

****GENERAL SPECIFICATIONS**

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SSD-680EX SPECIFICATIONS

GENERAL SPECIFICATIONS

Scanning method:	Electronic convex sector scanning Electronic linear scanning Electronic steered linear scanning
Display mode:	B (Multi-image display (2B, 3B or 4B) is possible.) Flow B (color blood flow display in B-mode image) B/M, B/PW Doppler simultaneous display and Flow B/PW Doppler simultaneous display M Doppler (PW or CW)
Memory capacity:	512 × 512 × 234 bit
Display gray shades:	256 display levels
Connectable probes :	26 kinds
Number of probe connectors:	For electronic multi-crystal probe : 2 connectors For independent probe : 1 connector
Viewing monitor:	10 or 12 inch RGB color monitor (monitor size is depending on the country) Up/down, swivel, tilt are possible
Preset function:	5 kinds, user programmable
Annotation presetting :	Possible up to 40 words.
Image polarity:	Positive (white on black) or negative (black on white), selectable on M-mode and D-mode image
Video output:	525 lines / frame, NTSC 3.58 or 625 lines / frame, PAL
Power requirement:	100 / 115 / 220 Vac ±10%, 50/60 Hz, Approx. 1000 VA
Dimensions:	Approx. 54 cm (W) × 91 cm (D) × 146 to 168 cm (H) (10 inch monitor type)
Weight:	Approx. 155 kg (10 inch monitor type)
Safety regulation:	Complies with IEC 601-1 Class 1, Type BF
Environment Requirements	In operation Temperature : + 10 to + 40 degrees C Relative humidity : 30 to 75 % (No condensing) In storage Temperature : - 10 to + 60 degrees C Relative humidity : 30 to 95 % (No condensing) Atmospheric pressure : 700 to 1060 mb

IMAGE ADJUSTMENT AND PROCESSING

B-mode image

Gain : Continuously variable between 30 and 60 dB
STC : 11-point slide control (common to M-mode)
Contrast : Changeable in 7 steps
Image processing : GAMMA 4 types (B&W image only)
(independent between viewing monitor and optional
photography unit)
Preprocess Enhance 4 kinds (RELEEF)
Postprocess Enhance 4 kinds
(common to M-mode and D-mode)
Frame correlation ON/OFF
AGC changeable in 10-stage
FTC

Color flow image

Gain : Continuously variable
Image processing : Frame correlation ON/OFF
Color line density changeable in 2 steps
Rejection: 0 / 32 ~ 16 / 32 tones, changeable

M-mode image

Gain : Continuously variable between 30 and 60 dB
STC : 11-point slide control (common to B-mode)
Contrast : Changeable in 7 steps
Image processing : GAMMA 4 types (B&W image only)
(independent between viewing monitor and optional
photography unit)
AGC
FTC
Echo erase

Doppler-mode image

Gain : Continuously variable in 7-stage
Image processing : GAMMA (B&W image only)
(independent between viewing monitor and optional
photography unit)
Gain: Changeable in 7 steps
Rejection: 0 / 32 ~ 16 / 32 tones, changeable

B-mode SPECIFICATIONS

Image magnification

Linear/convex sector:	×0.7, ×1, ×1.5, ×2, four steps changeable
Zoom :	Up to ×2 (magnification range dependent) (B and Flow B mode only)
Frame rate :	Max. 25 frames / sec.
Image scroll (up/down)	Available
Focal points	
In transmission:	Max. 4 points
In reception:	16 points
Image orientation:	Laterally and longitudinally changeable
Physiological signal display:	ECG

M-mode / DOPPLER-mode SPECIFICATIONS

Display method:	Scrolling
Scrolling speed:	Approx. 2, 4, 8, or 16 seconds/screen selectable
Physiological signal display:	ECG

CONVEX SECTOR IMAGING

Scanning angle:	Max. 90 degrees (probe dependent)
Probe frequency:	3.5 to 7.5 MHz (probe dependent★) ★ Probes are multi-frequency type. The indicated frequency is the dominant one.
Focusing method:	Full-range real-time dynamic focusing

LINEAR IMAGING

Scanning width:	Max. 97mm (Probe dependent)
Probe frequency:	3.5 to 7.5 MHz (probe dependent★) ★ Probes are multi-frequency type. The indicated frequency is the dominant one.
Focusing method:	Full-range Real-time Dynamic Focusing

SPECTRAL DOPPLER FUNCTION

Doppler method:	Pulsed wave Doppler/HPRF pulsed wave Doppler Continuous wave Doppler
Usable probe:	
PW/HPRF PW:	Linear / Convex sector probe
CW:	Independent probe
Display mode:	Power spectrum
Doppler analysis method:	FFT (Fast Fourier Transformation)
Doppler reference frequency:	2/2.5/3.5/5 MHz (probe dependent)
Analysis rate:	1 kHz to 25 kHz
PW Doppler velocity range :	± 5 cm/s ~ (Reference frequency 7MHz, PRF 1 kHz, Angle correction 0°) ± 273 cm/s <i>5.4 m/s</i> (Reference frequency 3.5 MHz, PRF 25 kHz, Angle correction 80°)
CW Doppler velocity range :	± 5 cm/s to + 10 or - 10 m/s (Reference frequency 2 MHz)
Base line sift:	Possible to shift in 64 steps up to double in both directions
Spectrum inversion:	Possible (upside down)
Wall motion filter:	50/100/200/400/800 Hz changeable
Pre-compression curve:	Low, mid 1, mid 2 or High, changeable
Sample volume size:	1/2/3/5/10 mm
Angle correction :	Available on B-mode image

COLOR DOPPLER FUNCTION

Use of color :	Red : Toward flow Blue : Away flow Green : Turbulence (dispersion)
Gradation :	64 (32 each for red and blue) 16 for green
Color Display Mode :	Velocity / variance display 2 mode Velocity enhance display 2 mode Variance display
Color Invert	Available
Wall motion filter:	4 types
Color Velocity Range:	± 4 cm/s (Reference frequency 5 MHz, PRF 0.5 kHz) ~ ± 131 cm/s (Reference frequency 3.5 MHz, PRF 12 kHz)
Analysis rate :	1kHz~12kHz
Color Filter:	Low, mid 1, mid 2 and high, 4 steps changeable
Color Edge :	White on / off, color on / off
Color Display Area :	80, 50, 35 and 25% of the display width or display angle of B-mode image are selectable. Display range is movable in the horizontal direction. Display area in the depth direction is adjustable. Color display area follows the sampling point of PW Doppler.

PHYSIOLOGICAL SIGNAL DISPLAY FUNCTION

Model PEU-680 (OPTIONAL)

Display signal

ECG : On B mode and M mode

Display position

Possible to move with the knob : On M mode only

ECG synchronized display: 1 time phase possible

MEASURING AND CALCULATING FUNCTIONS

On B-mode image:

Distance (4 channels)
Area and circumference by either ellipse or
trace method (4 channels)
Volume (4 channels)
Ratio
Percent stenosis
LV function (LV-AL)
Gestational age (Cambel, Hannsman, Tokyo university,
Osaka university, USA)
Fetal weight
Histogram by either box or trace method (2 channels)

On M-mode image:

Depth
Time interval
Velocity
Heart rate
LV function (Teichholz, Pombo)

Doppler :

Velocity (4 channels)
Acceleration (4 channels)
Average flow velocity (4 channels)
Valve area
 Peak velocity, Peak pressure gradient,
 Mean velocity, Mean pressure gradient,
 Time to peak, Acceleration, Flow time
 Pressure half time, Mitral / Tricuspid valve area
PV (peripheral vessels) analysis
 Pulsatility index / Purcelot index
Stroke volume
Cardiac output
 Ejection time, Cross sectional diameter,
 Cross sectional area, Stroke volume,
 Heart rate, Cardiac output
(Measurement unit can be selected from among m/s,
cm/s, and kHz.)

Report functions :

OB report function available
Interface with OB500 (Digisonics' Fetal Growth Analysis
System)

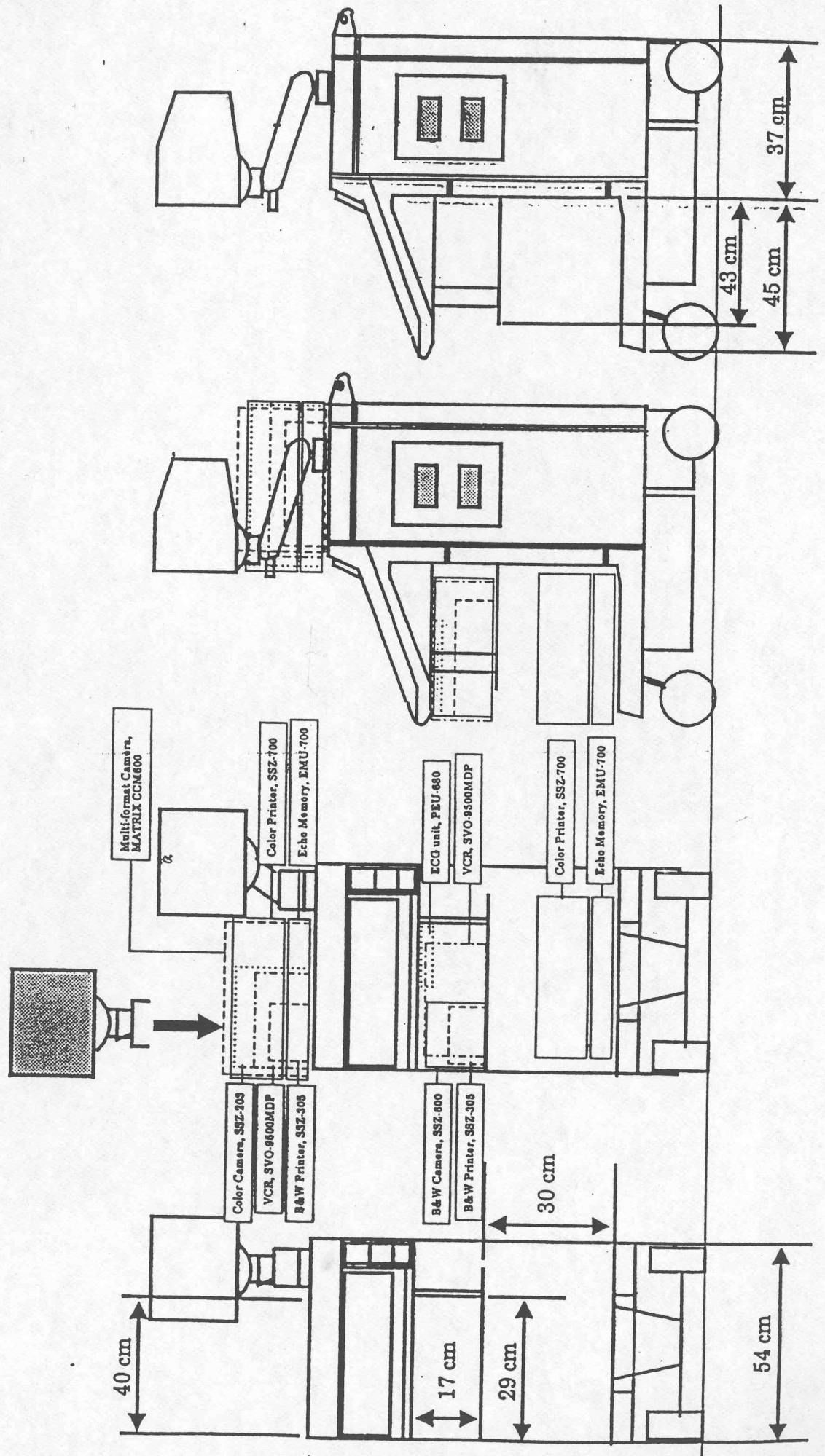
CHARACTER DISPLAY

ID (Patient-identification number) :	8 characters × 4 lines
Date and time :	Automatically displayed
Focal point :	Automatically displayed (F1, F2, F3, F4 and broad)
Probe frequency :	Possible to display automatically
Gain value :	Automatically displayed
Heart rate :	Automatically displayed when ECG is displayed (ECG display unit is optional.)
ECG synchronized timing :	Automatically displayed when ECG synchronizing function is set. (ECG display unit is optional.)
Doppler velocity range :	Automatically displayed
Character display within image area :	Maximum 48 characters × 34 lines
Hospital name display area (text retention area) :	50 characters
Measurement value :	Automatically displayed
Image scrolled position :	Automatically displayed
Gray scale & Color bar :	Automatically displayed
Others :	Automatically displayed items : Distance scale mark, image orientation mark, M-mode sampling cursor, M-mode time mark Possible to display automatically items : puncture guide line, body mark

※ The specifications may be subject to change without notice for improvement.

****SYSTEM STRUCTURE**

OPTIONAL UNIT — Where to Install and Styles



OPTIONAL UNIT — Dimensions and Where to Install

● : Available

OPTIONAL UNIT	DIMENSIONS (W) × (H) × (D) cm	Where to Install			Remarks
		Top panel	Intermediate shelf	Caster frame	
ECG unit, PEU-680	16.5 × 5 × 25 <small>a</small>		●		Simultaneous mounting of this unit and VCR on the intermediate shelf not allowed.
VCR (SONY SVO-9500MD/MDP)	27 × 14.4 × 37	●			
B&W Printer, SSZ-305/305E	15.4 × 10.6 × 30	●			
B&W Camera unit, SSZ-600	12.5 × 14.2 × 36.5		●		Simultaneous mounting of this unit and VCR on the intermediate shelf not allowed.
Color printer, SSZ-700/700E	43 × 12.5 × 43.5	●		●	
Color Camera unit, SSZ-203	26 × 17 40	●			
Echo memory, EMU-700/700E	43 × 5.4 × 41.6	●		●	Install on the lower part of SSZ-700/700E.
Multi-format camera, (MATRIX CCM600)	38 × 19 × 46	●			IIE, model 400 may also be mounted.

Top panel :

Only one unit among from VCR (SONY SVO-9500MD/MDP) or Color image recorder (SSZ-700 + EMU-700 or SSZ-203) may be mounted. B&W printer, SSZ-306/305E may be mounted only when the above units are not mounted.

The turning range of the motor arm is subject to a certain limitation when an option is mounted on the top panel.

Intermediate shelf :

B&W image recorder, (SSZ-305/305E or SSZ-600) is fixed on the left edge.

Simultaneous mounting of both PEU-680 and SSZ-600 is not available when VCR (SONY SVO-9500MD/MDP) has been mounted.

Caster frame :

Only one unit among from Multi-format camera and Color printer, SSZ-700/700E may be mounted.

SYSTEM CONFIGURATION FOR SSD-680EX

SSD-680EX STANDARD COMPONENTS

MAIN UNIT	
VIEWING COLOR MONITOR	10-Inch or 12-Inch (depending on the country)
ELECTRONIC CONVEX SECTOR PROBE	UST-959-3.5 (*3.5MHz / 60deg / 60mmR)
ULTRASOUND GEL	GEL-SCAN-PS (300g)
ACCESSORIES	

OPTIONAL PROBES

SUPER HIGH DENSITY ELECTRONIC CONVEX SECTOR PROBES

Pediatric abdomen	(*3.5MHz / 45deg / 40mmR)	UST-960-5
Heart	(*3.5MHz / 90deg / 14mmR)	UST-965-3.5
Abdomen, OB / GYN, Heart	(*3.5MHz / 90deg / 20mmR)	UST-966-3.5
OB / GYN / IVF (Transvaginal)	(*5MHz / 90deg / 14mmR)	UST-964P-5
Neurosurgery	(*5MHz / 36deg / 25mmR)	UST-961-5
Transesophageal	(*5MHz / 36deg / 25mmR)	UST-962-5
Neonatal head	(*5MHz / 90deg / 14mmR)	UST-967-5
Neurosurgery	(*5MHz / 65deg / 20mmR)	UST-969-5
Neurosurgery, Peripheral Vascular	(*7.5MHz / 65deg / 20mmR)	UST-970-7.5
Interoperation (I-shape)	(*7.5MHz / 65deg / 20mmR)	UST-965-7.5
Neurosurgery (burr-hole puncture)	(*5MHz / 50deg / 7mmR)	UST-968P-5
End-fire transrectal puncture	(*5MHz / 90deg / 9mmR)	UST-667P-5
Peripheral Vascular	(*7.5MHz / 30 deg / 60mmR)	UST-958-7.5

SUPER HIGH DENSITY ELECTRONIC LINEAR PROBES

General abdomen	(*3.5MHz / 97mm)	UST-5042-3.5
Puncture	(*3.5MHz / 80mm)	UST-5043P-3.5
Pediatrics	(*5MHz / 60mm)	UST-5817-5
Peripheral Vascular**	(*7.5MHz / 38mm)	UST-5518-7.5
Interoperation (T-shape)	(*7.5MHz / 60mm)	UST-576T-7.5
Small part	(*7.5MHz / 60mm)	UST-577-7.5
Steered linear for Peripheral Vascular	(*7.5MHz / 35mm)	UST-5525-7.5
Laparoscopic	(*7.5MHz / 38mm)	UST-5523L-7.5

SUPER HIGH DENSITY CONVEX SECTOR / LINEAR PROBE

Prostate	Sector: (*5MHz / 90deg / 9mmR)	
(Transrectal / bi-plane)	Linear: (*7.5MHz / 38mm)	UST-666-5 / 7.5

INDEPENDENT CW DOPPLER PROBE

CW spectral Doppler	2MHz	UST-2262-2
CW spectral Doppler	5MHz	Work In progress

OPTIONAL PROBE ACCESSORIES

Puncture adaptor for UST-959-3.5 → MP-2411

Puncture adaptor → MP-2415

Puncture adaptor → MP-2413C

Puncture adaptor → MP-2414B

Rubber boots → RB-945BP

Puncture adaptor → MP-2391

Puncture adaptor → MP-2413C

Puncture adaptor → MP-2458

Puncture adaptor → MP-2458

Puncture adaptor → MP-2458

Puncture adaptor → BIOPTY INSTRUMENT

Rubber boots → RB-665P

Rubber boots → RB-665P

Rubber boots → RB-665P

Rubber boots → RB-665P

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OPTIONAL FUNCTIONS

ECG signal display unit → PEU-688

ECG lead cord → CM-158

ECG electrode gel → OJ-81

Pediatric electrode → TE-36A

Disposable electrode → TE-1023

Pediatric disposable electrode → TE-1023S

OPTIONAL COLOR IMAGE RECORDERS

SSZ-203 fixture → MP-FX680-5

Color Polaroid camera unit → SSZ-203-PA

Color 35mm SLR camera unit → SSZ-203-35

Polaroid B/W film → Type 3311W

Polaroid color film → Type 3391W

35mm SLR camera adaptor → ACR-CA7515-35

Camera Body → F-801

Echo memory → NTSC: EMU-700
PAL: EMU-700E

Color echo copier → NTSC: SSZ-700
PAL: SSZ-700E

Color print pack → ECP-700S

Video Tape Recorder → NTSC: SVO-9500MD
PAL: SVO-9500MDP

Video Cassette Tape → S-VHS type

Remote controller → SVRM-100
Remote pause switch → SVAC-100

OPTIONAL B/W IMAGE RECORDERS

B/W Multi-format camera → SSZ-111

B/W Polaroid camera unit → NTSC: SSZ-600BU-P
PAL: SSZ-600BUV-P

B/W 35mm SLR camera unit → NTSC: SSZ-600BU-35
PAL: SSZ-600BUV-35

B/W Echo copier → 100 ~ 120V: SSZ-305
220 ~ 240V: SSZ-305E

Polaroid B/W film → Type 667W

IX-P mount for F-801

Print paper → ECP-303HD

Exposure foot switch → MP-2345

X-ray film → 8" X 10"

Film packet → MP-2701

Remote control cable → MC-4A

Camera Body → F-801

Exposure foot switch → MP-2345U

OPTIONAL ACCESSORIES

Foot switch for Freeze and Exposure → MP-2614

Ultrasound gel (300g) → GEL-SCAN-PS

Ultrasound gel (1 gallon) → GEL-SCAN-P

OPTIONAL VIEWING MONITOR

Add-on 9-inch B/W viewing monitor → DVS-5

Add-on 12-inch B/W viewing monitor → DVS-4

External 12-inch B/W monitor → IP-1221C-TM

Connection cable → CO-OPT-870-C15

External 12-inch color monitor → 110 ~ 120V: PVM-1342Q
220 ~ 240V: PVM-1442QM

* Probes are multi-frequency type and the indicated frequency is the dominant one.
** Requires Echo coupler, model ECM-6 for peripheral vascular Doppler imaging.
*** The system configuration may be subject to change, without notice for improvement. Please confirm the latest configuration with Aloka Co., Ltd.

SYSTEM CONFIGURATION FOR SSD-680STD

SSD-680STD STANDARD COMPONENTS

MAIN UNIT	10-inch or 12-inch (depending on the country)
VIEWING COLOR MONITOR	UST-959-3.5 (*3.5MHz / 60deg / 60mmR)
ELECTRONIC CONVEX SECTOR PROBE	GEL-SCAN-PS (300g)
ULTRASOUND GEL	

OPTIONAL PROBES

SUPER HIGH DENSITY ELECTRONIC CONVEX SECTOR PROBES

Pediatric abdomen	(*5MHz / 74 deg / 40mmR)	UST-960-5
Heart	(*3.5MHz / 90deg / 14mmR)	UST-965-3.5
Abdomen, OB / GYN, Heart	(*3.5MHz / 90deg / 20mmR)	UST-966-3.5
OB / GYN / IVF (Transvaginal)	(*5MHz / 90deg / 14mmR)	UST-964P-5
Neurosurgery	(*5MHz / 36deg / 25mmR)	UST-961-5
Transesophageal	(*5MHz / 36deg / 25mmR)	UST-962-5
Neonatal head	(*5MHz / 90deg / 14mmR)	UST-967-5
Neurosurgery	(*5MHz / 65deg / 20mmR)	UST-969-5
Neurosurgery, Peripheral Vascular	(*7.5MHz / 65deg / 20mmR)	UST-978-7.5
Interoperation (I-shape)	(*7.5MHz / 65deg / 20mmR)	UST-985-7.5
Neurosurgery (burr-hole puncture)	(*5MHz / 50deg / 7mmR)	UST-968P-5
End-fire transectal puncture	(*5MHz / 90deg / 9mmR)	UST-667P-5
Peripheral Vascular	(*7.5MHz / 30deg / 60mmR)	UST-958-7.5

SUPER HIGH DENSITY ELECTRONIC LINEAR PROBES

General abdomen	(*3.5MHz / 97mm)	UST-5042-3.5
Puncture	(*3.5MHz / 80mm)	UST-5043P-3.5
Pediatrics	(*5MHz / 60mm)	UST-5817-5
Peripheral Vascular**	(*7.5MHz / 38mm)	UST-5518-7.5
Interoperation (T-shape)	(*7.5MHz / 60mm)	UST-5767-7.5
Small part	(*7.5MHz / 60mm)	UST-577-7.5
Steered linear for Peripheral Vascular	(*7.5MHz / 35mm)	UST-5525-7.5
Laparoscopic	(*7.5MHz / 38mm)	UST-5523L-7.5

SUPER HIGH DENSITY CONVEX SECTOR / LINEAR PROBE

Prostate	Sector: (*5MHz / 90deg / 9mmR)	
(Transectal Ab-plane)	Linear: (*7.5MHz / 38mm)	UST-666-5 / 7.5

INDEPENDENT CW DOPPLER PROBE

CW spectral Doppler	2MHz	UST-2262-2
CW spectral Doppler	5MHz	Work in progress

OPTIONAL PROBE ACCESSORIES

Puncture adaptor for UST-959-3.5	MP-2411
Puncture adaptor	MP-2415
Puncture adaptor	MP-2413C
Puncture adaptor	MP-2414B
Rubber boots	RB-945BP
Puncture adaptor	MP-2391
Puncture adaptor	MP-2413C
Puncture adaptor	MP-245B
Puncture adaptor	BIOPTY INSTRUMENT
Rubber boots	RB-665P
Echo coupler for PV Doppler	ECM-6
Puncture adaptor	MP-244B
Water bag	MP-2463
Puncture adaptor	MP-2456
Trocar	SURGIPOINT 10mm stopcock
Rubber boots	BL-664
Elastic band	F55/16

OPTIONAL FUNCTIONS

ECG signal display unit	PEU-680	ECG lead cord	CM-15B	Pediatric electrode	TE-36A
Color IIR	CFM-680STD V	ECG electrode gel	OJ-81	Disposable electrode	TE-1023
Doppler unit	UGR-680STD			Pediatric disposable electrode	TE-1023S

OPTIONAL COLOR IMAGE RECORDERS

SSZ-203 fixture	MP-FX680-5	Color Polaroid camera unit	SSZ-203-PA	Polaroid B/W film	Type 331TW
		Color 35mm SLR camera unit	SSZ-203-35	Polaroid color film	Type 339TW
				35mm SLR camera adaptor	ACR-CA751S-35
Echo memory	NTSC: EMU-700 PAL: EMU-700E	Color echo copier	NTSC: SSZ-700 PAL: SSZ-700E	Camera Body	F-801
Video Tape Recorder	NTSC: SVO-9500MD PAL: SVO-9500MDP	Video Cassette Tape	S-VHS type	Color print pack	ECP-700S
				Remote controller	SVRM-100
				Remote pause switch	SVAC-100

OPTIONAL B/W IMAGE RECORDERS

B/W Multi-format camera	SSZ-111	Polaroid B/W film	Type 667TW	Exposure foot switch	MP-2345
B/W Polaroid camera unit	NTSC: SSZ-600BU-P PAL: SSZ-600BU-P			X-ray film	8" X 10"
B/W 35mm SLR camera unit	NTSC: SSZ-600BU-35 PAL: SSZ-600BU-35	TX-P mount for F-801	Remote control cable	MC-4A	Camera Body
B/W Echo copier	100 ~ 120V: SSZ-305 220 ~ 240V: SSZ-305E	Print paper	ECP-303HD	Exposure foot switch	MP-2345U
				Film pocket	MP-2701

OPTIONAL ACCESSORIES

Foot switch for Freeze and Exposure	MP-2614
Ultrasound gel (300g)	GEL-SCAN-PS
Ultrasound gel (1 gallon)	GEL-SCAN-P

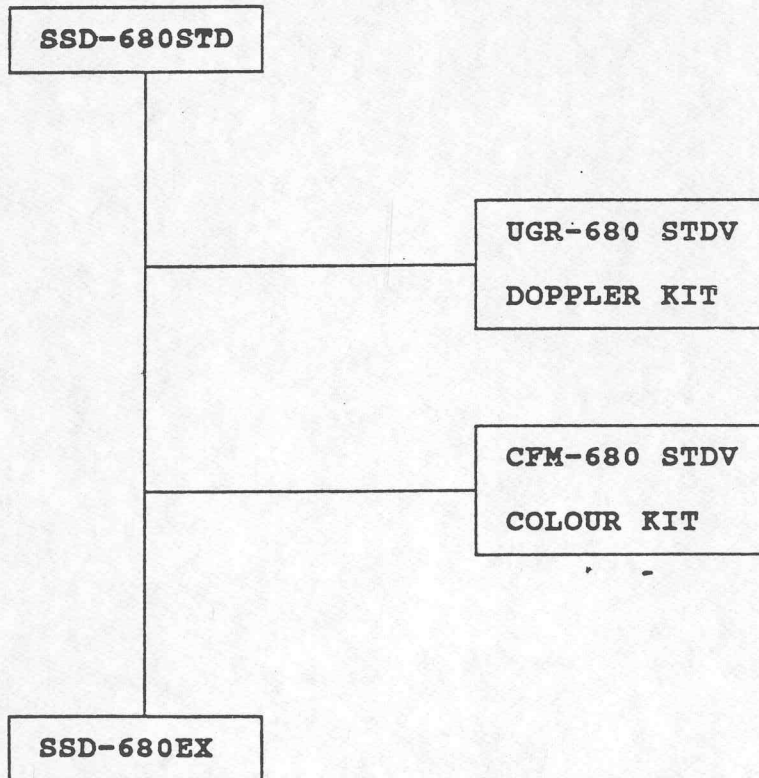
OPTIONAL VIEWING MONITOR

Add-on 9-inch B/W viewing monitor	D5-5
Add-on 12-inch B/W viewing monitor	D5-4
External 12-inch B/W monitor	IP-1221C-TM
Connection cable	CD-OPT-870-C15
External 12-inch color monitor	110 ~ 120V: PVM-1342Q 220 ~ 240V: PVM-1442QM

* Probes are multi-frequency type and the indicated frequency is the dominant one.
 ** Requires Echo coupler, model ECM-6 for peripheral vascular Doppler imaging.
 *** The system configuration may be subject to change, without notice for improvement. Please confirm the latest configuration with Aloka Co., Ltd.

SSD-680STD >>>>>>> SSD-680EX

UPGRADING



****APPLICATION CONFIGURATION**

*** APPLICATION CONFIGURATION:**

A. RADIOLOGY

B. OBSTETRICS/GYNAECOLOGY

C. VASCULAR LABORATORIES

D. SURGERY

E. UROLOGY

A. CONFIGURATION FOR RADIOLOGY :

1. UST - 959 - 3.5 (standard probe, 60deg, 60mmR convex sector)

Application: - general abdominal

2. UST - 960 - 5.0 (48deg, 40mmR convex sector)

Application: - kidney scanning (within 8cm depth)
- superficial abdominal organs
- pediatric abdominal
- small adults abdominal
- deeper peripheral vascular imaging

3. UST - 577 - 7.5 (60mm linear)

Application: - thyroid
- testis
- breast
- appendix
- muscles
- shoulder
- tendons
- menisci
- hip angle

4. UST - 5525 - 7.5 (38mm linear, 15deg steered linear)

Application: - superficial peripheral vascular scanning
- alternative probe for small parts (no.3)

5. UST - 576T - 7.5 (60mm, T - shape linear)

Application: - intraoperative for liver surgery, pancreas surgery etc.
- alternative probe for small parts imaging appendix, thyroid, muscles, tendons

6. UST - 966 - 3.5 (90deg, 20mmR convex sector)

Application: - abdominal intercostal scanning

B.CONFIGURATION FOR OBSTETRICS AND GYNACOLOGY:

1. UST - 959 - 3.5 (60deg,60mmR convex sector)

Application: - general gynaecology and obstetrics

2. UST - 5042 - 3.5 (alternative for doctors who prefer linear probe 97mm linear)

Application: - general gynaecology and obstetrics

3. UST - 964P - 5 (90 deg, 14mmR convex sector)

Application: - transvaginal
- early pregnancy
- tumorvascularisation
- IVF - application

4. UST - 960 - 5 (48 deg, 40mmR convex sector)

Application: - early pregnancy
- higher resolution images for structures within 10 cm

5. UST - 966 - 3.5 (90deg,20mmR convex sector)

Application: - fetal cardiology

Note: - This probe offers higher frame rate compared with the UST - 959 - 3.5 in CFM - imaging.
- B - mode quality is decreased

C. CONFIGURATION FOR VASCULAR LABORATORIES:

1. UST - 5525 -7.5 (38mm linear, 15 deg steered linear)

Application: - superficial peripheral vascular imaging
- femoral bypasses, shunts)

2. UST - 960 - 5.0 (48deg, 40mmR convex sector)

Application: - deeper peripheral vascular imaging
- DVT imaging
- pelvic vascular imaging

3. UST - 970 - 7.5 (65deg, 20mmR convex sector)

Application: - suitable probe for better approach
in carotid imaging (origin and higher
located internal and external branches)

D. CONFIGURATION FOR SURGERY :

1. UST - 576T - 7.5 (60mm T - shape linear)

Application: - liversurgery and pancreassurgery

2. UST - 985 - 7.5 (65deg, 20mmR finger type convex sector)

Application: - liversurgery and pancreassurgery
- better approach
- less resolution as UST - 576T - 7.5

2. UST - 970 - 7.5 (65deg, 20mmR convex sector)

Application: - neurosurgery
- vascularsurgery, for example checking
grafts

4. UST - 968P- 5.0 (50deg, 7mmR convex sector)

Application: - burrhole neurosurgery
- biopsy capability

5. For non - intraoperative imaging vascular application:

See configuration vascular laboratories

6. UST - 5523L - 7.5 (38mm linear, 10mm diameter, long type)
(length of probe 50,5 cm)

Application: - laparoscopic surgery
- staging liver/pancreas pathology
- evaluate gall bladder and hepatic ducts
during laparoscopic surgery

E. CONFIGURATION FOR UROLOGY:

1. UST - 959 - 3.5 (60deg,60mmR convex sector)

Application: - transabdominal scanning.
- kidneys
- prostate

2. UST - 666 - 5.0/7.5 (5MHz convex 90deg/9mmR)
(7.5MHz linear 38mm)

Application: - transrectal biplane imaging of prostate
- transperineal biopsy capability

3. UST - 667P - 5.0 (90deg,9mmR convex sector endfire)

Application: - transrectal imaging with transrectal
biopsy capability of the prostate

****NEW FUNCTIONS FOR OPERATION**

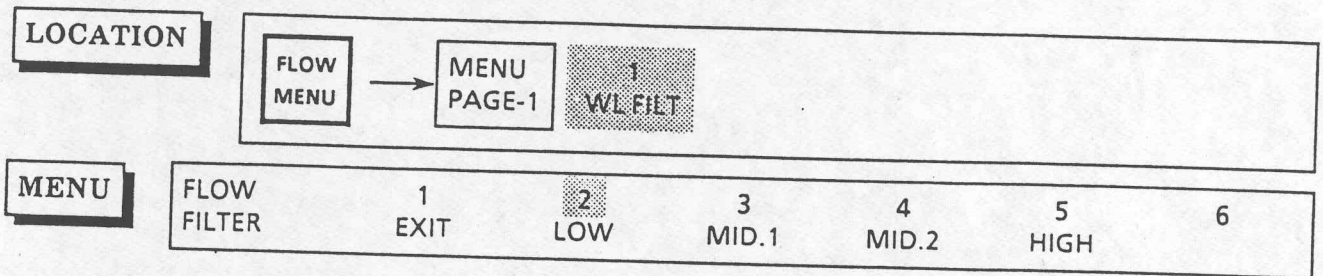
****NEW FUNCTIONS FOR OPERATION**

- * WALL FILTER
- * LINE DENSITY
- * VARIABLE SCANNING AREA
- * HORIZONTAL FUNCTION IN COLOR AVERAGE
- * VELOCITY RANGE SELECTION
- * BODY MARKERS OPERATION
- * APPLICATION (FLOW MENU)

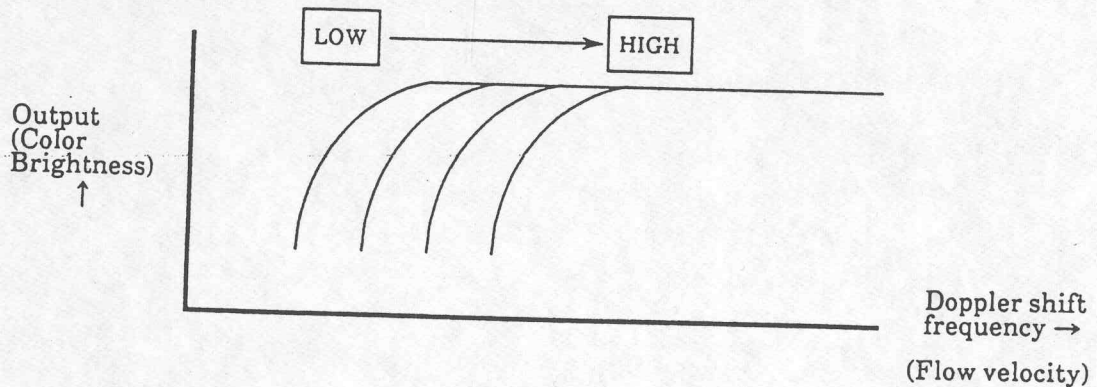
WALL FILTER

The wall filters are used to eliminate unwanted signals from slow moving organs and strong reflecting structures such as vessels walls. These unwanted signals causes color motion artifacts.

