
X1
4MHz
C4
33p
SWL
SWR
+5V YEL
GND RED
RIGHT BRN
LEFT GRN
BACK BLU
FWD BLK
STROBE VIO
TRG1 ORG
TRG2 GRY
TO
MULTI
VIDEO
TITLER
(MOUSE)
(See page 22.)

2-2. SEMICONDUCTORS

CXD1158M



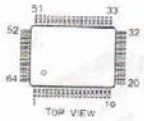
SI-3052V

DTC144EF

GL430

SLN-210MT

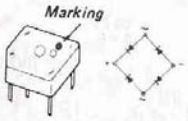
CXD1358
LMA9033-L7A0264
MB64H444PF



μPC78L12

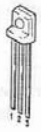
1S1555
10E2N
11DQ04

S4VB60



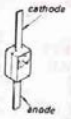
1SS133

IS435

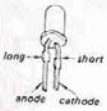


2SA733-P

1T25



SEL2210S

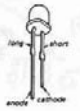


2SA1175
2SC2785

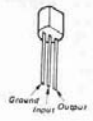
LH5310DY
LH531067
μPD23C4001EC-029

BR5551K

SEL2710K



NJM79L12A



2SC634SP
DTC114ES

GL-1EG101

SLH-38MC

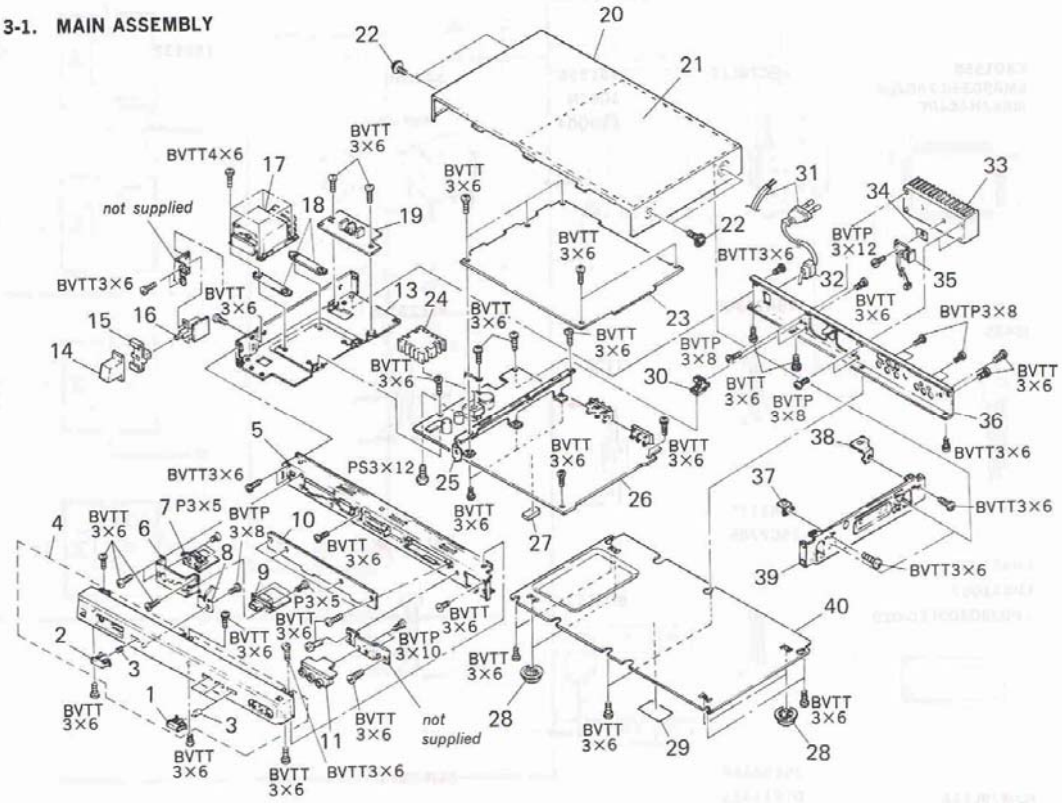
SECTION 3
EXPLODED VIEWS

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.
- Color Indication of Appearance Parts
  Example:
  (RED) . . . KNOB, BALANCE (WHITE)
  ↑ Cabinet's Color ↑ Parts Color

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

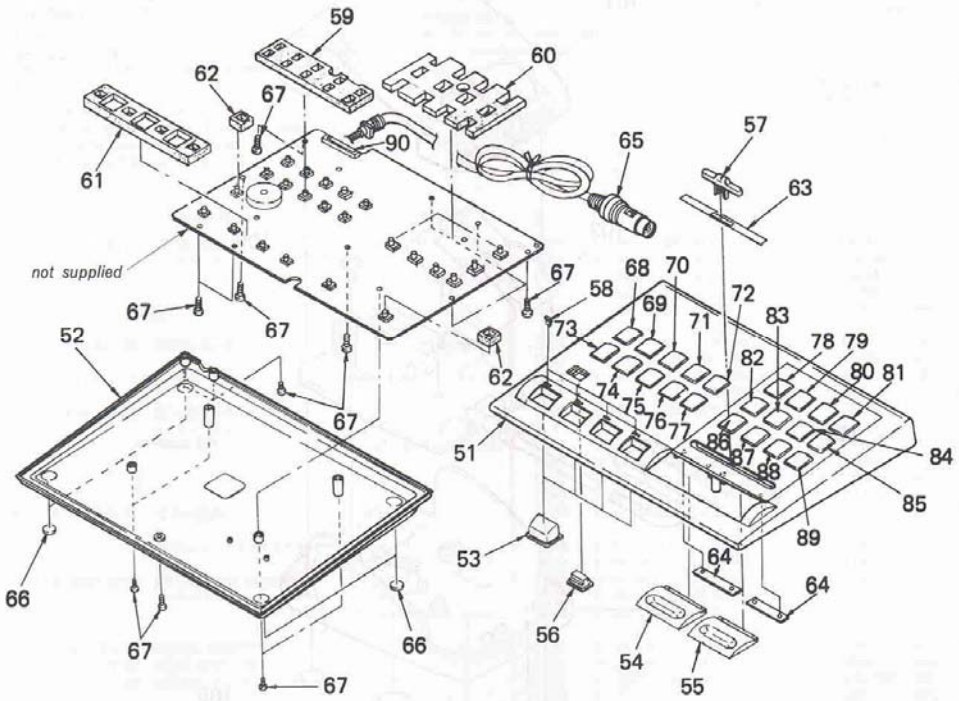
3-1. MAIN ASSEMBLY



Ref.No	Part No.	Description	Remark
1	X-2118-205-1	PUSH BUTTON (SL) ASSY	
2	X-2118-207-1	PUSH BUTTON (SLR) ASSY	
3	2-217-533-00	SPRING, COMPRESSION	1-3
4	X-4613-504-1	PANEL ASSY, FRONT	
5	*4-613-513-01	PANEL, SUB	
6	*2-120-634-01	BRACKET, P CONNECTOR	
7	*1-628-465-11	CN-19 BOARD	
8	*1-628-460-11	LE-14 BOARD	
9	*1-628-466-11	CN-20 BOARD	
10	*1-628-464-11	SW-20 BOARD	
11	*1-628-467-11	CN-21 BOARD	
13	*4-613-512-11	CHASSIS, TRANSFORMER	
14	2-118-215-01	BUTTON (POWER)	
15	2-118-218-01	JOINTER	
16	*1-628-463-11	SW-19 BOARD	
17	⚠1-449-413-11	TRANSFORMER, POWER	
18	*4-613-504-01	BRACKET, TRANSFORMER	
19	*1-628-461-11	PS-10 BOARD	
20	*4-881-528-61	CASE	
21	4-613-506-01	SHEET, CUSHION	

Ref.No	Part No.	Description	Remark
22	4-820-330-31	SCREW	
23	*A-8080-365-A	PU-24 BOARD, COMPLETE	
24	*4-863-132-00	HEAT SINK (SMALL)	
25	*4-613-511-01	BRACKET (D), PC BOARD	
26	*A-8080-364-A	EN-2 BOARD, COMPLETE	24
27	*4-613-507-01	SPACER (A)	
28	X-3701-069-0	FOOT ASSY, M.F	
29	*3-701-030-00	LABEL, SERIAL NUMBER	
30	*4-613-501-01	BRACKET (A), PC BOARD	
31	⚠1-555-001-12	CORD, POWER, (UK MODEL)	
	⚠1-551-908-11	CORD, POWER, EULO PLUG (AEP MODEL)	
32	⚠*3-703-244-00	BUSHING (2104), CORD	
33	*4-613-508-01	HEAT SINK	
34	*4-613-505-01	SHEET, RADIATION	
35	*1-628-462-11	RE-8 BOARD	
36	*4-613-510-11	PLATE, JACK	
37	*4-613-502-01	BRACKET (B), PC BOARD	
38	*4-613-503-01	BRACKET (C), PC BOARD	
39	*4-613-509-01	PLATE, SIDE	
40	*2-374-619-00	PLATE, BOTTOM	

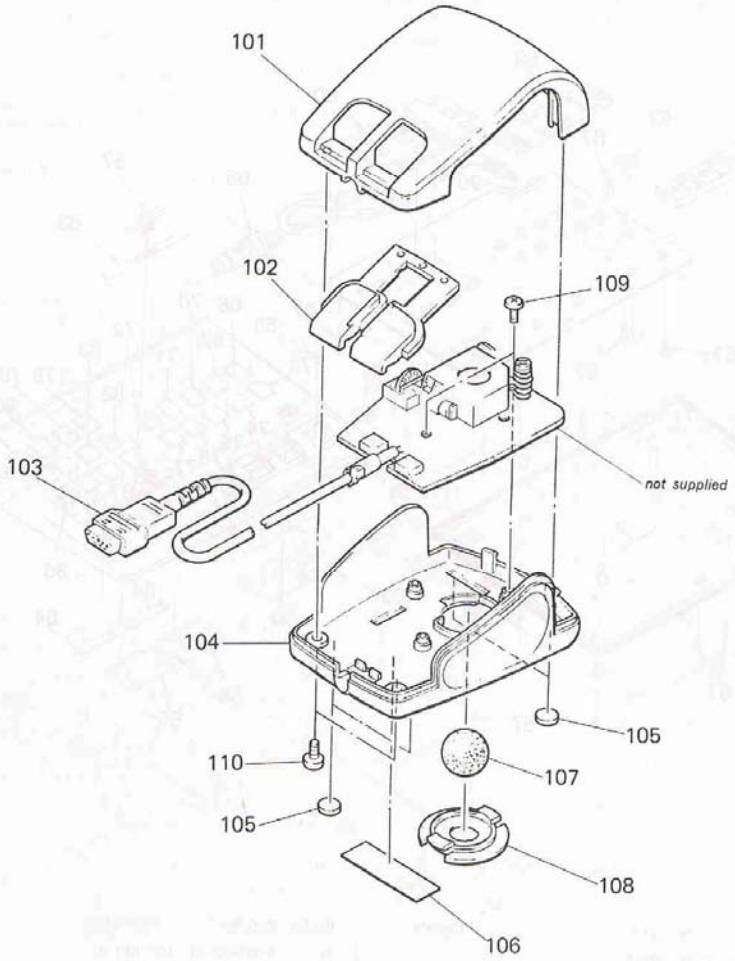
3-2. UNIT, KEY BOARD ASSEMBLY



Ref.No	Part No.	Description	Remark
51	9-994-405-01	CASE, UPPER	
52	9-993-627-01	CASE, LOWER	
53	9-993-628-01	TOR, KEY	
54	9-994-406-01	TOP, KEY (WIPE IN)	
55	9-994-407-01	TOP, KEY (WIPE OUT)	
56	9-993-587-01	TOP, KEY (CLEAR SCREEN)	
57	9-993-588-01	KNOB, VR (WIPE SPEED)	
58	9-993-589-01	CHIP, LIGHT	
59	9-993-590-01	CUSHION	
60	9-993-591-01	CUSHION	
61	9-993-592-01	CUSHION	
62	9-993-593-01	CUSHION	
63	9-993-594-01	PLATE, VR BLIND	
64	9-993-595-01	BRACKET	
65	9-993-596-01	CORD, CONNECTION	
66	9-992-625-01	FOOT, RUBBER	
67	9-993-597-01	SCREW +P 3X5	
68	9-993-604-01	TOP, KEY (1)	
69	9-993-605-01	TOP, KEY (2)	
70	9-993-606-01	TOP, KEY (3)	

Ref.No	Part No.	Description	Remark
71	9-993-607-01	TOP, KEY (4)	
72	9-993-608-01	TOP, KEY (5)	
73	9-993-609-01	TOP, KEY (6)	
74	9-993-610-01	TOP, KEY (7)	
75	9-993-611-01	TOP, KEY (8)	
76	9-993-612-01	TOP, KEY (9)	
77	9-993-613-01	TOP, KEY (10)	
78	9-993-614-01	TOP, KEY ( )	
79	9-993-615-01	TOP, KEY ( )	
80	9-993-616-01	TOP, KEY ( )	
81	9-993-617-01	TOP, KEY ( )	
82	9-993-618-01	TOP, KEY ( )	
83	9-993-619-01	TOP, KEY ( )	
84	9-993-620-01	TOP, KEY ( )	
85	9-993-621-01	TOP, KEY ( )	
86	9-993-622-01	TOP, KEY ( )	
87	9-993-623-01	TOP, KEY ( )	
88	9-993-624-01	TOP, KEY ( )	
89	9-993-625-01	TOP, KEY ( )	
90	9-993-603-01	CONNECTOR	

3-3. MOUSE ASSEMBLY



Ref.No	Part No.	Description	Remark
101	9-995-355-01	COVER, UPPER	
102	9-995-357-01	BUTTON	
103	9-994-905-01	CORD, CONNECTION 9PD	
104	9-995-356-01	COVER, LOWER	
105	9-994-875-01	SHEET	

Ref.No	Part No.	Description	Remark
106	9-994-911-01	LABEL, MODEL NUMBER	
107	9-994-874-01	BALL	
108	9-994-873-01	COVER, BALL	
109	9-994-877-01	SCREW, M2X4	
110	9-994-878-01	SCREW, M3X6	

SECTION 4
ELECTRICAL PARTS LIST

LE-14 | **RE-8** | **EN-2**

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF: μF, PF: μμF.

RESISTORS
- All resistors are in ohms.
- F: nonflammable

COILS
- MMH: mH, UH: μH

SEMICONDUCTORS
In each case, U: μ, for example:
UA...: μA..., UPA...: μPA..., UPC...: μPC, UPD...: μPD...