On the SSD680EX we have developed a new 6 stage color filter. Following options are available in the menu:



Each sets the cut-off frequency of the low-cut filter as shown below:



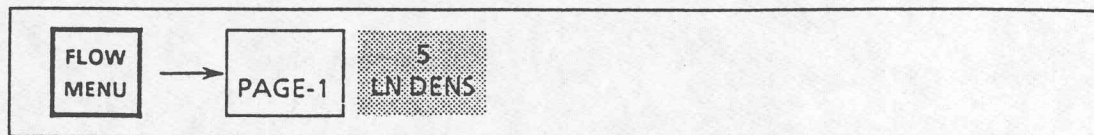
For displaying the lowest detectable velocity in CFM imaging we have to use the low setting. To calculate the lowest detectable velocity we have a factor 0.12 for this low setting. When we use a pulse repetition frequency of 500 Hz, we have a cut off frequency of 60 Hz. This a technical theoretical explanation. In reality it is possible that we can display flow below this level. This depends on the amplitude of the signals we receive.

LINE DENSITY

FUNCTION

The LN DENS changes line density for color image.

LOCATION



Each time the 5 switch is pressed, the line density for color image changes between low (B/W 1 : color 1) and high (B/W 1 : color 2). (Standard setting is low.)

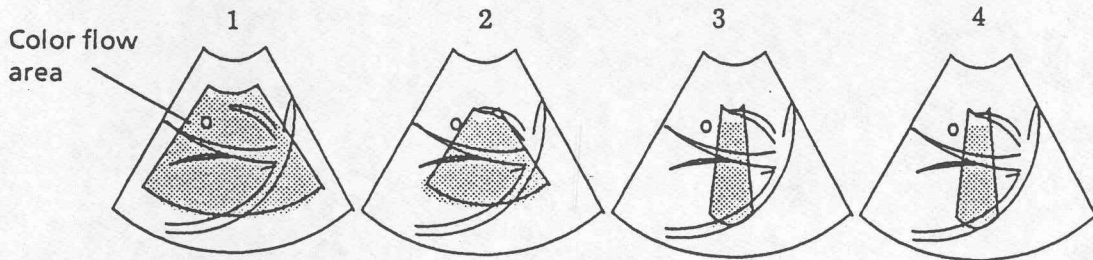
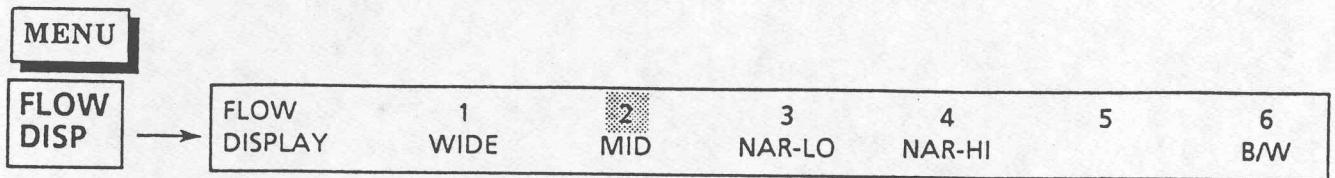
Low: Select low line density to observe large vessels.
When low line density is selected, smoothing is applied between adjacent lines. Frame rate is higher compared to high line density.

High: Select high line density to observe small vessels.
When high is selected, smoothing is not applied.

Changing the line density will result in more precise, higher resolution colour flow imaging. In small thin vessels this function can be useful to display these vessels as accurate as possible.
This option will decrease the frame rates. Off course this can be adjusted by correcting color average to low setting, flow display on narrow setting and B/W display on 60% setting.

VARIABLE SCANNING AREA IN B/FLOW MODE.

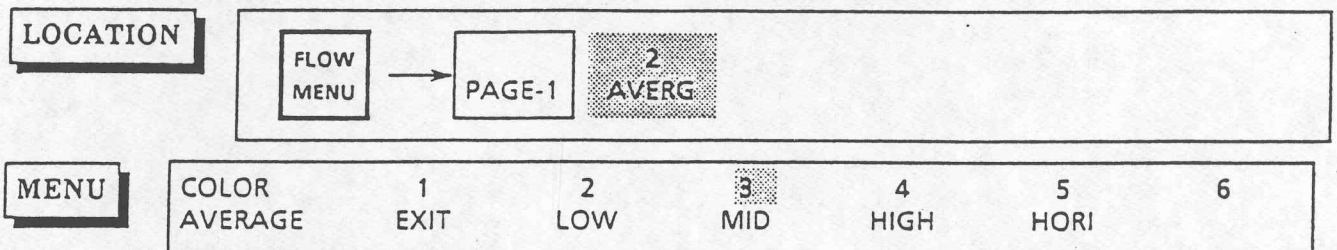
In the flow display menu is added a new function, B/W (6)



Changing the field of view will result in higher frame rates and will result in reduced color motion artifacts. By pressing switch 6 , the field of view will reduce 40%.

COLOUR AVERAGE

This function is related to the colour sensitivity. Increasing the pulses per line will increase the accuracy of the detection of slow flows , but as it takes more time to transmit more pulses, the frame rate will be decreased.
In the menu we can see a new function:



Horizontal smoothing (5) is added. This function will not give just vertical smoothing as on the spatial filter, but also horizontal smoothing. Both function works as noise rejection. Spatial filter works as signal selection , so sometimes weak signal will drop out.
The hori averaging works as signal averaging , so signal drop out will be minimum.

VELOCITY RANGES

More steps in velocity ranges are available now. Previously we had just one step between 6 - 22 cm/s, (11cm/s)
This is an example for the 3.5 Mhz probe with 15cm depth range.

Now we can use following steps:

- 6 cm/s
- 8 cm/s
- 11 cm/s
- 14 cm/s
- 16 cm/s
- 22 cm/s
- 32 cm/s
- 44 cm/s
- 65 cm/s
- 88 cm/s

Automatically depth range is decreased, when we select higher prf. This has been done to achieve higher frame rates.

Body Mark Display

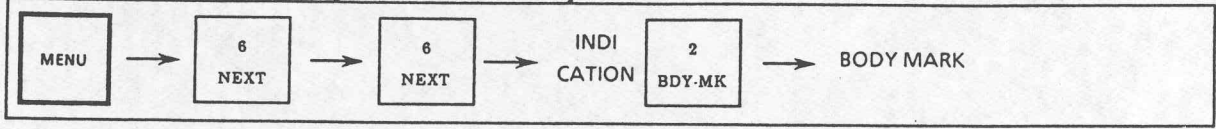
<Function>

Displays a body mark suitable for the object of diagnosis.

There are 19 body marks which fall into four groups. (See next page for the figures.)

<Use>

BDY-MK (BODY MARK)

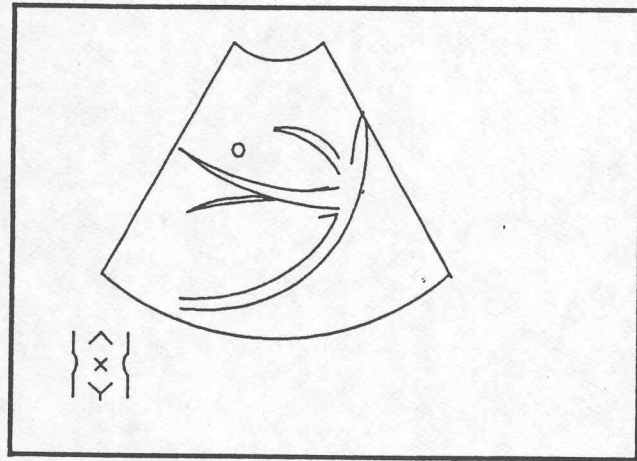


- a. Select 2 **BODY-MK** in the INDICATION menu. The BODY MARK menu below will be displayed.

BODY MARK	1	2	3	4	5	6
	EXIT	ABDOMEN	OB/GY	HEAD	BREAST	NEXT

- b. Select the body mark group you want from the above menu and press the switch.

The first body mark of the group is displayed at the lower left of the screen.



For example, when ABDOMEN is selected, the above figure appears.

B-MODE IMAGING

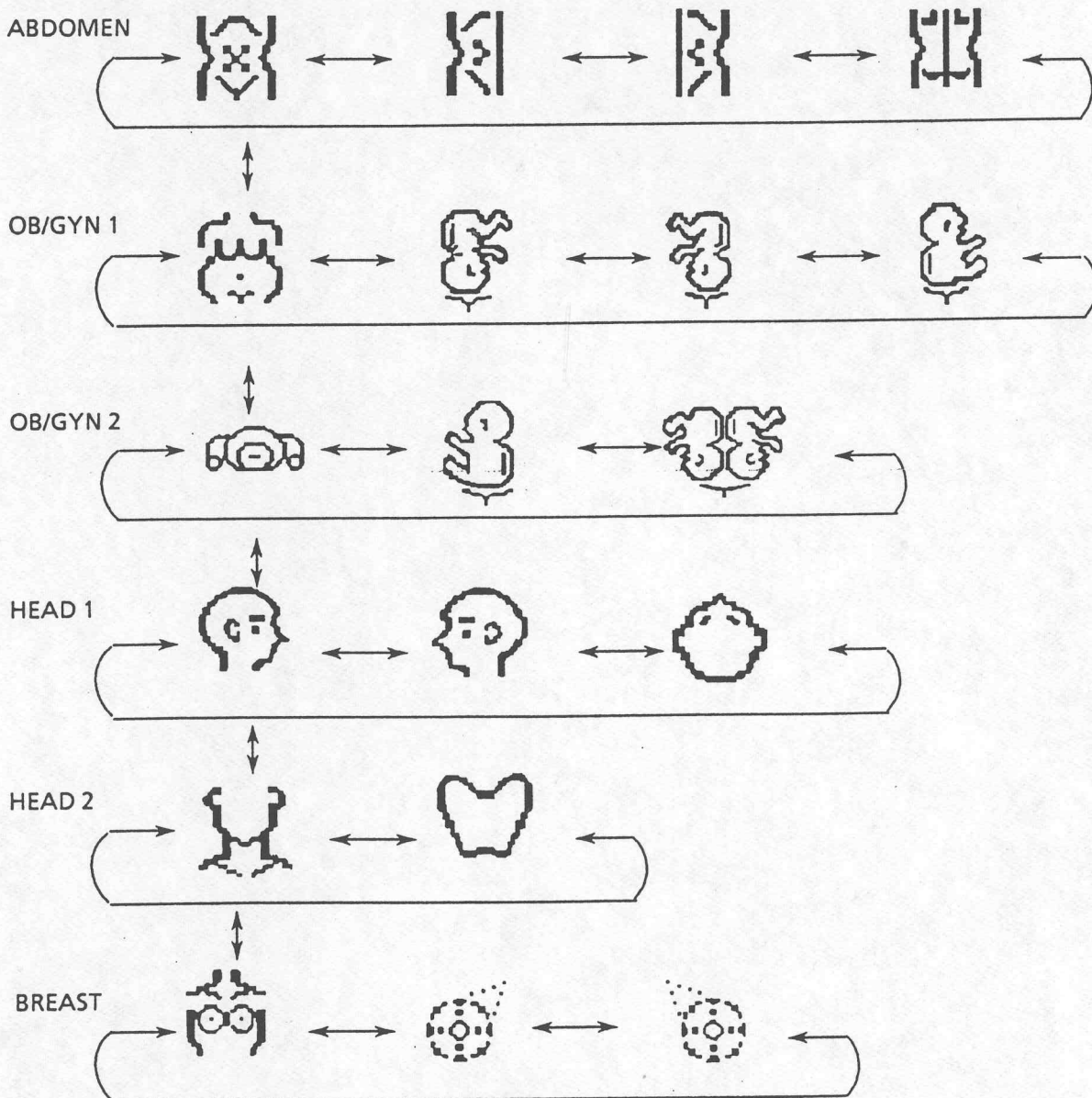
Useful Functions

To display another body mark:

Using the trackball, move the probe mark to the extreme right. Then roll the trackball furthermore. The body mark changes as shown below.

- Turning the trackball left changes the body mark in reverse.
- Turning the trackball up or down changes the body mark group as shown below.

<Body marks>



Probe Mark Setting

The probe mark is useful for keeping track of where the probe is being applied.



<Use>

- a. Select a body mark suitable for the displayed image.
- b. Roll the trackball to position the probe mark to an appropriate location.
- c. Press the **MARK REF** switch to change the direction of the probe mark, if necessary. Rolling the trackball to the right turns the probe mark clockwise.

Each time the **MARK REF** switch is pressed, steps b. and c. are altered.

[Note]

A body mark can be displayed regardless of image freezing.

<Erasing the body mark>

- Press the  switch.

NOTE: When the switch is not lighting press the switch twice to erase the body mark.

APPLICATION

There are two selections available in the flowmenu. Generally the received echo from cardiac cavity is stronger than from bloodvessels in the abdomen. A change of the window of the input signal to the colorcalculator is needed. Using cardio setting for the abdominal application, you might lose the signal of the weak echos. On the other hand overflow can occur if abdomen setting is used in cardiac application!!!!

**** PRESETTINGS**

PRESETTINGS SSD 680 EX:

A. RADIOLOGY

1. GENERAL ABDOMINAL
2. KIDNEY vascularisation and other thiny vessels
3. AORTA
4. THYROID

B. OBSTETRICS AND GYNACOLOGY:

1. UMBILICAL CORD . (use abdominal setting)
2. PLACENTAL FLOW , CEREBRAL BLOOD CIRCULATION
(kidneysetting)
3. FETAL HEART

C. VASCULAR LABORATORIES:

1. LARGE VESSELS HIGH FLOWS (arterial flow)
2. LARGE VESSELS LOWER FLOW (venous flow)
3. SMALL VESSELS (arterial flow)
4. SMALL VESSELS (venous flow)

Dop Control

(Abdominal)

	Initialize	Program			
Vel.Range		<u>2KHZ</u>	4KHZ	6KHZ	8KHZ
Filter	<u>50HZ</u>	100HZ	200HZ	400HZ	800HZ
Sample Vol	1mm	2mm	<u>3mm</u>	5mm	10mm
Pre Comp	low	mid1	mid2	<u>high</u>	
Reject	(00/14)				
Base Line	low	mid1	<u>cent</u>	midh	high
Invert	<u>norm</u>	invert.			
Unit	m/s	<u>cm/s</u>	KHZ		

Flow Control

(Abdominal)

	Program				
Color disp	V/Var1	V/Var2	Var	V-Enh1	<u>V-Enh2</u>
Vel Range	0.5KHZ	<u>1KHZ</u>	2KHZ	4KHZ	6KHZ
Filter	Low	Mid1	<u>Mid2</u>	High	
Col Avrg	Low	<u>Mid</u>	High	Hori	
Col Rej	(00,32)				
Disp Area	Wide	Mid1	<u>Mid2</u>	Narr	
Area Lock	Off	<u>On</u>			
Color edge	<u>Color-cut (25-63)</u>		<u>White-cut (25-63)</u>		
Flow Enh	Low 2	Low1	STD	<u>High1</u>	High2
Frame Corr	Off	Low	<u>Mid</u>	high	
Focus	1	2	3	4	<u>Broad</u>
Color Pol	<u>Normal</u>	Invert			
Spacial filter	Off	Low	<u>Mid</u>	High	
Line density	<u>Low</u>	High			
Application	<u>Abdomen</u>	Cardio			

Dop Control (kidneys)

	Initialize		Program		
Vel.Range		<u>2KHZ</u>	4KHZ	6KHZ	8KHZ
Filter	<u>50HZ</u>	100HZ	200HZ	400HZ	800HZ
Sample Vol	<u>1mm</u>	2mm	3mm	5mm	10mm
Pre Comp	low	mid1	mid2	<u>high</u>	
Reject	(00/14)				
Base Line	low	mid1	<u>cent</u>	midh	high
Invert	<u>norm</u>	invert.			
Unit	m/s	<u>cm/s</u>	KHZ		

Flow Control (kidneys)

	Program				
Color disp	V/Var1	V/Var2	Var	V-Enh1	<u>V-Enh2</u>
Vel Range	0.5KHZ	<u>1KHZ</u>	2KHZ	4KHZ	6KHZ
Filter	Low	<u>Mid1</u>	Mid2	High	
Col Avrg	Low	<u>Mid</u>	High	Hori	
Col Rej	(00,32)				
Disp Area	Wide	Mid1	<u>Mid2</u>	Narr	
Area Lock	Off	On			
Color edge	<u>Color-cut (25-63)</u>		<u>White-cut (25-63)</u>		
Flow Enh	Low 2	Low1	STD	High1	<u>High2</u>
Frame Corr	Off	Low	<u>Mid</u>	high	
Focus	1	2	3	4	<u>Broad</u>
Color Pol	<u>Normal</u>	Invert			
Spacial filter	Off	<u>Low</u>	Mid	High	
Line density	<u>Low</u>	High			
Application	<u>Abdomen</u>	Cardio			

Dop Control

(aorta)

	Initialize		Program		
Vel. Range		2KHZ	4KHZ	<u>6KHZ</u>	8KHZ
Filter	50HZ	<u>100HZ</u>	200HZ	400HZ	800HZ
Sample Vol	1mm	2mm	3mm	<u>5mm</u>	10mm
Pre Comp	low	mid1	mid2	<u>high</u>	
Reject	(00/14)				
Base Line	low	mid1	<u>cent</u>	midh	high
Invert	<u>norm</u>	invert.			
Unit	m/s	<u>cm/s</u>	KHZ		

Flow Control

(aorta)

	Program				
Color disp	V/Var1	V/Var2	Var	V-Enh1	<u>V-Enh2</u>
Vel Range	0.5KHZ	1KHZ	2KHZ	4KHZ	<u>6KHZ</u>
Filter	Low	Mid1	<u>Mid2</u>	High	
Col Avrg	Low	Mid	High	<u>Hori</u>	
Col Rej	(00,32)				
Disp Area	Wide	Mid1	<u>Mid2</u>	Narr	
Area Lock	Off	<u>On</u>			
Color edge	<u>Color-cut</u> (25-63)		<u>White-cut</u> (25-63)		
Flow Enh	Low 2	Low1	STD	<u>High1</u>	High2
Frame Corr	Off	Low	<u>Mid</u>	high	
Focus	1	2	3	4	<u>Broad</u>
Color Pol	<u>Normal</u>	Invert			
Spacial filter	Off	Low	Mid	<u>High</u>	
Line density	<u>Low</u>	High			
Application	<u>Abdomen</u>	Cardio			

Dop Control (fetal heart)

	Initialize		Program		
Vel.Range		2KHZ	4KHZ	<u>6KHZ</u>	8KHZ
Filter	50HZ	100HZ	200HZ	400HZ	800HZ
Sample Vol	1mm	2mm	<u>3mm</u>	5mm	10mm
Pre Comp	low	mid1	mid2	<u>high</u>	
Reject	(00/14)				
Base Line	low	mid1	<u>cent</u>	midh	high
Invert	<u>norm</u>	invert.			
Unit	m/s	<u>cm/s</u>	KHZ		

Flow Control (fetal heart)

	Program				
Color disp	<u>V/Var1</u>	V/Var2	Var	V-Enh1	V-Enh2
Vel Range	0.5KHZ	1KHZ	2KHZ	4KHZ	<u>6KHZ</u>
Filter	Low	Mid1	Mid2	<u>High</u>	
Col Avrg	Low	Mid	High	<u>Hori</u>	
Col Rej	(00,32)				
Disp Area	Wide	Mid1	Mid2	<u>Narr</u>	
Area Lock	Off	<u>On</u>			
Color edge	<u>Color-cut</u> (25-63)		<u>White-cut</u> (25-63)		
Flow Enh	Low 2	Low1	<u>STD</u>	High1	High2
Frame Corr	Off	<u>Low</u>	Mid	high	
Focus	1	2	<u>3</u>	<u>4</u>	Broad
Color Pol	<u>Normal</u>	Invert			
Spacial filter	Off	Low	Mid	<u>High</u>	
Line density	<u>Low</u>	High			
Application	Abdomen	<u>Cardio</u>			

Dop Control	(thyroid)				
	Initialize	Program			
Vel. Range		<u>2KHZ</u>	4KHZ	6KHZ	8KHZ
Filter	<u>50HZ</u>	100HZ	200HZ	400HZ	800HZ
Sample Vol	<u>1mm</u>	2mm	3mm	5mm	10mm
Pre Comp	low	mid1	mid2	<u>high</u>	
Reject	(00/14)				
Base Line	low	mid1	<u>cent</u>	midh	high
Invert	<u>norm</u>	invert.			
Unit	m/s	<u>cm/s</u>	KHZ		

Flow Control	(thyroid)				
	Program				
Color disp	V/Var1	V/Var2	Var	V-Enh1	<u>V-Enh2</u>
Vel Range	<u>0.5KHZ</u>	1KHZ	2KHZ	4KHZ	6KHZ
Filter	Low	<u>Mid1</u>	Mid2	High	
Col Avrg	<u>Low</u>	Mid	High	Hori	
Col Rej	(00,32)				
Disp Area	Wide	Mid1	<u>Mid2</u>	Narr	
Area Lock	Off	<u>On</u>			
Color edge	<u>Color-cut</u> (25-63)		<u>White-cut</u> (25-63)		
Flow Enh	Low 2	Low1	STD	High1	<u>High2</u>
Frame Corr	Off	Low	<u>Mid</u>	high	
Focus	1	<u>2</u>	3	4	Broad
Color Pol	<u>Normal</u>	Invert			
Spacial filter	<u>Off</u>	Low	Mid	High	
Line density	Low	<u>High</u>			
Application	<u>Abdomen</u>	Cardio			

Dop Control

(fetal heart)

	Initialize	Program			
Vel. Range		2KHZ	4KHZ	<u>6KHZ</u>	8KHZ
Filter	50HZ	100HZ	200HZ	400HZ	800HZ
Sample Vol	1mm	2mm	<u>3mm</u>	5mm	10mm
Pre Comp	low	mid1	mid2	<u>high</u>	
Reject	(00/14)				
Base Line	low	mid1	<u>cent</u>	midh	high
Invert	<u>norm</u>	invert.			
Unit	m/s	<u>cm/s</u>	KHZ		

Flow Control

(fetal heart)

	Program				
Color disp	<u>V/Var1</u>	V/Var2	Var	V-Enh1	V-Enh2
Vel Range	0.5KHZ	1KHZ	2KHZ	4KHZ	<u>6KHZ</u>
Filter	Low	Mid1	Mid2	<u>High</u>	
Col Avrg	Low	Mid	High	<u>Hori</u>	
Col Rej	(00,32)				
Disp Area	Wide	Mid1	Mid2	<u>Narr</u>	
Area Lock	Off	<u>On</u>			
Color edge	<u>Color-cut</u>	(25-63)		<u>White-cut</u>	(25-63)
Flow Enh	Low 2	Low1	<u>STD</u>	High1	High2
Frame Corr	Off	<u>Low</u>	Mid	high	
Focus	1	2	<u>3</u>	<u>4</u>	Broad
Color Pol	<u>Normal</u>	Invert			
Spacial filter	Off	Low	Mid	<u>High</u>	
Line density	<u>Low</u>	High			
Application	Abdomen	<u>Cardio</u>			

Dop Control

(large vessel, high flow)

	Initialize	Program			
Vel. Range		2KHZ	4KHZ	<u>6KHZ</u>	8KHZ
Filter	50HZ	<u>100HZ</u>	200HZ	400HZ	800HZ
Sample Vol	1mm	2mm	<u>3mm</u>	5mm	10mm
Pre Comp	low	mid1	mid2	<u>high</u>	
Reject	(00/14)				
Base Line	low	mid1	<u>cent</u>	midh	high
Invert	<u>norm</u>	invert.			
Unit	m/s	<u>cm/s</u>	KHZ		

Flow Control

(large vessel, high flow)

	Program				
Color disp	V/Var1	V/Var2	Var	V-Enh1	<u>V-Enh2</u>
Vel Range	0.5KHZ	1KHZ	2KHZ	4KHZ	<u>6KHZ</u>
Filter	Low	<u>Mid1</u>	Mid2	High	
Col Avrg	Low	Mid	High	<u>Hori</u>	
Col Rej	(00,32)				
Disp Area	Wide	<u>Mid1</u>	Mid2	Narr	
Area Lock	Off	<u>On</u>			
Color edge	<u>Color-cut</u> (25-63)		<u>White-cut</u> (25-63)		
Flow Enh	Low 2	Low1	STD	<u>High1</u>	High2
Frame Corr	Off	Low	<u>Mid</u>	high	
Focus	1	2	3	4	<u>Broad</u>
Color Pol	<u>Normal</u>	Invert			
Spacial filter	Off	Low	Mid	<u>High</u>	
Line density	<u>Low</u>	High			
Application	<u>Abdomen</u>	Cardio			

Dop Control

(large vessel, low flow)

	Initialize	Program			
Vel.Range		<u>2KHZ</u>	4KHZ	6KHZ	8KHZ
Filter	<u>50HZ</u>	100Hz	200HZ	400HZ	800HZ
Sample Vol	1mm	2mm	<u>3mm</u>	5mm	10mm
Pre Comp	low	mid1	mid2	<u>high</u>	
Reject	(00/14)				
Base Line	low	mid1	<u>cent</u>	midh	high
Invert	<u>norm</u>	invert.			
Unit	m/s	<u>cm/s</u>	KHZ		

Flow Control

(large vessel, low flow)

	Program				
Color disp	V/Var1	V/Var2	Var	V-Enh1	<u>V-Enh2</u>
Vel Range	<u>0.5KHZ</u>	1KHZ	2KHZ	4KHZ	6KHZ
Filter	<u>Low</u>	Mid1	Mid2	High	
Col Avrg	<u>Low</u>	Mid	High	<u>Hori</u>	
Col Rej	(00,32)				
Disp Area	Wide	Mid1	<u>Mid2</u>	Narr	
Area Lock	Off	<u>On</u>			
Color edge	<u>Color-cut (25-63)</u>		<u>White-cut (25-63)</u>		
Flow Enh	Low 2	Low1	STD	High1	<u>High2</u>
Frame Corr	Off	Low	<u>Mid</u>	high	
Focus	1	2	3	4	<u>Broad</u>
Color Pol	Normal	Invert			
Spacial filter	Off	Low	Mid	<u>High</u>	
Line density	<u>Low</u>	High			
Application	Abdomen	Cardio			

Dop Control

(small vessel, high flow)

	Initialize	Program			
Vel.Range		2KHZ	<u>4KHZ</u>	6KHZ	8KHZ
Filter	50HZ	<u>100HZ</u>	200HZ	400HZ	800HZ
Sample Vol	<u>1mm</u>	2mm	3mm	5mm	10mm
Pre Comp	low	mid1	mid2	<u>high</u>	
Reject	(00/14)				
Base Line	low	mid1	<u>cent</u>	midh	high
Invert	<u>norm</u>	invert.			
Unit	m/s	<u>cm/s</u>	KHZ		

Flow Control

(small vessel, high flow)

	Program				
Color disp	V/Var1	V/Var2	Var	V-Enh1	<u>V-Enh2</u>
Vel Range	0.5KHZ	<u>1KHZ</u>	2KHZ	4KHZ	6KHZ
Filter	Low	<u>Mid1</u>	Mid2	High	
Col Avrg	<u>Low</u>	Mid	High	Hori	
Col Rej	(00,32)				
Disp Area	Wide	Mid1	Mid2	<u>Narr</u>	
Area Lock	Off	On			
Color edge	<u>Color-cut (25-63)</u>		<u>White-cut (25-63)</u>		
Flow Enh	Low 2	Low1	STD	<u>High1</u>	High2
Frame Corr	Off	Low	<u>Mid</u>	high	
Focus	1	2	3	4	<u>Broad</u>
Color Pol	<u>Normal</u>	Invert			
Spacial filter	<u>Off</u>	Low	Mid	High	
Line density	Low	<u>High</u>			
Application	<u>Abdomen</u>	Cardio			

Dop Control

(.small vessel, low flow)

	Initialize		Program		
	Vel.Range		<u>2KHZ</u>	4KHZ	6KHZ
Filter	<u>50HZ</u>	100HZ	200HZ	400HZ	800HZ
Sample Vol	<u>1mm</u>	2mm	3mm	5mm	10mm
Pre Comp	low	mid1	mid2	<u>high</u>	
Reject	(00/14)				
Base Line	low	mid1	<u>cent</u>	midh	high
Invert	<u>norm</u>	invert.			
Unit	m/s	<u>cm/s</u>	KHZ		

Flow Control

(small vessel, low flow)

	Program				
	Color disp	V/Var1	V/Var2	Var	V-Enh1
Vel Range	<u>0.5KHZ</u>	1KHZ	2KHZ	4KHZ	6KHZ
Filter	<u>Low</u>	Mid1	Mid2	High	
Col Avrg	<u>Low</u>	Mid	High	Hori	
Col Rej	(00,32)				
Disp Area	Wide	Mid1	Mid2	<u>Narr</u>	
Area Lock	Off	<u>On</u>			
Color edge	<u>Color-cut</u> (25-63)		<u>White-cut</u> (25-63)		
Flow Enh	Low 2	Low1	STD	High1	<u>High2</u>
Frame Corr	Off	Low	<u>Mid</u>	high	
Focus	1	2	3	4	<u>Broad</u>
Color Pol	<u>Normal</u>	Invert			
Spacial filter	<u>Off</u>	Low	Mid	High	
Line density	Low	<u>High</u>			
Application	<u>Abdomen</u>	Cardio			

Aloka

SERVICE MANUAL

ECHO CAMERA

SSD - 680EX / SSD - 680STD

2 / 2

English Edition

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9 - 1 General

Adjusters shown in this section are used for direct adjustment of ultrasonic image itself.

9 - 2 Precautions

In order to prevent occurrence of secondary trouble incidental to mis-adjustment, every work according to the adjustment procedure described below should be performed only by highly educated and skilled persons who have attended a training course approved by ALOKA.

When performing actual adjustment work, give care to the following points:

- (1) Do not start working hastily soon after turning on the power switch, but wait for a time until the equipment warms up satisfactory.
- (2) When adjusting variable resistors, take care not to exert undue force on PCBs.
- (3) With advance in S.M.T. (Surface Mount Technology), some variable resistors actually mounted may be size smaller than before. When adjusting those small variable resistors, be sure to use screwdrivers well fitting in with those resistors.
- (4) Never temper with any variable resistors or variable inductance other than variable resistors specified in this section. Careless tempering with may result in a state hard to restore the normal condition.

9 - 3 Tools and Measurers

The prepared tools and measures are following

1. Oscilloscope

Sensitivity	:	5mV/div
Frequency width	:	DC~50MHz
Input voltage	:	more than 400V
2. Digital Volt meter

Range	:	ACV, DC, DCA, Ω
-------	---	------------------------
3. Probe

Convex	:	UST-959-3.5
--------	---	-------------
4. Screw driver

For + M3 screw	
For adjustment screw driver	
5. Extension board

	:	EP-2351
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9 - 4 Adjustment

All of the adjustment should be done with Convex probe "UST-959-3.5".

° EP-3265*-3 MAIN CONTROL

To make setting of the GAIN knob and indication on the TV monitor appropriate.

For adjustment, Menu "CHARACTER DISP" is ON

° EP-3265*-3 MAIN CONTROL

To set the echo erase of echo erase limit to an appropriate value.

For adjustment, "Measurement Function × " is ON.

° EP-3463* VBPF & GAIN CONTROL

To make the continuity smooth in depth direction of ultrasound image.

° EP-3459* Rx FOCUS

To make the continuity smooth in depth direction of ultrasound image.

° EP-3463* VBPF & GAIN CONTROL

To perform internal adjustment of GAIN and STC so that the acting range of the GAIN and STC knobs on the panel can be calibrated.

° EP-3463* VBPF & GAIN CONTROL

To perform internal adjustment of GAIN and STC so that the acting range of the GAIN and STC knobs on the panel can be calibrated.

° EP-3461*-* MAIN AMP & COLOR ITF

To set the noise level of ultrasound image to an appropriate value.

° EP-3461*-* MAIN AMP & COLOR ITF

To set the base level of FTC to an appropriate value.

° EP-3463* VBPF & GAIN CONTROL

To minimize the change of actual echo in the monochrome picture when B-mode Flow is ON.

° EP-2729* A/D D/A

To set the REC VIDEO and CAMERA B/W VIDEO to an appropriate level.

° EP-3443* VIDEO I.T.F.

To set the out put signal from the external out put terminal to an appropriate level

9-4-1 EP-3265*-* MAIN CONTROL

Purpose of Adjustment

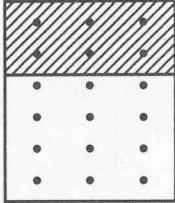
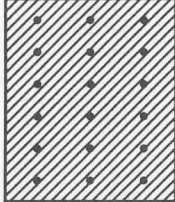
To make setting of the GAIN knob and indication on the TV monitor appropriate.
For adjustment, Menu "CHARACTER DISP" is ON.

Item	Condition	Adjust.	Test point	Standard
FLOW-GAIN display	MODE : B/FLOW FLOW-GAIN : 10	RV1	TP7	0V +0.2 -0 V
FLOW-GAIN display	MODE : B/FLOW FLOW-GAIN : 0	RV4	TP7	9.5V +0.2 -0 V
B-GAIN	MODE : B B-GAIN : 10	RV2	On TV monitor	Parameter display : G90
B-GAIN	MODE : B B-GAIN : 0	RV5	On TV monitor	Parameter display : G30

9-4-2 EP-3265*-* MAIN CONTROL

Purpose of Adjustment

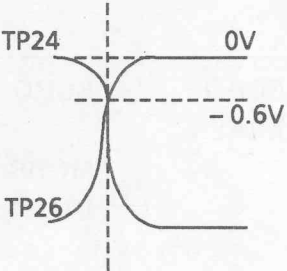
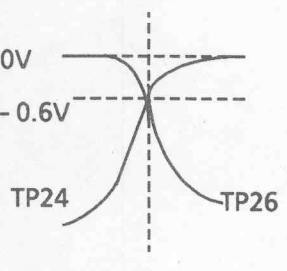
To set the echo erase of echo erase limit to an appropriate value.
For adjustment, Menu "Measurement Function X" is ON.