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description			Remark
	*1-628-460-11	LE-14 BOARD			
		********			(Ref. No. 1000 series)
		DIODE			
D231	8-719-918-67	DIODE GL-1EG101			
**********					
	*1-628-462-11	RE-8 BOARD			
		*******			(Ref. No. 1000 series)
		IC			
IC901	8-749-930-52	IC SI-3052V			
**********					
	*A-8080-364-A	EN-2 BOARD, COMPLETE			
		**********			(Ref. No. 1000 series)
	*3-662-075-00	COVER, CONTROL			
	*4-863-132-00	HEAT SINK (SMALL)			
	7-682-650-09	SCREW PS 3X12			
		CAPACITOR			
C500	1-126-157-11	ELECT	10MF	20%	16V
C501	1-126-157-11	ELECT	10MF	20%	16V
C502	1-124-499-11	ELECT	1MF	20%	50V
C503	1-162-851-11	CERAMIC	0.1MF		16V
C504	1-162-667-11	CERAMIC	10PF	5%	50V
C505	1-126-157-11	ELECT	10MF	20%	16V
C506	1-162-851-11	CERAMIC	0.1MF		16V
C507	1-162-674-11	CERAMIC	39PF	5%	50V
C509	1-162-851-11	CERAMIC	0.1MF		16V
C510	1-124-499-11	ELECT	1MF	20%	50V
C511	1-130-483-00	MYLAR	0.01MF	5%	50V
C512	1-162-673-11	CERAMIC	33PF	5%	50V
C514	1-102-123-00	CERAMIC	0.0033MF	10%	50V
C515	1-130-475-00	MYLAR	0.0022MF	5%	50V
C516	1-130-471-00	MYLAR	0.001MF	5%	50V
C517	1-162-726-11	CERAMIC	470PF	5%	50V
C518	1-130-483-00	MYLAR	0.01MF	5%	50V
C519	1-130-471-00	MYLAR	0.001MF	5%	50V
C520	1-130-469-00	MYLAR	680PF	5%	50V
C521	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C522	1-130-482-00	MYLAR	0.0082MF	5%	50V
C523	1-162-851-11	CERAMIC	0.1MF		16V
C524	1-126-157-11	ELECT	10MF	20%	16V
C525	1-136-171-00	FILM	0.33MF	5%	50V
C526	1-124-499-11	ELECT	1MF	20%	50V
C527	1-126-157-11	ELECT	10MF	20%	16V
C528	1-162-871-11	CERAMIC	47PF	5%	50V
C529	1-124-902-00	ELECT	0.47MF	20%	50V
C530	1-130-491-00	MYLAR	0.047MF	5%	50V
C531	1-130-483-00	MYLAR	0.01MF	5%	50V
C532	1-130-483-00	MYLAR	0.01MF	5%	50V
C533	1-126-233-11	ELECT	22MF	20%	25V
C534	1-162-871-11	CERAMIC	47PF	5%	50V
C535	1-130-483-00	MYLAR	0.01MF	5%	50V
C536	1-162-871-11	CERAMIC	47PF	5%	50V
C537	1-162-671-11	CERAMIC	22PF	5%	50V
C538	1-130-491-00	MYLAR	0.047MF	5%	50V
C539	1-162-851-11	CERAMIC	0.1MF		16V
C540	1-162-851-11	CERAMIC	0.1MF		16V
C541	1-126-101-11	ELECT	100MF	20%	16V
C543	1-126-157-11	ELECT	10MF	20%	16V
C544	1-126-103-11	ELECT	470MF	20%	16V
C545	1-162-851-11	CERAMIC	0.1MF		16V
C546	1-162-851-11	CERAMIC	0.1MF		16V
C547	1-162-851-11	CERAMIC	0.1MF		16V
C548	1-126-103-11	ELECT	470MF	20%	16V
C549	1-126-103-11	ELECT	470MF	20%	16V
C550	1-126-157-11	ELECT	10MF	20%	16V
C551	1-126-103-11	ELECT	470MF	20%	16V
C552	1-130-479-00	MYLAR	0.0047MF	5%	50V
C553	1-124-499-11	ELECT	1MF	20%	50V
C554	1-124-463-00	ELECT	0.1MF	20%	50V
C555	1-130-475-00	MYLAR	0.0022MF	5%	50V
C556	1-130-475-00	MYLAR	0.0022MF	5%	50V
C557	1-162-710-11	CERAMIC	100PF	5%	50V
C558	1-162-710-11	CERAMIC	100PF	5%	50V
C559	1-126-157-11	ELECT	10MF	20%	16V
C560	1-162-718-11	CERAMIC	220PF	5%	50V
C561	1-130-471-00	MYLAR	0.001MF	5%	50V
C562	1-130-471-00	MYLAR	0.001MF	5%	50V
C563	1-130-471-00	MYLAR	0.001MF	5%	50V
C564	1-124-464-11	ELECT	0.22MF	20%	50V
C565	1-130-467-00	MYLAR	470PF	5%	50V
C566	1-162-851-11	CERAMIC	0.1MF		16V
C567	1-130-483-00	MYLAR	0.01MF	5%	50V
C568	1-130-487-00	MYLAR	0.022MF	5%	50V
C569	1-130-475-00	MYLAR	0.0022MF	5%	50V
C570	1-130-477-00	MYLAR	0.0033MF	5%	50V
C571	1-124-499-11	ELECT	1MF	20%	50V
C572	1-130-479-00	MYLAR	0.0047MF	5%	50V
C573	1-162-851-11	CERAMIC	0.1MF		16V
C574	1-126-157-11	ELECT	10MF	20%	16V
C575	1-130-475-00	MYLAR	0.0022MF	5%	50V
C576	1-101-888-00	CERAMIC	68PF	5%	50V
C577	1-101-888-00	CERAMIC	68PF	5%	50V
C578	1-101-888-00	CERAMIC	68PF	5%	50V
C579	1-126-157-11	ELECT	10MF	20%	16V
C580	1-162-851-11	CERAMIC	0.1MF		16V
C581	1-130-483-00	MYLAR	0.01MF	5%	50V

Ref.No	Part No.	Description			Remark
C582	1-130-492-11	MYLAR	0.056MF	5%	50V
C583	1-126-157-11	ELECT	10MF	20%	16V
C584	1-126-157-11	ELECT	10MF	20%	16V
C585	1-102-129-00	CERAMIC	0.01MF	10%	50V
C586	1-162-667-11	CERAMIC	10PF	5%	50V
C587	1-125-428-11	ELECT(BLOCK)	22000MF	20%	16V
C588	1-124-771-00	ELECT	6800MF	20%	25V
C589	1-136-171-00	FILM	0.33MF	5%	50V
C590	1-101-005-00	CERAMIC	0.022MF		50V
C591	1-101-005-00	CERAMIC	0.022MF		50V
C592	1-101-005-00	CERAMIC	0.022MF		50V
C593	1-101-005-00	CERAMIC	0.022MF		50V
C594	1-101-005-00	CERAMIC	0.022MF		50V
C595	1-124-480-11	ELECT	470MF	20%	25V
C596	1-136-171-00	FILM	0.33MF	5%	50V
C597	1-101-005-00	CERAMIC	0.022MF		50V
C598	1-124-480-11	ELECT	470MF	20%	25V
C599	1-136-171-00	FILM	0.33MF	5%	50V
C600	1-124-477-11	ELECT	47MF	20%	25V
C601	1-124-477-11	ELECT	47MF	20%	25V
C602	1-124-477-11	ELECT	47MF	20%	25V
C603	1-162-851-11	CERAMIC	0.1MF		16V
C604	1-162-851-11	CERAMIC	0.1MF		16V
C605	1-162-851-11	CERAMIC	0.1MF		16V
C606	1-162-851-11	CERAMIC	0.1MF		16V
C607	1-162-851-11	CERAMIC	0.1MF		16V
C608	1-162-851-11	CERAMIC	0.1MF		16V
C609	1-162-851-11	CERAMIC	0.1MF		16V
C610	1-162-851-11	CERAMIC	0.1MF		16V
C611	1-162-851-11	CERAMIC	0.1MF		16V
C612	1-162-851-11	CERAMIC	0.1MF		16V
C613	1-124-902-00	ELECT	0.47MF	20%	50V
C614	1-124-902-00	ELECT	0.47MF	20%	50V
C615	1-124-902-00	ELECT	0.47MF	20%	50V
C616	1-124-902-00	ELECT	0.47MF	20%	50V
C617	1-130-471-00	MYLAR	0.001MF	5%	50V
C618	1-130-471-00	MYLAR	0.001MF	5%	50V
C619	1-102-973-00	CERAMIC	100PF	5%	50V
C620	1-162-871-11	CERAMIC	47PF	5%	50V
C621	1-162-851-11	CERAMIC	0.1MF		16V
C622	1-162-712-11	CERAMIC	120PF	5%	50V
C623	1-130-468-00	MYLAR	560PF	5%	50V

CONNECTOR

CN501	1-507-845-41	JACK, PIN (INPUT1)
CN502	*1-563-524-21	JACK, PIN (OUTPUT1/2)
CN503	*1-564-508-11	PLUG, CONNECTOR 5P
CN504	*1-564-340-61	PIN, CONNECTOR 6P
CN505	*1-564-340-81	PIN, CONNECTOR 6P
CN506	*1-564-342-11	PIN, CONNECTOR 8P
CN507	*1-564-509-11	PLUG, CONNECTOR 6P
CN901	*1-508-709-00	PIN, CONNECTOR 5P
CN902	*1-564-506-11	PLUG, CONNECTOR 3P

VARIABLE CAPACITOR

CV501	1-141-245-00	TRIMMER, CERAMIC (30PF)
CV502	1-141-245-00	TRIMMER, CERAMIC (10PF)
CV503	1-141-260-00	TRIMAR, CERAMIC (50PF)

DIODE

D501	8-712-500-00	DIODE 1T25
D502	8-719-504-60	DIODE S4VB60
D503	8-719-200-77	DIODE 10E2N
D504	8-719-200-77	DIODE 10E2N
D505	8-719-815-55	DIODE 1S1555
D506	8-719-815-55	DIODE 1S1555
D507	8-719-815-55	DIODE 1S1555
D508	8-719-815-55	DIODE 1S1555

DELAY LINE

DL502	1-415-608-11	DELAY LINE (WITH TRAP)

FERRITE BEAD RING

FB500	1-410-396-41	INDUCTOR	0.45UH
FB501	1-410-396-41	INDUCTOR	0.45UH
FB502	1-410-396-41	INDUCTOR	0.45UH
FB503	1-410-396-41	INDUCTOR	0.45UH
FB504	1-410-396-41	INDUCTOR	0.45UH
FB505	1-410-396-41	INDUCTOR	0.45UH
FB506	1-410-396-41	INDUCTOR	0.45UH
FB507	1-410-396-41	INDUCTOR	0.45UH
FB510	1-410-396-41	INDUCTOR	0.45UH
FB511	1-410-396-41	INDUCTOR	0.45UH

FILTER

FL501	1-235-439-11	FILTER, BAND PASS (4.43MHZ)
FL502	1-236-058-21	ENCAPSULATED COMPONENT

IC

IC501	8-759-902-21	IC SN74LS221N
IC502	8-759-902-21	IC SN74LS221N
IC503	8-759-900-74	IC SN74LS74AN
IC504	8-759-902-21	IC SN74LS221N
IC505	8-759-901-23	IC SN74LS123N
IC506	8-752-030-75	IC V7020
IC507	8-752-325-58	IC CXD1158M
IC508	8-759-902-21	IC SN74LS221N
IC509	8-759-902-21	IC SN74LS221N
IC510	8-759-100-60	IC UPC1377C
IC511	8-759-972-26	IC LM1881N
IC512	8-759-902-21	IC SN74LS221N
IC513	8-759-131-11	IC UPC311C
IC514	8-759-250-81	IC TC5081AP
IC515	8-759-145-58	IC UPC4558C
IC516	8-759-906-28	IC SN74LS628N
IC517	8-752-033-58	IC V7040
IC518	8-759-900-00	IC SN74LS00N
IC519	8-759-900-04	IC SN74LS04N
IC520	8-759-700-69	IC NJM79L12A
IC521	8-759-178-12	IC UPC78L12
IC522	8-759-145-58	IC UPC4558C
IC523	8-759-007-21	MC74HC4053
IC524	8-759-240-53	IC TC4053BP
IC525	8-759-960-32	IC SN74LS32

COIL

L500	1-408-413-00	INDUCTOR	22UH
L501	1-408-413-00	INDUCTOR	22UH
L502	1-408-414-00	INDUCTOR	27UH
L503	1-408-413-00	INDUCTOR	22UH
L504	1-408-413-00	INDUCTOR	22UH
L505	1-408-413-00	INDUCTOR	22UH
L506	1-408-414-00	INDUCTOR	27UH
L507	1-408-414-00	INDUCTOR	27UH

IC LINK

PS501 ⚠	1-532-686-00	LINK, IC (ICP-N75 2.7A)
PS502 ⚠	1-532-686-00	LINK, IC (ICP-N75 2.7A)
PS503 ⚠	1-532-686-00	LINK, IC (ICP-N75 2.7A)
PS504 ⚠	1-532-685-00	LINK, IC (ICP-N20 0.8A)
PS505 ⚠	1-532-685-00	LINK, IC (ICP-N20 0.8A)

When indicating parts by reference number, please include the board name.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref.No	Part No.	Description			Remark
PS506 ⚠	1-532-685-00	LINK, IC (ICP-N20 0.8A)			
PS507 ⚠	1-532-685-00	LINK, IC (ICP-N20 0.8A)			
		TRANSISTOR			
Q501	8-729-117-54	TRANSISTOR 2SA1175			
Q502	8-729-117-54	TRANSISTOR 2SA1175			
Q503	8-729-178-54	TRANSISTOR 2SC2785			
Q504	8-729-178-54	TRANSISTOR 2SC2785			
Q505	8-729-178-54	TRANSISTOR 2SC2785			
Q506	8-729-117-54	TRANSISTOR 2SA1175			
Q507	8-729-178-54	TRANSISTOR 2SC2785			
Q508	8-729-178-54	TRANSISTOR 2SC2785			
Q509	8-729-178-54	TRANSISTOR 2SC2785			
Q510	8-729-178-54	TRANSISTOR 2SC2785			
Q511	8-729-178-54	TRANSISTOR 2SC2785			
Q512	8-729-178-54	TRANSISTOR 2SC2785			
Q513	8-729-178-54	TRANSISTOR 2SC2785			
Q514	8-729-178-54	TRANSISTOR 2SC2785			
Q515	8-729-117-54	TRANSISTOR 2SA1175			
Q516	8-729-178-54	TRANSISTOR 2SC2785			
Q517	8-729-178-54	TRANSISTOR 2SC2785			
Q518	8-729-178-54	TRANSISTOR 2SC2785			
Q519	8-729-178-54	TRANSISTOR 2SC2785			
Q520	8-729-117-54	TRANSISTOR 2SA1175			
		RESISTOR			
R501	1-249-438-11	CARBON	56K	5%	1/4W
R502	1-249-417-11	CARBON	1K	5%	1/4W
R503	1-249-417-11	CARBON	1K	5%	1/4W
R504	1-249-438-11	CARBON	56K	5%	1/4W
R505	1-249-417-11	CARBON	1K	5%	1/4W
R506	1-249-417-11	CARBON	1K	5%	1/4W
R507	1-247-804-11	CARBON	75	5%	1/4W
R508	1-247-804-11	CARBON	75	5%	1/4W
R509	1-249-421-11	CARBON	2.2K	5%	1/4W
R510	1-249-405-11	CARBON	100	5%	1/4W
R511	1-247-903-00	CARBON	1M	5%	1/4W
R512	1-249-441-11	CARBON	100K	5%	1/4W
R513	1-249-405-11	CARBON	100	5%	1/4W
R514	1-249-413-11	CARBON	470	5%	1/4W
R515	1-249-429-11	CARBON	10K	5%	1/4W
R516	1-249-429-11	CARBON	10K	5%	1/4W
R517	1-249-430-11	CARBON	12K	5%	1/4W
R518	1-249-417-11	CARBON	1K	5%	1/4W
R519	1-249-417-11	CARBON	1K	5%	1/4W
R520	1-249-425-11	CARBON	4.7K	5%	1/4W
R521	1-249-425-11	CARBON	4.7K	5%	1/4W
R522	1-249-412-11	CARBON	390	5%	1/4W
R523	1-249-421-11	CARBON	2.2K	5%	1/4W
R524	1-249-425-11	CARBON	4.7K	5%	1/4W
R525	1-249-425-11	CARBON	4.7K	5%	1/4W
R526	1-249-429-11	CARBON	10K	5%	1/4W
R527	1-249-425-11	CARBON	4.7K	5%	1/4W
R528	1-247-887-00	CARBON	220K	5%	1/4W
R529	1-249-429-11	CARBON	10K	5%	1/4W
R530	1-249-441-11	CARBON	100K	5%	1/4W
R531	1-249-405-11	CARBON	100	5%	1/4W
R532	1-249-441-11	CARBON	100K	5%	1/4W
R533	1-249-421-11	CARBON	2.2K	5%	1/4W
R534	1-249-427-11	CARBON	6.8K	5%	1/4W
R535	1-249-418-11	CARBON	1.2K	5%	1/4W
R536	1-249-418-11	CARBON	1.2K	5%	1/4W
R537	1-249-417-11	CARBON	1K	5%	1/4W
R538	1-249-421-11	CARBON	2.2K	5%	1/4W
R539	1-249-421-11	CARBON	2.2K	5%	1/4W
R540	1-247-893-11	CARBON	390K	5%	1/4W

Ref.No	Part No.	Description			Remark
R541	1-249-413-11	CARBON	470	5%	1/4W
R542	1-249-421-11	CARBON	2.2K	5%	1/4W
R543	1-249-417-11	CARBON	1K	5%	1/4W
R544	1-249-417-11	CARBON	1K	5%	1/4W
R545	1-249-429-11	CARBON	10K	5%	1/4W
R546	1-249-434-11	CARBON	27K	5%	1/4W
R547	1-249-425-11	CARBON	4.7K	5%	1/4W
R548	1-249-413-11	CARBON	470	5%	1/4W
R549	1-249-420-11	CARBON	1.8K	5%	1/4W
R550	1-249-429-11	CARBON	10K	5%	1/4W
R551	1-249-417-11	CARBON	1K	5%	1/4W
R552	1-249-417-11	CARBON	1K	5%	1/4W
R553	1-249-421-11	CARBON	2.2K	5%	1/4W
R554	1-247-804-11	CARBON	75	5%	1/4W
R555	1-247-804-11	CARBON	75	5%	1/4W
R556	1-249-439-11	CARBON	68K	5%	1/4W
R557	1-249-435-11	CARBON	33K	5%	1/4W
R558	1-249-439-11	CARBON	68K	5%	1/4W
R559	1-249-436-11	CARBON	39K	5%	1/4W
R560	1-249-435-11	CARBON	33K	5%	1/4W
R561	1-249-425-11	CARBON	4.7K	5%	1/4W
R562	1-247-899-11	CARBON	680K	5%	1/4W
R563	1-249-430-11	CARBON	12K	5%	1/4W
R564	1-249-429-11	CARBON	10K	5%	1/4W
R565	1-249-433-11	CARBON	22K	5%	1/4W
R566	1-249-417-11	CARBON	1K	5%	1/4W
R567	1-249-424-11	CARBON	3.9K	5%	1/4W
R568	1-249-417-11	CARBON	1K	5%	1/4W
R569	1-249-439-11	CARBON	68K	5%	1/4W
R570	1-249-425-11	CARBON	4.7K	5%	1/4W
R571	1-249-439-11	CARBON	68K	5%	1/4W
R572	1-249-429-11	CARBON	10K	5%	1/4W
R573	1-249-425-11	CARBON	4.7K	5%	1/4W
R574	1-249-423-11	CARBON	3.3K	5%	1/4W
R575	1-249-421-11	CARBON	2.2K	5%	1/4W
R576	1-249-429-11	CARBON	10K	5%	1/4W
R577	1-249-415-11	CARBON	680	5%	1/4W
R578	1-249-429-11	CARBON	10K	5%	1/4W
R579	1-249-427-11	CARBON	6.8K	5%	1/4W
R580	1-249-436-11	CARBON	39K	5%	1/4W
R581	1-249-429-11	CARBON	10K	5%	1/4W
R582	1-249-440-11	CARBON	82K	5%	1/4W
R583	1-249-423-11	CARBON	3.3K	5%	1/4W
R584	1-249-425-11	CARBON	4.7K	5%	1/4W
R585	1-249-429-11	CARBON	10K	5%	1/4W
R586	1-249-421-11	CARBON	2.2K	5%	1/4W
R587	1-249-429-11	CARBON	10K	5%	1/4W
R588	1-249-417-11	CARBON	1K	5%	1/4W
R589	1-249-427-11	CARBON	6.8K	5%	1/4W
R590	1-249-426-11	CARBON	5.6K	5%	1/4W
R591	1-249-417-11	CARBON	1K	5%	1/4W
R592	1-249-422-11	CARBON	2.7K	5%	1/4W
R593	1-249-415-11	CARBON	680	5%	1/4W
R594	1-249-429-11	CARBON	10K	5%	1/4W
R595	1-249-429-11	CARBON	10K	5%	1/4W
R596	1-247-887-00	CARBON	220K	5%	1/4W
R597	1-249-431-11	CARBON	15K	5%	1/4W
R598	1-249-425-11	CARBON	4.7K	5%	1/4W
R599	1-249-429-11	CARBON	10K	5%	1/4W
R602	1-249-413-11	CARBON	470	5%	1/4W
R603	1-249-413-11	CARBON	470	5%	1/4W
R604	1-249-413-11	CARBON	470	5%	1/4W
R605	1-249-425-11	CARBON	4.7K	5%	1/4W
R606	1-249-425-11	CARBON	4.7K	5%	1/4W
R607	1-249-425-11	CARBON	4.7K	5%	1/4W

When indicating parts by reference number, please include the board name.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

EN-2 PU-24

Ref.No	Part No.	Description			Remark
R608	1-249-425-11	CARBON	4.7K	5%	1/4W
R609	1-249-429-11	CARBON	10K	5%	1/4W
R610	1-249-421-11	CARBON	2.2K	5%	1/4W
R611	1-249-423-11	CARBON	3.3K	5%	1/4W
R612	1-249-417-11	CARBON	1K	5%	1/4W
R613	1-249-414-11	CARBON	560	5%	1/4W
R614	1-249-421-11	CARBON	2.2K	5%	1/4W
R615	1-249-437-11	CARBON	47K	5%	1/4W
R616	1-249-437-11	CARBON	47K	5%	1/4W
R617	1-249-437-11	CARBON	47K	5%	1/4W
R618	1-249-437-11	CARBON	47K	5%	1/4W
R619	1-249-422-11	CARBON	2.7K	5%	1/4W
R620	1-249-421-11	CARBON	2.2K	5%	1/4W
R621	1-249-409-11	CARBON	220	5%	1/4W
R622	1-249-405-11	CARBON	100	5%	1/4W
R623	1-249-417-11	CARBON	1K	5%	1/4W

VARIABLE RESISTOR

RV501	1-226-770-11	RES, ADJ, METAL GLAZE	470
RV503	1-226-774-00	RES, ADJ, METAL GLAZE	47K
RV504	1-226-774-00	RES, ADJ, METAL GLAZE	47K
RV505	1-226-772-11	RES, ADJ, METAL GLAZE	4.7K
RV506	1-226-771-11	RES, ADJ, METAL GLAZE	1K
RV507	1-226-771-11	RES, ADJ, METAL GLAZE	1K
RV508	1-226-774-00	RES, ADJ, METAL GLAZE	47K

CRYSTAL

X501	1-527-521-00	VIBRATOR, CRYSTAL (17.734MHz)
X502	1-527-723-00	VIBRATOR, CRYSTAL (14.1875MHz)
X503	1-567-504-11	CRYSTAL, OSC (4.43MHz)

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*A-8080-365-A PU-24 BOARD, COMPLETE

****

(Ref. No. 1000 series)

BATTERY

BAT101	*1-528-138-11	BATTERY, LITHIUM

CAPACITOR

C101	1-124-499-11	ELECT	1MF	20%	50V
C102	1-124-902-00	ELECT	0.47MF	20%	50V
C103	1-124-472-11	ELECT	470MF	20%	6.3V
C104	1-162-851-11	CERAMIC	0.1MF		16V
C105	1-162-851-11	CERAMIC	0.1MF		16V
C106	1-164-159-11	CERAMIC	0.1MF		50V
C107	1-164-159-11	CERAMIC	0.1MF		50V
C108	1-164-159-11	CERAMIC	0.1MF		50V
C109	1-164-159-11	CERAMIC	0.1MF		50V
C110	1-164-159-11	CERAMIC	0.1MF		50V
C111	1-164-159-11	CERAMIC	0.1MF		50V
C112	1-162-851-11	CERAMIC	0.1MF		16V
C113	1-161-485-00	CERAMIC	0.1MF		50V
C114	1-161-485-00	CERAMIC	0.1MF		50V
C115	1-124-225-00	ELECT	100MF	20%	6.3V
C116	1-161-485-00	CERAMIC	0.1MF		50V
C117	1-161-485-00	CERAMIC	0.1MF		50V
C118	1-161-485-00	CERAMIC	0.1MF		50V
C119	1-161-485-00	CERAMIC	0.1MF		50V
C120	1-124-225-00	ELECT	100MF	20%	6.3V
C121	1-162-851-11	CERAMIC	0.1MF		16V
C122	1-126-157-11	ELECT	10MF	20%	16V
C123	1-161-485-00	CERAMIC	0.1MF		50V
C124	1-161-485-00	CERAMIC	0.1MF		50V
C125	1-162-851-11	CERAMIC	0.1MF		16V
C126	1-162-851-11	CERAMIC	0.1MF		16V
C127	1-162-851-11	CERAMIC	0.1MF		16V
C128	1-162-851-11	CERAMIC	0.1MF		16V
C129	1-162-851-11	CERAMIC	0.1MF		16V
C130	1-162-851-11	CERAMIC	0.1MF		16V
C131	1-162-851-11	CERAMIC	0.1MF		16V
C132	1-102-963-00	CERAMIC	33PF	5%	50V
C133	1-102-963-00	CERAMIC	33PF	5%	50V
C134	1-102-129-00	CERAMIC	0.01MF	10%	50V
C135	1-102-963-00	CERAMIC	33PF	5%	50V
C136	1-102-963-00	CERAMIC	33PF	5%	50V
C137	1-162-851-11	CERAMIC	0.1MF		16V
C138	1-162-851-11	CERAMIC	0.1MF		16V
C139	1-126-157-11	ELECT	10MF	20%	16V
C140	1-162-851-11	CERAMIC	0.1MF		16V
C141	1-162-851-11	CERAMIC	0.1MF		16V
C142	1-124-472-11	ELECT	470MF	20%	6.3V
C143	1-161-485-00	CERAMIC	0.1MF		50V
C144	1-124-472-11	ELECT	470MF	20%	6.3V
C145	1-162-851-11	CERAMIC	0.1MF		16V
C146	1-162-851-11	CERAMIC	0.1MF		16V
C147	1-161-485-00	CERAMIC	0.1MF		50V
C148	1-124-225-00	ELECT	100MF	20%	6.3V

CERAMIC FILTER

CF101	1-236-058-21	ENCAPSULATED COMPONENT 100PF
CF102	1-236-058-21	ENCAPSULATED COMPONENT 100PF
CF103	1-236-058-21	ENCAPSULATED COMPONENT 100PF
CF104	1-236-058-21	ENCAPSULATED COMPONENT 100PF
CF105	1-236-058-21	ENCAPSULATED COMPONENT 100PF

CONNECTOR

CN101	*1-564-341-11	PIN, CONNECTOR 7P
CN102	*1-564-340-00	PIN, CONNECTOR 6P
CN103	*1-506-503-11	PIN, CONNECTOR 9P
CN107	*1-564-341-71	PIN, CONNECTOR 7P
CN109	*1-564-340-71	PIN, CONNECTOR 6P
CN110	1-562-383-00	SOCKET, CONNECTOR
CN111	*1-564-505-11	PLUG, CONNECTOR 2P

DIODE

D101	8-719-200-29	DIODE 11DQ04
D102	8-719-200-29	DIODE 11DQ04
D103	8-719-815-55	DIODE 1S1555
D104	8-719-815-55	DIODE 1S1555

FERRITE BEAD RING

FB101	1-410-396-41	INDUCTOR	0.45UH
FB102	1-410-396-41	INDUCTOR	0.45UH
FB103	1-410-396-41	INDUCTOR	0.45UH
FB104	1-410-396-41	INDUCTOR	0.45UH
FB105	1-410-396-41	INDUCTOR	0.45UH
FB106	1-410-396-41	INDUCTOR	0.45UH

FILTER

FL101	1-421-972-11	COIL, LINE FILTER
FL102	1-421-972-11	COIL, LINE FILTER
FL103	1-421-972-11	COIL, LINE FILTER
FL104	1-421-972-11	COIL, LINE FILTER
FL105	1-421-972-11	COIL, LINE FILTER
FL106	1-421-972-11	COIL, LINE FILTER
FL107	1-421-972-11	COIL, LINE FILTER
FL108	1-421-972-11	COIL, LINE FILTER
FL109	1-421-972-11	COIL, LINE FILTER
FL110	1-421-972-11	COIL, LINE FILTER