Item	Condition	Adjust.	Test point	Standard
ECHO ERASE	ECHO ERASE : 10 MODE : M DIAGNOSTIC TRACKBALL FUNCTION : Press X	RV3	On TV monitor	 <p>VELOCITY X**cm/S</p> <p>Erosion of M mode image must reach to upper edge of letters VELOCITY.</p>
ECHO ERASE	ECHO ERASE : 0 MODE : M DIAGNOSTIC	RV6	On TV monitor	 <p>VEL **cm/S</p> <p>M-mode image must remain unerased at bottom of screen.</p>

9-4-3 EP-3463* VBPF & GAIN CONTROL

Purpose of Adjustment

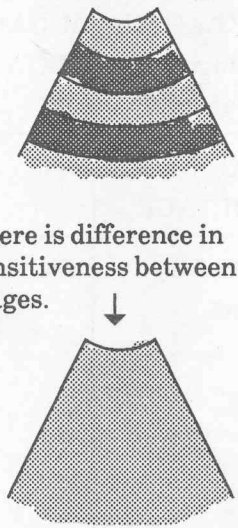
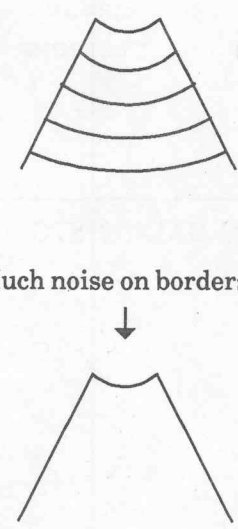
To make the continuity smooth in depth direction of ultrasound image.

Item	Condition	Adjust.	Test point	Standard
Making continuity in depth direction of image smooth	MODE : B	RV21	Observe TP24 and TP26 with an oscilloscope set to 2-channel, CHOP mode. Set trigger of oscilloscope at leading edge \uparrow of TP26.	<p>-0.6V point of falling edge \downarrow of TP24 must coincide in time with -0.6V point of leading edge \uparrow of TP26</p> 
	MODE : B	RV22	Observe TP24 and TP26 with an oscilloscope set to 2-channel, CHOP mode. Set trigger of oscilloscope at leading edge \uparrow of TP24.	<p>-0.6V point of falling edge \downarrow of TP26 must coincide in time with -0.6V point of leading edge \uparrow of TP24.</p> 

9-4-4 EP-3459* Rx FOCUS

Purpose of Adjustment

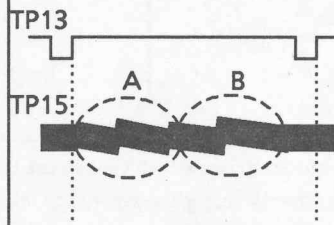
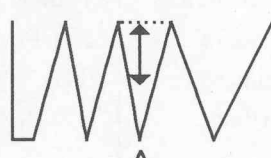
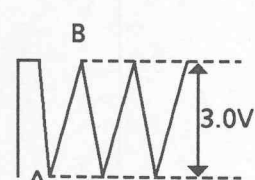
To make the continuity smooth in depth direction of ultrasound image.

Item	Condition	Adjust.	Test point	Standard
<p>Equalizing noise level</p>	<p>Probe is left in the air. MODE : B STC : All knobs turned to right fully. CONTRAST : 7 FOCUS : 4 AGC : Min GAIN : Max</p>	<p>RV301 Two PCBs EP-3459 are used. correct difference, if any, in brightness between adjacent areas by fine-adjustment with RV301 on an EP3459 (one which has been replaced) Prepared for repair. (Match brightness with that of original PCB.) For verification after adjustment, be sure to remove extension PCB.</p>	<p>ON TV monitor</p>	 <p>There is difference in sensitiveness between stages.</p> <p>Even sensitiveness.</p>
<p>Minimizing noise on focus borders.</p>	<p>Probe is left in the air. MODE : B STC : All knobs turned to right fully. CONTRAST : 7 FOCUS : 4 AGC : Min GAIN : Max</p>	<p>RV302 or RV303 With RV302 turned clockwise fully, adjust RV303 to minimize noise on focus borders on ultrasound image picture, or with RV303 turned counterclockwise fully, adjust RV302 to minimize noise on focus borders on ultrasound image picture.</p>	<p>On TV monitor</p>	 <p>Much noise on borders.</p> <p>Less noise on borders.</p>

9-4-5 EP-3463* VBPF & GAIN CONTROL

Purpose of Adjustment

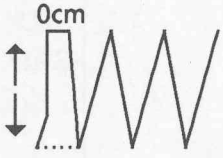
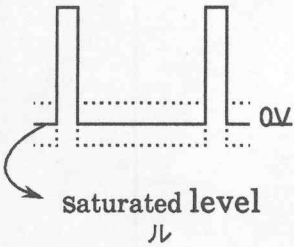
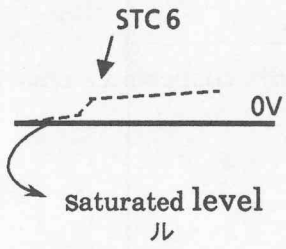
To perform internal adjustment of GAIN and STC so that the acting range of the GAIN and STC knobs on the panel can be calibrated.

Item	Condition	Adjust.	Test point	Standard
B, M, FLOW GAIN voltage adjustment	B GAIN : 10 M GAIN : 10 FLOW GAIN : 10	RV12	J2 B33pin	+4.00 ± 0.05V
STC VOLTAGE	STC : MAX	RV6	J2 B34pin	+1.00 ± 0.05V
STC DC level	STC : MIN	RV8	TP15	Adjust the DC level of B to be the DC level of A. 
Integral constant	STC 0, 2, 4, 8, 13, 19 : MIN STC 1, 3, 6, 10, 16 : MAX	RV7	TP15	to be level change minimum, when move max to minimum of STC4 (a point) 
STC GAIN	STC 0, 2, 4, 8, 13, 19 : MIN STC 1, 3, 6, 10, 16 : MAX	RV9	TP16	Level difference between STC 1 (point A) and STC 2 (point B) to be 3.0 ± 0.5 Vp-p. 

9-4-6 EP-3463* VBPF & GAIN CONTROL

Purpose of Adjustment

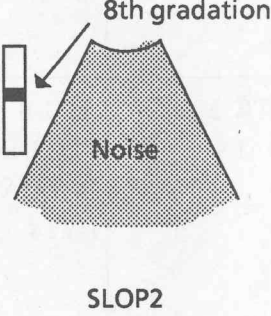
To perform internal adjustment of GAIN and STC so that the acting range of the GAIN and STC knobs on the panel can be calibrated.

Item	Condition	Adjust	Test point	Standard
STC LEVEL	STC 0, 2, 4, 8, 13, 19 : MIN STC 1, 3, 6, 10, 16 : MAX	RV10	TP16	To be change minimum, when moved max to minimum of STC 0cm 
STC MAX GAIN	STC 0~19 : MAX FOCUS : 4 B-GAIN : 10 RV14 : CW MAX	RV15	TP18	Waveform to be saturated at $0 \pm 0.05V$ 
STC OFFSET	STC 0~4 : MAX 6~19 : set to center FOCUS : 4 B-GAIN : 10	RV14	TP18	Waveform to be saturated at 0 V. 

9-4-7 EP-3461* MAIN AMP & COLOR ITF

Purpose of Adjustment

To set the noise level of ultrasound image to an appropriate value.

Item	Condition	Adjust.	Test point	Standard
Noise level	MODE : B FOCUS : 4 CONT : 1 STC : MAX GAIN : MAX	RV3	On Tv monitor	With menu PST PRO, SLOPE 2 selected 8th gradation, must become full with noise. 

9-4-8 EP-3463* V.B.P.F. & GAIN CONTROL

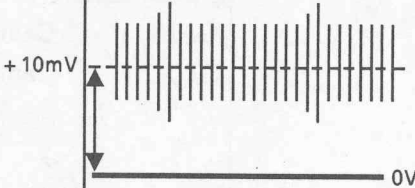
Purpose of Adjustment: To minimize the change of actual echo in the B/W image when B-mode Flow is ON.

Item	Condition	Adjust.	Test point	Standard
B/W image	<p>MODE : B FOCUS : B CONT : 4 FLOW : OFF→ON FLOW GAIN : 0 GAIN : Center STC : Center</p> <div> <p style="text-align: center;">Phantom RMI-412</p> </div>	RV16	On TV monitor	<p>When probe is put on against RMI- 412 phantom and FLOW is turned to ON, actual echo brightness on B/W image monochrome picture must remain unvaried, compared with FLOW OFF.</p> <div> </div> <p>B/W image must remain unvaried, compared with FLOW OFF.</p>

9-4-9 EP-3461* MAIN AMP & COLOR ITF

Purpose of Adjustment

To set the base level of FTC to an appropriate value.

Item	Condition	Adjust	Test point	Standard
Base level of FTC	MODE : B STC : MIN GAIN : MIN FOCUS : 4 CONT : 1	RV9	TP11	To be adjust, FTC waveform center of $+10\text{mV} \pm 10\text{mV}3$ 

9-4-10 EP-3461* MAIN AMP & COLOR ITF

Purpose of Adjustment: To set the base level of COLOR DOPPLER to an appropriate value.

Item	Condition	adjust	Test point	Standard
Base level of COLOR RF SIG	MODE : B FLOW : ON FLOW GAIN :MAX	EP-3461 RV12	EP-5100 TP13	0V ±20mV
Base level of COLOR RF SIG	MODE : B FLOW : ON FLOW GAIN :MAX	EP-3461 RV13	EP-5100 TP14	0V ±20mV

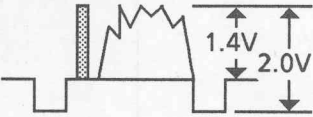
9-4-11

EP-2729*

A/D · D/A

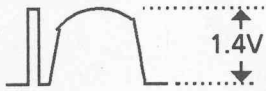
Purpose of Adjustment

To set the B/W VIDEO to an appropriate level.

Item	Condition	Adjust	Test point	Standard
B/W VIDEO OUTPUT VOLTAGE	MODE : B	RV6 RV7	B/W VIDEO connector on the rear panel.	<p>The temporary adjust RV7 at CCW full up</p> <p>Adjust RV6 amplitude at $2.0 \pm 0.05 V_{p-p}$</p> <p>Adjust RV7 to just before distortion of gray scale bar.</p> 

9-4-12 EP-3443* VIDEO ITF

Purpose of Adjustment: To set the output signal from the external output terminal to an appropriate level.

Item	Condition	Adjust	Test point	Standard
EXT VIDEO COLOR out put voltage	MODE : B FLOW : ON	EP-3443* RV78	Connector EXT VIDEO color at bottom in front of device	Adjust to $1.4V \pm 0.04 V_{p-p}$ 

10-1 Introduction

"Performance Check" describes the items to be confirmed for the maintenance of equipment quality and safety under the circumstances referred to below.

- Once a repair work has been done,
- Once a modification, for a problem or the like, has been made.
- Once a change as to upgrade the functions and/or specifications has been made,
- When a periodic inspection is made.

10-2 Precautions

Unless otherwise specified, this performance check must be conducted with all coverings attached in place and under the following environments:

- 30 minutes or more have passed after throwing the power switch ON.

If the performance check specified herein should be conducted after a repair or modification, make certain of the following:

- All the PCBs removed are reconnected properly.
- All the connectors removed are reconnected properly.
- The replaced ROM and others are mounted in place on a printed circuit board. The power pin, in particular, should never be mistaken for the GND pin.
- The unnecessary ROM is not left behind inside the equipment.
- Tool, measuring probe, and the like are not left behind inside the equipment.
- Optional components and grounding cable are properly reconnected.
- Screws and the like are not left behind inside the equipment.

10-3 Making Entries in Repair Report

Upon completion of the check, enter findings thereof in such a form as repair report or the like. And present it to the user. Keep a copy thereof in custody.

10-4 Performance check

Those items which are covered by a performance check vary, in principle, with what is done for the operation requiring the check. In accordance with the chart given below, identify an item or items required (those marked with ● in the chart). And check each of the items so marked.)

The terms referred to in the chart, meanwhile, are defined, respectively, as follows:

“Power Supply Unit” Power supply body, isolation transformer, and power switch

“Other units than above” Units other than the power supply unit, physiological signals and PCBs.

Check Requiring Operation	CHECK ITEM			REMARKS
	Function	Image quality	Safety	
Replacing parts or modification inside power supply unit.	●	●	●	including PCB replacement.
Replacing the power supply unit as a whole.	●	●		
Replacing parts or modification inside physiological signal unit.	●	●	●	including PCB replacement.
Replacing the physiological signal unit as a whole.	●	●		
Replacing a PCB in units other than that the above.	●	●		
Replacing parts or modification on PCB in other units.	●	●		including ROM replacement.
Replacing units other than that referred to above as a whole.	●	●		Including a probe.
Performance check before the modification	●	●		
Periodic inspection	●	●	●	

What be checked in each of the check items, meanwhile, is given on the pages described below, to which you are requested to refer.

- Functional Check Item 10-4-1 from Page 10-4 and on.
- Image quality Check Item 10-4-2 from Page 10-10 and on.
- Safety Check Item 10-4-3 from Page 10-13 and on.

If a specified performance or rating should be found unsatisfied as a result of the check, the equipment should be deemed failed.
Now, refer to Section 8 "Troubleshooting" to dissolve the failure.

10-4-1 Checking for function

Operate the equipment on the operation panel to make certain that the equipment is operating properly subject to each function related with the panel switches.

(1) Confirmation items on POWER ON

Setting conditions POWER : ON PROBE 1 : UST-959-3.5

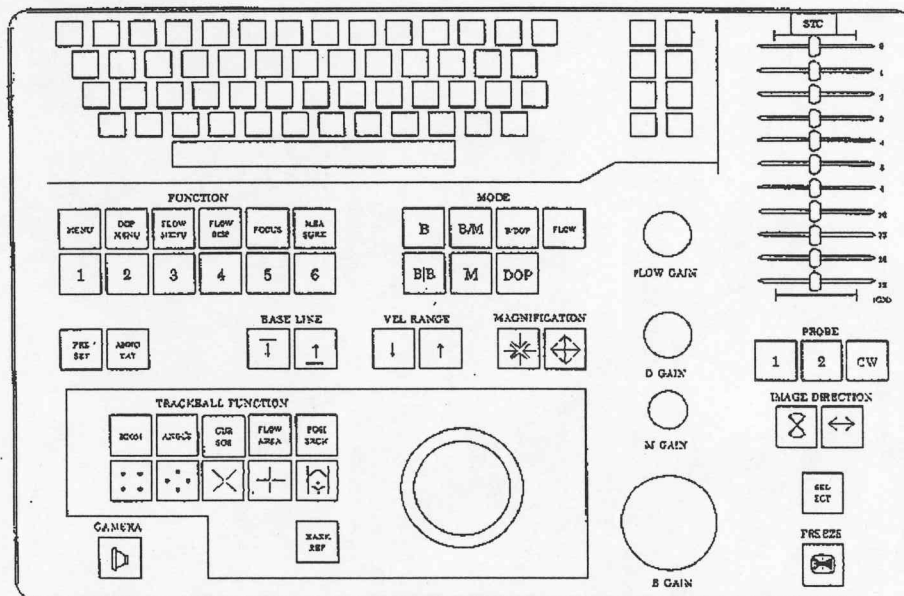
- ① The power lamp is lit.
- ② All the fans work normally.
- ③ The system should be started under the initial setting condition (RESET setting).
- ④ The set values of items set by the user including HOSPITAL, NAME, DATE or TIME are backed up.

(2) Confirmation of panel switch operation

When the PCB mounted closely to the panel switch is replaced, or a switch mounted on the panel is replaced, make sure to confirm key top conditions. If the key top is deviated, the correct switch operation may not be performed.

An LED is lit while the function equivalent to the switch is selected.

Confirm all the switches shown in the drawing of the panel shown below work correctly.



The LEDs on the panel switches provide the following three lighting conditions:

- OFF : Does not function even if this switch is pressed.
- Lit : The switch is currently selected.
- Half lit : Medium brightness. This switch is selectable.

(3) Confirmation of menu contents

Select FUNCTION MENU.

The contents once selected in the MENU are inherited until re-selection of the MENU or forced setting by preset switch is performed, even when setting conditions including mode or MAG are changed. However, some items are not selectable depending on the setting conditions.

Confirm the following items operate correctly.

MENU PAGE

Setting condition Desired page

- ① The LED is lit when MENU SW is pressed, and the LEDs of switches 1 to 6 are half lit. The following menu is displayed at the lower part of the screen.

IMAGE	1	2	3	4	5	6
CONT1	PREV	PRE PRO	GAMMA	FRO-CO	M-WIN	NEXT

- ② The menu changes to the following by pressing 6 NEXT.

IMAGE	1	2	3	4	5	6
CONT2	PREV	PST PRO	C-GAMMA			NEXT

- ③ The menu changes to the following by pressing 6 NEXT.

INDI	1	2	3	4	5	6
CATION	PREV	BDY-MK	PUNC	CH-DSP	ANNOTAT	NEXT

- ④ The menu changes to the following by pressing 6 NEXT.

SET UP	1	2	3	4	5	6
PREV	HOSP	DATE		TEST		NEXT

- ⑤ The menu returns to IMAGE CONT1 by pressing 6 NEXT.

- ⑥ The menu returns to the previous menu by pressing 1 PREV in any menu displayed.

- ⑦ The LED turns to half-lit state and the LEDs of switches 1 to 6 are turned off by pressing MENU switch.

SECTION 10 PERFORMANCE CHECK

(4) Confirmation of Focus

Setting conditions MODE:B, 2B
FREEZE:OFF

- ① The LED of the FOCUS switch is lit upon pressing the switch and the following menu is displayed.

FOCUS	1	2	3	4	5	6
	1	2	3	4	BROAD	MULTI

- ② Image transmission focuses are independently set by selecting a number or numbers of 1 to 4. (Any combinations are available.)
- ③ The setting is changed to (MULTI OFF) by pressing 5, and any one of 1 to 4 is set.
- ④ The setting is returned to (MULTI ON) by pressing 5 again, and the same operation as ② is obtained.

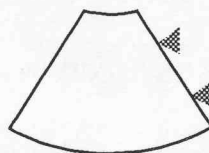
Setting conditions MODE:B FLOW, B/M
FREEZE:OFF

- ① One image transmission focus only is set by selecting one of the four.

Setting conditions MODE:B*/D
FREEZE:OFF

- ① The focuses can be changed according to the sampling point.
- * The automatic display on the screen is also changed according to the setting change.

Example F2, 4 are set. 1 3 (White against black)



BROAD FOCUS

Setting conditions Set FOCUS in PRESET FLOW CONTROL to B (BROAD FOCUS).
BROAD FOCUS is automatically selected in B/FLOW and

2B/FLOW

mode. (When doppler function is added, like B/PW + FLOW
mode, focus

point changes according to the depth of SAMPLE POINT.)

(5) Confirmation of measuring functions

Select MEASURE(NTSC) , MEAS (PAL) in the FUNCTION menu.

The menu shown below is displayed. Input a sample value to the measuring item freely selected and check the measured result.

Setting condition B, 2B

- ① The LED of the MEASUREMENT switch is lit when the switch is pressed, and the LEDs of switches 1 to 6 are half lit. the menu shown below is displayed at the bottom of the screen.

B-PAGE1	1	2	3	4	5	6
	CLEAR	DIST	AREA-T	OB	%STEN	NEXT

- ② The menu changes as shown below by pressing 6 NEXT.

B-PAGE2	1	2	3	4	5	6
	CLEAR	VOL	AREA-E	HIST	RATIO	NEXT

- ③ The menu returns to B-PAGE1 when 6 NEXT is pressed. Thereafter, the menus of ① and ② should be displayed in turn each time 6 NEXT is pressed.

SECTION 10 PERFORMANCE CHECK

Setting condition B/M

- ① The LED of the MEASUREMENT switch is lit when the switch is pressed, and the LEDs of switches 1 to 6 are half lit. The menu shown below should be displayed at the bottom of the screen.

M-PAGE1	1	2	3	4	5	6
	CLEAR	DIST	%STEN	RATIO	H-RATE	NEXT

- ② The menu changes as shown below by pressing 6 NEXT.

M-PAGE2	1	2	3	4	5	6
	CLEAR	POMBO	TEICH			NEXT

- ③ The menu changes as shown below by pressing 6 NEXT.

B-PAGE1	1	2	3	4	5	6
	CLEAR	DIST	AREA-T	OB	%STEN	NEXT

- ④ The menu changes as shown below by pressing 6 NEXT.

B-PAGE2	1	2	3	4	5	6
	CLEAR	VOL	AREA-E	HIST	RATIO	NEXT

- ⑤ The menu should return to M-PAGE1 when 6 NEXT is pressed. Thereafter, menus 1 and 2 should be displayed in turn each time 6 NEXT is pressed.

Setting condition M

- ① The LED of the MEASUREMENT switch is lit when the switch is pressed, and the LEDs of switches 1 to 6 are half lit. The menu shown below should be displayed at the bottom of the screen.

M-PAGE1	1	2	3	4	5	6
	CLEAR	DIST	%STEN	RATIO	H-RATE	NEXT

- ② The menu changes as shown below by pressing 6 NEXT.

M-PAGE2	1	2	3	4	5	6
	CLEAR	POMBO	TEICH			NEXT

- ③ The menu should return to M-PAGE1 when 6 NEXT is pressed. Thereafter, the menus of ① and ② should be displayed in turn each time 6 NEXT is pressed.

Setting condition B/DOP

- ① The LED of the MEASUREMENT switch is lit when the switch is pressed, and the LEDs of switches 1 to 6 are half lit. The menu shown below should be displayed at the bottom of the screen.

D-PAGE1	1	2	3	4	5	6
	CLEAR	VEL	F-VOL	PUL-IND	P-GRAD	NEXT

- ② The menu changes as shown below by pressing 6 NEXT.

D-PAGE2	1	2	3	4	5	6
	CLEAR	POU-IND	AVERG	ACCEL	RATIO	NEXT

- ③ The menu changes as shown below by pressing 6 NEXT.

B-PAGE1	1	2	3	4	5	6
	CLEAR	DIST	AREA-T	OB	%STEN	NEXT

- ④ The menu changes as shown below by pressing 6 NEXT.

B-PAGE2	1	2	3	4	5	6
	CLEAR	VOL	AREA-E	HIST	RATIO	NEXT

- ⑤ The menu should return to D-PAGE1 when 6 NEXT is pressed. Thereafter, menus ① to ④ should be displayed in turn each time 6 NEXT is pressed.

Setting condition DOP

- ① The LED of the MEASUREMENT switch is lit when the switch is pressed, and the LEDs of switches 1 to 6 are half lit. the menu shown below should be displayed at the bottom of the screen.

D-PAGE1	1	2	3	4	5	6
	CLEAR	VEL	F-VOL	PUL-IND	P-GRAD	NEXT

- ② The menu changes to the following by pressing 6 NEXT.

D-PAGE2	1	2	3	4	5	6
	CLEAR	POU-IND	AVERG	ACCEL	RATIO	NEXT

- ③ The menu should return to D-PAGE1 when 6 NEXT is pressed. Thereafter, the menus of ① and ② should be displayed in turn every time 6 NEXT is pressed.

10-4-2 Checking for image quality

To make certain of an ultrasound image quality, make a checkout by the use of a test piece.

(1) Confirmation of echoing

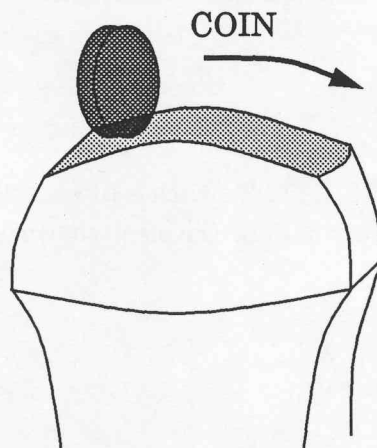
[Condition] MODE: B
 FOCUS: 1

[Procedure] Apply a small quantity of ultrasound gel to the probe surface . Slide a coin on the surface of the probe slowly with the coin touched to the probe.

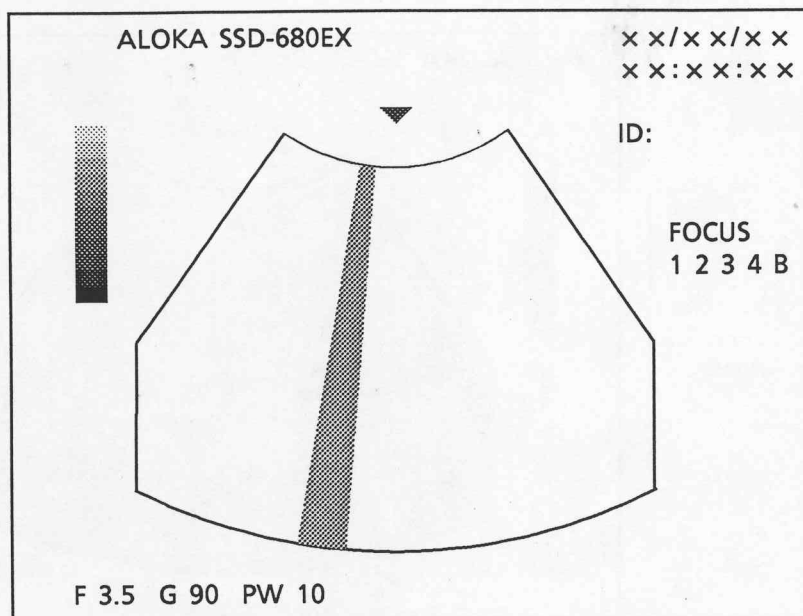
[Confirmation] Observe the image on the TV monitor and check if there is any missing echo, skipping or extreme difference in sensitivity.
Also, confirm that the echo generation is changed by changing the FOCUS setting.

[Caution] Be careful to handle the probe, as the surface of it is easily damaged.

PROBE



TV MONITOR



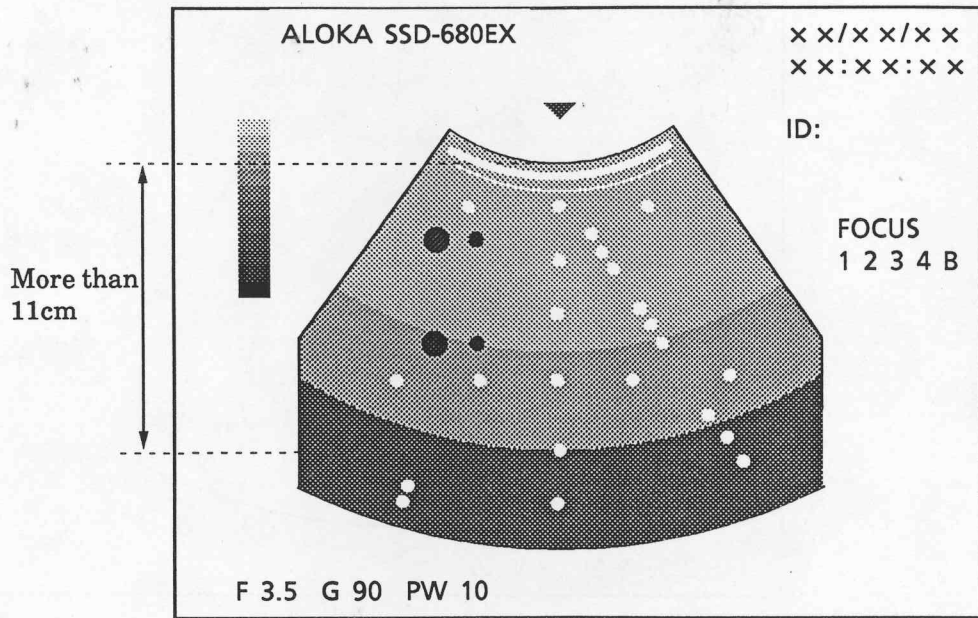
(7) Confirmation of total sensitivity

[Condition] PROBE : UST-959-3.5
 MODE : B
 FOCUS : MULTI All of 1, 2, 3, and 4 ON
 GAIN : Max.
 STC : All Max.
 ACOUSTIC : 10
 POWER

[Procedure] Touch the probe with the phantom.
 Phantom : Supplied by Radiation Measurements INC.
 MODEL : RMI - 412

[Confirmation] The reflected echo of the seventh target in the depth direction should be confirmed on the ultrasonic image.

Actual echo of 11 cm or longer should be observed.



10-4-3 Checking for Safety

Every confirmation item shown herein is intended to make certain of the protection performance relative to an insulation of the equipment and to an electric shock suffered by the subject (patient).

(1) Provisions

The provisions required for the check are as enumerated below. Provide them in advance.

(a) Digital Multi-meter

A meter, which has a resistance or a continuity test function, and is capable of determining an AC voltage of up to 1 mV.

(b) Megger

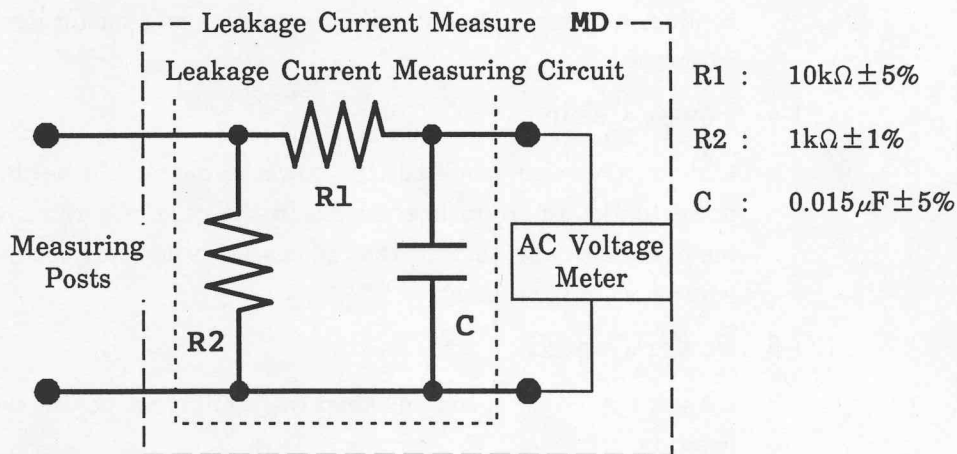
A tester capable of determining a test (applied) voltage of up to 100 M Ω at 500 VDC.

(c) Leakage Current Measuring Instrument

A measuring instrument capable of determining a leakage current from a medical electric appliance, or a combination of Leakage Current Measuring Circuit (d) below with Digital Multi-meter (a) above.

(d) Leakage Current Measuring Circuit

A circuit is illustrated below.



(e) Metal Foil

This foil is to be used to determine a patient leakage current at the probe. An area enough to cover the surface of a probe is required.

(f) Weight

500g \times 2 pieces

- The description below is given with (a) thru (e) used as the names of the provisions referred to above.

- A meter or measuring device may be separated into two or more components as long as each of them satisfies the specifications (standards) shown, respectively.
- Each of the measuring devices and circuits requires a calibration once a year. Besides, keep the calibration records in custody.

(2) Precautions

(2)-1 Environments

To make a check, set up the same goods or environments as those which the user are normally using in terms of the following

- Power and grounding cable, and method of interconnecting them,
- Probe and scanner,
- Cables and optional features, among others, required for diagnosis.

(2)-2 Handling a Measuring Device, etc.

Before putting a measuring device or a measuring circuit into operation, make certain of their respective usage and of the precautions to be taken during the operation.

(2)-3 Calibration

Any measuring device or leakage current measuring circuit that may have had a calibration period expired is prohibited from being used to conduct a check. Do not fail to employ a measuring device properly calibrated.

(2)-4 Power Cable

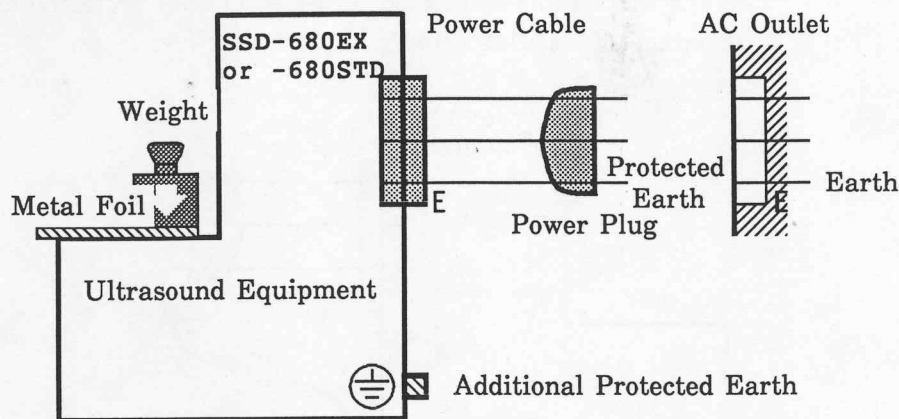
Unless otherwise specified, the power cable should be unplugged out of a power outlet to do an operation. In the case of a removable power cable, meanwhile, make certain that it has been normally connected to the equipment on the body.

(2)-5 Power Switch

Unless otherwise specified, keep the equipment power switch at the OFF position.

(2)-6 Connection Diagram

A connection diagram is given below for the check in which a measuring device is to be employed. The diagram, meanwhile, is expressed in a common format, which has meanings as follows.



(3) Appearance Inspection

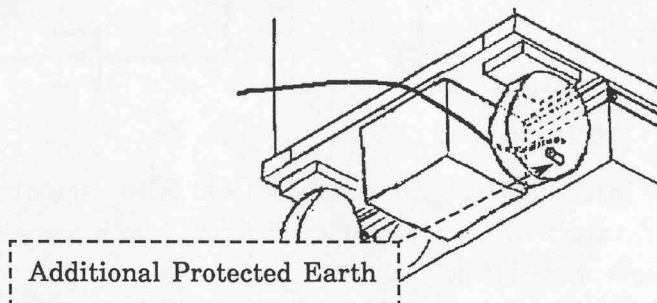
Check the equipment enclosure to make certain that it is free from a remarkable concave or distortion.

- If the enclosure should have a concave or a distortion, observe it in the interior and make certain that any metal part does not come in abnormal contact.
- ▶ If the metal should be in abnormal contact, discontinue checking subsequent hereto and dissolve the problem involved.

(4) Checking Protected Earth Cable for Continuity

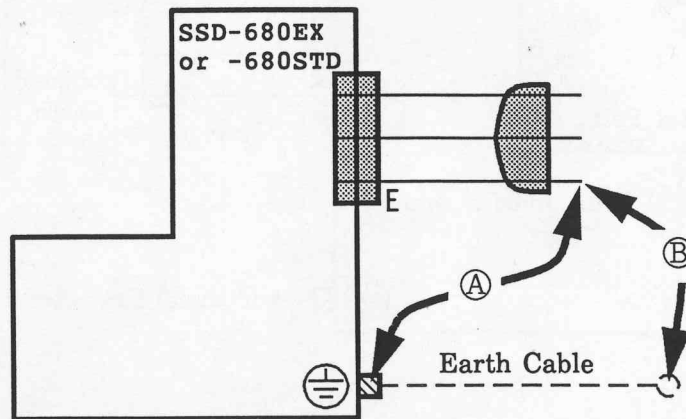
According as the equipment is installed, use a digital multi-meter to make certain that the protected earth cable is electrically connected. Nevertheless, it is necessary to make certain that every cable existing in the system which must be checked for continuity is tensioned properly enough not to invite a disconnection of cable.

- In case where the equipment is grounded through the power cable: Between power cable plug earth pin and the additional protected earth terminal on the equipment body (A) as illustrated)



- In case where the equipment is grounded through the earth cable: Between earth pin on the plug side of the power cable and the other end

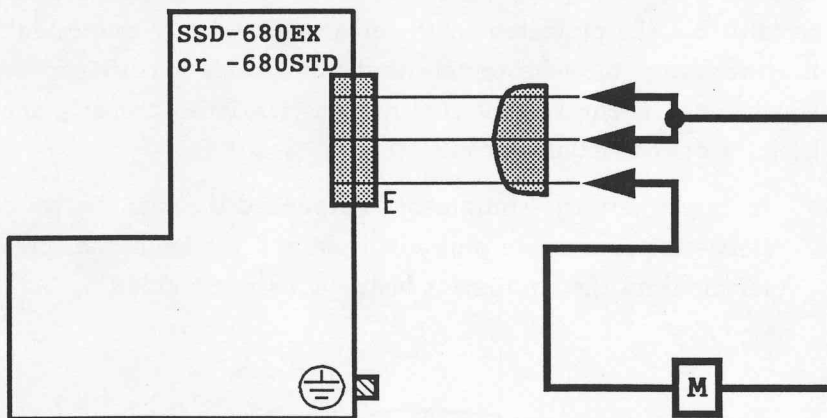
of the earth cable connected to the additional protected grounding terminal (ⓑ as illustrated)



- ▶ If you cannot check the protected earth cable for continuity, discontinue testing subsequent hereto and dissolve the related problem.

(5) Measuring an Insulation Resistance

As illustrated below, employ a megger to determine the insulation resistance between the power input line and the protected earth cable. "M" in the illustration, moreover, relates to a megger.



Rating : 10MΩ or more

- ▶ If the insulation resistance tester should fail to satisfy the standards, make contact with our Technical Support before proceeding to a subsequent checkout.

(6) Leakage Current

Use the digital multi-meter and the leakage current measuring circuit to determine the values of "Earth leakage current", "Enclosure leakage current" and "Patient leakage current."

All the leakage currents are to be determined, with the power switch ON.

When the leakage current measuring circuit shown on page 10-× is in use, the relation between the indication of AC Volt meter and leakage current is as follow,

$$(\text{Leakage Current}) = (\text{Indication of AC Volt meter}) \div 1000$$

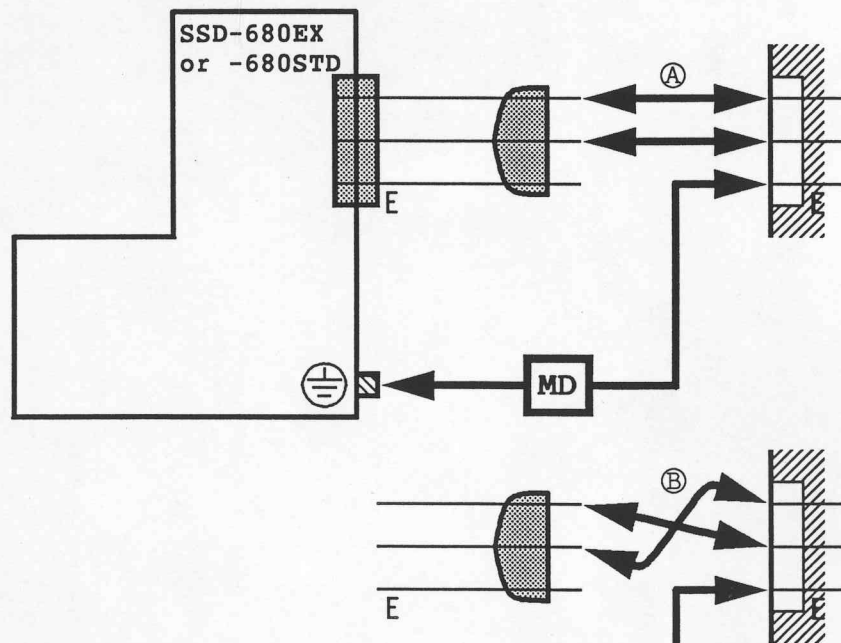
Accordingly, if the AC Volt meter shows 1mV, the leakage current must be 0.001mA.

If the ultrasound diagnostic equipment has an earth with the earth cable attached to the additional protected earth terminal, remove this earth cable before following checks.

(6)-1 Earth leakage current

① Normal conditions

Referring to the illustration given below, connect a measured unit with a leakage current measuring device (MD).

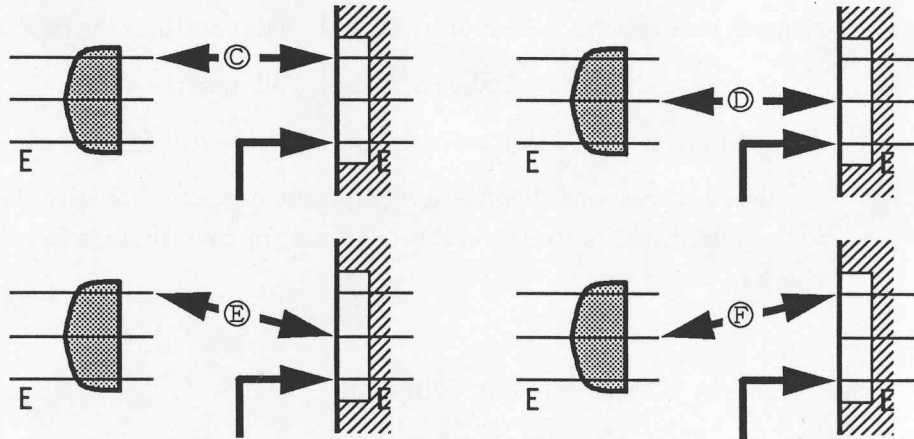


Using Connection Methods ① and ②, determine their respective leakage currents. And take the higher one for the value under the "Normal conditions".

Rating : Not to exceed 0.5mA

② Single Fault Condition

Based on Normal Connection Method ①, determine the leakage current at each of Connections ③ thru ⑥. And take the highest leakage current for the "Single Fault Condition".



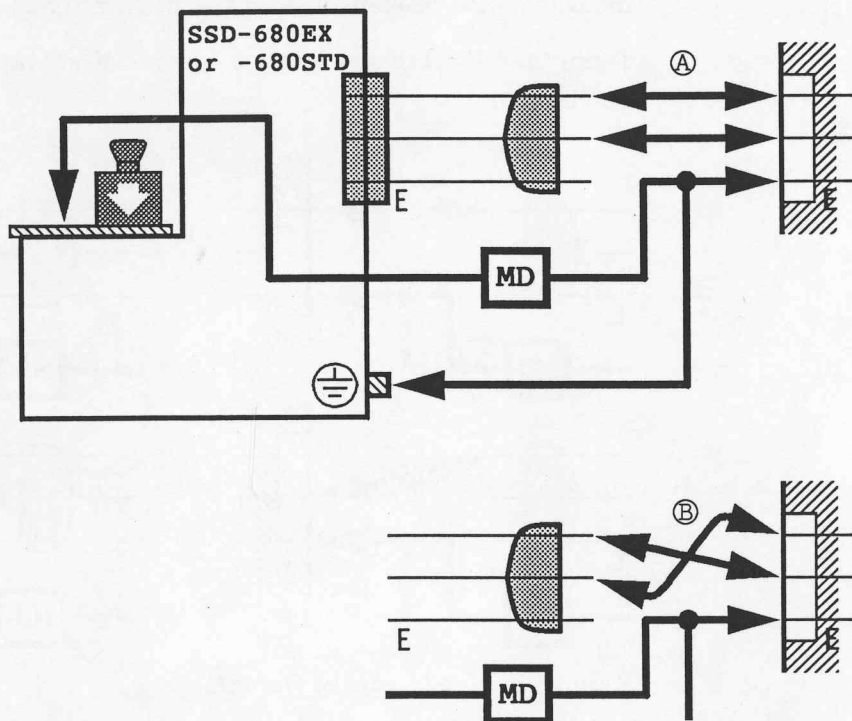
Rating : Not to exceed 1mA

(6)-2 Enclosure leakage current (a)
(Between the enclosure and the earth)

① Normal conditions

Referring to the illustration given below, connect a measured unit with a leakage current measuring device (MD).

With the metal foil (10 cm × 20 cm) placed on the enclosure, put a weight thereon. Then, connect the leakage current measuring device (MD) between the metal foil piece and the earth.



Using Connection Methods ① and ②, determine their respective leakage currents. And take the higher one for the value under the "Normal conditions".

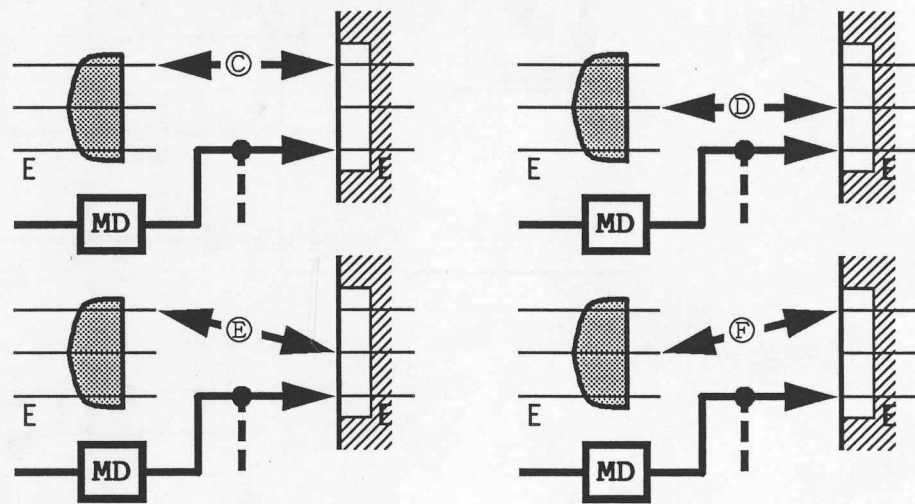
Rating : Not to exceed 0.1 mA

② Single Fault Condition

Measure the leakage current without grounding based on ① and ② of Normal Connection Method ①.

Furthermore, based on Normal Connection Method ①, determine the leakage current at each of Connections ③ thru ⑥. In each connection, moreover, determine the leakage currents, respectively in the two cases where the equipment is and is not grounded (as indicated with broken lines in the illustration).

Then, take the highest leakage current of above for the "Single Fault Condition".



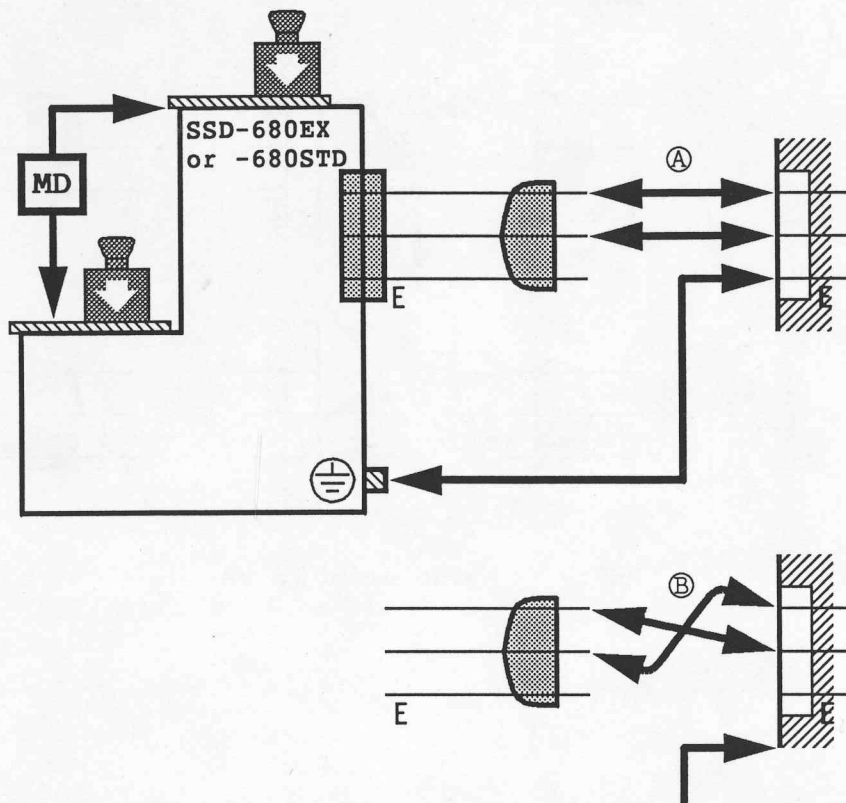
Rating : Not to exceed 0.5 mA

(6)-3 Enclosure leakage current (b)
(Between the enclosures)

① Normal conditions

Referring to the illustration given below, connect a measured unit with a leakage current measuring device (MD).

With two pieces of metal foil (10 cm × 20 cm per piece) placed separately on the enclosure, put weights thereon. Then, connect the leakage current measuring device (MD) to these metal foil pieces.



Using Connection Methods ① and ②, determine their respective leakage currents. And take the higher one for the value under the "Normal conditions".

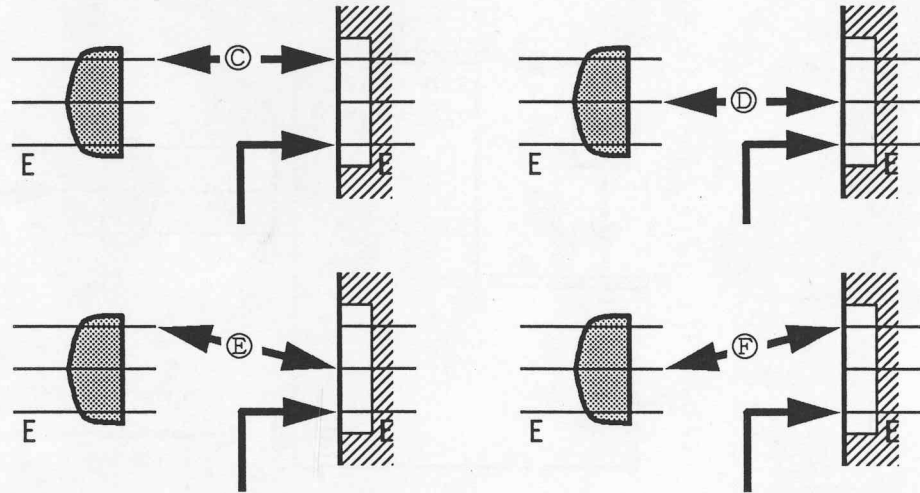
Rating : Not to exceed 0.1 mA

② Single Fault Condition

Measure the leakage current without grounding based on ① and ② of Normal Connection Method ①.

Furthermore, based on Normal Connection Method ①, determine the leakage current at each of Connections ③ thru ⑥.

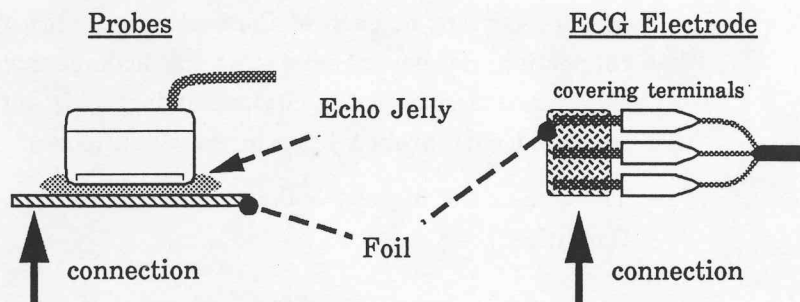
Then, take the highest leakage current of above for the "Single Fault Condition".



Rating : Not to exceed 0.5 mA

(6)-4 Patient leakage current

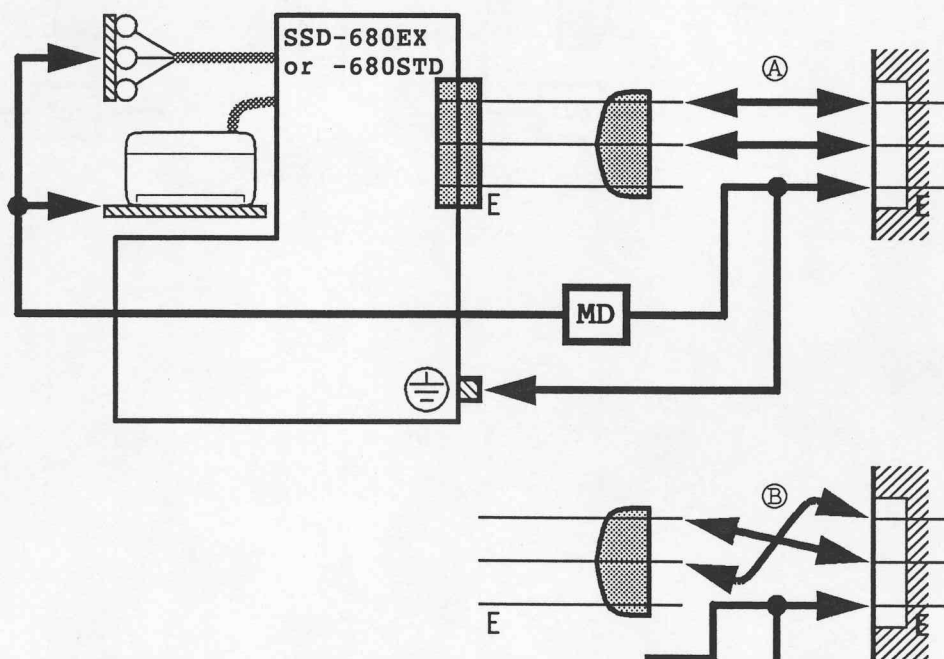
Connect all serviceable probes to the measured equipment. If the physiological signal display unit is installed, moreover, connect the ECG cable, likewise. For the connection method to determine their leakage currents, refer to the illustration below.



① Normal conditions

Referring to the illustration given below, connect a measured unit with a leakage current measuring device (MD).

The leakage current measuring device (MD), meanwhile, should be connected between the point where all the applied parts (probe, scanner, and ECG cable) are connected and the earth.



Using Connection Methods A and B, determine their respective leakage currents. And take the higher one for the value under the "Normal conditions".

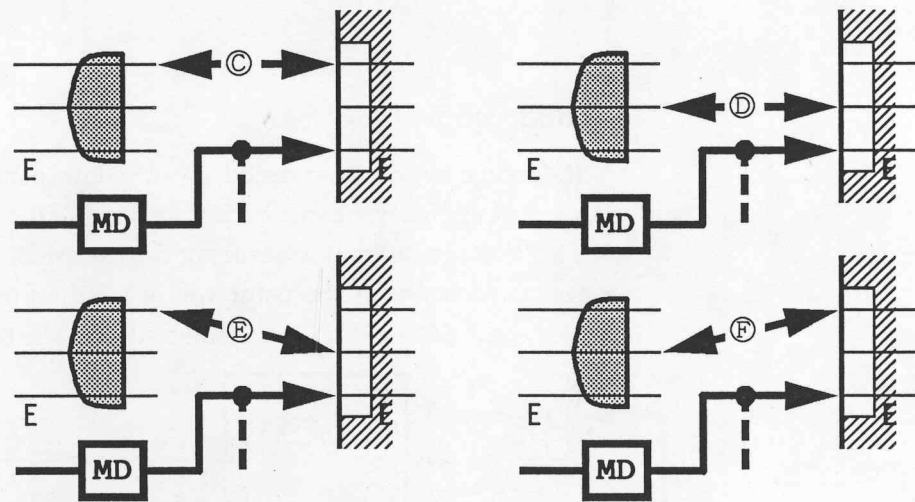
Rating : Not to exceed 0.1 mA

② Single Fault Condition

Measure the leakage current without grounding based on ① and ② of Normal Connection Method ①.

Furthermore, based on Normal Connection Method ①, determine the leakage current at each of Connections ③ thru ⑥. In each connection, moreover, determine the leakage currents, respectively in the two cases where the equipment is and is not grounded (as indicated with broken lines in the illustration).

Then, take the highest leakage current of above for the "Single Fault Condition".









Rating : Not to exceed 0.5 mA.

10-5 Check sheet

A check sheet is provided to record the performance results after a performance check is performed according to this section. Use the check sheet as a simplified record of the performance check of a unit.

SECTION 10 PERFORMANCE CHECK

Check sheet for Performance Check of SSD-680EX/STD S/N _____
 Check date _____ Checker _____

No.	Check item	Details	Confirmed or not		Remarks
			1	2	
10-4-1	Checking for function				
(1)	Confirmation on POWER ON	The system should be started under the initial setting condition (PRESET setting condition).			
(2)	Confirmation of the panel switch operation	MODE B B/M B/PW FLOW BIB M PW ↓ ← → ↑ ↓ ← → ↓ PROBE 1 2 IND IMAGE DIRECTION  ← → SELECT SELECT FREEZE FREEZE BASE LINE ↓ ↑ VEL RANGE ↓ ↑ PRESET ANNOTAT FUNCTION MENU DOP MENU FLOW MENU FLOW DISP FOCUS MEASURE TRACKBALL ZOOM FUNCTION ANGLE CURSOR FLOW AREA POS1      MARK REF			

SECTION 10 PERFORMANCE CHECK

Check sheet for Performance Check of SSD-680EX/STD S/N _____
Check date _____ Checker _____

No.	Check item	Details	Confirmed or not		Remarks
			1	2	
(2)	Confirmation of the panel switch operation	CAMERA			
(3)	Confirmation of menu contents				
(4)	Confirmation of focus				
(5)	Confirmation of measuring function	Setting conditions B, 2B			
		B/M			
		M			
		B/PW			
		PW			
10-4-2	Checking for image quality				
(1)	Confirmation of echoing				
(2)	Confirmation of total sensitivity				
10-4-3	Checking for Safety				
	Appearance Inspection				
	Checking Protected Earth Cable for Continuity				
	Measuring an Insulation Resistance				
	Leakage Currents	Earth leakage current			
		Enclosure leakage current(a)			
		Enclosure leakage current(b)			
		Patient leakage current			

11-1 Power supply Voltage Changing Procedure

11-1-1 If a 100V system unit is changed to other 100V system,

- (1) Wire the transtap voltage switching terminal TB501 to obtain the voltage to be changed, with reference to fig. 1.

11-1-2 If a 100V system unit is changed to a 200V system,

- (1) Turn relay circuit input switch S1 (refer to Fig. 1) to the 200V system side.
- (2) Wire the transtap voltage switching terminal TB501 to obtain the voltage to be changed, with reference to fig. 1.
- (3) Replace AC plug, with reference to fig. 2.
- (4) Replace Isolation transformer PTU-004 for 200V system. (Refer to Fig.3)

11-1-3 If a 200V system unit is changed to other 200V system,

- (1) Wire the transtap voltage switching terminal TB501 to obtain the voltage to be changed, with reference to fig. 1.

11-1-4 If a 200V system unit is changed to a 100V system,

- (1) Turn relay circuit input switch S1 (refer to Fig. 1) to the 100V system side.
- (2) Wire the transtap voltage switching terminal TB501 to obtain the voltage to be changed, with reference to fig. 1.
- (3) Replace AC plug, with reference to fig. 2.
- (4) Replace Isolation transformer PTU-004 for 100V system. (Refer to Fig.3)

Fig. 1 Relay circuit input switch S1, Transtap voltage switching terminal TB501

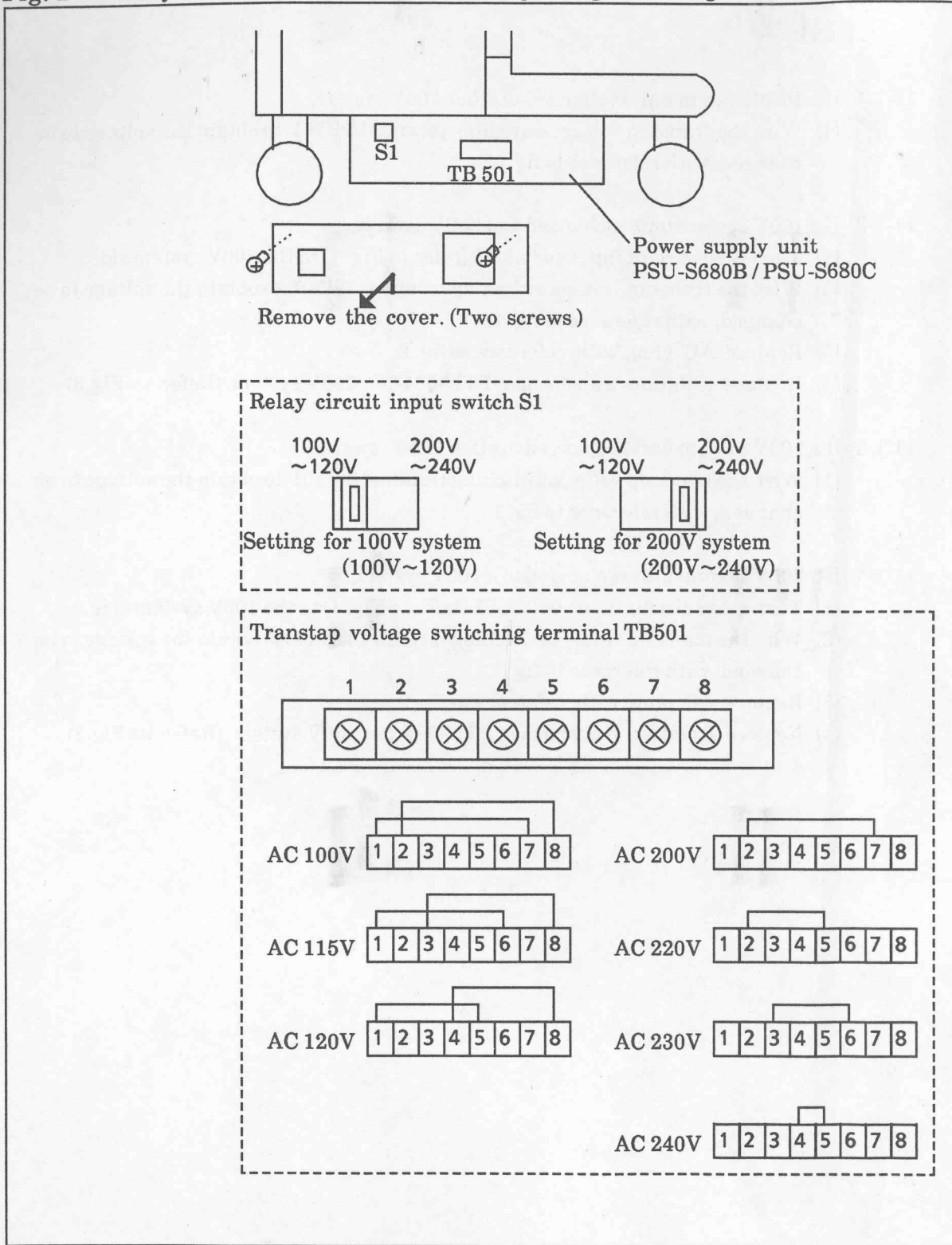


Fig.2 AC plug

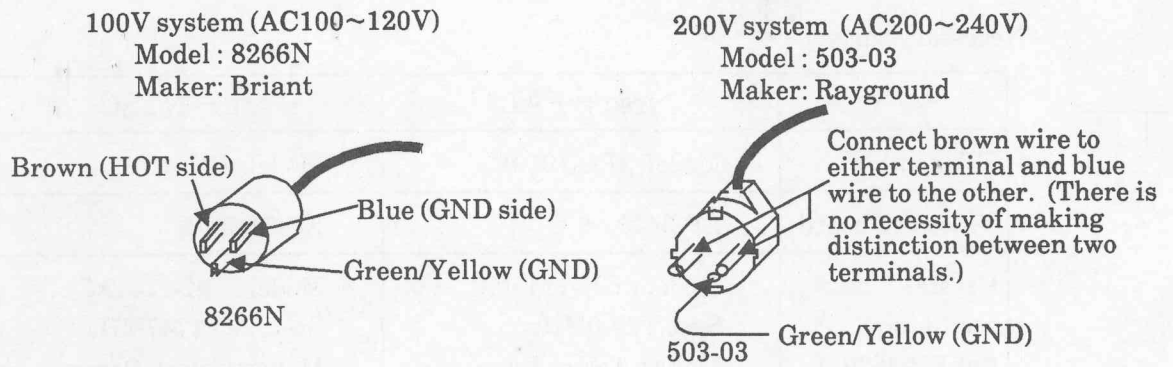
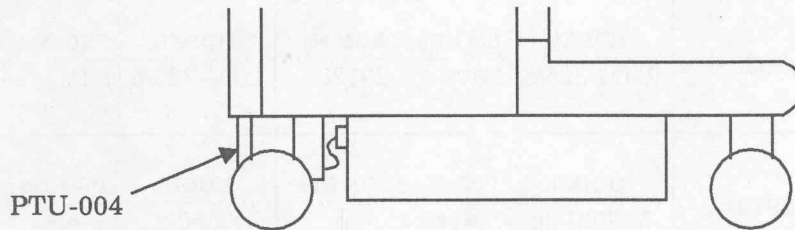


Fig.3 Isolation transformer PTU-004



(The differences between 100V system and 200V system in PTU-004 are AC outlets & its mounting plates, fuse, and transtap setting. When you change from 100V system to 200V system or vice versa, replace whole PTU-004.)

11-2 SSD-680EX Scanning Lines Changing Procedure

Necessary parts

	NTSC → PAL			PAL → NTSC		
TV monitor	Model: IPC-1010V			Model: IPC-1010		
Video ITF board	EP-3443*-6			EP-3443*-5		
Crystal oscillator (for EP-3620*)	Model : CK-1145MC Spec. : 25.0MHz Maker: Tokyo Denpa 1 pc.			Model : CK-1144AC Spec. : 25.1747MHz Maker: Tokyo Denpa 1 pc.		
Jumper wire (for EP-3620*)	Unnecessary			3cm		
ROM (for EP-3620*) 1 pc.	MODEL UIM-325/6	PRO. No. PHTM	ROM No. 2012C	MODEL UIM-325/6	PRO. No. HTM	ROM No. 2012C
ROM (for EP-2913*-1) 6 pc.	MODEL M0680-2u	PRO. No. **	ROM No. 1	MODEL M0680-2	PRO. No. **	ROM No. 1
	M0680-2u	**	2	M0680-2	**	2
	M0680-2u	**	3	M0680-2	**	3
	M3002-0V	** d	1	M3002-0U	** d	1
	M3002-0V	** d	2	M3002-0U	** d	2
	M3002-0V	** d	3	M3002-0U	** d	3
ROM (for EP-3477*) 5 pc.	MODEL UIM-325/6	PRO. No. POFS	ROM No. 778Q	MODEL UIM-325/6	PRO. No. OFS	ROM No. 778Q
	UIM-325/6	PX ₀ L	778J	UIM-325/6	X ₀ L	778J
	UIM-325/6	PMDXY	776Q	UIM-325/6	MDXY	776Q
	UIM-325/6	PCDXY	776N	UIM-325/6	CDXY	776N
	UIM-325/6	PX ₀ H	776J	UIM-325/6	X ₀ H	776J

- Note (1) PRO. No ** of ROM for EP-2913*-1 differs from SSD-680EX's version. For detail, refer to History of SSD-680EX.
- (2) PRO. No of ROM for EP-3477* changes according to specification change. (Ex. OFS→OFS1→OFS2)
For detail, refer to History of SSD-680EX.

Changing method

(1) Replacement of TV monitor

Replace TV monitor.

NTSC IPC-1010

PAL IPC-1010V

(2) Replacement of VIDEO ITF board

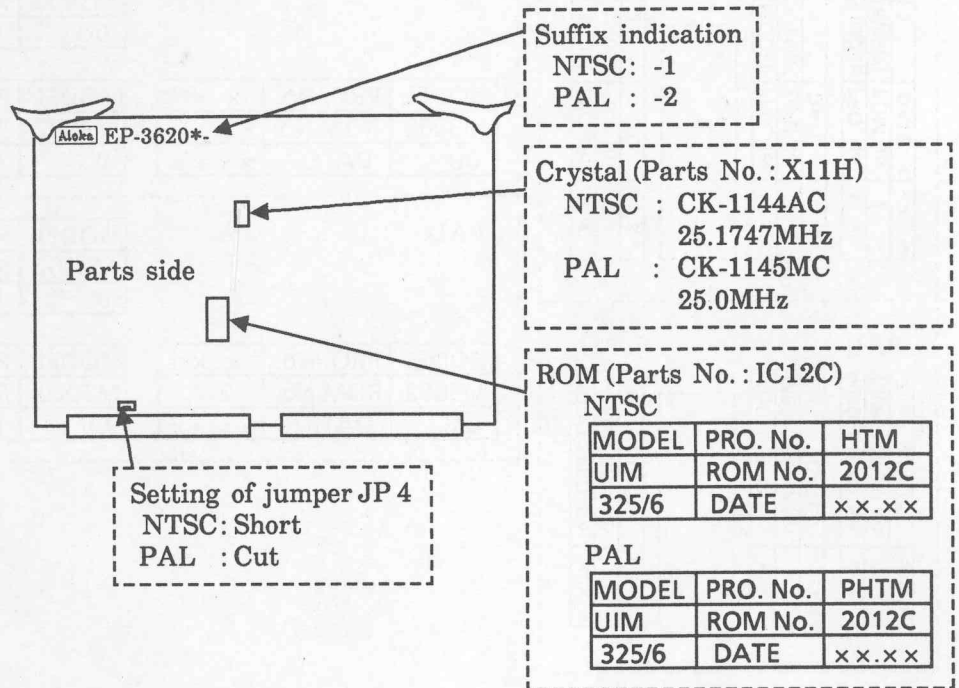
Replace VIDEO ITF board in DSC unit UIM-325.

NTSC EP-3443*-5

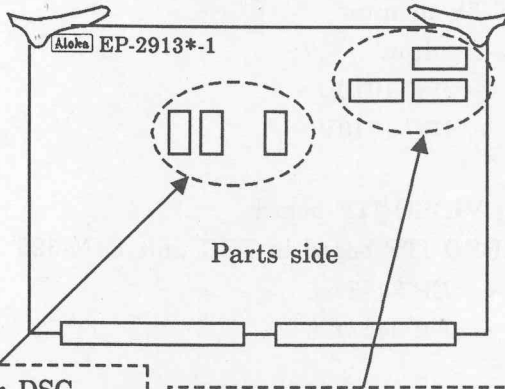
PAL EP-3443*-6

(3) Modification of EP-3620*

Replace a crystal, replace ROM, make setting of a jumper, and change suffix.



(4) Replacement of ROMs on EP-2913*-1
 Replace six software ROMs.