When indicating parts by reference number, please include the board

Ref.No	Part No.	Description	Remark
FL111	1-421-972-11	COIL, LINE FILTER	
FL112	1-421-972-11	COIL, LINE FILTER	
FL113	1-421-972-11	COIL, LINE FILTER	
FL114	1-421-972-11	COIL, LINE FILTER	
FL115	1-421-972-11	COIL, LINE FILTER	
FL116	1-421-972-11	COIL, LINE FILTER	
FL117	1-421-972-11	COIL, LINE FILTER	
FL118	1-424-151-21	COIL, LINE FILTER	
FL119	1-424-151-21	COIL, LINE FILTER	
FL120	1-424-151-21	COIL, LINE FILTER	
FL121	1-424-151-21	COIL, LINE FILTER	
FL122	1-424-151-21	COIL, LINE FILTER	
FL123	1-424-151-21	COIL, LINE FILTER	
FL124	1-424-151-21	COIL, LINE FILTER	
FL125	1-424-151-21	COIL, LINE FILTER	
FL126	1-424-151-21	COIL, LINE FILTER	
FL127	1-424-151-21	COIL, LINE FILTER	
FL128	1-421-972-11	COIL, LINE FILTER	
FL129	1-421-972-11	COIL, LINE FILTER	
FL130	1-421-972-11	COIL, LINE FILTER	
FL131	1-421-972-11	COIL, LINE FILTER	
		IC	
IC101	8-759-916-80	IC LH0080A	
IC102	8-759-970-74	IC LH531067	
IC103	8-759-922-42	IC MB81464-12	
IC104	8-759-922-42	IC MB81464-12	
IC105	8-759-939-62	IC MB64H444PF	
IC106	8-759-933-46	IC S-1985	
IC107	8-759-794-29	IC CXD1358	
IC108	8-759-980-36	IC LH5310DY	
IC111	8-759-143-74	IC UPD23C4001FC-029	
IC112	8-759-230-75	IC TC5564APL-15	
IC113	8-759-230-75	IC TC5564APL-15	
IC114	8-759-902-45	IC SN74LS245N	
IC115	8-759-922-51	IC V9938	
IC116	8-759-980-37	IC LMA9033-L7A0264	
IC117	8-759-929-47	IC MB81464-10	
IC118	8-759-929-47	IC MB81464-10	
IC119	8-759-929-47	IC MB81464-10	
IC120	8-759-929-47	IC MB81464-10	
IC121	8-759-603-69	IC M51957BL	
IC122	8-759-903-67	IC SN74LS367AN	
IC123	8-759-902-44	IC SN74LS244N	
IC124	8-759-901-39	IC SN74LS139N	
IC125	8-759-901-25	IC SN74LS125AN	
IC126	8-759-974-04	IC SN7404N	
IC127	8-759-900-14	IC SN74LS14N	
IC128	8-759-900-32	IC SN74LS32N	
IC129	8-759-900-00	IC SN74LS00N	
		IC LINK	
PS101 ⚠	1-532-679-00	LINK, IC (ICP-N15 0.6A)	
PS102 ⚠	1-532-685-00	LINK, IC (ICP-N20 0.8A)	
PS103 ⚠	1-532-679-00	LINK, IC (ICP-N15 0.6A)	
		TRANSISTOR	
Q101	8-729-900-80	TRANSISTOR DTC114ES	
Q102	8-729-600-27	TRANSISTOR 2SC634SP	
Q103	8-729-600-27	TRANSISTOR 2SC634SP	
		RESISTOR	
R101	1-249-415-11	CARBON 680 5% 1/4W	
R102	1-249-425-11	CARBON 4.7K 5% 1/4W	
R103	1-249-417-11	CARBON 1K 5% 1/4W	

Ref.No	Part No.	Description	Remark
R104	1-249-409-11	CARBON 220 5% 1/4W	
R105	1-249-417-11	CARBON 1K 5% 1/4W	
R106	1-249-417-11	CARBON 1K 5% 1/4W	
R107	1-249-415-11	CARBON 680 5% 1/4W	
R108	1-249-415-11	CARBON 680 5% 1/4W	
R109	1-249-415-11	CARBON 680 5% 1/4W	
R110	1-249-415-11	CARBON 680 5% 1/4W	
R111	1-249-415-11	CARBON 680 5% 1/4W	
R112	1-249-415-11	CARBON 680 5% 1/4W	
R113	1-249-415-11	CARBON 680 5% 1/4W	
R114	1-249-417-11	CARBON 1K 5% 1/4W	
R115	1-249-425-11	CARBON 4.7K 5% 1/4W	
R116	1-249-417-11	CARBON 1K 5% 1/4W	
R117	1-249-417-11	CARBON 1K 5% 1/4W	
R118	1-249-415-11	CARBON 680 5% 1/4W	
R119	1-249-414-11	CARBON 560 5% 1/4W	
R120	1-249-414-11	CARBON 560 5% 1/4W	
R121	1-249-413-11	CARBON 470 5% 1/4W	
R122	1-249-419-11	CARBON 1.5K 5% 1/4W	
R123	1-249-424-11	CARBON 3.9K 5% 1/4W	
R124	1-249-425-11	CARBON 4.7K 5% 1/4W	
R125	1-249-429-11	CARBON 10K 5% 1/4W	
R126	1-249-429-11	CARBON 10K 5% 1/4W	
R127	1-249-435-11	CARBON 33K 5% 1/4W	
R128	1-249-429-11	CARBON 10K 5% 1/4W	
R129	1-249-417-11	CARBON 1K 5% 1/4W	
R130	1-249-425-11	CARBON 4.7K 5% 1/4W	
R131	1-249-417-11	CARBON 1K 5% 1/4W	
R132	1-249-421-11	CARBON 2.2K 5% 1/4W	
R133	1-249-421-11	CARBON 2.2K 5% 1/4W	
R134	1-249-421-11	CARBON 2.2K 5% 1/4W	
R135	1-249-425-11	CARBON 4.7K 5% 1/4W	
R136	1-249-417-11	CARBON 1K 5% 1/4W	
		CRYSTAL	
X101	1-567-505-11	CRYSTAL, OSC (3.58MHz)	
		**********	
	*1-628-463-11	SW-19 BOARD ********	(Ref. No. 1000 series)
		SWITCH	
SW961 ⚠	1-553-318-23	SWITCH, PUSH (1 KEY) (POWER)	
		**********	
	*1-628-464-11	SW-20 BOARD ********	(Ref. No. 1000 series)
		CONNECTOR	
CN223	*1-564-336-41	PIN, CONNECTOR 2P	
		DIODE	
D221	8-719-301-38	DIODE SEL2210S-C (TITLE)	
D222	8-719-301-38	DIODE SEL2210S-C (VIDEO)	
D223	8-719-301-38	DIODE SEL2210S-C (SUPERIMPOSE)	
D224	8-719-300-95	DIODE SEL2710K (1)	
D225	8-719-300-95	DIODE SEL2710K (2)	
		RESISTOR	
R221	1-249-409-11	CARBON 220 5% 1/4W	
R222	1-249-409-11	CARBON 220 5% 1/4W	

When indicating parts by reference number, please include the board name.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

SW-20 | CN-19 | CN-20 | CN-21 | PS-10 | SNY-2

Ref.No	Part No.	Description			Remark
		SWITCH			
SW221	1-554-303-21	SWITCH, KEY BOARD (INPUT SELECT)			
SW222	1-554-303-21	SWITCH, KEY BOARD (VIDEO)			
SW223	1-554-303-21	SWITCH, KEY BOARD (SUPERIMPOSE)			
SW224	1-554-303-21	SWITCH, KEY BOARD (TITLE)			
**********					
	*1-628-465-11	CN-19 BOARD			
		********			
					(Ref. No. 1000 series)
		CAPACITOR			
C201	1-162-851-11	CERAMIC	0.1MF		16V
C202	1-124-472-11	ELECT	470MF	20%	6.3V
		CONNECTOR			
CN203	1-562-407-11	SOCKET 13P (CONTROLLER)			
**********					
	*1-628-466-11	CN-20 BOARD			
		********			
					(Ref. No. 1000 series)
		CAPACITOR			
C211	1-162-851-11	CERAMIC	0.1MF		16V
		CONNECTOR			
CN213	1-564-372-00	PIN, CONNECTOR 9P (MOUSE)			
**********					
	*1-628-467-11	CN-21 BOARD			
		********			
					(Ref. No. 1000 series)
		CONNECTOR			
CN601	1-507-845-41	JACK, PIN (INPUT2)			
**********					
	*1-628-461-11	PS-10 BOARD			
		********			
					(Ref. No. 1000 series)
	1-533-183-11	HOLDER, FUSE			
		CAPACITOR			
C951	⚠1-136-211-12	FILM	0.022MF	20%	250V
C952	⚠1-136-211-12	FILM	0.022MF	20%	250V
C953	⚠1-161-742-51	CERAMIC	0.0022MF	20%	400V
		FUSE			
F951	⚠1-532-259-11	FUSE TIME LAG 1.6A			
		COIL			
L951	⚠1-421-895-11	COIL, SU (LFT)			
**********					
		SNY-2 BOARD			
		********			
					(Ref. No. 2000 series)
	9-993-603-01	CONNECTOR 14P			

Ref.No	Part No.	Description			Remark
		BUZZER			
BZ1	9-993-601-01	BUZZER			
		CAPACITOR			
C1	1-124-225-00	ELECT	100MF	20%	6.3V
C2	1-126-157-11	ELECT	10MF	20%	6.3V
C3	1-162-562-11	CERAMIC	0.22MF		16V
C4	1-164-095-11	CERAMIC	0.01MF	20%	16V
C5	1-124-225-00	ELECT	100MF	20%	6.3V
C6	1-162-851-11	CERAMIC	0.1MF	10%	16V
C7	1-162-851-11	CERAMIC	0.1MF	10%	16V
C8-1	1-162-851-11	CERAMIC	0.1MF	10%	16V
C8-2	1-162-851-11	CERAMIC	0.1MF	10%	16V
C9	1-162-851-11	CERAMIC	0.1MF	10%	16V
C10	1-162-851-11	CERAMIC	0.1MF	10%	16V
C11	1-162-851-11	CERAMIC	0.1MF	10%	16V
C12	1-162-851-11	CERAMIC	0.1MF	10%	16V
C13	1-162-851-11	CERAMIC	0.1MF	10%	16V
		DIODE			
D1	8-719-815-55	DIODE 1S1555			
D2	8-719-815-55	DIODE 1S1555			
D3	9-993-598-01	DIODE SLN-210MT			
D4	9-993-598-01	DIODE SLN-210MT			
D5	9-993-598-01	DIODE SLN-210MT			
D6	9-993-598-01	DIODE SLN-210MT			
D7	9-993-598-01	DIODE SLN-210MT			
D8	9-993-598-01	DIODE SLN-210MT			
D9	9-993-598-01	DIODE SLN-210MT			
D10	9-993-598-01	DIODE SLN-210MT			
D11	9-993-598-01	DIODE SLN-210MT			
D12	9-993-598-01	DIODE SLN-210MT			
D13	9-993-598-01	DIODE SLN-210MT			
D14	9-993-598-01	DIODE SLN-210MT			
D15	9-993-598-01	DIODE SLN-210MT			
D16	9-993-598-01	DIODE SLN-210MT			
D17	9-993-598-01	DIODE SLN-210MT			
D18	9-993-598-01	DIODE SLN-210MT			
D19	9-993-598-01	DIODE SLN-210MT			
D20	9-993-598-01	DIODE SLN-210MT			
D21	9-993-598-01	DIODE SLN-210MT			
D22	9-993-598-01	DIODE SLN-210MT			
D23	9-993-598-01	DIODE SLN-210MT			
D24	9-993-598-01	DIODE SLN-210MT			
D25	8-719-945-71	DIODE BR5551K			
D26	9-993-599-01	DIODE SLH-38MC			
D27	9-993-599-01	DIODE SLH-38MC			
D28	9-993-599-01	DIODE SLH-38MC			
		IC			
IC1	8-759-903-67	IC SN74LS367AN			
IC2	8-759-903-67	IC SN74LS367AN			
IC3	8-759-901-75	IC SN74LS175N			
IC4	8-759-900-08	IC SN74LS08N			
IC5	8-759-240-69	IC TC4069UBP			
IC6	8-759-900-74	IC SN74LS74AN			
IC7	8-759-901-39	IC SN74LS139N			
IC8	8-759-906-70	IC SN74LS670N			
IC9	8-759-906-70	IC SN74LS670N			
IC10	8-759-901-45	IC SN74LS145N			
		TRANSISTOR			
Q1	8-729-900-33	TRANSISTOR DTC144EF			
Q2	8-729-173-37	TRANSISTOR 2SA733-P			
Q3	8-729-173-37	TRANSISTOR 2SA733-P			

When indicating parts by reference number, please include the board name.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref.No	Part No.	Description			Remark
Q4	8-729-173-37	TRANSISTOR 2SA733-P			
Q5	8-729-173-37	TRANSISTOR 2SA733-P			
		RESISTOR			
R1	1-247-713-11	CARBON	1K	5% 1/4W	
R2	1-247-721-11	CARBON	4.7K	5% 1/4W	
R3	1-247-721-11	CARBON	4.7K	5% 1/4W	
R4	1-247-721-11	CARBON	4.7K	5% 1/4W	
R5	1-247-721-11	CARBON	4.7K	5% 1/4W	
R6	1-247-713-11	CARBON	1K	5% 1/4W	
R7	1-247-713-11	CARBON	1K	5% 1/4W	
R8	1-247-725-11	CARBON	10K	5% 1/4W	
R9	1-249-469-11	CARBON	100K	5% 1/4W	
R10	1-249-749-00	CARBON	2.2K	5% 1/4W	
R11	1-249-469-11	CARBON	100K	5% 1/4W	
R12	1-249-469-11	CARBON	100K	5% 1/4W	
R13	1-247-703-11	CARBON	180	5% 1/4W	
R14	1-247-703-11	CARBON	180	5% 1/4W	
R15	1-247-703-11	CARBON	180	5% 1/4W	
R16	1-247-703-11	CARBON	180	5% 1/4W	
R17	1-247-703-11	CARBON	180	5% 1/4W	
R18	1-247-703-11	CARBON	180	5% 1/4W	
R19	1-247-703-11	CARBON	180	5% 1/4W	
R20	1-247-703-11	CARBON	180	5% 1/4W	
R21	1-247-725-11	CARBON	10K	5% 1/4W	
R22	1-247-725-11	CARBON	10K	5% 1/4W	
R23	1-247-725-11	CARBON	10K	5% 1/4W	
R24	1-247-725-11	CARBON	10K	5% 1/4W	
		VARIABLE RESISTOR			
RV1	9-993-600-01	RES, VAR, SLIDE 100K			
		SWITCH			
S1	9-993-602-01	SWITCH, TACT (1)			
S2	9-993-602-01	SWITCH, TACT (2)			
S3	9-993-602-01	SWITCH, TACT (3)			
S4	9-993-602-01	SWITCH, TACT (4)			
S5	9-993-602-01	SWITCH, TACT (5)			
S6	9-993-602-01	SWITCH, TACT (6)			
S7	9-993-602-01	SWITCH, TACT (7)			
S8	9-993-602-01	SWITCH, TACT (8)			
S9	9-993-602-01	SWITCH, TACT (9)			
S10	9-993-602-01	SWITCH, TACT (10)			
S11	9-993-602-01	SWITCH, TACT			
S12	9-993-602-01	SWITCH, TACT			
S13	9-993-602-01	SWITCH, TACT			
S14	9-993-602-01	SWITCH, TACT			
S15	9-993-602-01	SWITCH, TACT			
S16	9-993-602-01	SWITCH, TACT			
S17	9-993-602-01	SWITCH, TACT			
S18	9-993-602-01	SWITCH, TACT			
S19	9-993-602-01	SWITCH, TACT			
S20	9-993-602-01	SWITCH, TACT			
S21	9-993-602-01	SWITCH, TACT			
S22	9-993-602-01	SWITCH, TACT			
S23	9-993-602-01	SWITCH, TACT (CREATE)			
S24	9-993-602-01	SWITCH, TACT (STORE)			
S25	9-993-602-01	SWITCH, TACT (RECALL)			
S26	9-993-602-01	SWITCH, TACT (STANDBY)			
S27	9-993-602-01	SWITCH, TACT (CLEAR SCREEN)			
S28	9-993-602-01	SWITCH, TACT (WIPE IN)			
S29	9-993-602-01	SWITCH, TACT (WIPE OUT)			

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Ref.No	Part No.	Description			Remark
		MOUSE BOARD			
		*********			(Ref. No. 3000 series)
	9-994-905-01	CORD WITH D SUB CONNECTOR (9P)			
		CAPACITOR			
C1	9-994-900-01	ELECT	10MF	20% 16V	
C2	9-994-898-01	ELECT	2.2MF	20% 50V	
C3	9-994-899-01	CERAMIC	33PF	5% 50V	
C4	9-994-899-01	CERAMIC	33PF	5% 50V	
		DIODE			
D1	9-994-889-01	LED GL430			
D2	9-994-889-01	LED GL430			
D3	9-994-889-01	LED GL430			
D4	9-994-889-01	LED GL430			
D5	9-994-893-01	DIODE 1SS133			
		IC			
IC1	9-994-890-01	PHOTO SENSOR IS435			
IC2	9-994-890-01	PHOTO SENSOR IS435			
IC3	9-994-890-01	PHOTO SENSOR IS435			
IC4	9-994-890-01	PHOTO SENSOR IS435			
IC5	9-994-892-01	IC TMP42C40P-1307			
		RESISTOR			
R1	9-994-895-01	CARBON	680	5% 1/4W	
R2	9-994-895-01	CARBON	680	5% 1/4W	
R3	9-994-896-01	CARBON	33K	5% 1/4W	
R4	9-994-897-01	CARBON	10K	5% 1/4W	
		SWITCH			
SWL	9-994-903-01	SWITCH HKW0180-01-900			
SWR	9-994-903-01	SWITCH HKW0180-01-900			
		CRYSTAL			
X1	9-994-894-01	VIBRATOR, CRYSTAL (4MHz)			

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MISCELLANEOUS
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⚠	1-551-908-11	CORD, POWER, EULO PLUG (AEP MODEL)
⚠	1-555-001-12	CORD, POWER, (UK MODEL)
T901 ⚠	1-449-413-11	TRANSFORMER, POWER

****

ACCESSORY AND PACKING MATERIALS
****

	1-550-422-11	MOUSE
	3-769-631-11	MANUAL INSTRUCTION
	4-613-518-01	CUSHION (FRONT)
	4-613-519-01	CUSHION (REAR)
*	4-613-527-01	INDIVIDUAL CARTON

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HARDWARE LIST

SCREW

7-682-546-04	SCREW +P	3X5	
7-685-646-79	SCREW +BVTP	3X8	TYPE2 N-S
7-685-646-79	SCREW +BVTP	3X8	TYPE2 IT-3
7-685-647-79	SCREW +BVTP	3X10	TYPE2 N-S
7-685-648-79	SCREW +BVTP	3X12	TYPE2 IT-3
7-682-147-01	SCREW +BVTT	3X6	(S)

When indicating parts by reference number, please include the board name.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

SECTION 5
ELECTRICAL ADJUSTMENTS

See the adjusting elements location diagram on page 47 for the adjustments.

The following measuring instruments are needed in adjusting.

[Equipment Required]

1) Monitor TV
2) Oscilloscope, dual-trace, band 10MHz or wider, with delay mode
   (Use a 10 : 1 probe unless otherwise specified)
3) Frequency counter
4) Signal generator
5) Vectorscope
6) Digital voltmeter

[Connection]

Unless otherwise specified connect and adjust the measuring instruments as shown in the following diagram.

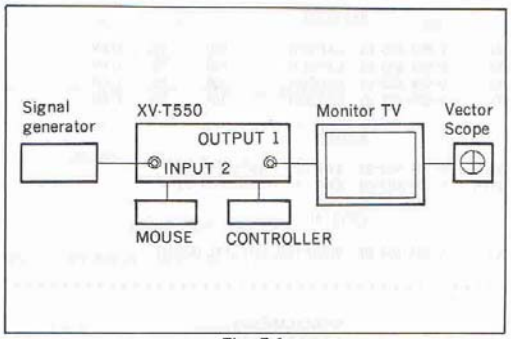


Fig. 5-1.

5-1. POWER SUPPLY CHECK (EN-2 BOARD)

Mode	E-E
Measurement equipment	Digital voltmeter
+12V check	
Measurement point	Output of IC521
Specified value	+12±0.3V
+5V check	
Measurement point	Pin ② of CN902
Specified value	+5±0.3V
−12V check	
Measurement point	Output of IC520
Specified value	−12±0.3V

[Checking methed]

1) Confirm that each voltage satisfies its specified value.

EN-2 board (component side)

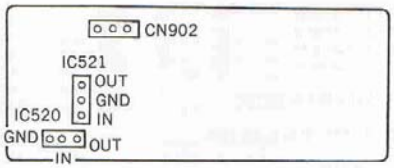


Fig. 5-2.

5-2. S.G FREQUENCY ADJUSTMENT (EN-2 BOARD)

5-2-1. S.G Frequency Adjustment

Mode	E-E
Signal	None
Measurement point	TP503
Measurement equipment	Frequency counter
Adjustment element	CV501
Specified value	4433618±10Hz

[Adjustment method]

1) Set the INPUT SELECT switch to the INPUT 1 position. (None signal)
2) Adjust to 4433618±10Hz with CV501.

5-2-2. S.G Reference Voltage Adjustment (EN-2 BOARD)

Mode	E-E
Signal	None
Measurement point	TP516
Measurement equipment	Digital voltmeter
Adjustment element	CV502
Specified value	2.0±0.1Vdc

[Adjustment method]

1) Set the INPUT SELECT switch to the INPUT 1 position. (None signal)
2) Adjust to 2.0±0.1Vdc with CV502.

5-3. AFC FREQUENCY ADJUSTMENT (EN-2 BOARD)

Mode	E-E
Signal	None
Measurement point	TP518
Measurement equipment	Frequency counter
Adjustment element	RV505
Specified value	15625±50Hz

[Adjustment method]

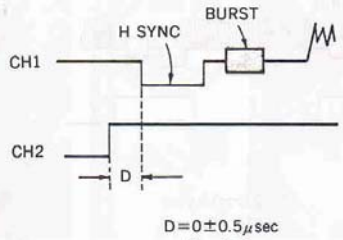
1) Set the INPUT SELECT switch to the INPUT 1 position (None signal)
2) Connect TP513 and GND with a jumper wire.
3) Adjust to 15625±50Hz with RV505.
4) Disconnect the jumper wire.

5-4. AFC H-POSITION ADJUSTMENT (EN-2 BOARD)

Mode	E-E
Signal	Color bar
Measurement point	CH1 : TP501 CH2 : TP518
Measurement equipment	Oscilloscope
Adjustment element	RV503
Specified value	D=0±0.5μsec

[Adjustment method]

1) Set the INPUT SELECT switch to the INPUT 2 position.
2) Set the OUTPUT SELECT switch to the SUPER-IMPOSE position.
3) Adjust to D=0±0.5μsec with RV503



D=0±0.5μsec

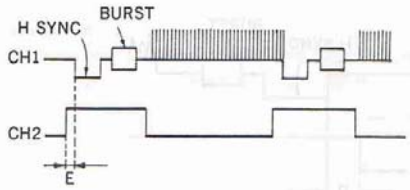
Fig. 5-3.

5-5. BLK-POSITION ADJUSTMENT (EN-2 BOARD)

Mode	E-E
Signal	Color bar
Measurement point	CH1 : TP501 CH2 : TP519
Measurement equipment	Oscilloscope
Adjustment element	RV508
Specified value	E=2.0±0.2μsec

[Adjustment method]

1) Set the INPUT SELECT switch to the INPUT 2 position.
2) Set the OUTPUT SELECT switch to the SUPER-IMPOSE position.
3) Adjust to E=2.0±0.2μsec.



E=2.0±0.2μsec

Fig. 5-4.

5-6. DECODER ADJUSTMENT (EN-2 BOARD)

Mode	E-E
Signal	None
Measurement point	TP505
Measurement equipment	Frequency counter
Adjustment element	RV501
Specified value	4433618±10Hz

[Adjustment method]

1) Connect the TP517 and GND with a jumper wire.
2) Adjust to 4433618±10Hz with RV501.
3) Disconnect the jumper wire.

5-7. VDP FREQUENCY ADJUSTMENT (EN-2 BOARD)

Mode	E-E
Signal	None
RV507 PRE ADJUSTMENT	
Measurement point	TP511
Measurement equipment	Digital voltmeter
Adjustment element	RV507
Specified value	3.3±0.1Vdc
RV506 ADJUSTMENT	
Measurement point	TP506
Measurement equipment	Frequency counter
Adjustment element	RV506
Specified value	20.4±0.1MHz
RV507 ADJUSTMENT	
Measurement point	TP506
Measurement equipment	Frequency counter
Adjustment element	RV507
Specified value	22.4±0.1MHz

[Adjustment method]

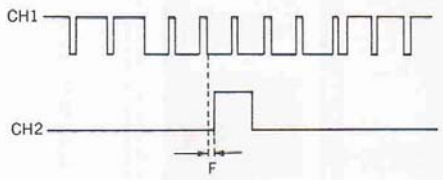
1) Set the INPUT SELECT switch to the INPUT 1 position.
2) Connect the digital voltmeter to the TP511 and adjust to 3.3±0.1V with RV507.
3) Connect the TP509 and GND with a jumper wire.
4) Connect the frequency counter to the TP506 and adjust to 20.4±0.1MHz with RV506.
5) Disconnect the jumper wire.
6) Connect the TP508 and GND with a jumper wire.
7) Connect the frequency counter to the TP506 and adjust to 22.4±0.1MHz with RV507.
8) Disconnect the jumper wire.

5-8. V-RESET ADJUSTMENT (EN-2 BOARD)

Mode	E-E
Signal	Color bar
Measurement point	CH1 : TP501 CH2 : TP507
Measurement equipment	Oscilloscope
Adjustment element	RV504
Specified value	F=8±1μsec

[Adjustment method]

1) Set the INPUT SELECT switch to the INPUT 2 position.
2) Set the OUTPUT SELECT switch to the SUPER-IMPOSE position.
3) Adjust to F=8±1μsec with RV504.



F=8±1μsec
Fig. 5-5.

5-9. S.C PHASE ADJUSTMENT (EN-2 BOARD)

Mode	Note1 : (State of initial screen)
Signal	Color bar
Measurement point	VIDEO OUTPUT Terminal
Measurement equipment	Vectorscope
Adjustment element	CV503
Specified value	The phases of the Computer's and signal generator's color bar should be the same.

Note 1 : (state of initial screen)
After turning off the power supply once, turn on the power supply. Then, wait for a moment by setting INPUT SELECT switch to INPUT 2 position. At this time, the state of initial screen is shown as in Fig. 5-6. However, the screen disappears in about 20 seconds. In this case, press CREATE switch of the controller to display this screen again.

[Adjustment method]

1) Set the INPUT SELECT switch to the INPUT 2 position.
2) Set the OUTPUT SELECT switch to the SUPER-IMPOSE position.
3) Make the state of initial screen (Fig. 5-6).
4) Match the phases of the computer's color bar and signal generator's with CV503.

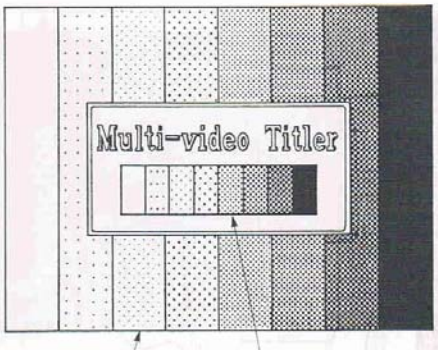
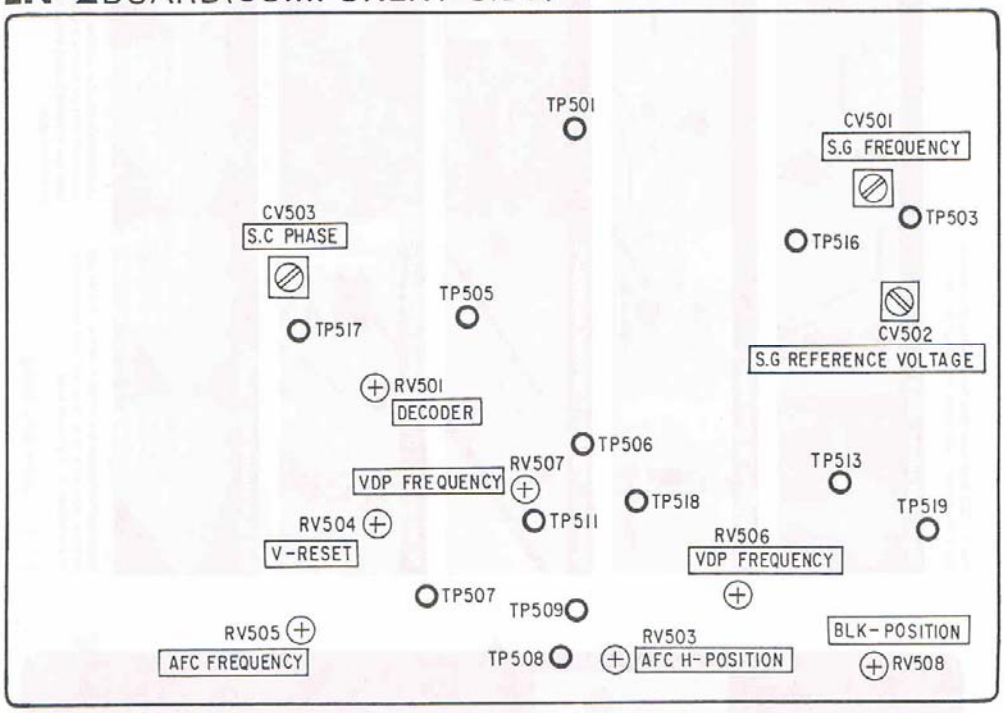


Fig. 5-6.