Software ROMs for DSC control

NTSC

MODEL	PRO. No.	x . x
M0680	ROM No.	1
2	DATE	x x . x x

MODEL	PRO. No.	x . x
M0680	ROM No.	3
2	DATE	x x . x x

MODEL	PRO. No.	x . x
M0680	ROM No.	2
2	DATE	x x . x x

PAL

MODEL	PRO. No.	x . x
M0680	ROM No.	1
Zu	DATE	x x . x x

MODEL	PRO. No.	x . x
M0680	ROM No.	3
Zu	DATE	x x . x x

MODEL	PRO. No.	x . x
M0680	ROM No.	2
Zu	DATE	x x . x x

Software ROMs for Measurement

NTSC

MODEL	PRO. No.	x . x d
M3002	ROM No.	3
0U	DATE	x x . x x

MODEL	PRO. No.	x . x d
M3002	ROM No.	2
0U	DATE	x x . x x

MODEL	PRO. No.	x . x d
M3002	ROM No.	1
0U	DATE	x x . x x

PAL

MODEL	PRO. No.	x . x d
M3002	ROM No.	3
0V	DATE	x x . x x

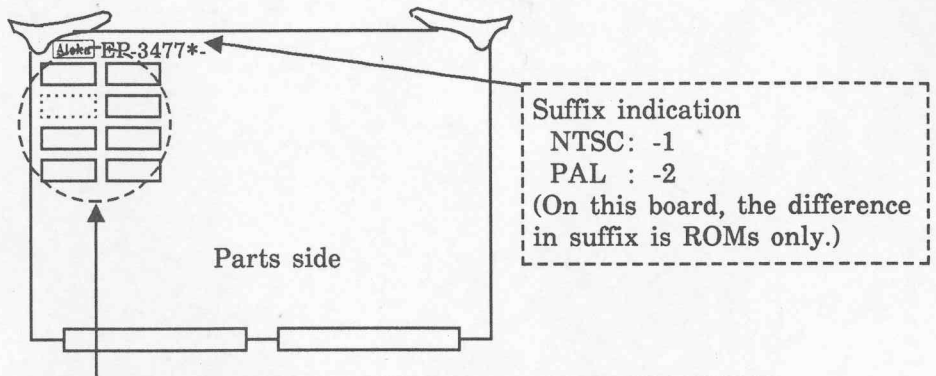
MODEL	PRO. No.	x . x d
M3002	ROM	2
0V	DATE	x x . x x

MODEL	PRO. No.	x . x d
M3002	ROM	1
0V	DATE	x x . x x

PCB version must be "B" or more.
 (EP-2913-1 used in the early model of SSD-680 have the different ROM locations. However SSD-680EX/SSD-680STD use EP-2913B-1 from the beginning, and the above locations can be used.)

(5) Replacement of ROMs on EP-3477*

Replace five ROMs, and change suffix.



NTSC					
MODEL	PRO. No.	OFS	MODEL	PRO. No.	MDXY
UIM	ROM No.	778Q	UIM	ROM No.	776Q
325/6	DATE	x x . x x	325/6	DATE	x x . x x
No need to replace. (Common to NTSC and PAL.)			MODEL	PRO. No.	CDXY
			UIM	ROM No.	776N
			325/6	DATE	x x . x x
No need to replace. (Common to NTSC and PAL.)			MODEL	PRO. No.	X ₀ L
			UIM	ROM No.	778J
			325/6	DATE	x x . x x
No need to replace. (Common to NTSC and PAL.)			MODEL	PRO. No.	X ₀ H
			UIM	ROM No.	776J
			325/6	DATE	x x . x x
PAL					
MODEL	PRO. No.	POFS	MODEL	PRO. No.	PMDXY
UIM	ROM No.	778Q	UIM	ROM No.	776Q
325/6	DATE	x x . x x	325/6	DATE	x x . x x
No need to replace. (Common to NTSC and PAL.)			MODEL	PRO. No.	PCDXY
			UIM	ROM No.	776N
			325/6	DATE	x x . x x
No need to replace. (Common to NTSC and PAL.)			MODEL	PRO. No.	PX ₀ L
			UIM	ROM No.	778J
			325/6	DATE	x x . x x
No need to replace. (Common to NTSC and PAL.)			MODEL	PRO. No.	PX ₀ H
			UIM	ROM No.	776J
			325/6	DATE	x x . x x

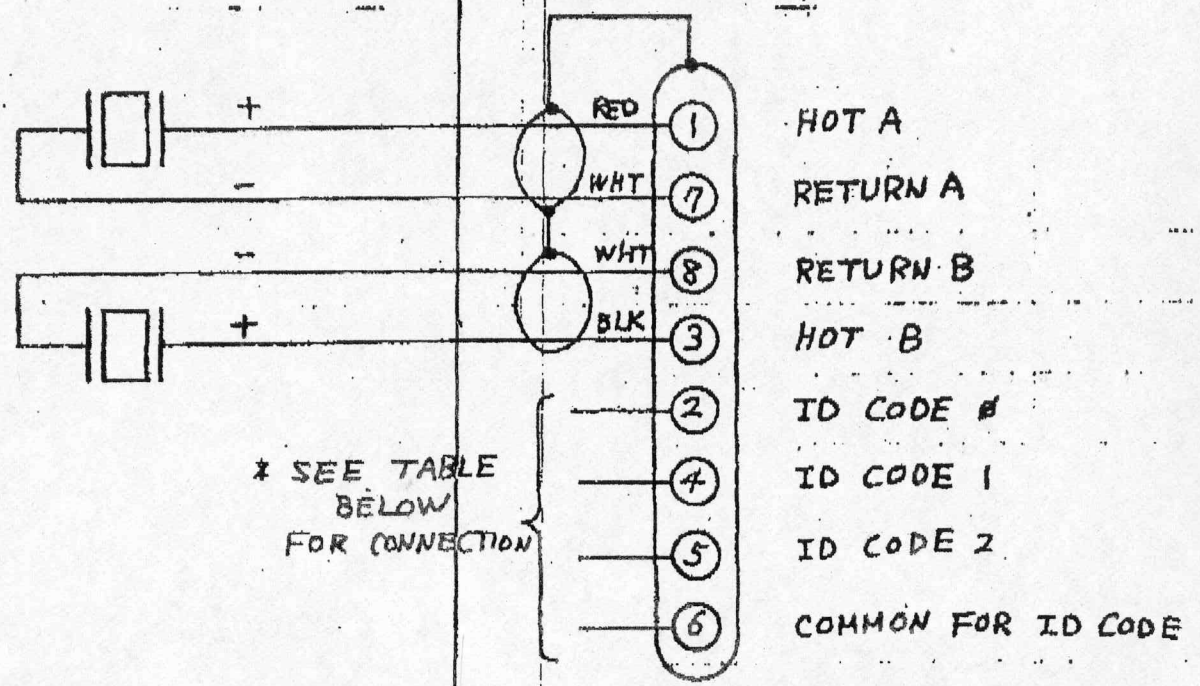
Note PRO. No. changes according to the specification change.
(Ex. OFS→OFS1→OFS2)
For detail, refer to History of SSD-680EX.

SSD-680EX ISTD Manual Change Information

Ver.	Date	Contents	Page	Note		
1	08 Apr. '93	1st. edition				
2	20 May '93	Title page(1/2)	Replaced			
		Title page(2/2) Contents(2/2)	Replaced Replaced	1~2		
		Section 13 "Parts List"	Added	13-1~13-94		
3	01 Oct. '93	Title page(1/2)	Replaced			
		Title page(2/2) Contents(2/2)	Replaced Replaced	1~2		
		Section 9 "9-4-3 EP-3463 VBPF & GAIN CONTROLL" "9-4-4 EP-3459 Rx FOCUS"	Replaced Replaced	9-5~9-6 9-7~9-8		
		Section 11 "Manual Change Information"	Added	11-9~11-10		
		Section 15 "15-2-1 Description of System" "15-2-2 Panel Information signal flow" "15-2-3 B/W signal flow" "15-2-4 Color signal flow" "15-2-6 DSC Unit"	Replaced Replaced Replaced Replaced Replaced	15-7~15-8 15-9~15-10 15-11~15-12 15-13~15-14 15-19		
		4	22 Jul '94	Title page(1/2) Contents(1/2) Back cover(1/2)	Replaced Replaced Added	1~6
				Title page(2/2) Contents(2/2) Back cover(2/2)	Replaced Replaced Added	1~4
		Section 3 "Before Repairing"	Replaced and added	3-1~3-15	Previously pages were 3-1~3-3.	
		Section 8 "Trouble Shooting"	Replaced	8-3~8-6		
		Section 10 "Performance Check"	Replaced and added	10-1~10-28	Previously pages were 10-1~10-13.	
		Section 11 "Manual Change Information"	Replaced	11-9, 11-10		
		Section 12 "HISTORY"	Added	12-1		

SECTION 11 Maintenance Information

AE-9777 - N 2/2



CONNECTOR:
 DIN
 E 87018-00

PROBE FREQUENCY	ID CODING CONNECTION
2 MHz	2 — 6 4 (OPEN) 5 — 6
2-3 MHz	2 (OPEN) 4 — 6 5 (OPEN)
5 MHz	2 (OPEN) 4 (OPEN) 5 — 6

NOTE 1) INDUCTORS AND/OR OTHER REQUIRED COMPONENTS ARE NOT SHOWN IN THIS DIAGRAM.

NOTE 2) SYSTEMS APPLICABLE
 ALOKA 730
 ALOKA 725
 ALOKA 860
 ALOKA 870
 ALOKA 650
 ALOKA 623

VST-2262-2
 VST-2263-2/3

Aloka		TITLE 名称 SCHEMATIC DOPPLER INDEPENDENT PROBES			MODEL 形名
3RD ANGLE PROJECTION 第3角法	DRAWN 制图	DESIGNED 设计	CHECKED 検図	APPRO 承認	DRAWING NO. 図番
SCALE 尺度	mm	8-31-89	-	-	
UNITS 単位	mm				

12-1 HISTORY of this equipment

This equipment may have the history upon the specification. Please refer to the "HISTORY" of this equipment which is separately prepared for the field service on your repair and modification work.

SSD-680EX / SSD-680STD SERVICE MANUAL 2/2

MN2-0187

Aloka



ALOKA CO.,LTD.

6-22-1 MURE, MITAKA-SHI, TOKYO, JAPAN

TELEPHONE : 81-422-45-5111

FAX : 81-422-48-5058

HISTORY OF SSD-680STD
 S/N 21M08242~31M01345
 HI - 1902
 Ver. 1
 28 - Sep. -1993

Caution

The purpose of this document is maintenance only.
 Do not use this for other purpose.

1	ECHO CAMERA STANDARD UNIT	1 - 1
2	PSC-120* (Main body) PCB	2 - 1
3	GEU-65* (TX / RX unit) PCB	3 - 1
4	UIM-326* (DSC unit) PCB	4 - 1
5	UGR-680STD* (Optional Doppler unit) PCB	5 - 1
6	CFM-680STD* (Optional color unit) PCB	6 - 1
7	PEU-680* (Optional ECG display unit) PCB	7 - 1
8	REMARKS (Explanation of the remarks ★ in the section 1 to 6)	8 - 1
9	PROBE CONNECTION	9 - 1
10	ROM (Software, hardware)	10 - 1 ~ 10 - 7
11	SPECIFICATION CHANGE LIST	11 - 1 ~ 11 - 2
12	MODIFICATION KIT (S/N\$Version\$Upgrade kit)	12 - 1 ~ 12 - 2

HISTORY OF SSD-680STD

(STANDARD UNIT)

← : One directional interchangeability ⚡ : Bi-directional interchangeability # : No interchangeability

Version	6.1	6.2	6.3						
S/N	21M08243~08262	31M01326~01335	31M01336~01345						
MAIN BODY	PSC-120								
TX/RX unit	GEU-65								
DSC unit	UIM-326								
Power supply unit	PSU-S680B								
Power supply unit	PSU-S680B	PSU-S680C ⚡★1							
Isolation Trans.	PTU-004	21M08253~							
TV monitor NTSC For domestic	IP-1230C-TH								
TV monitor NTSC For export	IP-1230C-TH								
TV monitor PAL For export	IP-1230CV-TH								

* : Correction of artwork

HISTORY OF SSD-680STD

(PSC-120* Main body PCB)

≠ : No interchangeability

≧ : Bi-directional interchangeability

← : One directional interchangeability

Version	6.1	6.2	6.3				
S/N	21M08243~08262	31M01326~01335	31M01336~01345				
MAIN CONTROL	EP-3265B-3						
MAIN PANEL	L-KEY-19D						
BLIND PANEL	EP-2512B-1						
POWER LAMP	EP-3143						
HEAD PHONE JACK	EP-2510						
Full Key board	L-KEY-26						

* : Correction of artwork

HISTORY OF SSD-680STD

(GEU-64* TX / RX unit PCB)

← : One directional interchangeability \$: Bi-directional interchangeability # : No interchangeability

Version	6.1	6.2	6.3					
S/N	21M08243~08262	31M01326~01335	31M01336~01345					
PROBE SELECT RELAY (2sets)	EP-3453-1~4							
PROBE SELECTOR	EP-3454B							
RX SELECT	EP-3455C							
TX 1	EP-3456							
TX 2	EP-3457							
Pre AMP	EP-3458B							
RX FOCUS (2 PCBs)	EP-3459B	EP-3459C ← ★ 10						
MAIN AMP & COLOR I/F	EP-3461B-1	EP-3461D-2 ← ★ 15						
VBPF & GAIN CONTROL	EP-3463	EP-3463 ← ★ 12						
TX TRIGGER GENE	EP-3464B	EP-3464C ← ★ 2						
GEU TIMING & ADDRESS	EP-3465C ← ★ 3 (21M08253~)	EP-3465D ← ★ 4						
GEU INTERFACE	EP-3452B							
RX SELECT CONT	EP-3452							
MOTHER BOARD	EP-3466B							

EP 3465D E Version E Midu new for In de pad-1 Probes Count. scale Beilkoje
 Modification on wiring

* : Correction of artwork

HISTORY OF SSD-680STD

(UIM-326* DSC unit PCB)

: No interchangeability

⌘ : Bi-directional interchangeability

← : One directional interchangeability

Version	6.1	6.2	6.3				
S/N	21M08243~ 08262	31M01326~ 01335	31M01336~ 01345				
B/W MEMORY	EP-3247B						
DSC ADDRESS	EP-3236E						
DSC TIMING (NTSC)	EP-3620-1						
DSC TIMING (PAL)	EP-3620-2						
A/D, D/A	EP-2729H-8						
DUAL MPU	EP-2913B-1						
AGDC	EP-2629D						
US ITF (NTSC)	EP-3477B-1 ← ★5 (21M08248~)						
US ITF (PAL)	EP-3477B-2 ← ★5 (21M08248~)						
COLOR D/A	EP-2651E-3						
FOOT SW CONNECTOR	EP-2700						
SVHS CONNECTOR	EP-3179						
BW CINE MEMORY	EP-3237B						
MOTHER BOARD	EP-3467C ← ★7 (21M08253~)						

* : Correction of artwork

31206533329

9254

ALOKA EUROPE TELEFAX

Date: 20-12-1996	Reference: FB-2219	Page 1 of 3
To : Aloka Deutschland Dept.: Technical Dept. Attn.: Mr.H-G.Rokita	Country: Germany Fax : 0049 69 839189 Loc. :	
CC: Mr.S.Aoyama	Loc.: Technical Manager	
From : ALOKA EUROPE F. van Beek Logistics Supervisor	Fax : (31) 20 6533329 Phone: (31) 20 6533479 Telex: 71372 ALOKA NL	

SUBJECT: SHIPMENT OF EP-3465D FOR YOUR ORDER 359 OF MAY 1995

Dear Roki-san,

In May 1995 !! you ordered the above mentioned PCB at Aloka Europe. Only you have ordered the revision EP-3465E.

EP-3465E seems to be out of production so Aloka Japan finally decided to ship EP-3465D. You can use the -D version as long as the doctor for which you needed the board does not use Independent Probe with Doppler Mode. If the doctor does use Independent Probe with Doppler Mode the board needs to be modified.

Please find attached to this fax the modification procedure for the EP-3465D if the doctor uses the mentioned application. If you have any questions about this modification, please contact Mr. Aoyama.

Thanking you in advance for your cooperation and have a very merry Christmas.

Best regards,

Frank.

EP-3465D SSD - 680 EX

31206533329

ALOKA Europe Internal Memo

To: Beek-san
From: S. Aoyama
Date: 28-Nov-1996
Subject: Compatibility of EP-3465D for revision E
CC:

Dear Beek-san,

I have checked the compatibility and difference between EP-3465 revision D and E. The difference on the function is only for Independent Probe with Doppler mode. If they don't use the machine with this combination, the revision D can be used for E.

If they really need revision E, it requires the following modification on hardware circuit and replacement of ROMs,

- | | |
|---------------------------------|--|
| 1. Remove component | Crystal X2, P/N: TCO-707F(10MHz) |
| 2. Add component | IC 1B, P/N: HC163 |
| 3. Pattern cut (component side) | between IC 8C pin 13 and GND
between IC 8C pin 12 and GND
between IC 4K pin 5 and GND |
| 4. Pattern cut (soldering side) | between IC 4K pin 4 and GND
between IC 3P pin 9 and IC 6C pin 3 |
| 5. Add jumper wire | between IC 1B pin 16 and IC 1C pin 14
between IC 1B pin 13 and IC 4K pin 5
between IC 1B pin 12 and IC 4K pin 4
between IC 1B pin 12 and IC 6C pin 3
between IC 1B pin 10 and IC 1D pin 16
between IC 1B pin 9 and IC 8C pin 11
between IC 1B pin 8 and IC 1C pin 7
between IC 1B pin 7 and IC 1E pin 16
between IC 1B pin 6 and IC 1D pin 8
between IC 1B pin 5 and IC 1E pin 8
between IC 1B pin 4 and IC 1F pin 8
between IC 1B pin 3 and IC 1F pin 16
between IC 1B pin 2 and IC 1H pin 9
between IC 1B pin 1 and IC 1G pin 16
between IC 4K pin 6 and IC 8C pin 12
between IC 8C pin 10 and IC 8C pin 13 |

Then, all ROMs must be replaced with ones on the original board which is defective now.

31206533329

We can make them in our office, but cannot check the operation after the modification because we don't have SSD-680EX as our test-bench.

If they need the modification and they accept to do by themselves, please give them above information attaching with board.

Regards.

HISTORY OF SSD-680STD

(UGR-680STD* Optional Doppler unit PCB)

← : One directional interchangeability \$: Bi-directional interchangeability # : No interchangeability

S/N	21M14104~ 14123								
DOP TXRX	EP-3260B								
DOP CONTROLLER	EP-2810B-4								
DOP FILTER	EP-3259C								
DOP INTERFACE	EP-2812B-1								
FFT BOARD	Frequency analyzer (NJK-196A) made by JRC								
OUTPUT BOARD									
MOTHER BOARD	EP-2808								

* : Correction of artwork

HISTORY OF SSD-680STD

(CFM-680STD* Optional color unit PCB)

← : One directional interchangeability \$: Bi-directional interchangeability # : No interchangeability

PCB S/N	2409001~ 2409010								
COLOR POST PROCESS	EP-3114E								
COLOR MEMORY VEL	EP-2213B								
COLOR MEMORY VAR	EP-2213B-1								
COLOR CINE MEMORY	EP-3238								
VIDEO ITF (NTSC)	EP-3443B-5 (Not manufactured)								
VIDEO ITF (PAL)	EP-3443B-6								
COLOR D/A	EP-2651E-4								
COLOR POST PROCESS	EP-3115D								
MAIN AMP & COLOR ITF	EP-3461B-1								
COLOR CAL	EP-5100B (PM-680EX-4 for EP-5100C)								
COLOR MONITOR (NTSC)	IPC-1010 (Not manufactured)								
COLOR MONITOR (PAL)	IPC-1010V								

* : Correction of artwork

HISTORY OF SSD-680STD

(PEU-680* Optional ECG display unit PCB)

← : One directional interchangeability \$: Bi-directional interchangeability # : No interchangeability

S/N of PEU-680*	31M01484~ 01493								
ECG signal display unit ★9	PEU-680B								
ECG SIGNAL UNIT	EU-5026								
PHYSIO AMP	EP-3117C								
ECG PANEL	L-KEY-8B								
ECG MEMORY (in DSC unit)	EP-2841C								

* : Correction of artwork

HISTORY OF SSD-680EX for export (Explanation of ★ mark)

No.	Explanation of ★ mark	Note
★ 1	PSU-5680B..... Power supply unit for SSD-680EX/STD which is a modified SSD-680 power supply unit. PSU-5680C..... New power supply unit which is designed for SSD-680EX/STD. Both types of power supply unit are electrically and mechanically identical.	PSU-5680B→PSU-5680C
★ 2	Improvement for noise problem that appeared near the transmitting wave signal on the image of B/FLOW or B/*D at minimum transmitting power.	EP-3464B→EP-3464C
★ 3	Improvement for lateral line color noise problem that appeared on the image when using 5MHz or 7.5MHz probe. (It occurred on five systems out of 15 when using EP-5100C.	EP-3465B→EP-3465C
★ 4	Improvement for the ECG SYNC problem. Correction of the artwork.	EP-3465C→EP-3465D
★ 5	Improvement for an unnecessary display.	EP-3477B-1→EP-3477C-1, EP-3477B-2→EP-3477C-2
★ 6	Improvement for the display method of strong color signal. Addition of the Spatial Filter function for the variance. Color noise reduction (improvement of the dynamic range)	EP-5100B→C
★ 7	Improvement of the external video signal switching problem. Improvement of the EXT BW OUT problem.	EP-3467B→D
★ 8	Improvement of the FFT malfunction.	EP-2810B-3→B-4
★ 9	PEU-680B is ECG signal display unit for SSD-680EX/STD. (PEU-680 is for only SSD-680.) PEU-680B = PEU-680 + CABLE4 + CABLE 34	PEU-680→680B
★ 10	Improvement of the RX DELAY noise (slanting).	EP-3459B→C
★ 11	Improvement of the frequency characteristic.	EP-3461B-1→C-1
★ 12	Improvement of the lateral arc line noise (by changing the wiring only). Therefore, no suffix change.	
★ 13	Improvement of the vertical striped noise when using SSZ-305.	EP-3443C-5→C-15 EP-3443C-6→C-16
★ 14	Improvement of the EMI.	EP-2510→-1, EP-2812B→B-1
★ 15	Improvement of the image quality (by changing the buffer amp.).	EP-3461C-1→D-1
★ 16	Improvement of the frequency characteristic of the video signal.	EP-3443B-1→B-5, EP-3443B-2→B-6
★ 17	Part change 25C503 (Q1, Q2, Q3, Q9) to 25C2235. Elimination of the parts (C251, 253, 255).	EP-3443B-5→C-5, EP-3443B-6→C-6
★ 18	Improvement of dynamic range as changing a fixed number of pre amplifier.	EP-3458B→C
★ 19	Improvement of dynamic range as changing a fixed number.	EP-3459C→D
★ 20	Corresponding to 2.5MHz probe. The function of flow gain is eliminated on EP-3461, because of EP-5100 control.	EP-3461D-1→E-1

HISTORY OF SSD-680EX for export

(Explanation of ★ mark)

No.	Explanation of ★ mark	Note
★ 21	Corresponding to center angle F0. This function isn't used as things are.	EP-3463→B
★ 22	Corresponding to image select.	EP-3464C→D
★ 23	Decrease of side band noise as using an independent probe.	EP-3465D→E
★ 24	Improvement of functions of electronic sector probe. This functions are not used as things are.	EP-3466B→C
★ 25	Correction of the artwork , addition of new transvaginal probe UST-996P-5.	EP-3236E→F
★ 26	Improvement of signal to noise ratio and frequency band width.	EP-2729F-7→F-9
★ 27	The number of measurement ROMs increase from three to four. If Main control;EP-3265 has ROMs of version 7.1,this PCB has a directional interchangeability; "←".	EP-2913B-1→B-2
★ 28	It changes a control method of Flow gain from analog to digital. Improvement for wall motion.	EP-2651E-4→E-5
★ 29	Corresponding to Ver.7.1.	EP-5100C→D
★ 30	Corresponding to tuning circuit of 2.5MHz.	EP-3260B→C

HISTORY OF SSD-680EX for export (Probe Connection)

Model	TYPE	Note	Software Version								△: see note		
			6.0	6.2	6.3	6.4	7.1	○ : connectable	x : unconnectable				
UST-958-7.5	C		○	○	○	○	○						
UST-959-3.5	C		○	○	○	○	○						
UST-960-5	C		○	○	○	○	○						
UST-961-5	C		○	○	○	○	○						
UST-961-7.5	C		○	○	○	○	○						
UST-962-5	C		○	○	○	○	○						
UST-964P-5	C		○	○	○	○	○						
UST-965-3.5	C		○	○	○	○	○						
UST-966-3.5	C		○	○	○	○	○						
UST-967-5	C		○	○	○	○	○						
UST-968P-5	C		○	○	○	○	○						
UST-969-5	C		○	○	○	○	○						
UST-970-7.5	C		○	○	○	○	○						
UST-996P-5	C		x	x	x	x	○						
UST-998-2.5	C		x	x	x	x	○						
UST-999-5	C		x	x	x	x	○						
UST-667P-5	C		○	○	○	○	○						
UST-5042-3.5	L		○	○	○	○	○						
UST-5043P-3.5	L		○	○	○	○	○						
UST-5518-7.5	L		○	○	○	○	○						
UST-5525-5	L	Steerable linear	x	x	x	x	○						
UST-5525-7.5	L	Steerable linear	○	○	○	○	○						
UST-5817-5	L		○	○	○	○	○						
UST-576T-7.5	L		○	○	○	○	○						
UST-577-7.5	L		○	○	○	○	○						
UST-5523-7.5	L		○	○	○	○	○						

TYPE : A: Annular array, B: Biplane, C: Convex sector, I: Independent, L: Linear array, M: Mechanical sector, P: Phased array sector, R: Radial, S: Single element
 SC: Steerable CW doppler, IC: Independent CW doppler

Caution Be noted that the probe connectability information is solely based upon the engineering stand point.

HISTORY OF SSD-680EX for export (Probe Connection)

Model	TYPE	Note	Software Version							Connectability			
			6.0	6.2	6.3	6.4	7.1	○	x	△			
UST-666-5/7.5	B		○	○	○	○	○						
UST-2262-2	IC		○	○	○	○	○						
UST-2266U-5	IC		x	x	x	x	x	○					

TYPE : A: Annular array, B: Biplane, C: Convex sector, I: Independent, L: Linear array, M: Mechanical sector, P: Phased array sector, R: Radial, S: Single element
 SC: Steerable CW doppler, IC: Independent CW doppler

Caution Be noted that the probe connectability information is solely based upon the engineering stand point.

HISTORY OF SSD-680STD

(Explanation of ★ mark)

No.	Explanation of ★ mark	Note
★ 1	PSU-5680B..... Power supply unit for SSD-680EX/STD which is a modified SSD-680 power supply unit. PSU-5680C..... New power supply unit which is designed for SSD-680EX/STD. Both types of power supply unit are electrically and mechanically identical.	PSU-5680B→PSU-5680C
★ 2	Improvement for noise problem that appeared near the transmitting wave signal on the image of B/FLOW or B*/D at minimum transmitting power.	EP-3464B→EP-3464C
★ 3	Improvement for lateral line color noise problem that appeared on the image when using 5MHz or 7.5MHz probe. (It occurred on five systems out of 15 when using EP-5100C.	EP-3465B→EP-3465C
★ 4	Improvement for Doppler noise and ECG SYNC problem.	EP-3465C→EP-3465D
★ 5	Improvement for an unnecessary display.	EP-3477B-1→EP-3477C-1, EP-3477B-2→EP-3477C-2
★ 6	Open	
★ 7	Improvement of the external video signal switching problem. Improvement of the EXT BW OUT problem.	EP-3467C→D
★ 8	Open	
★ 9	PEU-680B is a ECG signal display unit for SSD-680EX/STD. (PEU-680 is for only SSD-680.) PEU-680B = PEU-680 + CABLE4 + CABLE 34	PEU-680→680B
★ 10	Improvement of the RX DELAY noise (slant).	EP-3459B→C
★ 11	Open	
★ 12	Improvement of the lateral line noise.	
★ 13	Open	
★ 14	Open	
★ 15	Improvement of the image quality (by changing the buffer amp).	EP-3461B-1→D-1

HISTORY OF SSD-680STD (Probe Connection)

Model	TYPE	Note	Software Version																		
			6.0	6.2	6.3																
UST-958-7.5	C																				
UST-959-3.5	C																				
UST-960-5	C																				
UST-961-5	C																				
UST-961-7.5	C																				
UST-962-5	C																				
UST-964P-5	C																				
UST-965-3.5	C																				
UST-966-3.5	C																				
UST-967-5	C																				
UST-968P-5	C																				
UST-969-5	C																				
UST-970-7.5	C																				
UST-667P-5	C																				
UST-5042-3.5	L																				
UST-5043P-3.5	L																				
UST-5518-7.5	L																				
UST-5525-7.5	L	Steerable linear																			
UST-5817-5	L																				
UST-576T-7.5	L																				
UST-577-7.5	L																				
UST-5523-7.5	L																				
UST-666-5/7.5	B																				
UST-2262-2	IC																				

TYPE : A: Annular array, B: Biplane, C: Convex sector, I: Independent, L: Linear array, M: Mechanical sector, P: Phased array sector, R: Radial, S: Single element
 SC: Steerable CW doppler, IC: Independent CW doppler
 Caution Be noted that the probe connectability information is solely based upon the engineering stand point.

HISTORY OF SSD-680STD (Software ROM)

(— : not mounted, ← : same as left, ■ : not exist)

Version	Ver. 6.1	Ver. 6.2	Ver. 6.3					
PCB	21M08243~08262	31M01326~01335	31M01336~01345					
EP-3265* PANEL For NTSC & PAL	M0680-1-6.1-1 M0680-1-6.1-2 M0680-1-6.1-3 M0680-1-6.1-4	M0680-1-6.2-1 M0680-1-6.2-2 M0680-1-6.2-3 M0680-1-6.2-4	M0680-1-6.3-1 M0680-1-6.3-2 M0680-1-6.3-3 M0680-1-6.3-4					
EP-2913* DSC For NTSC	M0680-2-6.1-1 M0680-2-6.1-2 M0680-2-6.1-3	M0680-2-6.2-1 M0680-2-6.2-2 M0680-2-6.2-3	← ← ←					
For PAL	M0680-2u-6.1-1 M0680-2u-6.1-2 M0680-2u-6.1-3	M0680-2u-6.2-1 M0680-2u-6.2-2 M0680-2u-6.2-3	← ← ←					
MEASUREMENT	M3002-0U-4.0d-1 M3002-0U-4.0d-2 M3002-0U-4.0d-3	← ← ←	← ← ←					
For PAL	M3002-0V-2.0d-1 M3002-0V-2.0d-2 M3002-0V-2.0d-3	← ← ←	← ← ←					
EP-2629* GDC For NTSC & PAL	M1010-4.0a-1 M1010-4.0a-2	← ←	← ←					
EP-2810* DOP CONTROLLER For NTSC & PAL	M2006-1.0-1 M2006-1.0-2	← ←	← ←					

HISTORY OF SSD-680STD (Hardware ROM in the TX / RX unit)

(— : not mounted, ← : same as left, ■ : not used)

Version	Ver. 6.1	Ver. 6.2	Ver. 6.3				
PCB	21M08243~08262	31M01326~01335	31M01336~01345				
EP-3459* (RX FOCUS)	RXROT MASK RXDLY2 OFFSET1 594H	← ← RXDLY3 OFFSET2 ←	← ← ← ← ←				
EP-3463* (VBPF & GAIN CONT)	6312B	←	←				
EP-3464* (TX TRIGGER GENE)	LCDLY1 GEUAD2 EMASK TXROT	LCDLY2 GEUAD3 ← ←	← ← ← ←				
EP-3465B, C (GEU TIMING & ADRS) (~VER. 6.1)	CVN6 CADR DF6 TIM6 MODE6 6511S	■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■				
EP-3465D (GEU TIMING & ADRS) (VER. 6.2~)	■ ■ ■ ■ ■ ■	DCADR TIM61 DCVN61 MODE62 DF62 657E 658G 6510C	← ← ← ← ← ← ← ←				
EP-3452* (RX SELECT CONT)	SEL	←	←				

HISTORY OF SSD-680STD

(Hardware ROM in the DSC unit, 1/4)

(— : not mounted, ← : same as left, ■ : not exist)

Version	Ver. 6.1	Ver. 6.2	Ver. 6.3					
PCB	21M08243~ 08262	31M01326~ 01335	31M01336~ 01345					
EP-3247* (BW MEMORY)	BUD1 BUD2 BUD1 BUD2	← ← ← ←	← ← ← ←					
EP-3236* (DSC ADDRESS)	368L 368D 362KA 361JA	← ← ← ←	← ← ← ←					
EP-3620* (DSC TIMING) For NTSC	VTM HTM HIP LEP REP	← ← ← ← ←	← ← ← ← ←					
For PAL	VTM PHTM HIP LEP REP	← ← ← ← ←	← ← ← ← ←					
EP-2729* (AD,DA)	GMA68	←	←					
EP-2629* (AGDC)	CG1B CG2B 2912A2	← ← ←	← ← ←					

HISTORY OF SSD-680STD (Hardware ROM in the DSC unit, 2/4)

(— : not mounted, ← : same as left, ■ : not exist)

Version PCB S/N	Ver. 6.1	Ver. 6.2	Ver. 6.3	Ver. 6.2	Ver. 6.3			
EP-3477* (US ITF) For NTSC	21M08243~ 08262	31M01326~ 01335	31M01336~ 01345					
	OF5	←	←					
	CY0L	CY0L1	←					
	X0L	X0L1	←					
	MDXY	MDXY1	←					
	CDXY	CDXY1	←					
	CY0H	CY0H1	←					
	X0H	X0H1	←					
	778G	←	←					
	776G	←	←					
	776B	←	←					
For PAL EP-2651* (COLOR D/A)	POF5	←	←					
	CY0L	CY0L1	←					
	PX0L	PX0L1	←					
	PMDXY	PMDXY1	←					
	PCDXY	PCDXY1	←					
	CY0H	CY0H1	←					
	PX0H	PX0H1	←					
	778G	←	←					
	776G	←	←					
	776B	←	←					


HISTORY OF SSD-680STD

(Hardware ROM in the DSC unit, 3/4)

(— : not mounted, ← : same as left, ■ : not exist)

Version	Ver. 6.1	Ver. 6.2	Ver. 6.3					
PCB	21M08243~08262	31M01326~01335	31M01336~01345					
EP-5100C (COLOR FLOW PROCESSOR)	008 0019 0038 0044 0049 0068 0069 0070 0071 0072 00117	← ← ← ← ← ← ← ← ← ← ←	← ← ← ← ← ← ← ← ← ← ←					
EP-3115* (COLOR LINE BUFFER)	VEUPD1 VEUPD1 VAUPD1 VAUPD1	← ← ← ←	← ← ← ←					
EP-3114* (COLOR POST PROCESS)	148H 148G 148F 148C 147H 147G 147D 145L 144L	← 148GA 148FA 148CA 147HA 147GA 147DA ← ←	← ← ← ← ← ← ← ← ←					

HISTORY OF SSD-680STD (Hardware ROM in the DSC unit, 4/4)

(— : not mounted, ← : same as left,  : not exist)

Version	Ver. 6.1	Ver. 6.2	Ver. 6.3					
PCB	21M08243~08262	31M01326~01335	31M01336~01345					
EP-3114* (COLOR POST PROCESS)	144J 143P 143L 141N 141K 141J	← ← ← ← ← ←	← ← ← ← ← ←					

HISTORY OF SSD-680STD

(Hardware ROM in the Doppler unit)

(— : not mounted, ← : same as left, ■ : not exist)

Version	Ver. 6.1	Ver. 6.2	Ver. 6.3					
PCB	21M08243~08262	31M01326~01335	31M01336~01345					
EP-2810* (DOP CONTROLLER)	M2006-1.0-1	←	←					
EP-3259* (DOP FILTER)	DM2-AGC-V1.0	←	←					
	T112D	←	←					
	C113D	←	←					
CDC-522A (FFT board)	DZMD124	←	←					
	DZMD125	←	←					
CDG-266A1 (OUTPUT board)	DZMD126	←	←					
	DZMD127A	←	←					

HISTORY OF SSD-680STD

(Specification change list)