5-10. ADJUSTING ELEMENT LOCATION

EN-2 BOARD(COMPONENT SIDE)



SECTION 6
GENERAL

This section is extracted from instraction manual.

6-1. WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

NOTICE FOR THE CUSTOMERS IN THE UNITED KINGDOM

Important
The wires in this mains lead are coloured in accordance with the following codes:
Blue: Neutral
Brown: Live
As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows: The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black. The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

Note:
This appliance conforms with EEC Directives 76/889 and 82/499 regarding interference suppression.

6-2. OVERVIEW

This manual will show you how to design your own titles and add them to videos with the Multi-video Titler.

Begin with "Getting Started" for instructions on how to connect your equipment and how to get it ready for making titles.

"Tutorial" teaches you step-by-step how to make a title and then add it to a video. If this is your first time using the titler, you may want to go through this section for an introduction to the basic skills necessary for creating titles.

"Creating Titles" explains how to write titles, how to specify their colour, style, and size, how to choose their positions on the screen, and how, finally, to store them. Since this section is organized by each specific choice, you can use "Creating Titles" as a reference once you become more familiar with the Multi-video Titler.

"Adding Titles to Your Videos" shows you how to combine the titles you've made with your videos and record them onto a second tape. This section also describes the various ways you can have the titles arrive on and go off the video.

"More About the Video Titler" not only tells you how to fine tune the titler and the monitor, it provides a simple guide which explains what to do if something goes wrong.

Introduction

6-3. INTRODUCTION

6-3-1. POSSIBILITIES WITH THE TITLER

Your XV-T550 Multi-video titler has a palette of 14 colours and a wide range of type styles with which you can:

Begin your videos with titles.

Add captions to your videos.

Insert messages on a coloured backround.

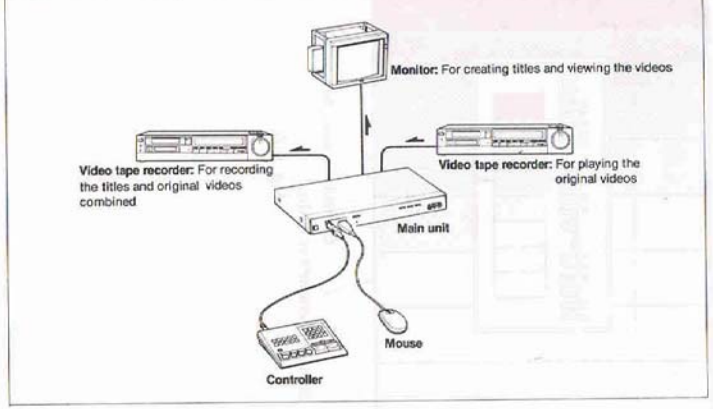
Divide portions of your videos with solid colour.

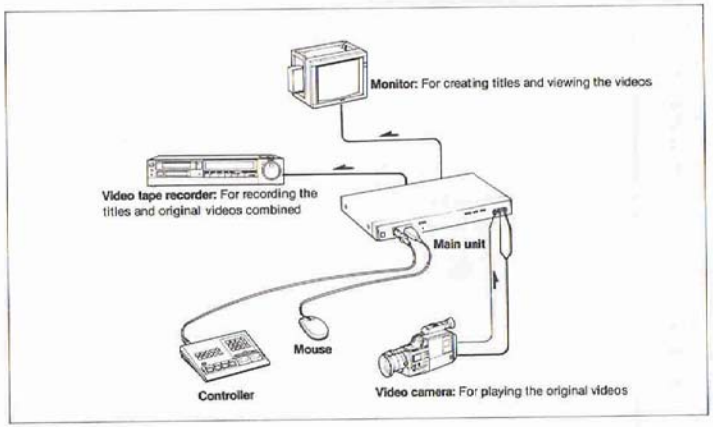
End your videos with "credits".

In fact, you can create innumerable varieties of titles and captions, store up to 10 of them, and bring them on and off your videos in 12 different ways.

Use the this manual as a guide, but don't hesitate to experiment with the titler — it's almost impossible to break and it's easy to start afresh by just turning the titler off then on again.

The following are two possible system configurations:





6-3-2. PRECAUTIONS

On general safety:

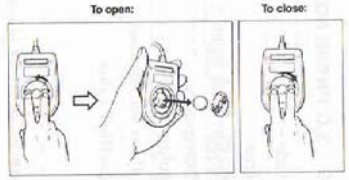
- Before you use the titler, make sure that its operating voltage and frequency—these can be found on the unit itself—are the same as those of your local power supply.
- If anything falls or spills into the cabinet, unplug the titler and have it checked by a qualified serviceman.
- Unplug the titler from the wall outlet if it will not be used for an extended period of time. Pull the cord out by the plug—never yank the cord itself.
- Never use the titler when its cord is damaged.

On placement:

- Position the cord so that it will not come in contact with hot surfaces, be triped over or be stepped on.
- Allow room around the titler for air to circulate. This prevents the internal heat from building up.
- Do not place the titler near a heat source, such as a radiator or air duct, or in a location subject to direct sunlight, excessive dust, mechanical vibration or shock.
- The titler is designed to be used in a horizontal position. Do not use it at an angle.
- Do not place a monitor on top of the titler.

On cleaning:

- Unplug the titler before cleaning it.
- Clean the cabinet, panel and controls with a soft dry cloth or a soft cloth moistened with a mild detergent. Do not use any type of solvent, like alcohol or benzine, which might damage the finish.
- To clean the ball within the mouse, rotate the bottom plate counterclockwise then turn the mouse over so that the weight of the ball pushes the plate out into your hand. Clean the ball with a soft dry cloth or a soft cloth moistened with a mild detergent. Return the ball to its socket, making sure it is thoroughly dry, and place the bottom plate over the ball. Rotate the plate clockwise so that it locks in place.



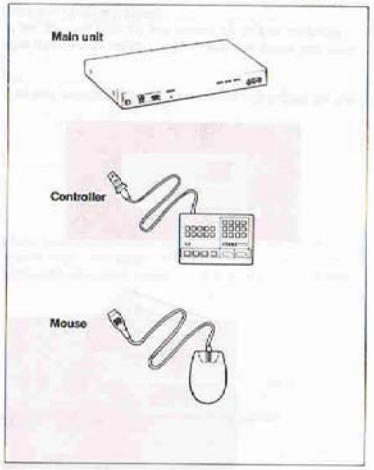
On moving:

- Save the carton and packing materials for when you have to move the titler. Repack it as illustrated on the carton.

Getting Started

6-4-1. CONNECTING YOUR EQUIPMENT

Check that the following parts have been supplied:



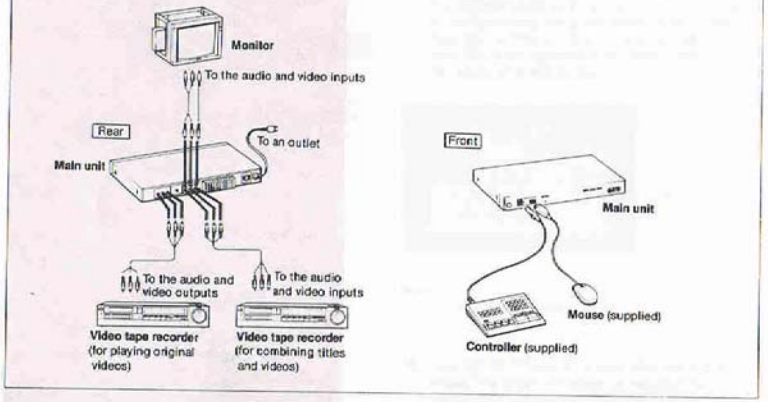
In addition, you'll need:

- A monitor on which you can create titles and view the video.
- Either a video camera or a video tape recorder on which you can play the original video.
- A video tape recorder on which you can record the titles and the original video combined.
- Connecting cords.

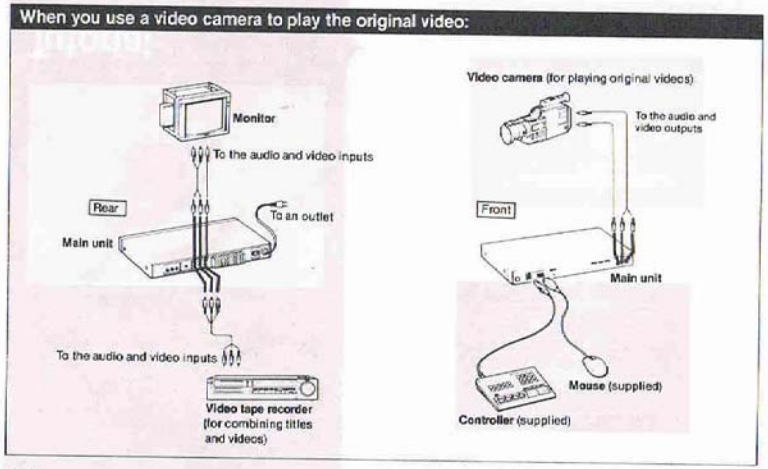
Note:

- Unplug each unit before connecting the equipment.
- To make it easier for you to connect your equipment, the INPUT and OUTPUT jacks on the main unit are colour coded. If the plugs of your connecting cords are similarly coded, make sure that the plugs' and the jacks' colours match.
- As you set up your equipment, you may have to unplug connecting cords. Always **pull** them out by their plugs—never pull the cords themselves.
- Refer to the individual manuals of your other equipment for further details on how to connect them.

When you use a video tape recorder to play the original video:



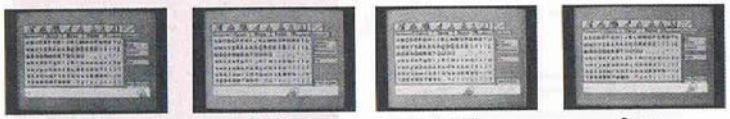
When you use a video camera to play the original video:



Note:
Make sure the connections you've made are secure. A loose connection may cause a noisy picture.

6-4-2. SPECIFYING THE TITLER'S LANGUAGE

The Multi-video titler has four different language settings: English, French, Spanish and German. Although the titler comes preset to English, you can easily change it to one of the other three.



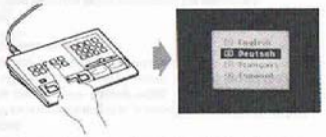
English French Spanish German

1. Turn on the monitor and the titler. A test pattern will appear.

2. While the test pattern is on the screen, press the left button of the mouse and, keeping the mouse button depressed, press CREATE on the controller. (If you miss the test pattern, turn the titler off and start again.)

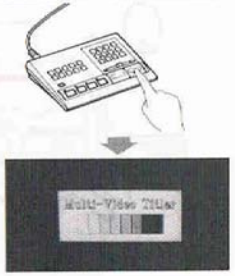
A menu of the four possible choices will appear:

3. Press the numbered button on the controller that corresponds to the number of the language youll be using.



The language that corresponds to the number will be highlighted. You can always change your choice by pressing another number.

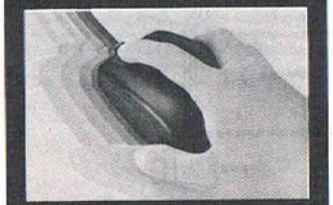
4. Press WIPE OUT to confirm your choice.



The test pattern will reappear as if you just turned the titler on.

The titler is now set for the language you chose and, even if you turn the titler off, will remain set to that language until you change it again.

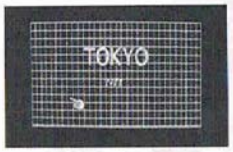
6-5. TUTORIAL



Tutorial

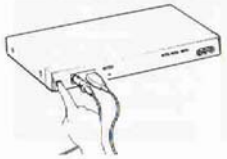
6-5-1. INTRODUCTION

This section is devoted to a tutorial that will teach you how to create a title like the one illustrated here. It takes less than 10 minutes and when you finish you'll have covered many of the options on the Multi-video titler. Refer to "Creating Titles" (p. 18) for a detailed explanation of each option.



6-5-2. GETTING THE EQUIPMENT READY

1. Turn on the monitor and the titler. If the equipment is already on, turn the titler off then on again for a fresh start.



The following test pattern will appear on the screen:

The titler is able to demonstrate how it can be used to make a variety of titles and how its many WIPE PATTERNS can bring titles on and off the screen.

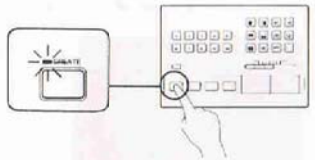
If you'd like to go through this demonstration: Wait about 20 seconds and the test pattern will be replaced by a grid. The titler will then begin demonstrating itself and continue for about 10 minutes.

To stop the demonstration, press CLEAR SCREEN and you'll return the screen to the test pattern. Press CLEAR SCREEN again while the test pattern is still on the screen. The screen will empty.

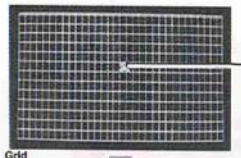
When the demonstration is over, the test pattern will appear again and the demonstration will repeat until you stop it.

If you'd rather skip the demonstration:
Press CLEAR SCREEN while the test pattern is on the screen. (Pressing it during the demonstration will bring back the test pattern.) The screen will empty.

2. Press CREATE. The lamp will blink, showing you that you are now in the process of creating a title.



First, a grid appears with a picture of a mouse in the centre; then, after about 10 seconds, a menu will appear with a pointing hand where the picture of the mouse was.



Grid

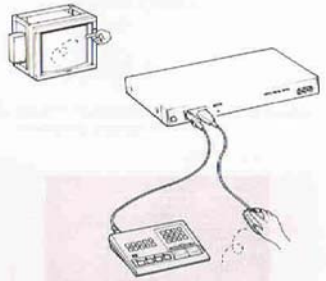
Main menu

6-5-3. CREATING THE TITLE

The way you create titles is to select letters and characteristics from the menu with the mouse. This is easiest to learn by actually doing it.

Trying the mouse by writing the first row

1. Roll the mouse on a flat surface. By doing this, you will also move the pointed hand on the screen in the same way. When you want to move the hand, roll the mouse on the surface in the direction you want the hand to move on the screen.



2. Lift up the mouse and place it on a different spot. The pointing hand will not move. If you run out of room to move the mouse, just lift it up, put it down where you have more room, and pick up where you left off.

3. Position the hand so that it points to T on the menu. Press and quickly release the left button of the mouse. This is called clicking. When you click T, you'll put a T in the working line at the bottom of the screen and thus choose it for your title. If you click a wrong letter, click BS at the right end of the working line to erase the wrong letter and try again.

Note:
The right button doesn't work for clicking.

4. Click O, K, Y and O to select the rest of the letters. The letters will appear as you click them in the working line. Remember, if you click a wrong letter, just click BS at the right end of the line and you'll erase the last letter you clicked.