LEVEL	Specification change (except probe connection)																		
Ver. 6.1 (21M08243~08262)	<ul style="list-style-type: none"> Initial lot 																		
Ver. 6.2 (31M01326~01335)	<ul style="list-style-type: none"> The image quality improvement. (correction of the uneven sensitivity on the B/W image when using UST-959-3.5, 960-5, 577-7.5, 5817-5, 967-5, 964P-5.) Addition of the new PRESET item. (B/W POWER added to IMAGE CONTROL in the PRESET function.) The following problems were solved. <ol style="list-style-type: none"> Panel lock up problem that is occurred by the cursor movement when chosen the annotation of the PRESET function. (Occurred on the NTSC system only) Panel lock up problem that is occurred by the cursor movement when chosen the measurement of the PRESET function. (Occurred on the NTSC system only) The contents of initial setting of FLOW AVERAGE differ in compliance with the number of PRESET. The velocity range at the start is different from one which was set by FLOW in the PRESET function. Malfunction of the PRESET for mode and body mark. The image of slant scanning remains after changing the probe to others in case of the PRESET is performed at a state of slant scanning mode. The image is disappeared during the flow area is moving under the slant scanning of UST-5525-7.5. The flow area display mark doesn't show the correct position of that. A wrong image is displayed at the store memory where the image was stored by the following order (FREEZE→CINE→STORE→FREEZE→NEW PAT→NEW PAT→FREEZE→CINE→STORE). (Occurred on the NTSC system only) The message of the "IMAGE STORE" is still displayed after changing the mode from STORE to REVIEW. Wrong velocity range data is displayed when using the independent probe. Wrong image is displayed under the ECG SYNC function. (it's displaying a image which was taken at one beat before) Data of MAX VEL display is wrong when B/F/DOP mode. Scale mark at MAG. 1.5 when using UST-5518-7.5 doesn't display the correct scale. (Occurred on the PAL system only) B mode image is disappeared (should be still at ECG timing) under the condition of B/DOP mode and ECG SYNC. The only one frame of color image is displayed under the condition of FLOW AVERAGE HIGH in the ECG SYNC function. Bottom end of B/W image is notched (should be a curved line or line). The image is expanded by 5 % in lateral direction at MAG. x 1 when using UST-5042-3.5 or 5043P-3.5. The ellipse calculation error of the OB measurement on PAL systems. The following operation was improved. <ol style="list-style-type: none"> The halt time of color frame correlation is shorten to about 0.5 sec.. and the color frame interpolation is not prohibited when the flow area moving or mode switching. The PRESET item "VEL RANGE" was deleted from PRESET PW. The contents of "VEL RANGE" in FLOW of PRESET was changed as below. <table border="1"> <tr> <td>VEL RANGE</td> <td>0.7K</td> <td>1.2K</td> <td>1.5K</td> <td>2K</td> <td>4K</td> </tr> <tr> <td>VELOCITY</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td>MODE</td> <td>3K(x4)</td> <td>5K(x4)</td> <td>6K(x4)</td> <td>4K(x2)</td> <td>4K(x1)</td> </tr> </table> The Doppler sampling mark maintain its position when the mode is changed to Doppler active in the B or B/FLOW mode When the mode is B/*DOP, The transmitting focus point is determined by the panel setting (not by the Doppler sampling position). In case of the receiving focus, it follows the Doppler sampling position as before. 	VEL RANGE	0.7K	1.2K	1.5K	2K	4K	VELOCITY	2	3	4	5	6	MODE	3K(x4)	5K(x4)	6K(x4)	4K(x2)	4K(x1)
VEL RANGE	0.7K	1.2K	1.5K	2K	4K														
VELOCITY	2	3	4	5	6														
MODE	3K(x4)	5K(x4)	6K(x4)	4K(x2)	4K(x1)														

HISTORY OF SSD-680STD

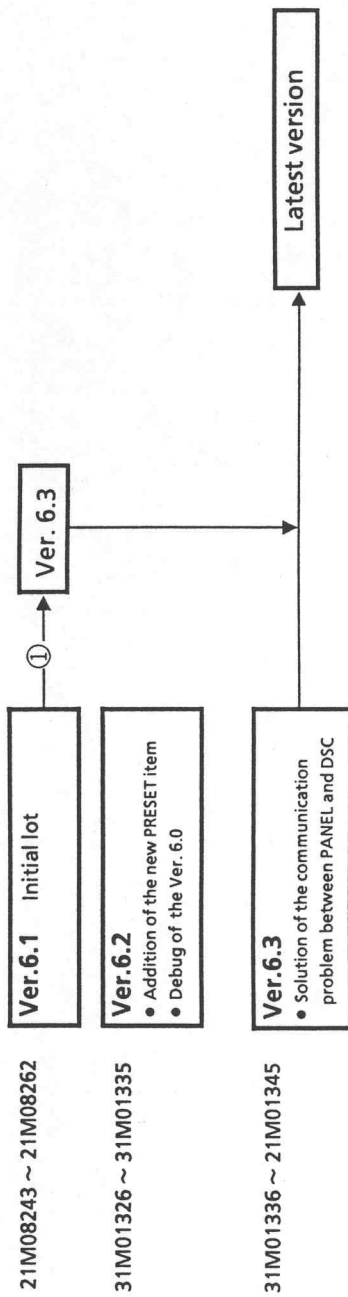
(Specification change list)

LEVEL	Specification change (except probe connection)
Ver. 6.3 (31M01336~01345)	<ol style="list-style-type: none"> 6. The B/* image is always still regardless of the velocity range when the mode is selected to DOP active by SELECT switch in the B*/DOP mode. When changing the velocity range in B*/DOP mode without pushing SELECT switch, it will be a still B image (in the HPRF condition) or B*/DOP simultaneous active image depending on the velocity range. 7. The Doppler sampling mark was changed to =. 8. The data of initial setting of FLOW PRESET was changed. 9. The display way of the color flow area for linear probe was changed from a line to a dotted line. <ul style="list-style-type: none"> • The DSC is rarely locked up when power on due to communication trouble between panel and DSC. (M0-680-1-6.2-1 → M0-680-1-6.3-1)

SSD-680STD Upgrade / Modification Kit (S/N ⇄ Version ⇄ Upgrade kit)

S/N	21M08243~21M08262	31M01326~31M01335	31M01336~31M01345	
Version	6.1	6.2	6.3	
Contents of the main change	Initial lot	<ul style="list-style-type: none"> Improvement of the B/W image sensitivity problem. Addition of the new PRESET item. Debug of the problem on version 6.0. 	<ul style="list-style-type: none"> Solution of the communication problem between PANEL and DSC. (Refer to the specification change list) 	
Upgrade/Modification Kit				
PM-680STD-1 (Not exist)				
PM-680STD-2 (Ver.6.1→Ver. 6.2 version up kit for PAL)	All systems of version 6.1 can be upgraded by PM-680STD-2.			PM-680STD-2 are performed at factory on the systems from S/N. 31M01326.
PM-680STD-3 (Image quality improvement kit)	The affected S/N. is 21M08243~21M08261			PM-680STD-3 is performed at factory on the systems from S/N. 21M08262.

SSD-680STD Upgrade / Modification kit (S/N ⇄ Software Version ⇄ Upgrade kit)



Version # in the shows the original version # when it shipped.

	Number of kit	Note	Number of Technical Bulletin
①	PM-680STD-2 (For PAL)	Ver. 6.1 → Ver. 6.3	
②			
③			
④			
⑤			
⑥			
⑦			

For export
HISTORY OF SSD-680EX S/N 21M08463~31M11753 HI - 1802 Revision 3 19 - Oct. -1995

Edited by Aloka ME Service Center		
Approved by	Checked by	Written by
<i>X. Rozenta</i>	<i>K. Nakashima</i>	<i>K. Edamoto</i>
<i>19 Oct. '95</i>	<i>19 Oct. '95</i>	<i>19 Oct. '95</i>

Caution

The purpose of this document is maintenance only.
Do not use this for other purpose.

1	ECHO CAMERA STANDARD UNIT	1 - 1
2	PSC-118* (Main body) PCB	2 - 1
3	GEU-64* (TX / RX unit) PCB	3 - 1
4	UIM-325* (DSC unit) PCB	4 - 1
5	FFA-18* (Doppler unit) PCB	5 - 1
6	PEU-680* (Optional ECG display unit) PCB	6 - 1
7	REMARKS (Explanation of the remarks "★" in the section 1to 6)	7 - 1 ~ 7 - 2
8	PROBE CONNECTION	8 - 1 ~ 8 - 2
9	ROM (Software, hardware)	9 - 1 ~ 9 - 7
10	SPECIFICATION CHANGE LIST	10 - 1 ~ 10 - 3
11	MODIFICATION KIT (S/N\$Version\$Upgrade kit)	11 - 1 ~ 11 - 2

HISTORY OF SSD-680EX for export (STANDARD UNIT)

← : One directional interchangeability ⌘ : Bi-directional interchangeability # : No interchangeability

Version	6.0	6.0	6.0	6.0	6.2	6.4	6.3	6.4	7.1
S/N	21M08463~08482	21M08483~08512	21M10986~11035	21M12644~12683	31M00876~00925	31M01326~01345	31M01879~01928	31M03899~03928	31M11719~11753
MAIN BODY	PSC-118								
TX/RX unit	GEU-64								
DSC unit	UIM-325								
DOPPLER unit (UGR-680EX)	FFA-18B					FFA-18C ←★14			
Power supply unit	PSU-S680B			PSU-S680C ⌘★1					
Isolation Trans.	PTU-004			(Except 21M12659, 12661~12663, 12666 which have PSU-S680B)					
Color TV monitor NTSC	IPC-1230W								
Color TV monitor PAL	IPC-1230WV								
Color TV monitor NTSC	IPC-1010								
Color TV monitor PAL	IPC-1010V								

* : Correction of artwork

HISTORY OF SSD-680EX for export (PSC-118* Main body PCB)

← : One directional interchangeability \$: Bi-directional interchangeability # : No interchangeability

Version	6.0	6.0	6.0	6.0	6.2	6.4	6.3	6.4	7.1
S/N	21M08463~08482	21M08483~08512	21M10986~11035	21M12644~12683	31M00876~00925	31M01326~01345	31M01879~01928	31M03899~03928	31M11719~11753
MAIN CONTROL	EP-3265B-3								
MAIN PANEL	L-KEY-19D								
BLIND PANEL	EP-2512B-1								
POWER LAMP	EP-3143								
HEAD PHONE JACK	EP-2510					EP-2510-1 ← ★14			
Full Key board	L-KEY-26								

* : Correction of artwork

HISTORY OF SSD-680EX for export (GEU-64* TX / RX unit PCB)

← : One directional interchangeability \$: Bi-directional interchangeability # : No interchangeability

Version	6.0	6.0	6.0	6.0	6.2	6.4	6.3	6.4	7.1
S/N	21M08463~ 08482	21M08483~ 08512	21M10986~ 11035	21M12644~ 12683	31M00876~ 00925	31M01326~ 01345	31M01879~ 01928	31M03899~ 03928	31M11719~ 11753
PROBE SELECT RELAY (2sets)	EP-3453-1~4								
PROBE SELECTOR	EP-3454B								
RX SELECT	EP-3455C								
TX 1	EP-3456								
TX 2	EP-3457								
Pre AMP	EP-3458B								
RX FOCUS (2 PCBs)	EP-3459B								
MAIN AMP & COLOR ITF	EP-3459C ← ★10								
	EP-3461C-1 ← ★11								
VBPF & GAIN CONTROL	EP-3463 ← ★12								
	EP-3461D-1 ← ★15								
TX TRIGGER GENE	EP-3464C ← ★2								
	EP-3464D ← ★22								
GEU TIMING & ADDRESS	EP-3465B ← ★3								
	EP-3465D ← ★4								
GEU INTERFACE	EP-3465E ← ★23								
RX SELECT CONT	EP-3452								
MOTHER BOARD	EP-3466B								
	EP-3466C ← ★24								

* : Correction of artwork

HISTORY OF SSD-680EX for export (UIM-325* DSC unit PCB, 1/2)

← : One directional interchangeability ↔ : Bi-directional interchangeability # : No interchangeability

Version	6.0	6.0	6.0	6.0	6.2	6.4	6.3	6.4	7.1
S/N	21M08463~08482	21M08483~08512	21M10986~11035	21M12644~12683	31M00876~00925	31M01326~01345	31M01879~01928	31M03899~03928	31M11719~11753
B/W MEMORY	EP-3247B								
DSC ADDRESS	EP-3236E								EP-3236F ← * ★25
DSC TIMING (NTSC)	EP-3620-1								
DSC TIMING (PAL)	EP-3620-2								
A/D, D/A	EP-2729H-7								EP-2729F-9 ← ★26
DUAL MPU	EP-2913B-1								EP-2913B-2 # ★27
AGDC	EP-2629D								
US ITF (NTSC)	EP-3477B-1			EP-3477C-1 21M11001, 21M11011~ ← ★5					
US ITF (PAL)	EP-3477B-2			EP-3477C-2 21M11001, 21M11011~ ← ★5					
COLOR D/A	EP-2651E-4								EP-2651E-5 ← ★28
FOOT SW CONNECTOR	EP-2700								
SVHS CONNECTOR	EP-3179								
B/W CINE MEMORY	EP-3237B								
COLOR FLOW PROCESSOR	EP-5100B								EP-5100C ← * ★6
COLOR LINE BUFFER	EP-3115E								

* : Correction of artwork

HISTORY OF SSD-680EX for export (UIM-325* DSC unit PCB, 2/2)

← : One directional interchangeability ⌘ : Bi-directional interchangeability # : No interchangeability

Version	6.0	6.0	6.0	6.0	6.0	6.2	6.4	6.3	6.4	7.1
S/N	21M08463~ 08482	21M08483~ 08512	21M10986~ 11035	21M12644~ 12683	31M00876~ 00925	31M01326~ 01345	31M01879~ 01928	31M03899~ 03928	31M11719~ 11753	
COLOR POST PROCESS	EP-3114E									
COLOR MEMORY VEL	EP-2213B									
COLOR MEMORY VAR	EP-2213B-1									
COLOR CINE MEMORY	EP-3238									
VIDEO ITF (NTSC)	EP-3443 B-1	EP-3443B-5 ←★16 21M08466~	EP-3443C-5 ←★17 21M08483~				EP-3443C-15 ←★13			
VIDEO ITF (PAL)	EP-3443 B-2	EP-3443B-6 ←★16 21M08466~	EP-3443C-6 ←★17 21M08483~				EP-3443C-16 ←★13			
MOTHER BOARD	EP-3467B			EP-3467D ←★7						

* : Correction of artwork

HISTORY OF SSD-680EX for export (FFA-18* Doppler unit PCB)

← : One directional interchangeability ⌘ : Bi-directional interchangeability # : No interchangeability

Version	6.0	6.0	6.0	6.0	6.0	6.2	6.4	6.3	6.4	7.1
S/N	21M08463~ 08482	21M08483~ 08512	21M10986~ 11035	21M12644~ 12683	31M00876~ 00925	31M01326~ 01345	31M01879~ 01928	31M03899~ 03928	31M11719~ 11753	
DOP TXRX	EP-3260B									
DOP CONTROLLER	EP-2810B-3									
DOP FILTER	EP-3259C									
DOP INTERFACE	EP-2812B									
FFT BOARD	Frequency analyzer (NJK-196A) made by JRC									
OUTPUT BOARD	EP-2808									
MOTHER BOARD	EP-3260C # ★30									
	EP-2810B-4 21M11001, 21M11011~ ← ★8									
	EP-2812B-1 ← ★14									

* : Correction of artwork

HISTORY OF SSD-680EX for export

(PEU-680* Optional ECG display unit PCB)

← : One directional interchangeability ⚡ : Bi-directional interchangeability # : No interchangeability

S/N of PEU-680*	31M01484~01493	31M08027~08046								
ECG signal display unit ★9	PEU-680B									
ECG SIGNAL UNIT	EU-5026									
PHYSIO AMP	EP-3117C									
ECG PANEL	L-KEY-8B									
ECG MEMORY (in DSC unit)	EP-2841C									

* : Correction of artwork

HISTORY OF SSD-680EX

(Explanation of ★ mark)

No.	Explanation of ★ mark	Note
★ 1	PSU-5680B..... Power supply unit for SSD-680EX/STD which is a modified SSD-680 power supply unit. PSU-5680C..... New power supply unit which is designed for SSD-680EX/STD. Both types of power supply unit are electrically and mechanically identical.	PSU-5680B→PSU-5680C
★ 2	Improvement for noise problem that appeared near the transmitting wave signal on the image of B/FLOW or B*/D at minimum transmitting power.	EP-3464B→EP-3464C
★ 3	Improvement for lateral line color noise problem that appeared on the image when using 5MHz or 7.5MHz probe. (It occurred on five systems out of 15 when using EP-5100C.	EP-3465B→EP-3465C
★ 4	Improvement for the ECG SYNC problem. Correction of the artwork.	EP-3465C→EP-3465D
★ 5	Improvement for an unnecessary display.	EP-3477B-1→EP-3477C-1, EP-3477B-2→EP-3477C-2
★ 6	Improvement for the display method of strong color signal. Addition of the Spatial Filter function for the variance. Color noise reduction (improvement of the dynamic range)	EP-5100B→C
★ 7	Improvement of the external video signal switching problem. Improvement of the EXT B/W OUT problem.	EP-3467B→D
★ 8	Improvement of the FFT malfunction.	EP-2810B-3→B-4
★ 9	PEU-680B is a ECG signal display unit for SSD-680EX/STD. (PEU-680 is for only SSD-680.) PEU-680B = PEU-680 + CABLE4 + CABLE 34	PEU-680→680B
★ 10	Improvement of the RX DELAY noise (slanting).	EP-3459B→C
★ 11	Improvement of the frequency characteristic.	EP-3461B-1→C-1
★ 12	Improvement of the lateral arc line noise (by changing the wiring only). Therefore, no suffix change.	
★ 13	Improvement of the vertical striped noise when using SSZ-305.	EP-3443C-5→C-15 EP-3443C-6→C-16
★ 14	Improvement of the EMI.	EP-2510→-1, EP-2812B→B-1
★ 15	Improvement of the image quality (by changing the buffer amp.).	EP-3461C-1→D-1
★ 16	Improvement of the frequency characteristic of the video signal.	EP-3443B-1→B-5, EP-3443B-2→B-6
★ 17	Part change 25C503 (Q1, Q2, Q3, Q9) to 25C2235. Elimination of the parts (C251, 253, 255).	EP-3443B-5→C-5, EP-3443B-6→C-6

HISTORY OF SSD-680EX

(Probe Connection)

Model	TYPE	Note	Software Version															
			6.0			6.2			6.3			○: connectable	x: unconnectable	△: see note				
			6.0	6.2	6.3	6.0	6.2	6.3	6.0	6.2	6.3							
UST-958-7.5	C		○	○	○													
UST-959-3.5	C		○	○	○													
UST-960-5	C		○	○	○													
UST-961-5	C		○	○	○													
UST-961-7.5	C		○	○	○													
UST-962-5	C		○	○	○													
UST-964P-5	C		○	○	○													
UST-965-3.5	C		○	○	○													
UST-966-3.5	C		○	○	○													
UST-967-5	C		○	○	○													
UST-968P-5	C		○	○	○													
UST-969-5	C		○	○	○													
UST-970-7.5	C		○	○	○													
UST-667P-5	C		○	○	○													
UST-5042-3.5	L		○	○	○													
UST-5043P-3.5	L		○	○	○													
UST-5518-7.5	L		○	○	○													
UST-5525-7.5	L	Steerable linear	○	○	○													
UST-5817-5	L		○	○	○													
UST-576T-7.5	L		○	○	○													
UST-577-7.5	L		○	○	○													
UST-5523-7.5	L		○	○	○													
UST-666-5/7.5	B		○	○	○													
UST-2262-2	IC		○	○	○													

▶TYPE : A: Annular array, B: Biplane, C: Convex sector, I: Independent, L: Linear array, M: Mechanical sector, P: Phased array sector, R: Radial, S: Single element
 SC: Steerable CW doppler, IC: Independent CW doppler

Caution Be noted that the probe connectability information is solely based upon the engineering stand point.

HISTORY OF SSD-680EX for export (Software ROM)

(— : not mounted, ← : same as left, ■ : not exist)

Version	Ver. 6.0	Ver. 6.0	Ver. 6.0	Ver. 6.2	Ver. 6.3	Ver. 6.4	Ver. 6.4	Ver. 6.4	Ver. 7.1
PCB	Ver. 6.0	Ver. 6.0	Ver. 6.0	Ver. 6.2	Ver. 6.3	Ver. 6.4	Ver. 6.4	Ver. 6.4	Ver. 7.1
EP-3265* PANEL For NTSC & PAL	21M08463~08482	21M10986~11035	21M12644~12683	31M00876~00925	31M01879~01928	31M01326~01345	31M03899~03928	31M11719~11753	
	M0680-1-6.0-1	←	←	M0680-1-6.2-1	M0680-1-6.3-1	M0680-1-6.4-1	←	M0680-1-7.1-1	
	M0680-1-6.0-2	←	←	M0680-1-6.2-2	M0680-1-6.3-2	M0680-1-6.4-2	←	M0680-1-7.1-2	
	M0680-1-6.0-3	←	←	M0680-1-6.2-3	M0680-1-6.3-3	M0680-1-6.4-3	←	M0680-1-7.1-3	
	M0680-1-6.0-4	←	←	M0680-1-6.2-4	M0680-1-6.3-4	M0680-1-6.4-4	←	M0680-1-7.1-4	
EP-2913* DSC For NTSC	M0680-2-6.0-1	←	←	M0680-2-6.2-1	←	←	←	M0680-2-7.1-1	
	M0680-2-6.0-2	←	←	M0680-2-6.2-2	←	←	←	M0680-2-7.1-2	
	M0680-2-6.0-3	←	←	M0680-2-6.2-3	←	←	←	M0680-2-7.1-3	
	M0680-2u-6.0-1	←	←	M0680-2u-6.2-1	←	←	←	M0680-2u-7.1-1	
	M0680-2u-6.0-2	←	←	M0680-2u-6.2-2	←	←	←	M0680-2u-7.1-2	
	M0680-2u-6.0-3	←	←	M0680-2u-6.2-3	←	←	←	M0680-2u-7.1-3	
MEASUREMENT	M3002-0U-4.0d-1	←	←	←	←	←	←	M3002-0X-1.0-1	
For NTSC	M3002-0U-4.0d-2	←	←	←	←	←	←	M3002-0X-1.0-2	
	M3002-0U-4.0d-3	←	←	←	←	←	←	M3002-0X-1.0-3	
								M3002-0X-1.0-4	
	M3002-0V-2.0d-1	←	←	←	←	←	←	M3002-0Y-1.0-1	
	M3002-0V-2.0d-2	←	←	←	←	←	←	M3002-0Y-1.0-2	
	M3002-0V-2.0d-3	←	←	←	←	←	←	M3002-0Y-1.0-3	
								M3002-0Y-1.0-4	
EP-2629* GDC For NTSC & PAL	M1010-4.0a-1	←	←	←	←	←	←	←	
	M1010-4.0a-2	←	←	←	←	←	←	←	
EP-2810* DOP CONTROLLER For NTSC & PAL	M2006-1.0-1	←	←	←	←	←	←	←	
	M2006-1.0-2	←	←	←	←	←	←	←	

HISTORY OF SSD-680EX for export

(Hardware ROM in the TX / RX unit)

(— : not mounted, ← : same as left, ■ : not exit)

Version	Ver. 6.0	Ver. 6.0	Ver. 6.0	Ver. 6.0	Ver. 6.2	Ver. 6.3	Ver. 6.4	Ver. 6.4	Ver. 6.4	Ver. 7.1
PCB	21M08463~ 08482	21M08483~ 08512	21M10986~ 11035	21M12644~ 12683	31M00876~ 00925	31M01879~ 01928	31M01326~ 01345	31M03899~ 03928	31M11719~ 11753	
EP-3459* (RX FOCUS)	RXROT MASK RXDLY1 OFFSET1 594H	← ← RXDLY2 ← ←	← ← ← ← ←	← ← ← ← ←	← ← RXDLY3 OFFSET2 ←	← ← ← ← ←	← ← ← ← ←	← ← ← ← ←	← ← RXDLY4 OFFSET3 ←	
EP-3463* (VBPF & GAIN CONT)	6312B	←	←	←	←	←	←	←	←	
EP-3464* (TX TRIGGER GENE)	LCDLY1 GEUAD1 EMASK TXROT	← GEUAD2 ← ←	← ← ← ←	← ← ← ←	LCDLY2 GEUAD3 ← ←	← ← ← ←	← ← ← ←	← ← ← ←	LCDLY3 GEUAD4 EMASK1 ←	
EP-3465B, C (GEU TIMING & ADRS) (~VER. 6.0)	CVN6 CADR DF6 TIM6 MODE6 6511S	← ← ← ← ← ←	← ← ← ← ← ←	← ← ← ← ← ←	← ← ← ← ← ←	← ← ← ← ← ←	← ← ← ← ← ←	← ← ← ← ← ←	(CVN6/7) (CADR/7) (DF7) (TIM6/7) (MODE7) (6511S)	
EP-3465D, E (GEU TIMING & ADRS) (VER. 6.2~)	■	■	■	■	DCADR TIM61 DCVN61 MODE62 DF62 657E 658G 6510C	← ← ← ← ← ← ← ←	← ← ← ← ← ← ← ←	← ← ← ← ← ← ← ←	← ← ← ← ← ← ← ←	
EP-3452* (RX SELECT CONT)	SEL	←	←	←	←	←	←	←	←	

It is ROM No., as using
PMI-680EX-5/6.
PCB No. is EP-3465d.

HISTORY OF SSD-680EX for export (Hardware ROM in the DSC unit, 1/4)

(— : not mounted, ← : same as left, ■ : not exist)

Version	Ver. 6.0	Ver. 6.0	Ver. 6.0	Ver. 6.2	Ver. 6.3	Ver. 6.4	Ver. 6.4	Ver. 6.4	Ver. 7.1
PCB S/N	21M08463~08482	21M08483~08512	21M10986~11035	21M12644~12683	31M00876~00925	31M01879~01928	31M01326~01345	31M03899~03928	31M11719~11753
EP-3247* (BW/MEMORY)	BUD1 BUD2 BUD1 BUD2	← ← ← ←	← ← ← ←	← ← ← ←	← ← ← ←	← ← ← ←	← ← ← ←	← ← ← ←	BUD1B BUD2B BUD1B BUD2B
EP-3236E (OSC ADDRESS)	368L 368D 362KA 361JA	← ← ← ←	← ← ← ←	← ← ← ←	← ← ← ←	← ← ← ←	← ← ← ←	← ← ← ←	■
EP-3236F (OSC ADDRESS)	■	■	■	■	■	■	■	■	368M 368D 362L 361K
EP-3620* (DSC TIMING) For NTSC	VTM HTM HIP LEP REP	← ← ← ← ←	← ← ← ← ←	← ← ← ← ←	← ← ← ← ←	← ← ← ← ←	← ← ← ← ←	← ← ← ← ←	← ← ← ← ←
For PAL	VTM PHTM HIP LEP REP	← ← ← ← ←	← ← ← ← ←	← ← ← ← ←	← ← ← ← ←	← ← ← ← ←	← ← ← ← ←	← ← ← ← ←	← ← ← ← ←
EP-2729* (AD,DA)	GMA68	←	←	←	←	←	←	←	←

HISTORY OF SSD-680EX for export

(Hardware ROM in the DSC unit, 2/4)

(— : not mounted, ← : same as left, ■ : not exist)

Version	Ver. 6.0	Ver. 6.0	Ver. 6.0	Ver. 6.0	Ver. 6.0	Ver. 6.0	Ver. 6.2	Ver. 6.3	Ver. 6.4	Ver. 6.4	Ver. 6.4	Ver. 7.1
PCB S/N	21M08463~ 08482	21M08483~ 08512	21M10986~ 11035	21M12644~ 12683	31M00876~ 00925	31M01879~ 01928	31M01326~ 01345	31M03899~ 03928	31M11719~ 11753			
EP-2629* (AGDC)	CG1B	←	←	←	←	←	←	←	←	←	←	CG1C
	CG2B	←	←	←	←	←	←	←	←	←	←	CG2C
	2912A2	←	←	←	←	←	←	←	←	←	←	←
EP-3477* (US/ITF) For NTSC	OF5	←	←	←	←	←	←	←	←	←	←	OF51
	CY0L	←	←	←	←	←	CY0L1	←	←	←	←	CY0L3
	X0L	←	←	←	←	←	X0L1	←	←	←	←	X0L3
	MDXY	←	←	←	←	←	MDXY1	←	←	←	←	MDXY2
	CDXY	←	←	←	←	←	CDXY1	←	←	←	←	CDXY3
	CY0H	←	←	←	←	←	CY0H1	←	←	←	←	CY0H3
	X0H	←	←	←	←	←	X0H1	←	←	←	←	X0H3
	778G	←	←	←	←	←	←	←	←	←	←	←
	776G	←	←	←	←	←	←	←	←	←	←	←
	776B	←	←	←	←	←	←	←	←	←	←	←
For PAL	POFS	←	←	←	←	←	←	←	←	←	←	POFS1
	CY0L	←	←	←	←	←	CY0L1	←	←	←	←	CY0L3
	PX0L	←	←	←	←	←	PX0L1	←	←	←	←	PX0L3
	PMDXY	←	←	←	←	←	PMDXY1	←	←	←	←	PMDXY2
	PCDXY	←	←	←	←	←	PCDXY1	←	←	←	←	PCDXY3
	CY0H	←	←	←	←	←	CY0H1	←	←	←	←	CY0H3
	PX0H	←	←	←	←	←	PX0H1	←	←	←	←	PX0H3
	778G	←	←	←	←	←	←	←	←	←	←	←
	776G	←	←	←	←	←	←	←	←	←	←	←
	776B	←	←	←	←	←	←	←	←	←	←	←
EP-2651* (COLOR D/A)	COLMD	←	←	←	←	←	←	←	←	←	←	←

HISTORY OF SSD-680EX for export

(Hardware ROM in the DSC unit, 3/4)

(— : not mounted, ← : same as left, □ : not exist)

Version	Ver. 6.0	Ver. 6.0	Ver. 6.0	Ver. 6.0	Ver. 6.2	Ver. 6.3	Ver. 6.4	Ver. 6.4	Ver. 7.1
PCB	21M08463~ 08482	21M08483~ 08512	21M10986~ 11035	21M12644~ 12683	31M00876~ 00925	31M01879~ 01928	31M01326~ 01345	31M03899~ 03928	31M11719~ 11753
EP-5100B (COLOR FLOW PROCESSOR)	008 0019 0038 0044 0049 0068 0069 0070 0071 0072 00117	← ← ← ← ← ← ← ← ← ← ←	← ← ← ← ← ← ← ← ← ← ←						
EP-5100C (COLOR FLOW PROCESSOR)				0018b 0032b 0060b 0096b 0049b 0069b	← ← ← ← ← ←	← ← ← ← ← ←	← ← ← ← ← ←	← ← ← ← ← ←	
EP-5100D (COLOR FLOW PROCESSOR)									002LA 008LA 006QA 0010EA 009HA 002FA 002GA 0011QA 0011RA 002NA

HISTORY OF SSD-680EX for export

(Hardware ROM in the DSC unit, 4/4)

(— : not mounted, ← : same as left, ■ : not exist)

Version	Ver. 6.0	Ver. 6.0	Ver. 6.0	Ver. 6.0	Ver. 6.2	Ver. 6.3	Ver. 6.4	Ver. 6.4	Ver. 7.1
PCB S/N	21M08463~08482	21M08483~08512	21M10986~11035	21M12644~12683	31M00876~00925	31M01879~01928	31M01326~01345	31M03899~03928	31M11719~11753
	VEUPD1	←	←	←	←	←	←	←	VEUPD2
	VEUPD1	←	←	←	←	←	←	←	VEUPD2
	VAUPD1	←	←	←	←	←	←	←	←
VAUPD1	←	←	←	←	←	←	←	←	
EP-3114* (COLOR POST PROCESS)	148H	←	←	←	←	←	←	←	←
	148G	←	←	←	←	←	←	←	←
	148F	←	←	←	←	148GA	←	←	←
	148C	←	←	←	←	148FA	←	←	←
	147H	←	←	←	←	148CA	←	←	←
	147G	←	←	←	←	147HA	←	←	←
	147D	←	←	←	←	147GA	←	←	←
	145L	←	←	←	←	147DA	←	←	←
	144L	←	←	←	←	←	←	←	←
	144J	←	←	←	←	←	←	←	←
	143P	←	←	←	←	←	←	←	←
143L	←	←	←	←	←	←	←	←	
141N	←	←	←	←	←	←	←	←	
141K	←	←	←	←	←	←	←	←	
141J	←	←	←	←	←	←	←	←	

HISTORY OF SSD-680EX for export

(Hardware ROM in the Doppler unit)

(— : not mounted, ← : same as left, ■ : not exist)

Version	Ver. 6.0	Ver. 6.0	Ver. 6.0	Ver. 6.0	Ver. 6.2	Ver. 6.3	Ver. 6.4	Ver. 6.4	Ver. 6.4	Ver. 7.1
PCB	21M08463~08482	21M08483~08512	21M10986~11035	21M12644~12683	31M00876~00925	31M01879~01928	31M01326~01345	31M03899~03928	31M11719~11753	
EP-2810* (DOP CONTROLLER)	M2006-1.0-1				←	←	←	←	←	←
EP-3259* (DOP FILTER)	DM2-AGC-V1.0	←	←	←	←	←	←	←	←	←
	T112D	←	←	←	←	←	←	←	←	←
	C113D	←	←	←	←	←	←	←	←	←
CDC-522A (FFT board)	DZMD124	←	←	←	←	←	←	←	←	←
	DZMD125	←	←	←	←	←	←	←	←	←
CDG-266A1 (OUTPUT board)	DZMD126	←	←	←	←	←	←	←	←	←
	DZMD127A	←	←	←	←	←	←	←	←	←

HISTORY OF SSD-680EX for export (Specification change list)

LEVEL	Specification change (except probe connection)																		
Ver. 6.0 (21M08463~12683)	<ul style="list-style-type: none"> Initial lot 																		
Ver. 6.1	<ul style="list-style-type: none"> This version is not exist on SSD-680EX. (SSD-680STD has this version.) 																		
Ver. 6.2 (31M00876~00925)	<ul style="list-style-type: none"> The image quality improvement. (correction of the uneven sensitivity on the B/W image when using UST-959-3.5, 960-5, 577-7.5, 5817-5, 967-5, 964P-5.) Addition of the new PRESET item. (B/W POWER added to IMAGE CONTROL in the PRESET function.) The following problems were solved. <ol style="list-style-type: none"> Panel lock up problem that is occurred by the cursor movement when chosen the annotation of the PRESET function. (Occurred on the NTSC system only) Panel lock up problem that is occurred by the cursor movement when chosen the measurement of the PRESET function. (Occurred on the NTSC system only) The contents of initial setting of FLOW AVERAGE differ in compliance with the number of PRESET. The velocity range at the start is different from one which was set by FLOW in the PRESET function. Malfunction of the PRESET for mode and body mark. The image of slant scanning remains after changing the probe to others in case of the PRESET is performed at a state of slant scanning mode. The image is disappeared during the flow area is moving under the slant scanning of UST-5525-7.5. The flow area display mark doesn't show the correct position of that. A wrong image is displayed at the store memory where the image was stored by the following order (FREEZE→CINE→STORE→FREEZE→NEW PAT→NEW PAT→FREEZE→CINE→STORE). (Occurred on the NTSC system only) The message of the "IMAGE STORE" is still displayed after changing the mode from STORE to REVIEW. Wrong velocity range data is displayed when using the independent probe. Wrong image is displayed under the ECG SYNC function. (it's displaying a image which was taken at one beat before) Data of MAX VEL display is wrong when B/F/DOP mode. Scale mark at MAG. 1.5 when using UST-5518-7.5 doesn't display the correct scale. (Occurred on the PAL system only) B mode image is disappeared (should be still at ECG timing) under the condition of B/DOP mode and ECG SYNC. The only one frame of color image is displayed under the condition of FLOW AVERAGE HIGH in the ECG SYNC function. Bottom end of B/W image is notched (should be a curved line or line). The image is expanded by 5 % in lateral direction at MAG. x 1 when using UST-5042-3.5 or 5043P-3.5. The ellipse calculation error of the OB measurement on PAL systems. The following operation was improved. <ol style="list-style-type: none"> The halt time of color frame correlation is shorten to about 0.5 sec.. and the color frame interpolation is not prohibited when the flow area moving or mode switching. The PRESET item "VEL RANGE" was deleted from PRESET PW. The contents of "VEL RANGE" in FLOW of PRESET was changed as below. <table border="1"> <tr> <td>VEL RANGE</td> <td>0.7K</td> <td>1.2K</td> <td>1.5K</td> <td>2K</td> <td>4K</td> </tr> <tr> <td>VELOCITY</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td>MODE</td> <td>3K(x4)</td> <td>5K(x4)</td> <td>6K(x4)</td> <td>4K(x2)</td> <td>4K(x1)</td> </tr> </table> The Doppler sampling mark maintain its position when the mode is changed to Doppler active in the B or B/FLOW mode When the mode is B*/DOP, The transmitting focus point is determined by the panel setting (not by the Doppler sampling position). In case of the receiving focus, it follows the Doppler sampling position as before. 	VEL RANGE	0.7K	1.2K	1.5K	2K	4K	VELOCITY	2	3	4	5	6	MODE	3K(x4)	5K(x4)	6K(x4)	4K(x2)	4K(x1)
VEL RANGE	0.7K	1.2K	1.5K	2K	4K														
VELOCITY	2	3	4	5	6														
MODE	3K(x4)	5K(x4)	6K(x4)	4K(x2)	4K(x1)														

HISTORY OF SSD-680EX for export (Specification change list)

LEVEL	Specification change (except probe connection)
Ver. 6.3 (31M01879~01928)	6. The B/* image is always still regardless of the velocity range when the mode is selected to DOP active by SELECT switch in the B/*/DOP mode. When changing the velocity range in B/*/DOP mode without pushing SELECT switch, it will be a still B image (in the HPRF condition) or B/*/DOP simultaneous active image depending on the velocity range. 7. The Doppler sampling mark was changed to "=". 8. The data of initial setting of FLOW PRESET was changed. 9. The display way of the color flow area for linear probe was changed from a line to a dotted line.
Ver. 6.4 (31M01326~01345) (31M03899~03928)	<ul style="list-style-type: none"> The DSC is rarely locked up when power on due to communication trouble between panel and DSC. (M0-680-1-6.2-1 → M0-680-1-6.3-1) Solution of the system start up problem once in a while, when power on.
Ver. 7.1 (31M11719~11793)	<ul style="list-style-type: none"> The following problems were solved by Ver.7.1. <ol style="list-style-type: none"> Scrolling method is changed to moving bar method on M mode by the order of "flow→vel ↑ →B B→select(activate right side)→M". The order that has "B B→select→flow→select" change the value of velocity range itself. The function of search doesn't work, changing velocity range from 8kHz to 6kHz on DOP mode and freezing the image. The left side of images is not frozen by the order of "M mode→working a cursor →freeze". Focus marks appear on the image area, as using UST-960-5 in 2B mode. You set B/M mode on preset you turn on the equipment. imaging format is B/M mode, but B image doesn't display. As replaying VCR, replaying image disappear as you use MD-POS/NEGA switch. As using UST-667P-5, the imaging area has lacks. Doppler gain drops itself in B/FLOW/DOP mode as the velocity range is increased and HPRF mode is achieved. If UST-666-5/7.5 or UST-667P-5 is connected, the both edges of the B-mode image are displayed jaggedly. Improvement of operability. <ol style="list-style-type: none"> It provides 7 steps of setting magnifications for the UST-959-3.5 and the UST-999-5, and 5 steps for the UST-960-5. Changing scanning width and angle of the black-and-white image. Addition of F-B/W and B-B/W on flow display in flow menu. Addition of AUTO to AREA LOCK in the FLOW menu. Addition of LOW (1:3), MID (1:2), and HIGH (1:1) as sub-menu for LINE DENSITY in the FLOW menu. Addition of an IMG QLT menu for setting the image quality. Addition of a SEC APP menu for the sector probes. Changing a name from FRM-COR to CORR and addition of a line correlation setup. Addition of ZOOM operation in B/DOP mode and B/FLOW/DOP mode. Addition of ECG waves display in 2B mode. Changing the cursor switch operation so that when the cursor switch is changed as follows: B*→B*/DOP→B*. Addition of velocity range of 5kHz. Expanding the upper and lower limits of the flow area when HORI is selected for Color average. Changing the PRESET contents and operation. Changing the frame correlation of black-and-white and color images.

HISTORY OF SSD-680EX for export (Specification change list)

LEVEL	Specification change (except probe connection)
	<ul style="list-style-type: none"> • Improvement of calculation functions. <ol style="list-style-type: none"> 1. Addition of bone angle measurements;HIP-J. 2. Addition of left ventricular cardiac function measurements with the A-L method on B-mode;LV-AL. 3. Addition of venous flow volume measurements;F-VOL. 4. Changing the name from PUL-IND to P.I. and from POU-IND to R.I. , and it enable to display results of measurements. 5. Improvement of precision for measurements. 6. Addition of the Campbell and the Hansmann tables to O.B. tables. 7. Changing operation of the O.B. report. 8. Addition of the AUTO-TRACE function. 9. Elimination of the page that make you select fetal weight equation on the O.B. program.

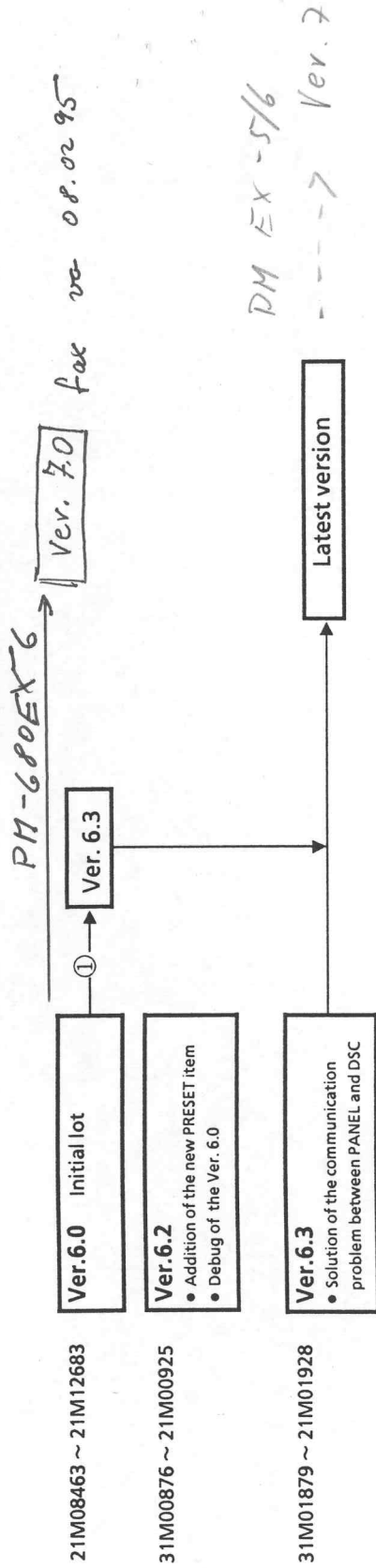
SSD-680EX Upgrade/Modification Kit (S/N⇄Version⇄Upgrade kit)

S/N	21M08463~21M12683	31M00876~31M00925	31M01879~31M01928	31M01326~31M01345 31M03899~31M03928	31M11719~31M11753
Version	6.0	6.2	6.3	6.4	7.1
Contents of the main change	Initial lot	<ul style="list-style-type: none"> Improvement of the B/W image sensitivity problem. Addition of the new PRESET item. Debug of the problem on version 6.0. 	<ul style="list-style-type: none"> Solution of the communication problem between PANEL and DSC. 	<ul style="list-style-type: none"> Solution of the system cannot start up once in a while, when you turn the switch ON. 	<ul style="list-style-type: none"> Improvement of operability. Improvement and addition of measuring function. Connection of new optional probes.
Upgrade/Modification Kit					
PM-680EX-1 (for NTSC) PM-680EX-2 (for PAL) Ver.6.0→Ver.6.4 version up kit	All systems from version 6.0 to version 6.3 can be upgraded by PM-680EX-1 or 2.				
PM-680EX-3 B/W Image quality improvement kit	All systems of version 6.0 and 6.2 can be upgraded by PM-680EX-3.				
PM-680EX-4 Color quality improvement kit See Note 1. PM-680EX-3 should be performed before this	The affected S/N is 21M08463~21M11035 PM-680EX-4 is performed at factory from S/N 21M12644.				
PM-680EX-5 (for NTSC) PM-680EX-6 (for PAL) Ver.6.0~6.4→Ver.7.0, 7.1 version up kit Kit does not include the improvement by PM-680EX-7.	All systems from version 6.0 to version 6.4 can be upgraded by PM-680EX-5 or 6.				
PM-680EX-7 B/W Image Quality Improvement Kit PM-680EX-5 (for NTSC) or PM-680EX-6 (for PAL) should be performed before this.	After using PM-680EX-5 or 6, the systems from version 6.0 to version 6.4 can be upgraded by PM-680EX-7.				
PM-680EX-9 Color quality improvement kit See Note 2. In case of S/N 21M08463~21M11035, PM-680EX-3 should be performed before this.	The affected S/N is 21M08463~31M03928.				
					PM-680EX-5 or 6 is performed at factory on the systems S/N 31M11719~.
					PM-680EX-7 is performed at factory on the systems S/N 31M11719~.
					PM-680EX-9 is performed at factory on the systems S/N 31M11719~.

Note1: The purpose of PM-680EX-4 is to add the feature which is changed by Color Flow Processor board EP-5100C, for S/N 21M08463~21M11035.

Note2: The purpose of PM-680EX-9 is to add the feature which is changed by Color Flow Processor board EP-5100D, for S/N 21M08463~31M03928.

SSD-680EX Upgrade / Modification kit (S/N ⇄ Software Version ⇄ Upgrade kit)



Version # in the shows the original version # when it shipped.

	Number of kit	Note	Number of Technical Bulletin
①	PM-680EX-1 (For NTSC) PM-680EX-2 (For PAL)	Ver. 6.0 → Ver. 6.3	
②			
③			
④			
⑤			
⑥			
⑦			

SSD-880EX-2

ALOKA Deutschland GmbH
Zentrale Düsseldorf
Büropark Wolfsteil
Wolfssteil 5
40670 Meerbusch

Aloka

FAX-TRANSMISSION

<p><i>from</i> To: Mr. Nakayama ALOKA EUROPE</p>	<p>Date: 08.02.1996 Pages (incl coverpage): 2238 <i>to</i> from: H.-G. Rokita Phone.: 02159/915630 Fax: 02159/915699</p>
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Reference: SSD-880EX S/N 21M12679

Good morning dear Nakayama san,
 Above mentioned I want to modify the machine from Ver. 6.0 to Ver 7.0.
 My opinion is first whe must modify the machine with PM-680EX-2 after that it is possible
 to built in PM-680EX-5/6.
 Please tell my, Is this proceeding correct?

Thank you in advanced for your cooperation.

H.-G. Rokita
 H.-G. Rokita

*You don't need PM-680EX-2.
 You can directly modify with PM-680EX-6*

H. Nakayama

21M 0224C

SSD-680STD用カラーユニット

CFM-680STD

据付

仕様書・要領書

整理番号

MS5-0362 -

葉番

1/16

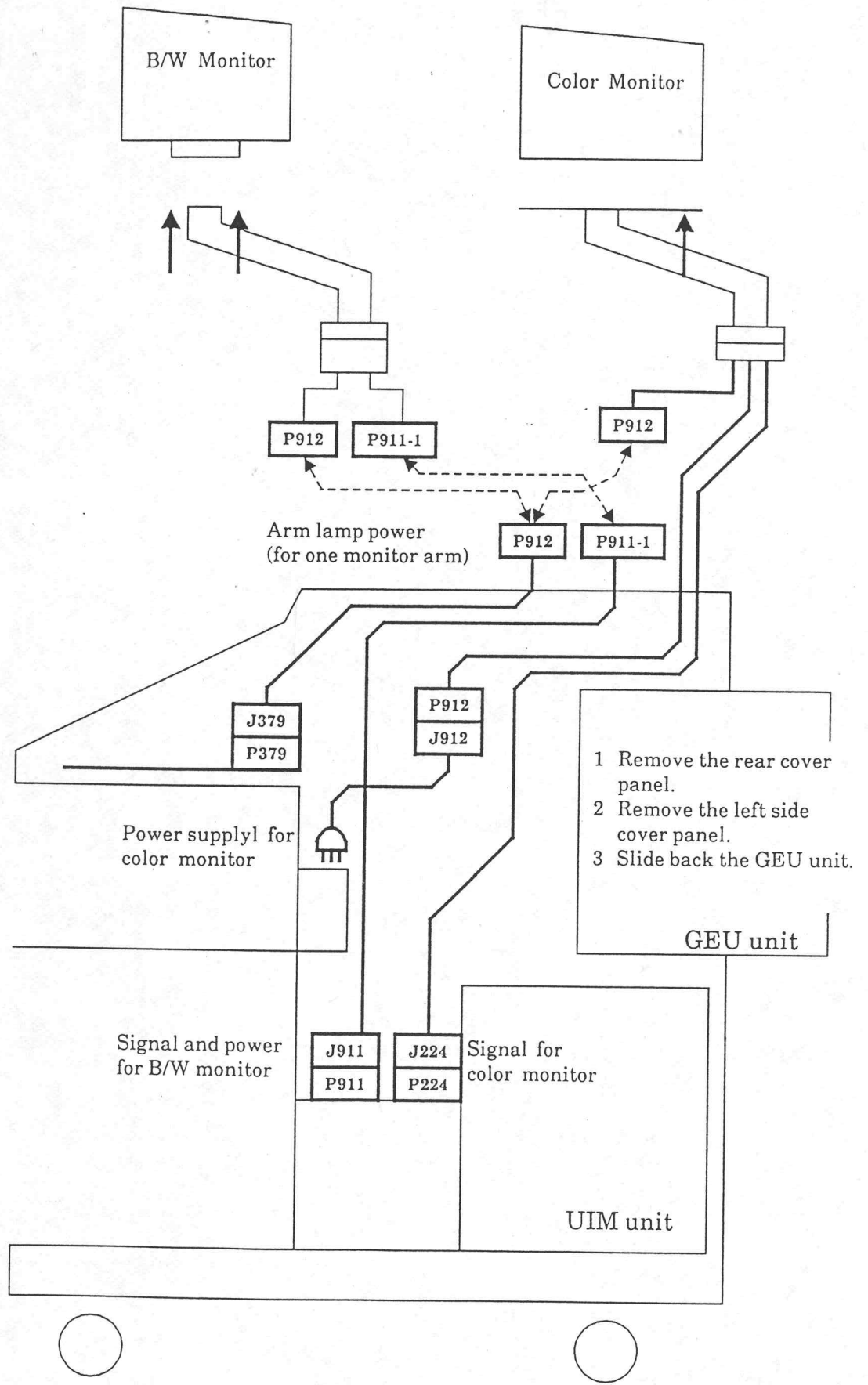
名前	SSD-680STD用カラーユニット		作成	担当	検印	承認
形名	CFM-680STD		企画課	企画G	企画G	近藤
			93年3月11日	93.3.11 近藤	93.3.11 馬木	93.3.11 八江
イッ		備				
ホク		考				

- | | | | | | |
|---|-----------------|---------------|---|-----------------------------------|-----------------|
| 1 | 対象機器 | SSD-680STD | 1 | Applied unit | SSD-680STD |
| 2 | 必要工具 | 3mmドライバー | 2 | Tools Needed | screw driver 3M |
| 3 | 改造時間 | 約3時間 | 3 | Modification Time | 3hours |
| 4 | 改造手順 | | 4 | Modification Procedure | |
| | 1) モニターの交換または追加 | | | 1) Change or add Monitor | |
| | 2) PCB交換、追加 | | | 2) Replace and instal PCB's | |
| | EP-3461B-2→ | EP-3461B-1 | | EP-3461B-2→ | EP-3461B-1 |
| | EP-2651E-3→ | EP-2651E-3 | | EP-2651E-3→ | EP-3461B-2 |
| | 追加 | EP-5100B or C | | Instal | EP-5100B or C |
| | | EP-3115D | | | EP-3115D |
| | | EP-3114E | | | EP-3114E |
| | | EP-2213B | | | EP-2213B |
| | | EP-2213B-1 | | | EP-2213B-1 |
| | | EP-3238 | | | EP-3238 |
| | | EP-3443B-1 | | | 3443B-1(NTSC) |
| | | | | | 3443B-2(PAL) |
| | 3) ショートプラグの削除 | | | 3) Take off Short Plug | |
| | 4) パネルスイッチの設定 | | | 4) Set Dip Switch on Main Control | |
| | 5) 動作確認 | | | 5) Check performance | |

出図印

改訂

1 モニターの交換または追加
Chan or add monitor

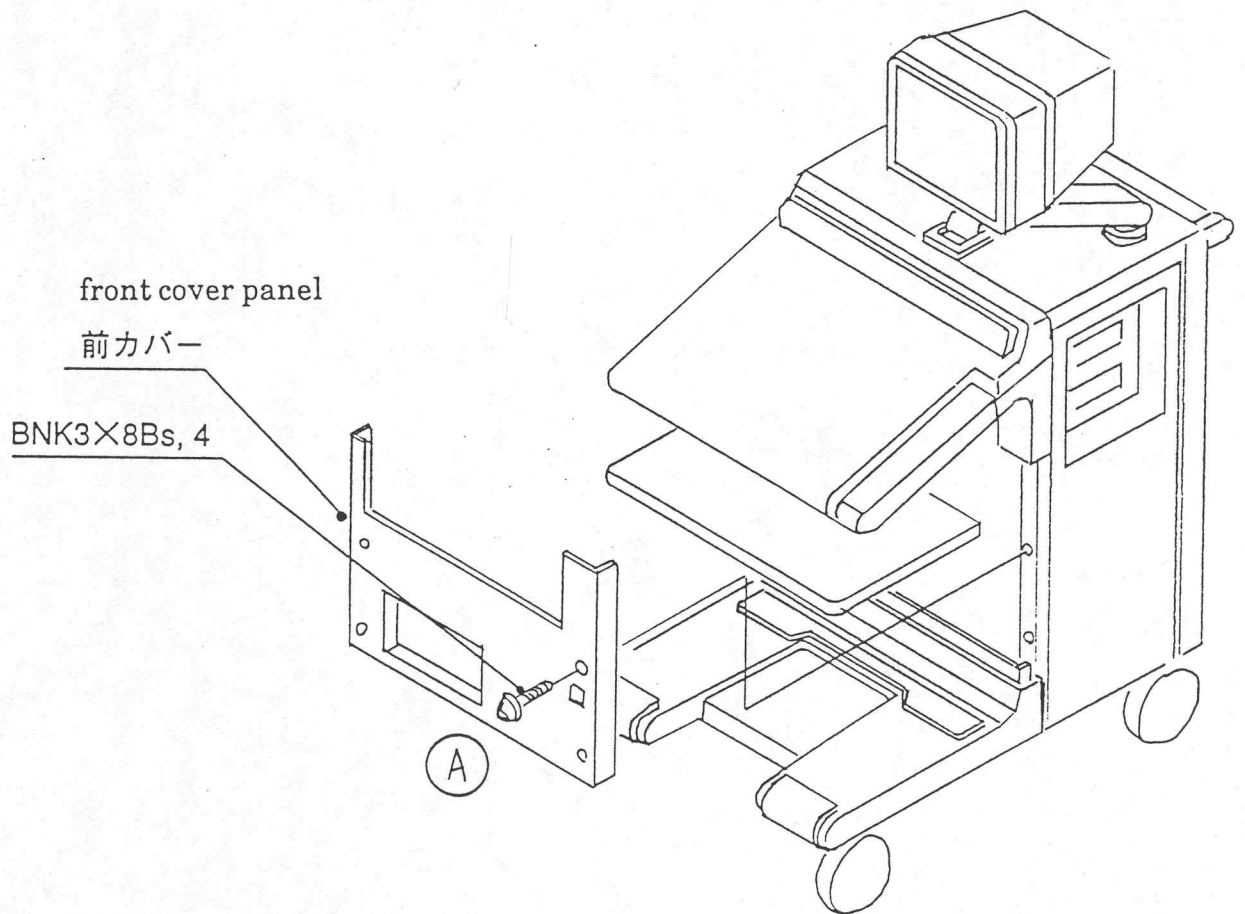


カバー類の取り外し方法	Take off cover panels
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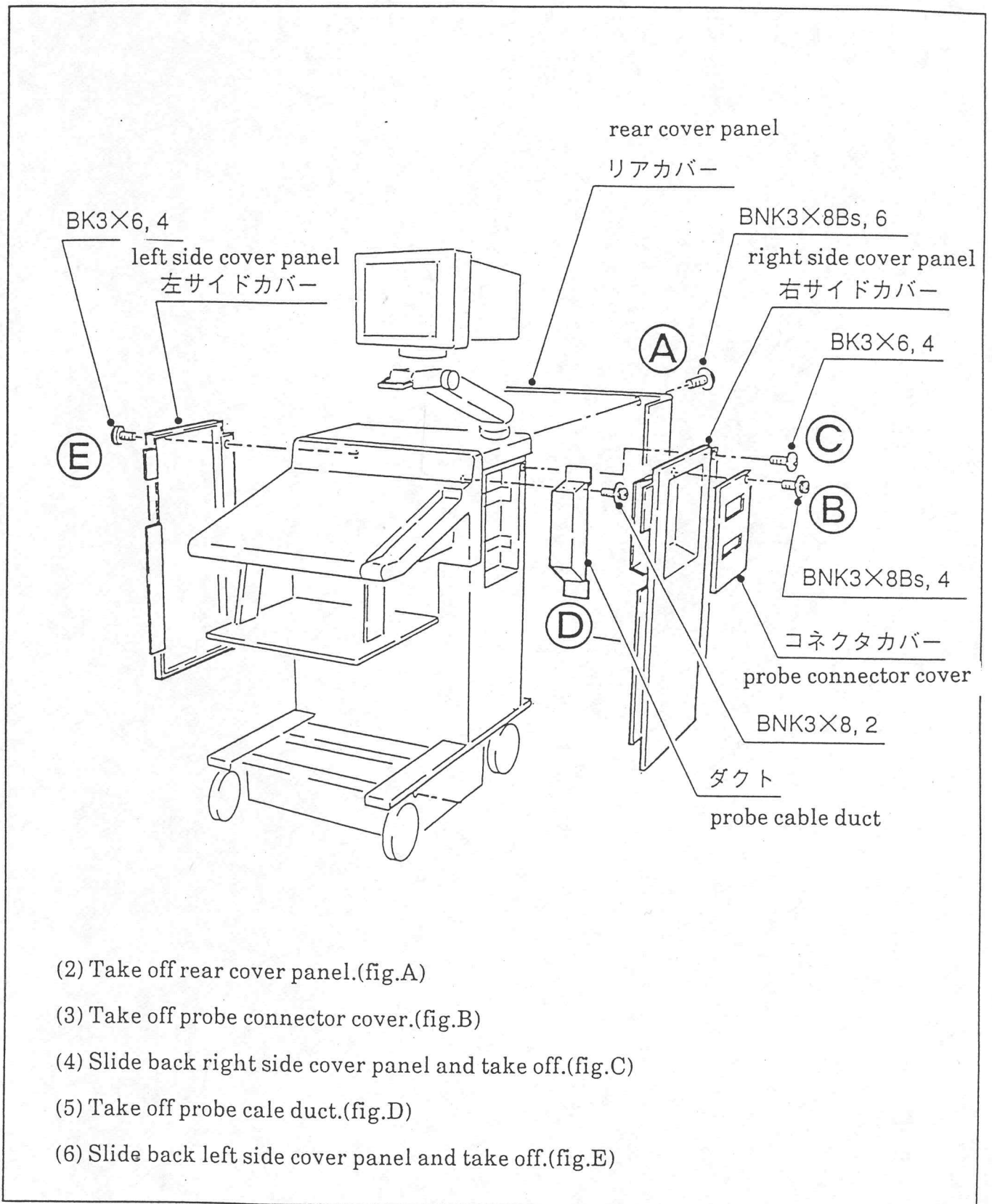
S/N 21M08252～の装置は(3)の作業は不要。
 (1) 前カバーをねじ4本を外して取り外す。(図中Ⓐ)

S/N 21M08252~do not need (3) procedure.

(1) Take off front cover panel.(fig.A)



- (2) リアカバーをねじ6本を外して取り外す。(図中 ㊸)
- (3) コネクタカバーをねじ4本外して取り外す。(図中 ㊹)
- (4) 右サイドカバーをねじ4本を外し、後方にずらして取り外す。(図中 ㊺)
- (5) ダクトをねじ2本を外して取り外す。(図中 ㊻)
- (6) 左サイドカバーをねじ4本を外し、(7)と同様に取り外す。(図中 ㊼)



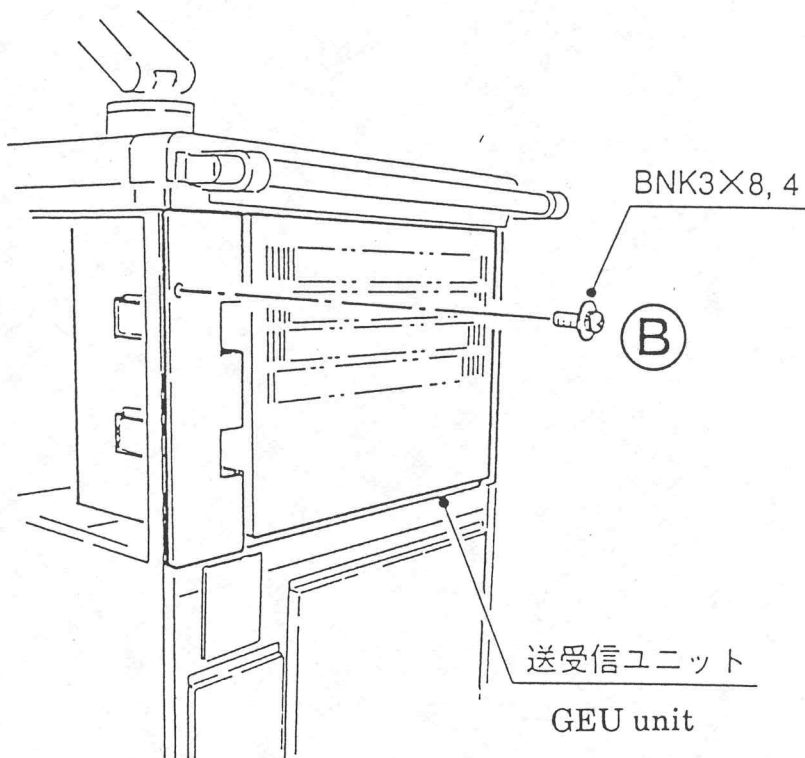
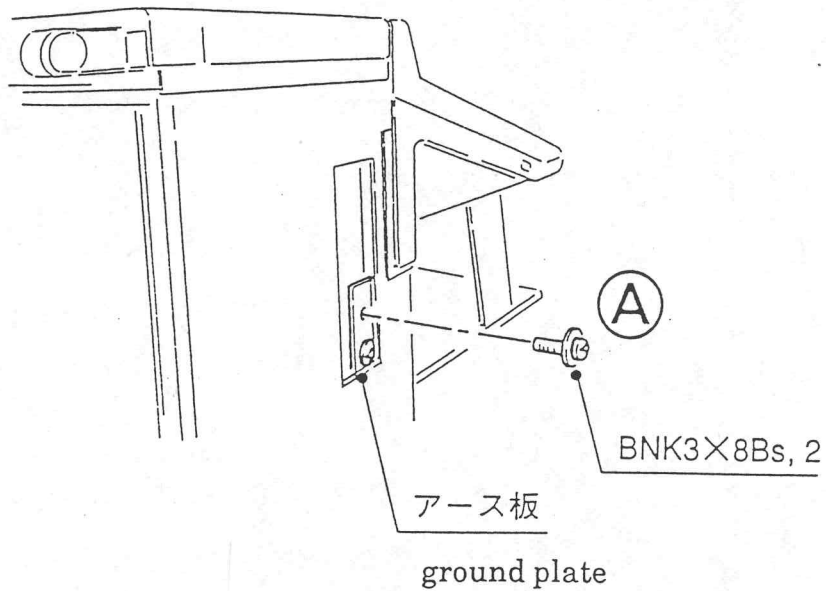
Way to take off units

● ユニットの取り外し方法

- (1) 左側面のアース板のねじ2本を外す。(図中 ㉠)
- (2) 送受信ユニットをねじ4本を外して取り外す。(図中 ㉡)

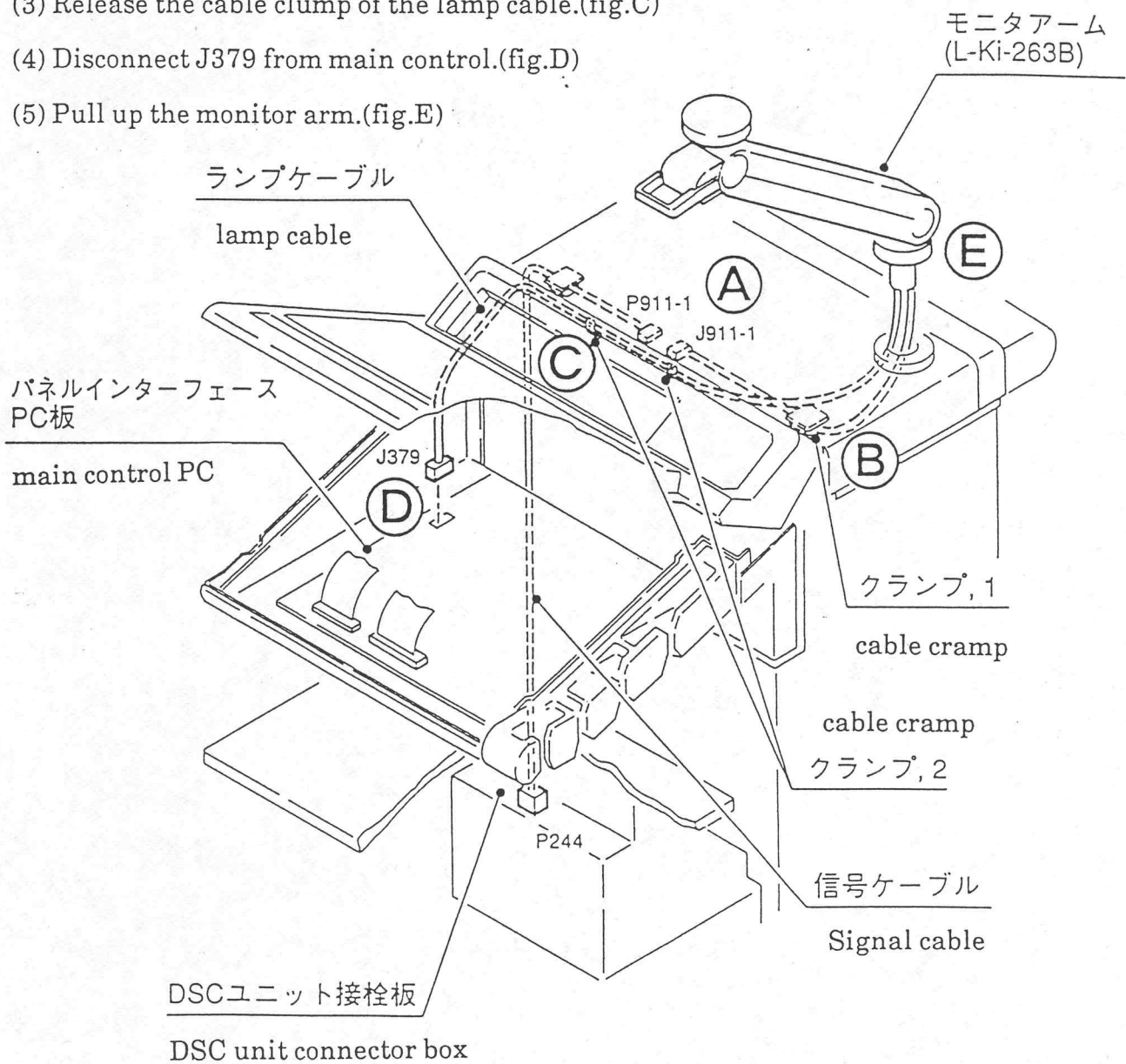
(1) Take off two screws of left side ground plate.(fig.A)

(2) Take off four screws of the GEU unit and slide it back.(fig.B)