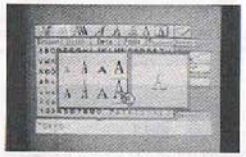
Selecting a type style and colour

1. Click A for a choice of type sizes. A small menu will pop out of A. As this happens, the pointing hand temporarily turns into the picture of the mouse.

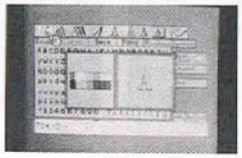
is on the screen when the titler is busy.

is on the screen when the titler is ready to accept a choice.

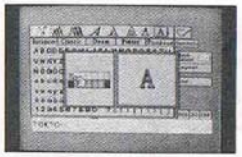
2. Click the largest letter in the size menu. The sample letter on the right will get larger, indicating the size of all the letters in the working line once they're laid out on the screen. If you click the wrong size, click the size you want—in this case, the largest—and you'll correct your mistake.



3. Click A for a choice of colours for the letters in the working line. The size menu will go back into A and a different small menu will pop out of A.

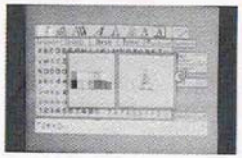


4. Click the grey square. The sample letter will turn grey. If you click another colour by mistake, just try again.



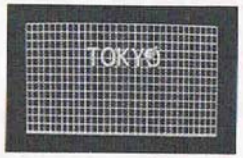
Laying out the first row

1. Click [Layout] to position the first part of the title.



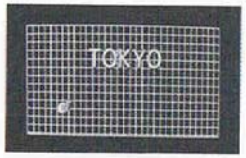
The screen will change to a simple grid and attached to the pointing hand will be a rectangle. This rectangle shows you the approximate size of the line you just entered and moves with the pointing hand as you roll the mouse.

2. Move the rectangle to the centre of the grid then click it to confirm its placement. The letters will appear on the grid in the style and colour you chose for them.

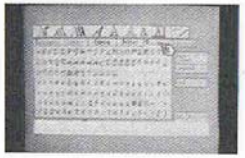


Writing and laying out the second row

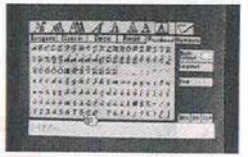
1. Move the pointer away from "TOKYO" and click the open grid to return to the main menu and begin creating the second part of the title.



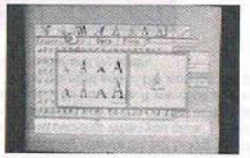
2. Click [Freehand] to change the typeface. The alphabet will reappear in "Freehand."



3. Click [1], [9], [8], and [8]. Remember, all you have to do is click [BS] to back up if you make a mistake.



4. Click A. The size menu will pop out.



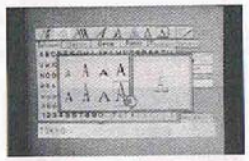
Selecting a type style and colour

1. Click A for a choice of type sizes. A small menu will pop out of A. As this happens, the pointing hand temporarily turns into the picture of the mouse.

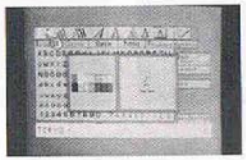
is on the screen when the titler is busy.

is on the screen when the titler is ready to accept a choice.

2. Click the largest letter in the size menu. The sample letter on the right will get larger, indicating the size of all the letters in the working line once they're laid out on the screen. If you click the wrong size, click the size you want—in this case, the largest—and you'll correct your mistake.



3. Click A for a choice of colours for the letters in the working line. The size menu will go back into A and a different small menu will pop out of A.



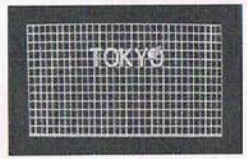
4. Click the grey square. The sample letter will turn grey. If you click another colour by mistake, just try again.

Laying out the first row

1. Click Layout to position the first part of the title.

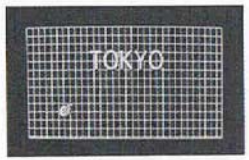
The screen will change to a simple grid and attached to the pointing hand will be a rectangle. This rectangle shows you the approximate size of the line you just entered and moves with the pointing hand as you roll the mouse.

2. Move the rectangle to the centre of the grid then click it to confirm its placement. The letters will appear on the grid in the style and colour you chose for them.

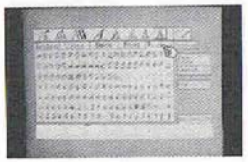


Writing and laying out the second row

1. Move the pointer away from "TOKYO" and click the open grid to return to the main menu and begin creating the second part of the title.



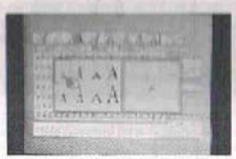
2. Click Freehand to change the typeface. The alphabet will reappear in "Freehand."



3. Click 1, 9, 8, and 8. Remember, all you have to do is click BS to back up if you make a mistake.

4. Click A. The size menu will pop out.

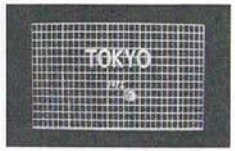
5. Click the smallest letter in the size menu. The sample letter will get smaller.



6. Click Layout.

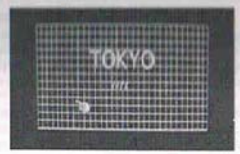
The screen will turn back to the layout grid where you left the first line.

7. Position the rectangle below "TOKYO" and click it in place.



Ending the title

1. Move the pointer away from "1988" and click the open grid to call the main menu.

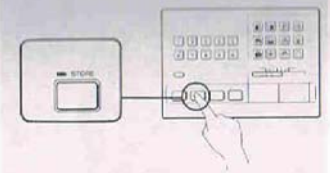


2. Click End to complete the title. Your title will appear without the lines of the grid and the CREATE lamp will stop blinking.

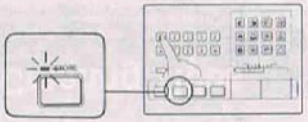
6-5-4. STORING THE TITLE

It is important now to store the title you've made. This way you can recall it if you clear the screen or wipe it off.

1. Press STORE. The lamp will light.



2. Press 1. The STORE lamp will blink until the title is entered into STORED TITLE 1.



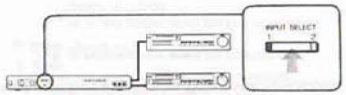
6-5-5. ADDING THE TITLE TO A VIDEO

To practice putting your stored title on a video, collect two tapes: one with something recorded on it, and one which is blank.

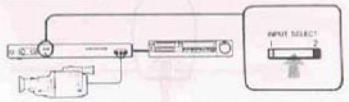
1. Put the blank tape into your video tape recorder for recording the video and title combined.

2. Put the recorded video tape into either a second video tape recorder or a video camera—whichever you have to play the original video.

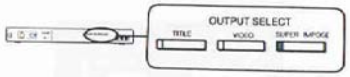
If you are using a video tape recorder to play the original video:
Check that INPUT SELECT is lit below 1. If it isn't, press it.



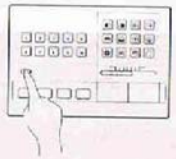
If you are using a video camera to play the original video:
Connect the camera to INPUT 2 (p. 8) and press INPUT SELECT so that it lights below 2.



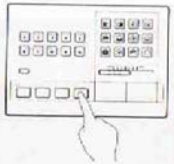
3. Check that OUTPUT SELECT is set for SUPER-IMPOSE. If it isn't, press SUPERIMPOSE so that it lights.



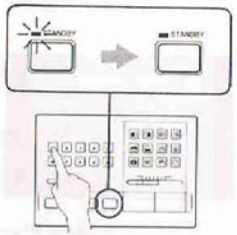
4. Press CLEAR SCREEN.



5. Press STANDBY. The lamp will light.



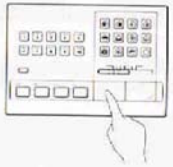
6. Press STORED TITLE 1. The STANDBY lamp will blink until the title enters STANDBY and the titler is ready to wipe it—that is, bring it accross the screen.



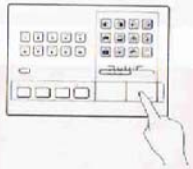
7. Begin recording on blank tape.

8. Play the original video on either the camera or your second video tape recorder. You should be able to see it on the monitor.

9. Press WIPE IN. The title will enter the screen from the left, in the ■ WIPE PATTERN.



10. Press WIPE OUT. The title will reverse its direction and leave the screen.



There. You've created a simple title and have combined it with a video. Now you can make any title, no matter how complex, by using the basic skills you've learned: selecting options with the mouse from menus, laying out characters on the grid, and wiping.

Experiment with the menus of the titler. See what's inside each. Select characters from the alphabets of the different typefaces. Then select some symbols. Change their colors and make them italic. Don't forget to lay them out to confirm what they'll look like together on the screen.

When you go on to making titles you'll actually use, you may want some specific directions. "Creating Titles" (p. 18) will serve as a guide. Whether you want to put your title on a solid color backround or review how to end it, you can find the procedures there.

In the tutorial, you saw how one WIPE PATTERN looked. Go on to "Adding Titles to Your Videos" (p. 26) to begin exploring the other 11 styles.

Creating Titles

This section explains in detail the various options you have in making titles. Here you'll find how to write titles, how to specify their colour, style, and size, how to choose their positions on the screen, and how, finally, to store them.

If you are unfamiliar with clicking and words like menu, grid, and line, you may first want to go through "Tutorial" (p. 10).

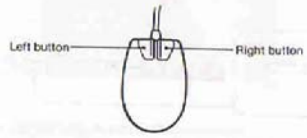
Using the mouse to choose from a menu—clicking

Whether you want to change a title's colour or set the Multi-video titler to a different typeface, you can select the necessary choices with the mouse from the "menus" that appear on the monitor's screen.

1. Roll the mouse on a flat surface. By doing this, you will also move the pointed hand on the screen in the same way. When you want to move the hand, roll the mouse on the surface in the direction you want the hand to move on the screen.

2. Position the hand so that it points to the item on the menu you want to select. Press and quickly release the left button of the mouse. This is called clicking.

Note:
The right button doesn't work for clicking. Instead, it quickly recalls the main menu and cancels edit commands.



If you run out of room to move the mouse:
Just lift it up and put it down where you have more room—the hand will not move. Pick up where you left off.

is on the screen when the titler is busy.

is on the screen when the titler is ready to accept a choice.

Beginning titles

You can create titles at any time by pushing CREATE. A grid is placed on the screen and it becomes your canvas for laying out titles. After about 10 seconds, the screen automatically changes to the main menu.

Stopping the demonstration

Every time you turn on the titler a test pattern will appear. The test pattern is followed by a 10-minute demonstration. The demonstration, in turn, is followed by the test pattern, and this repetition continues until you break the loop.

When the test pattern is on the screen:
Press CLEAR SCREEN. You'll break the loop and clear the screen.

When the demonstration is on the screen:

1. Press CLEAR SCREEN. The loop will begin again from the test pattern.
2. Press CLEAR SCREEN again. You'll break the loop and clear the screen.

Getting a fresh start

Since the grid is placed on top of the screen, any previous titles left on the screen will become part of the new one. This is useful if you want to add to the existing title or change it, but if you want a fresh start, you need to clear what's been written.

To protect your work, the screen will not clear when the grid is on the screen. First, end the title.

Important:
You'll lose what was on the screen if you clear it and haven't stored it.

1. Press CLEAR SCREEN. You'll remove what may already be on the monitor.
2. Press CREATE. The grid will be placed on a clean screen.

Calling the grid

You can refer to the grid by clicking Layout.

Note:
If there are characters in the working line, however, you will bring them with you. Click the right button of the mouse to take them back to the working line.

Returning to the main menu

When you are creating titles, you can quickly bring up the main menu.

From the grid:
- Push the right button on the mouse or
- Click an empty part of the grid.

From a small menu:
- Push the right button of the mouse or
- Click part of the dark area of the main menu around the small menu.

Ending titles

There are two ways to end your work:
- Click End on the main menu.
- Press CREATE. The CREATE lamp will stop blinking but will remain on.

Important:
If you do not layout the working line on the grid before end your work, you'll loose what was in the working line. Also, remember to store your title. You will not be able to recall your title if you clear the screen, by either pushing CLEAR SCREEN or WIPE OUT, without storing it.

6-6-2. WRITING A TITLE

Choosing a typeface

The Multi-video titler has five different typefaces—families of characters—you can choose characters from: European, Classic, Deco, Poster and Freehand.

Click the typeface you want to display on the main menu.

Choosing characters from the main menu

1. Position the pointing hand so that its finger points to the character you want. Click it. The character you select will appear in the working line at the bottom of the screen.

The triangle within the working line shows you up to what point characters will fit across the screen. This point varies with the size and style of the characters.

You can layout a line only if the letters are within the space between the left end of the working window and the triangle. The triangle will turn red if the letters don't fit.

2. Repeat for each character. Each will appear after the one entered before.

To choose a space:
Click the empty space among the characters.

To choose a symbol not on the main menu:

1. Click Symbols.
2. Click the symbol you want. If the it is not within Symbols, you can always draw it yourself (p. 21).

Changing what is in the working line

To erase everything in the line:
Click CLR.

The cursor is the red bar within the working line. When you click a character from the main menu, it appears to the left of the cursor. You can move the cursor by clicking the letter in the working line you want it under.

Cursor

To delete characters:

1. Move the cursor to the character right of the characters you want to erase.
2. Click BS.

or

1. Move the cursor to the first character you want to erase.
2. Click DEL.

To insert characters:

1. Move the cursor to the character right of the point you want to insert the new characters.
2. Click the new characters.

To change a character you've made:
Refer to page 21.

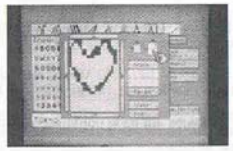
Designing your own letters and symbols

You can design and store up to 10 different symbols. Once you store them, they will appear within Symbols and you can use them in your titles by clicking them as you would any other character.

1. Click [✎].
2. "Draw" your design by clicking white squares to make them blue.

To draw a line:
Keep the left button on the mouse depressed as you roll the mouse.
To erase a blue mark:
Click the blue mark and it will turn white.
To erase everything in the drawing space:
Click [Clear].

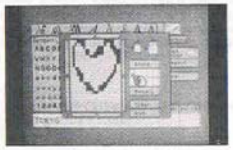
To refine your design:
Click the large rectangle and get a finer drawing space.



To return to the rough drawing space:
Click the smaller rectangle.

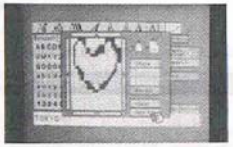
To correct the position of your symbol in its space:
If you click a bar on the side of the drawing space, the symbol will slide in the bar's direction.

3. Click [Store].
4. Click one of the spaces under Store. Your design will be entered in that space.



If the space you click is filled, your new design will take its place.

5. Click [End] when you have finished.



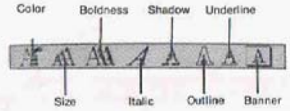
To change a symbol you've made:

1. Click [Recall].
2. Click the symbol.
3. Complete it as you would a new design.

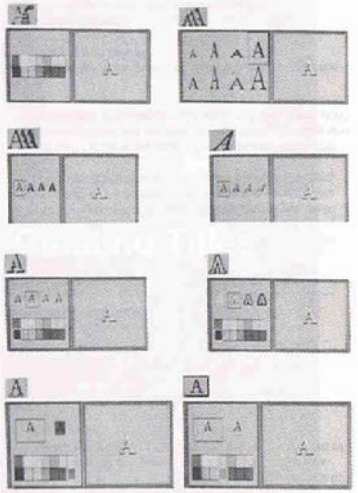
If the symbol appears within a title on the grid, it will change there accordingly.

6-6-3. CHOOSING A TYPE STYLE AND COLOUR

1. Click what you want to specify from the main menu.



A small menu will pop out of what you click.



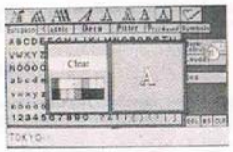
Note:
See "Choosing a typeface" on page 26 for instructions on how to specify a typeface, or family of letters.

2. Click a color or style of letter from the small menu. For A, A, A, and [A], make both choices. The sample letter on the right side of the menu will change so that it reflects your choice.
3. Return to the main menu.

You can change the style and colour of the characters in the working line at any time. Since the choices you make will affect the entire line, if you want to make a word with different colour letters, you'll have to make each letter an individual line and put them together on the grid one at a time. Put together words of different type styles in the same way.

6-6-4. CHOOSING A BACKGROUND FOR THE TITLE

1. Click Back Colour. A small menu will pop out of Back Colour.



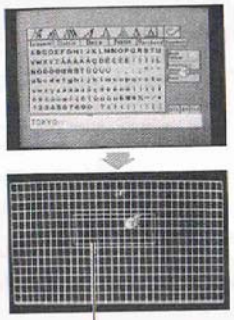
2. Click a colour in the Back Colour menu for a solid colour background; click Clear to see your video behind the title. The sample letter will adopt the background you choose.

Note:
As with type styles and colour, you can change the background at any time.
If you specify a new background colour when there are many characters on the grid, there will be a slight delay before the background changes.

6-6-5. CHOOSING A POSITION FOR A LINE—LAYOUT

After you put characters into the working line and you specify their shape and colour, you can position the line on the grid as you would cut-out words on a piece of paper.

1. Click Layout on the main menu. The screen will change to the grid and attached to the pointing hand will be a rectangle. This rectangle shows you the approximate size of the line and moves with the pointing hand as you roll the mouse.



2. Move the rectangle to an empty space where you want to position the line.

3. Click to confirm its placement.
(Or push the right button on the mouse to take it back to the working line.)

To move, copy, change or remove the line:
Refer to "Editing your Title." (p. 24)

To view the title on your video:
Press SUPERIMPOSE of OUTPUT SELECT and play your video.

To view the titles only:
Press TITLE. The lamp of TITLE will light.

To view the videos only:
Press VIDEO. The lamp of VIDEO will light.

6-6-6. MAKING TITLES WITH MORE THAN ONE ROW

Write and layout one row at a time: write one line, lay it out, then return to the main menu, where you can write another line.

Note:
The titler can store up to 20 lines per title.

6-6-7. MAKING WORDS OR ROWS OF MORE THAN ONE STYLE AND COLOUR

To make words which are a combination of different colour and different style letters, add each character to the grid one at a time rather than as a single group in the working line. Click one character, specify its style and colour, lay it out, then return to the main menu to click the next character. Layout the second character next to the first.

Put together varied words to make rows in the same way you put together varied characters to make words.

Note:
The titler considers things placed on the grid at time a line—even if that line is only one character long. Up to 20 lines can be stored per title.

6-6-8. MAKING SCREENS OF ONLY SOLID COLOUR

Choose a background colour and click a space into the working line. Next, layout the space on the grid and end as you would any other line.

6-6-9. EDITING YOUR TITLE

You can change a title at any time it is on the grid. Since each entry is treated as a separate line, words and rows of a combination of styles and colours must be changed by their individual parts.

Moving lines

1. Click the line you want to move. A red rectangle will form around it and a new white rectangle will move with the pointing hand.

2. Position the white rectangle where you want to move the line. (Push the right button of the mouse to cancel the move.)

3. Click to confirm the new position. The line will move from the old position to the new one.

Changing the contents

1. Click a line twice in rapid succession*. The screen will change to the main menu and the line will appear in the working line.

2. Change the line as described in "Changing what is in the working line." (p. 20)

3. Click Layout to return the new line to the grid.

Changing the type style or colour

1. Click a line twice in rapid succession*. The screen will change to the main menu and the line will appear in the working line.

2. Change the line by choosing new specifications as described within "Choosing a type style and colour." (p. 22)

3. Click Layout to return the new line to the grid.

* Twice within 1.5 seconds. (If you click too quickly, the titler will react as if you clicked only once.)

Changing the typeface

The Multi-video titler treats the same letter of two different typefaces as two distinct characters. Thus, to change the typeface of a word or of an entire title, you have to reenter the individual characters as you would if you wanted to change the contents.

Copying lines

1. Click the line you want to copy. A red rectangle will form around it and a new white rectangle will move with the pointing hand.
2. Position the white rectangle where you want a copy to go. (Push the right button of the mouse to cancel the copy.)
3. Click twice in rapid succession* to confirm the position. The white rectangle will remain on the grid.
4. Double click another copy in place or push the right button of the mouse to stop making copies.

Removing lines

1. Click a line twice in rapid succession*. The screen will change to the main menu and the line will appear in the working line.
2. Click CLR.
3. Click Layout. The line will have been erased.

* Twice within 1.5 seconds. (If you click too quickly, the titler will react as if you clicked only once.)

6-6-10. STORING YOUR TITLE

It is important that you store your title after you end the actual writing and arranging of it. You'll then be able to recall the title should you clear it off the screen.

1. Click End. (You can't store titles when they are still on the grid.)
2. Press STCRE.
3. Press one of the numbers under STORED TITLES. If the number is filled, the new title will replace the first title. The title will be stored in that number until you replace it with another title—even if you turn the power off.

6-6-11. MAKING ONE TITLE AFTER THE OTHER

After you create, end, and store one title, press CLEAR SCREEN. You'll then have a fresh canvas on which you can create a second title. (Remember, if you don't store the first title, you'll lose it when you clear the screen.) Press CREATE and begin making the second title. End it, store it, press CLEAR SCREEN, then go on to the next title.

6-6-12. MODIFYING STORED TITLES

You can change a title you've stored at any time.

1. Press RECALL.
2. Press a numbered key under STORED TITLES. The title stored in that number will appear on the screen. If you want a different title, press RECALL and a different numbered key.
3. Press CREATE. The grid will be placed on top of the stored title.
4. Modify the title as described in "Editing your title." (p. 24)
5. Press CREATE to end.
6. Press STORE.
7. **To replace the original title:**
   Press the numbered key of the original title.

   To save both the original title and the new one:
   Press a numbered key other than the original title's.

6-7. ADDING TITLES OF YOUR VIDEOS

Adding Titles to Your Videos

This section explains how to combine your videos and titles. Here you'll learn the way to record the two together on a second tape and you'll also learn the varied ways of bringing titles on the screen.

6-7-1. HINTS BEFORE RECORDING

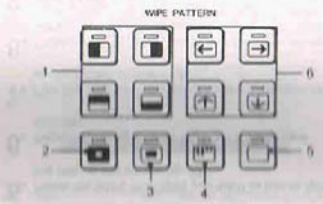
Checking what is stored in a STORED TITLES number

You can check what you've stored in each number at any time, but it's best to do this before you begin the actual recording.

1. Press RECALL.
2. Press the STORED TITLES number. The screen will show what is stored in that space.

Learning the wipe functions

When titles arrive on the screen, they wipe in.
When they leave the screen, they wipe out.
The Multi-video titler offers you 12 different patterns to wipe titles in and wipe them out.



1. The title appears first and disappears last from the solid side.
2. The outer part of the title appears first and disappears last.
3. The centre of the title appears first and disappears last.
4. The title appears and disappears one character at a time.*
5. The title appears and disappears at once.
6. The title comes in from and goes out in these directions.

* When you use bold shadowed letters, the individual characters of your title may touch each other. The completed title will look fine. If you wipe it one character at a time, however, characters may appear with parts "missing" that will be filled in by the adjoining characters.

The best way to learn what they are is by experimenting:

1. Press STANDBY. The STANDBY lamp will begin blinking.
2. Press the number of a STORED TITLE. The number's lamp will blink.
3. Press a WIPE PATTERN – the lamp of the button you press will light – and select the speed of the wipe.

When the light of STANDBY has stops blinking, the STORED TITLE has entered STANDBY and the titler is ready to wipe it.

4. Press WIPE IN. The title will enter the screen.
5. Press WIPE OUT. The title will reverse its direction and leave the screen.

To wipe in a different title next:

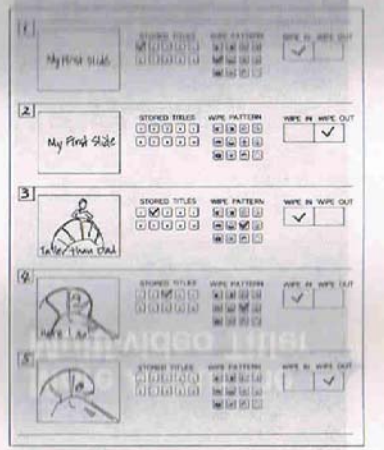
1. Press STANDBY.
2. Press a different STORED TITLE. It replaces the first in STANDBY.
3. Press WIPE IN when the STANDBY lamp stops blinking.

To change the WIPE PATTERN:
Press a different WIPE PATTERN between any of the steps in wiping. This not only lets you wipe in different titles in different ways, but lets you wipe in a title one way and wipe it out in another.

To change the WIPE SPEED:
You can change the WIPE SPEED any time before or during wiping.

Planning your recording

If you'll be adding more than one title to your video, your recording will go much more smoothly if you plan a script: at what point during your video do you want to wipe in a title, how will you wipe it, where will the next title go, and so on.

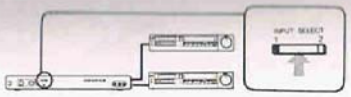


Note:
An empty form of the above example is inside the back cover of this manual for you to use for your recording.

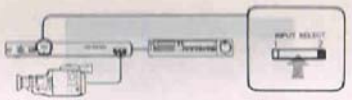
6-7-2. COMBINING TITLES AND VIDEOS

To smooth the recording process, create the titles you'll be using (p. 18) and practice the way you'll be wiping them on the screen (p. 27) before you actually begin recording. It's also a good idea to wite a "script" that tells you where and how a title goes on the video (left).

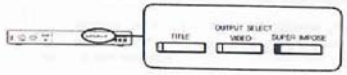
When you use two video tape recorders:
Check that INPUT SELECT is lit below 1. If it isn't, press it.



When you use one video tape recorder to record the combination while a camera plays the original video:
Connect the camera to INPUT 2 (p. 8) and press INPUT SELECT so that it lights below 2.



1. Press CLEAR SCREEN to clear any titles off the screen.
2. Check that OUTPUT SELECT is set for SUPER-IMPOSE. If it isn't, press SUPERIMPOSE so that it lights. The titler will then be in the mode to super-impose titles onto your videos and the monitor will show the titles and videos combined.



To view the titles only:
Press TITLE. The lamp of TITLE will light.

To view the videos only:
Press VIDEO. The lamp of VIDEO will light.

3. Press STANDBY to prepare for wiping.
4. Press the number of a STORED TITLE to select the title you want to wipe.
5. Press the WIPE PATTERN you want to use to bring the title on the screen. (p. 27)
6. Begin recording on your OUTPUT 2 video tape recorder.
7. Play the original video either on the camera or on your second video tape recorder.
8. Press WIPE IN when the part of the video where you want to add the title appears.
9. Press WIPE OUT where you want to remove the title.

Variation:

Variation:

The following is a convinient technique if you'll be adding several titles, one after the other, to your video.

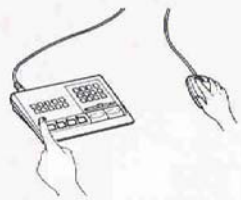
1. Press STANDBY and a STORED TITLE.
2. Select a WIPE PATTERN.
3. Press WIPE IN.
4. Press STANDBY and the next STORED TITLE.
5. If you want to change the WIPE PATTERN, select a new one.
6. Press WIPE IN.
7. Press WIPE OUT when you reach your last title.

More About the Multi-video Titler

6-8. MORE ABOUT THE MULTI-VIDEO TITLER

6-8-1. CLEARING EVERYTHING IN THE TITLE

1. Turn the titler off then on again. A test pattern will appear on the screen.
2. While the test pattern is on the screen, press the left button of the mouse and, keeping the mouse button depressed, press CLEAR SCREEN on the controller.



The following message will appear on the screen:

3. Press WIPE IN to clear all titles stored in the titler.
   Press WIPE OUT to leave everything intact.

The test pattern will reappear as if you just turned the titler on.

6-8-2. CENTRING THE LAYOUT GRID ON THE MONITOR

1. Turn the titler off then on again. A test pattern will appear on the screen.
2. While the test pattern is on the screen, press the left button of the mouse and, keeping the mouse button depressed, press [STANDBY] on the controller.

A rectangle that represents the frame of the grid and the following message will appear:

3. Press [←], [→], [↑] and [↓] (WIPE PATTERN) on the controller to move the position of the grid frame.
4. Press [WIPE OUT] to confirm the position.

The test pattern will reappear as if you just turned the titler on.

6-8-3. TROUBLESHOOTING

The titler won't turn on.
Check that the titler is plugged in.

The video image won't appear.
- Press [INPUT SELECT] and try the other setting.
- Make sure that the video tape is not blank and that it is playing.
- Check the connections between your equipment.

The title won't combine with the video.
Press [SUPERIMPOSE] below OUTPUT SELECT.

The colour of the superimposed title is odd.
Titles superimposed on black and white videos may have an odd colour.

The title runs into the edges of the screen.
Centre the grid as described on the left of this page.

You can't layout a line on the grid.
- Check that the triangle within the working line is to the right of the letters. If the triangle is red and is among the letters, delete some letters or change their style so that the line fits.
- Clear the working line and click layout. If you have 20 lines on the grid, you can't add any more. Redesign your title so that it is within 20 lines. Remember, even one character layed out by itself is a "line."

The titler is erratic and skips commands.
Wait until an operation is completed before entering your next command. If the titler receives several commands at once, it will usually perform them all, one after another, without pausing.

The titles you've stored have disappeared.
Call your Sony Service Centre. The titler has within it a lithium battery whose power retains everything in STORED TITLES when the titler is turned off. If the battery dies, it must be replaced by a qualified serviceman.

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