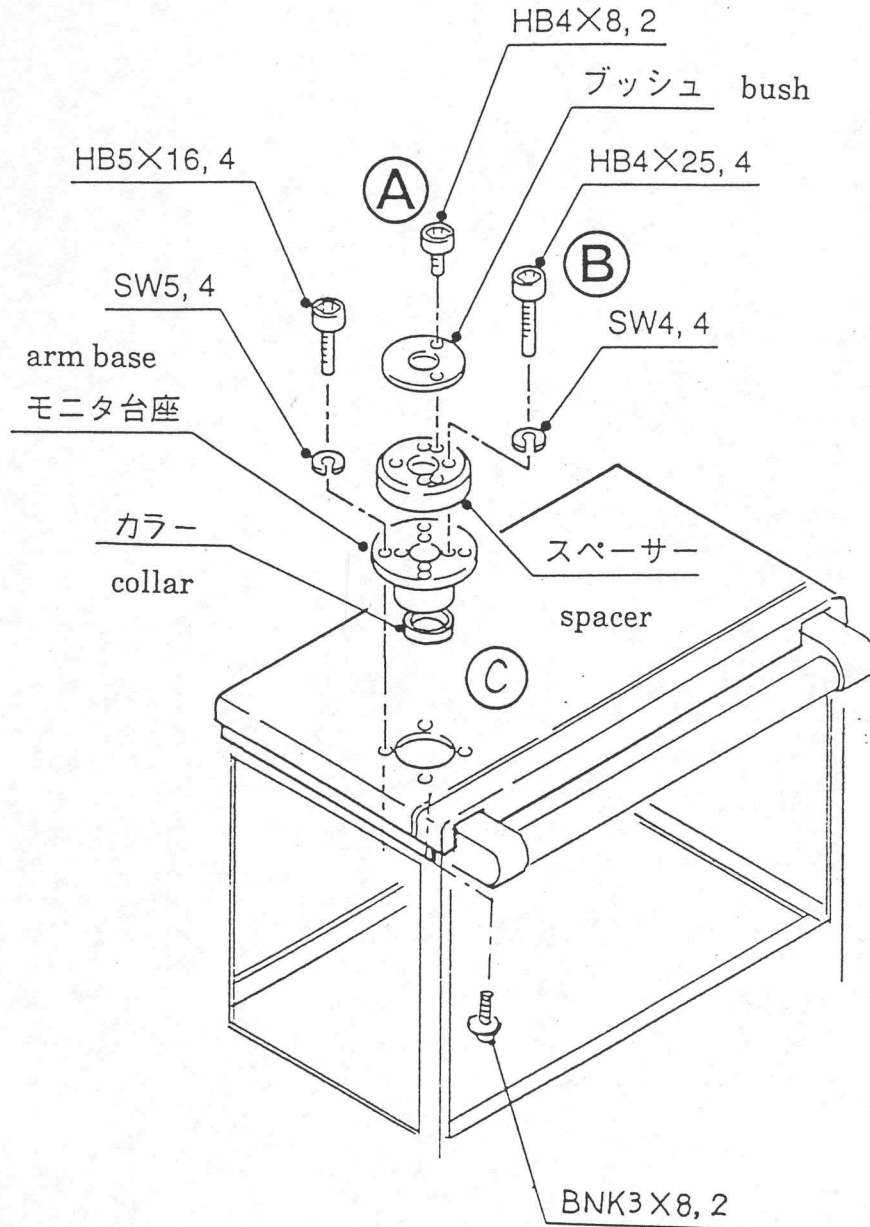
- (1) DSCユニット接栓板に接続されている信号ケーブルの中継コネクタ (J911-1, P911-1) を取り外す。(図中 ㉠)
- (2) 信号ケーブルをクランプ1個から取り外す。(図中 ㉡)
- (3) ランプケーブルをパネルエスカッションのクランプ2個から取り外す。(図中 ㉢)
- (4) ランプケーブルのコネクタ (J379) をパネルインターフェースPC板から取り外す。(図中 ㉣)
- (5) モニタアームを上方へ引き上げ、本体から取り外す。(図中 ㉤)

- (1) Disconnect J911-1 from P911-1.(fig.A)
- (2) Release the cable clamp of the signal cable.(fig.B)
- (3) Release the cable clamp of the lamp cable.(fig.C)
- (4) Disconnect J379 from main control.(fig.D)
- (5) Pull up the monitor arm.(fig.E)



モニタ台座の取り外し方法

- (1) ブッシュを六角穴付ボルト2本を外して取り外す。(図中Ⓐ)
- (2) スペーサーを六角穴付ボルト4本とスプリングワッシャー4個を外して取り外す。(図中Ⓑ)
- (3) モニタ台座とカラーを六角穴付ボルト4本とスプリングワッシャー4個と下方のねじ2本を外して取り外す。(図中Ⓒ)



Way to take off arm base

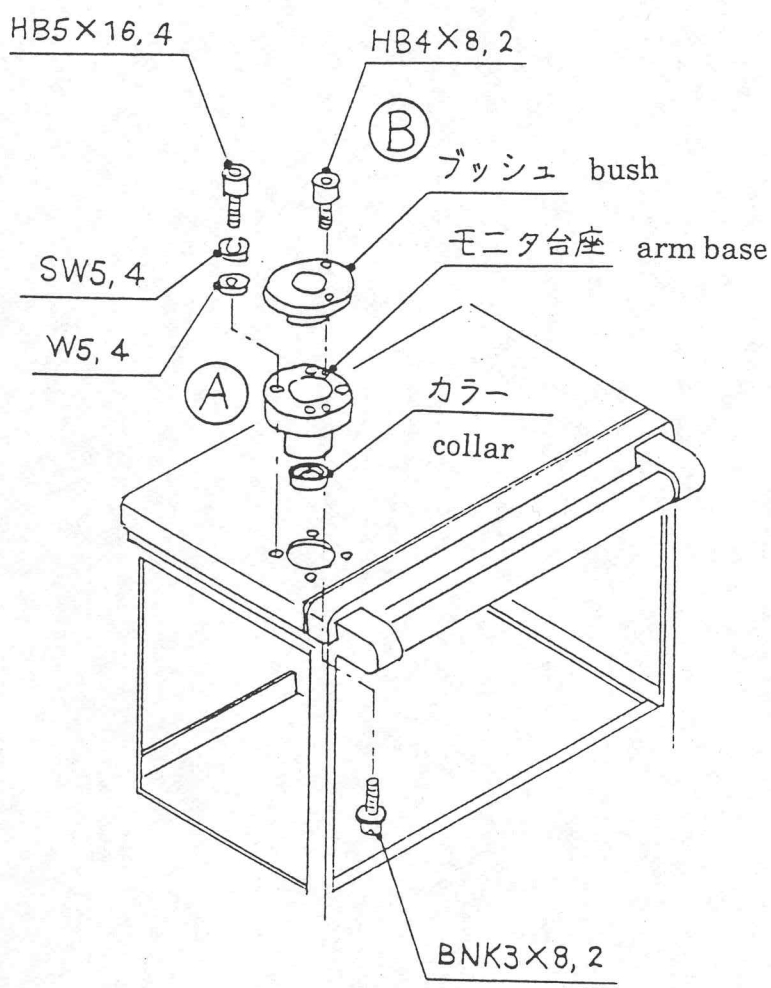
- (1) Take off the bush.(fig.A)
- (2) take off the spacer.(fig.B)
- (3) Take off the arm base and collar.(fig.C)

カラーモニター用台座の右側への取付方法

- (1) 台座とカラーを六角穴付ボルト、スプリングワッシャー、ワッシャー各4コと下方の2本のねじで固定する。(図中Ⓐ)
- (2) ブッシュを六角穴付ボルト2本で固定する。(図中Ⓑ)

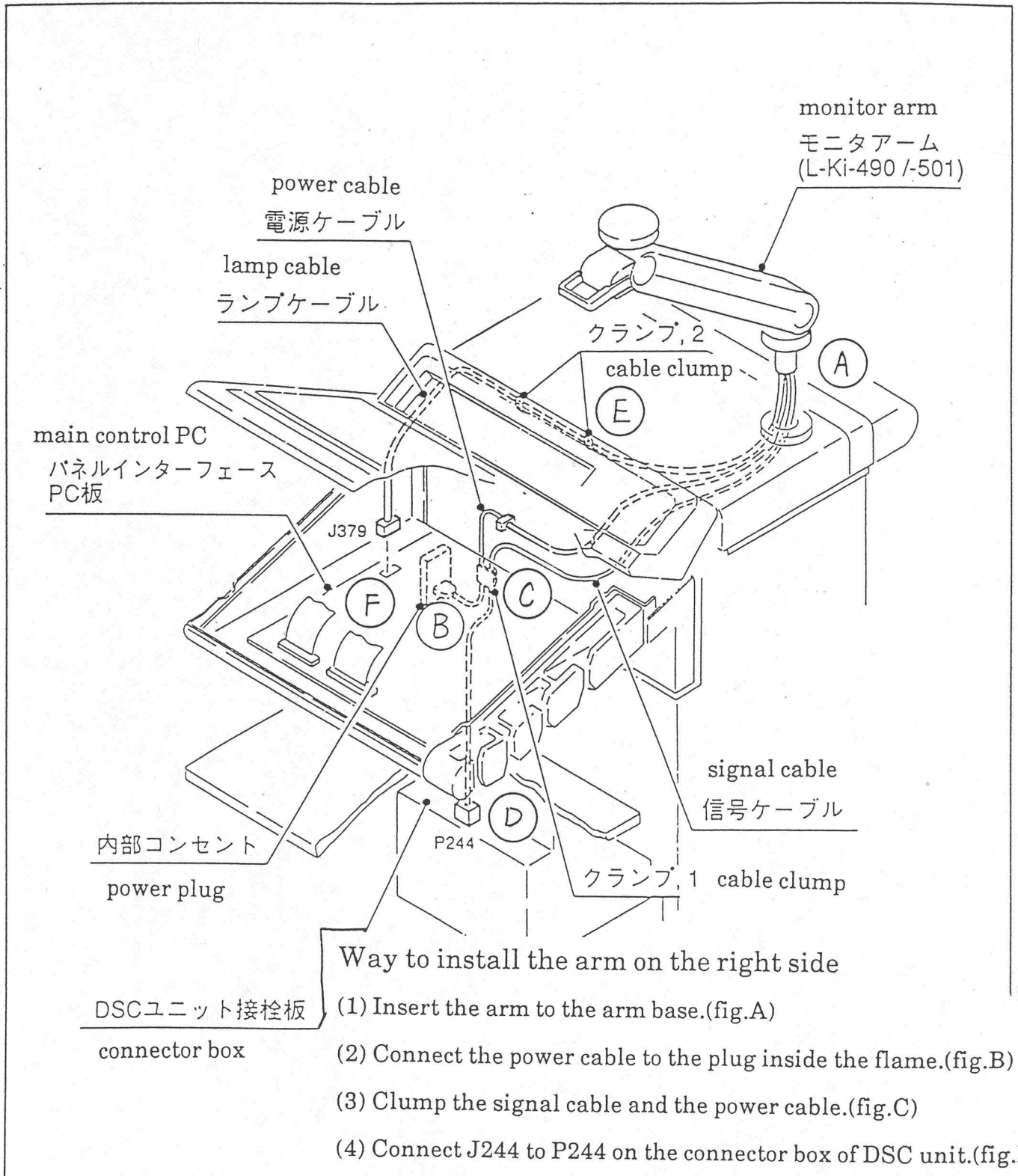
Way to install the arm base at the right side

- (1) Fix the arm base and collar.(fig.A)
- (2) Fix the bush.(fig.B)



モニターアーム (L-Ki-490 /-501) の取り付け方法

- (1) モニターアームを台座に差し込む。(図中A)
- (2) 内部コンセントに電源ケーブルを接続する。(図中B)
- (3) 信号ケーブルと電源ケーブルをクランプする。(図中C)
- (4) 信号ケーブルのコネクタ (P244) をDSCユニット接栓板に取り付ける。(図中D)
- (5) ランプケーブルをパネルエスカッションのクランプ2個に取り付ける。(図中E)
- (6) ランプケーブルのコネクタ (J379) をパネルインターフェースPC板に取り付ける。(図中F)



Way to install the arm on the right side

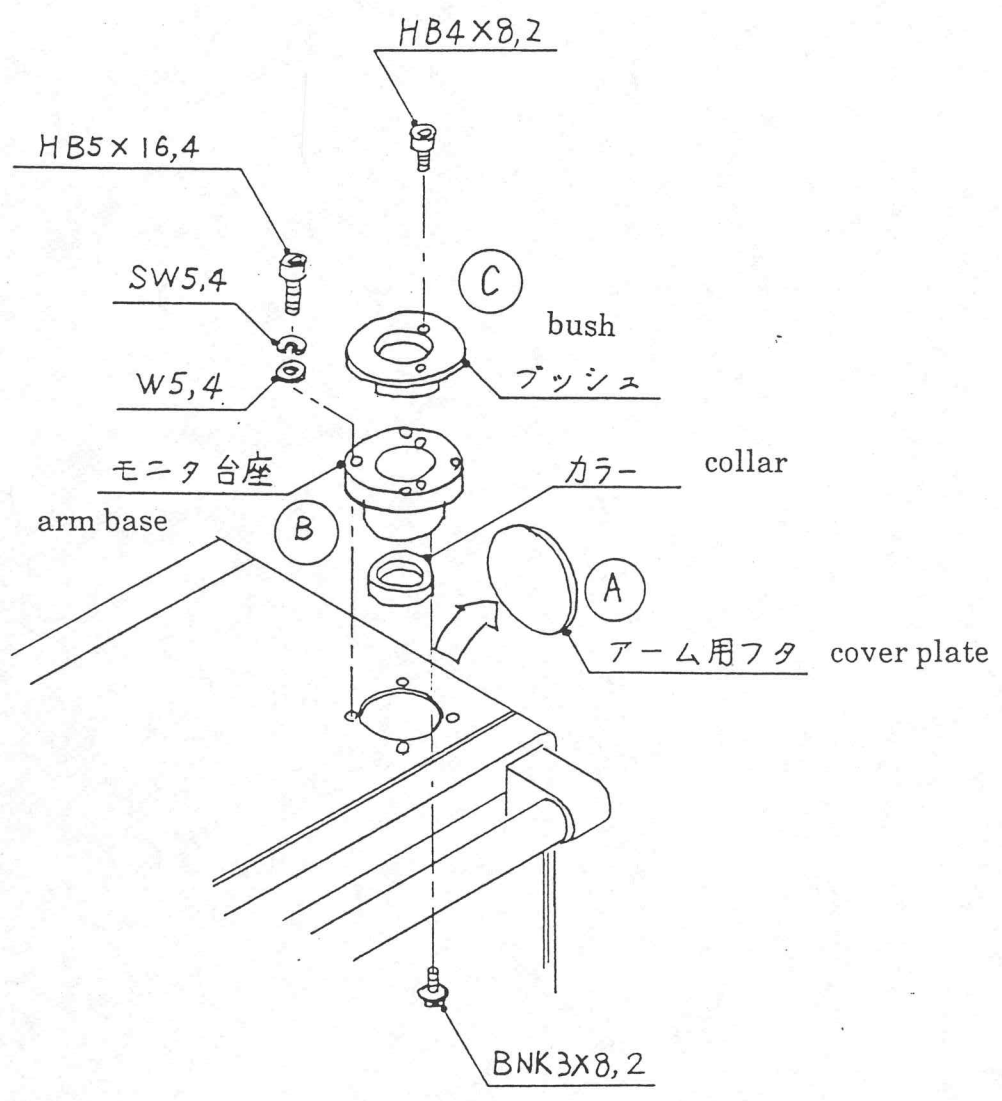
- (1) Insert the arm to the arm base.(fig.A)
- (2) Connect the power cable to the plug inside the flame.(fig.B)
- (3) Clump the signal cable and the power cable.(fig.C)
- (4) Connect J244 to P244 on the connector box of DSC unit.(fig.D)
- (5) Clump the lamp cable.(fig.E)
- (6) Connect J379 to P379 on main control PC.(fig.F)

カラーモニター用台座左側への取付方法

- (1) アーム用フタをトップカバーから取り外す(図中④)
- (2) 台座とカラーを六角穴付ボルト、スプリングワッシャー、ワッシャー各4コと下方の2本のねじで固定する。(図中③)
- (3) ブッシュを六角穴付ボルト2本で固定する。(図中②)

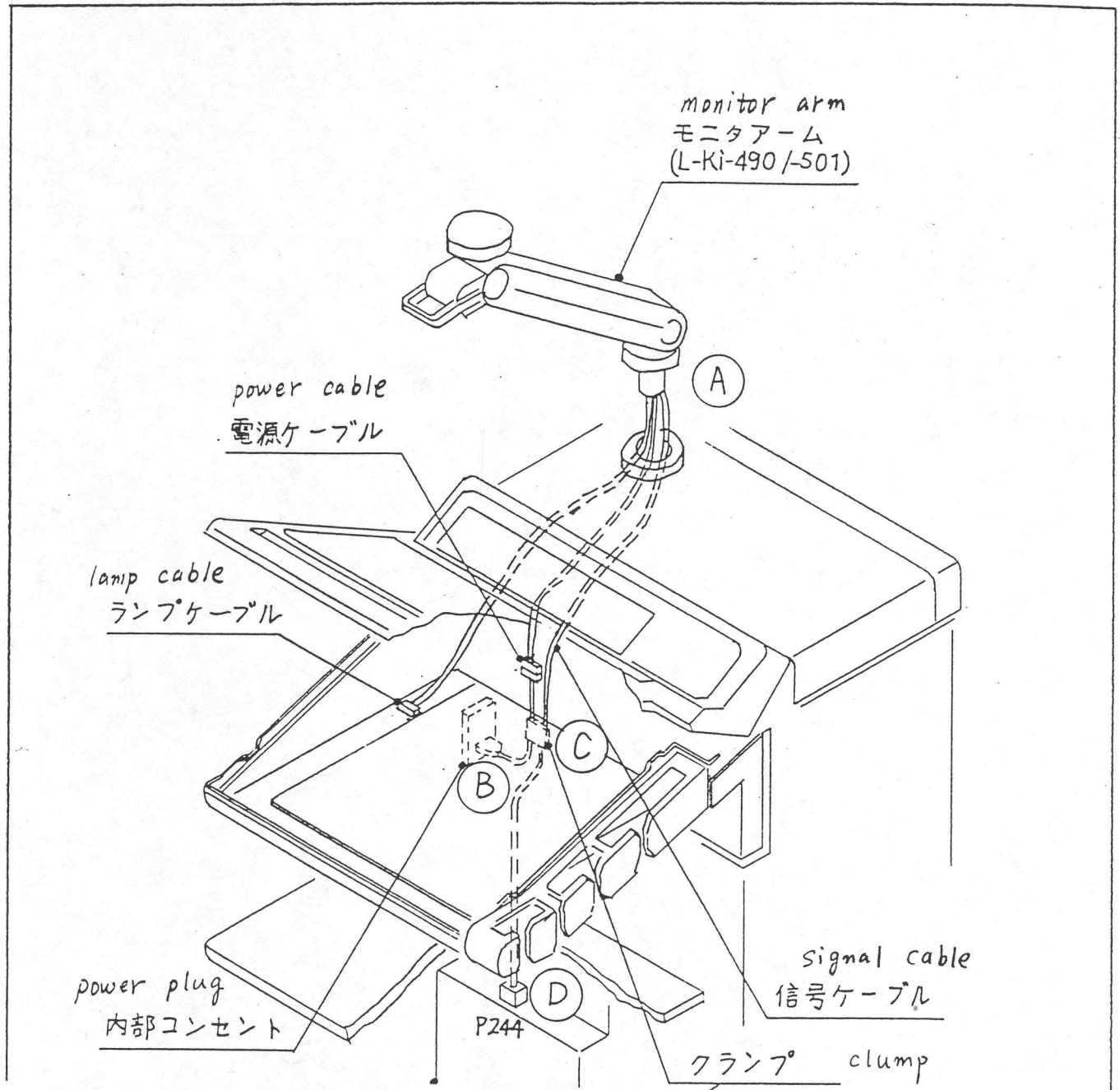
Way to install the arm base at the left side

- (1) Take off the cover plate.(fig.A)
- (2) Fix the arm base and collar.(fig.B)
- (3) Fix the bush.(fig.C)



モニターアーム (L-Ki-490 /-501) の 左側 取り付け方法

- (1) モニターアームを台座に差し込む。(図中①)
- (2) 内部コンセントに電源ケーブルを接続する。(図中②)
- (3) 信号ケーブルと電源ケーブルをクランプする。(図中③)
- (4) 信号ケーブルのコネクタ (P244) をDSCユニット接栓板 に 取り付ける。(図中④)
- (5) ランプケーブルはコネクティングしない。



Way to install the arm on the left side

- (1) Insert the arm to the arm base.(fig.A)
- (2) Connect the power cable to the plug inside the flame.(fig.B)
- (3) Clump the signal cable and the power cable.(fig.C)
- (4) Connect J244 to P244 on the connector box of DSC unit.(fig.D)
- (5) Do not connect lamp cable

○ モニタ (IPC-1010, 1010V)

- (2) チルト台のつめをモニタ底面のフック金具にひっかけてから、モニタを、チルト台にねじ2本で取付ける。(図中Ⓐ)
- (3) ACケーブルを、モニタ背面に接続する。(図中Ⓑ)
- (4) 信号ケーブルをモニタに接続し、取付けねじ2本で固定する。(図中Ⓒ)
- (5) ACケーブル固定金具を、ねじ2本で取付ける。(図中Ⓓ)

○ Monitor (IPC-1010, 1010V)

- (2) Hook the claw of the tilt table onto the hook metal fitting on the under side of the monitor and then, mount the monitor on the tilt table with 2 screws. (A in Fig.)
- (3) Connect the AC cable to the back of the monitor. (B in Fig.)
- (4) Connect the signal cable to the monitor and fasten 2 fixing screws. (C in Fig.)
- (5) Install the AC cable fixing metal fitting with 2 screws. (D in Fig.)

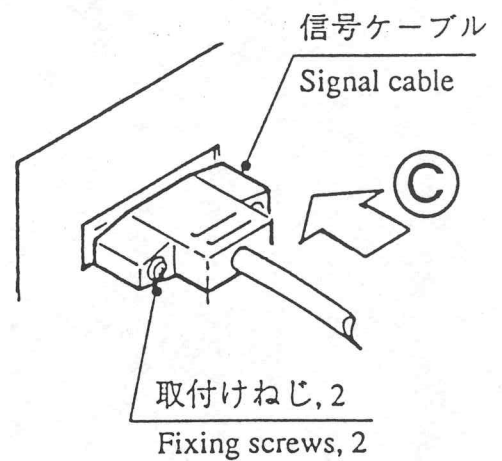
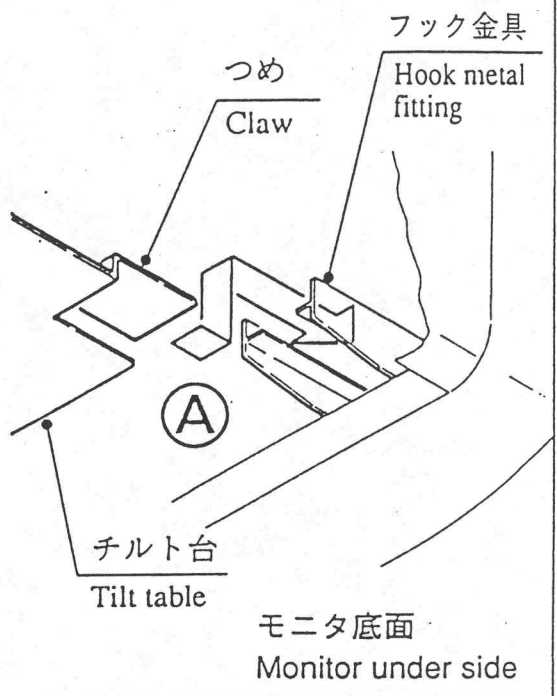
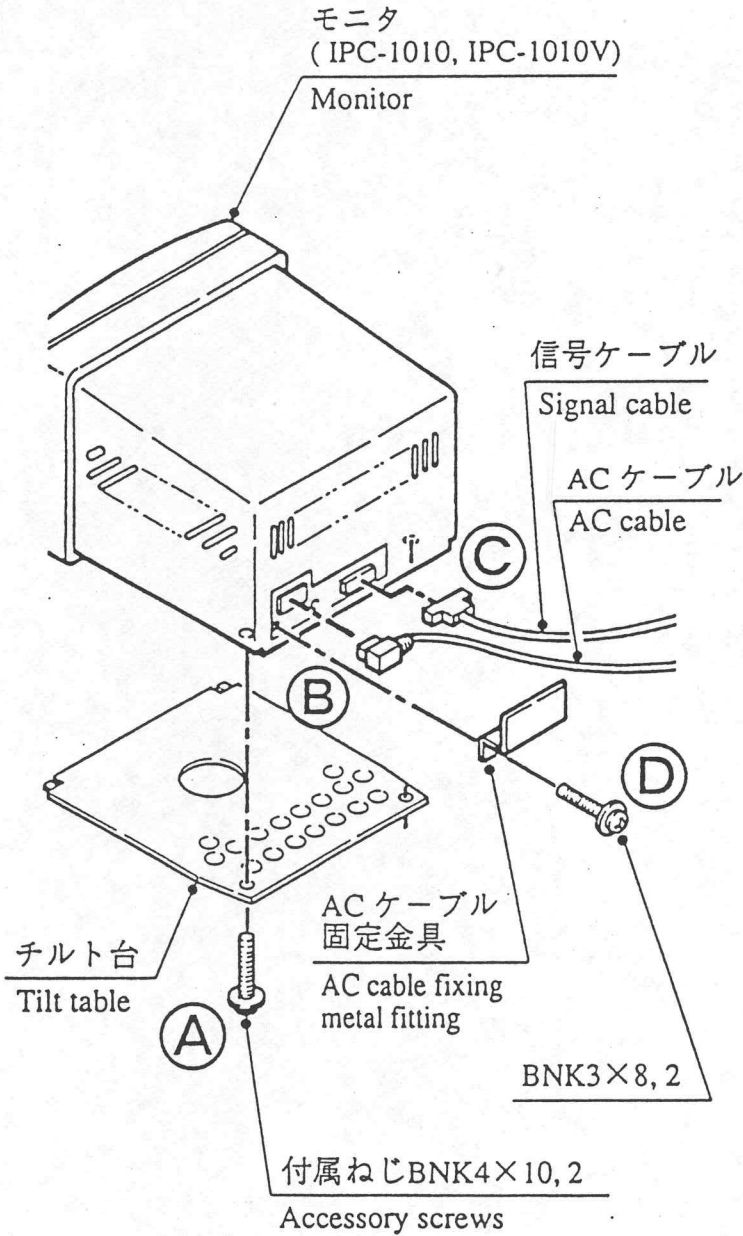
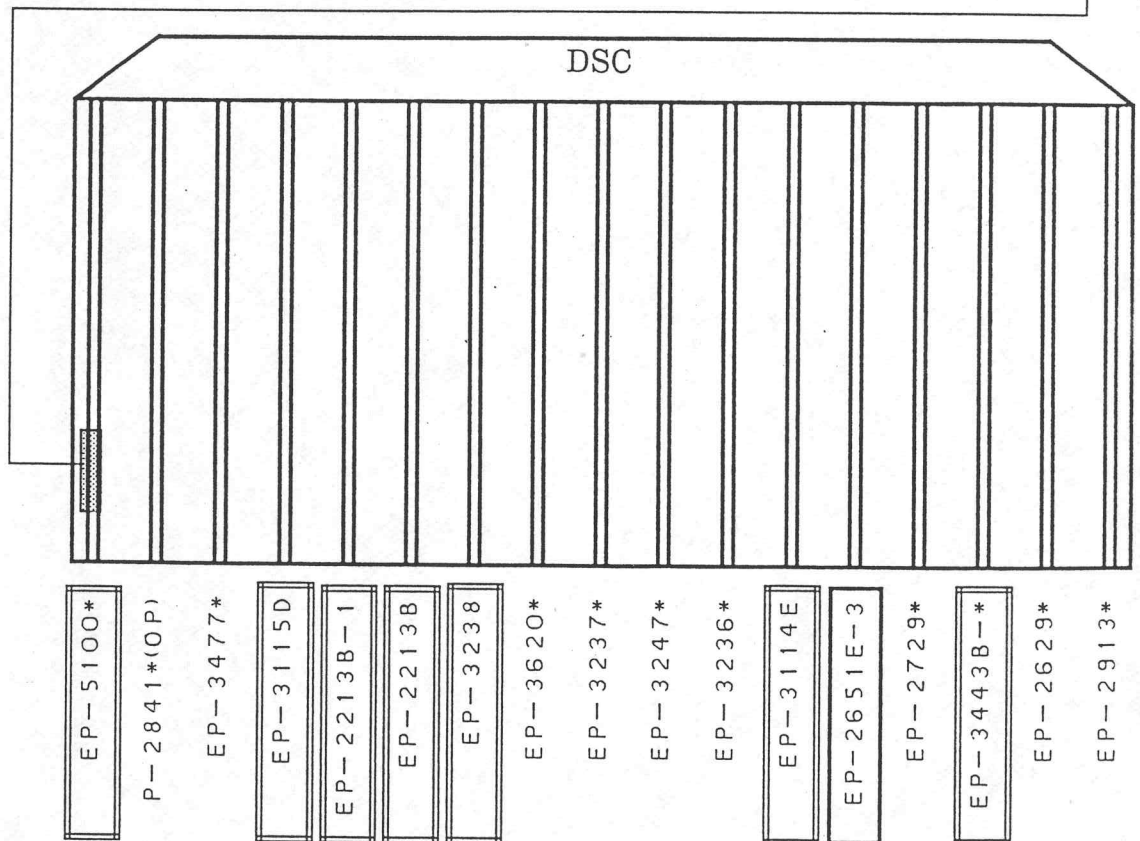
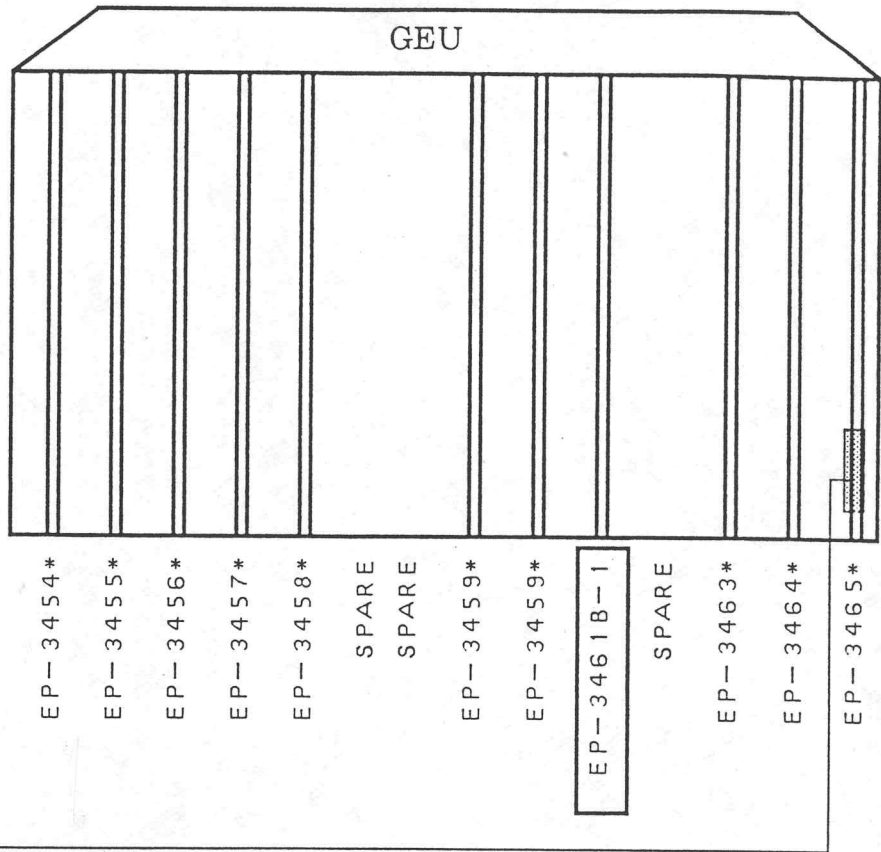
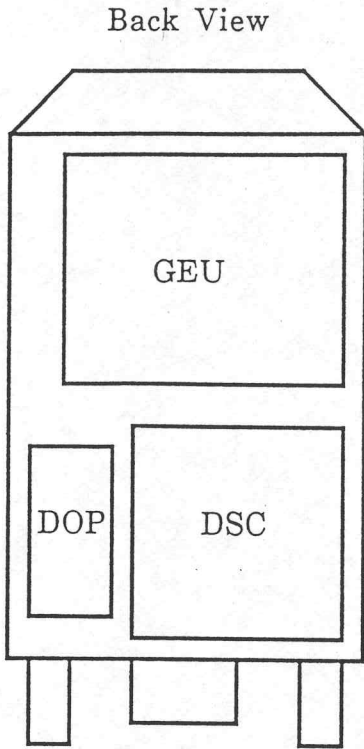


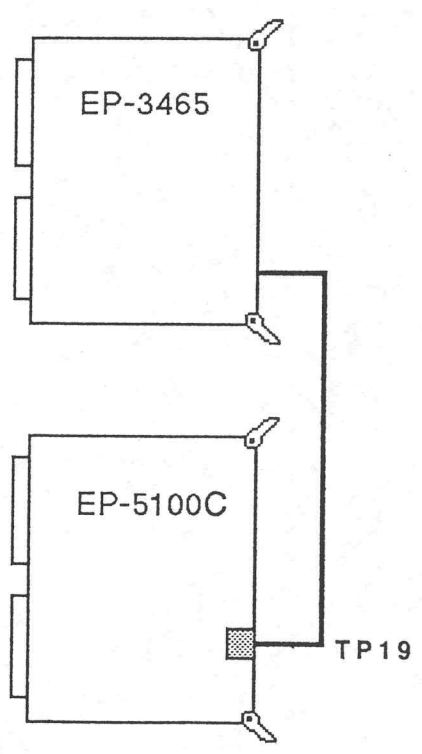
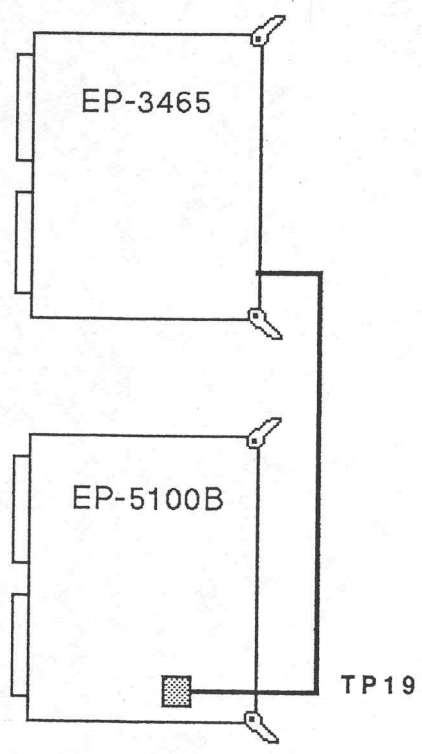
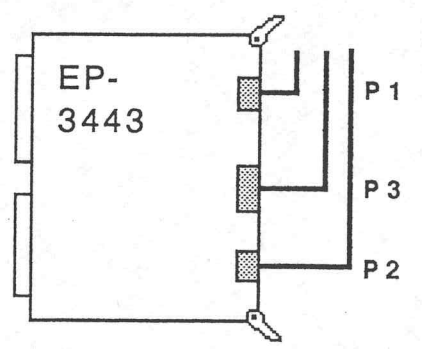
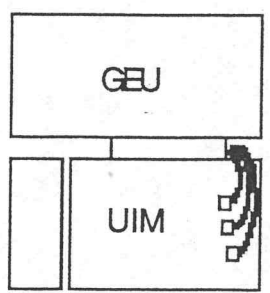
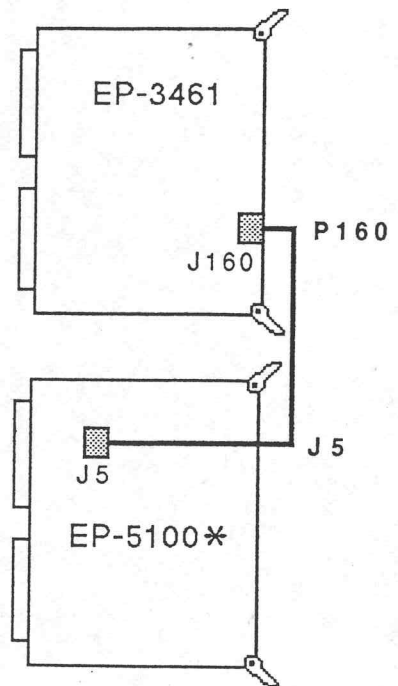
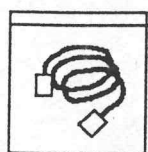
図2 Fig. 2

2 PCBの交換、追加

2 Replace and instal PCB's



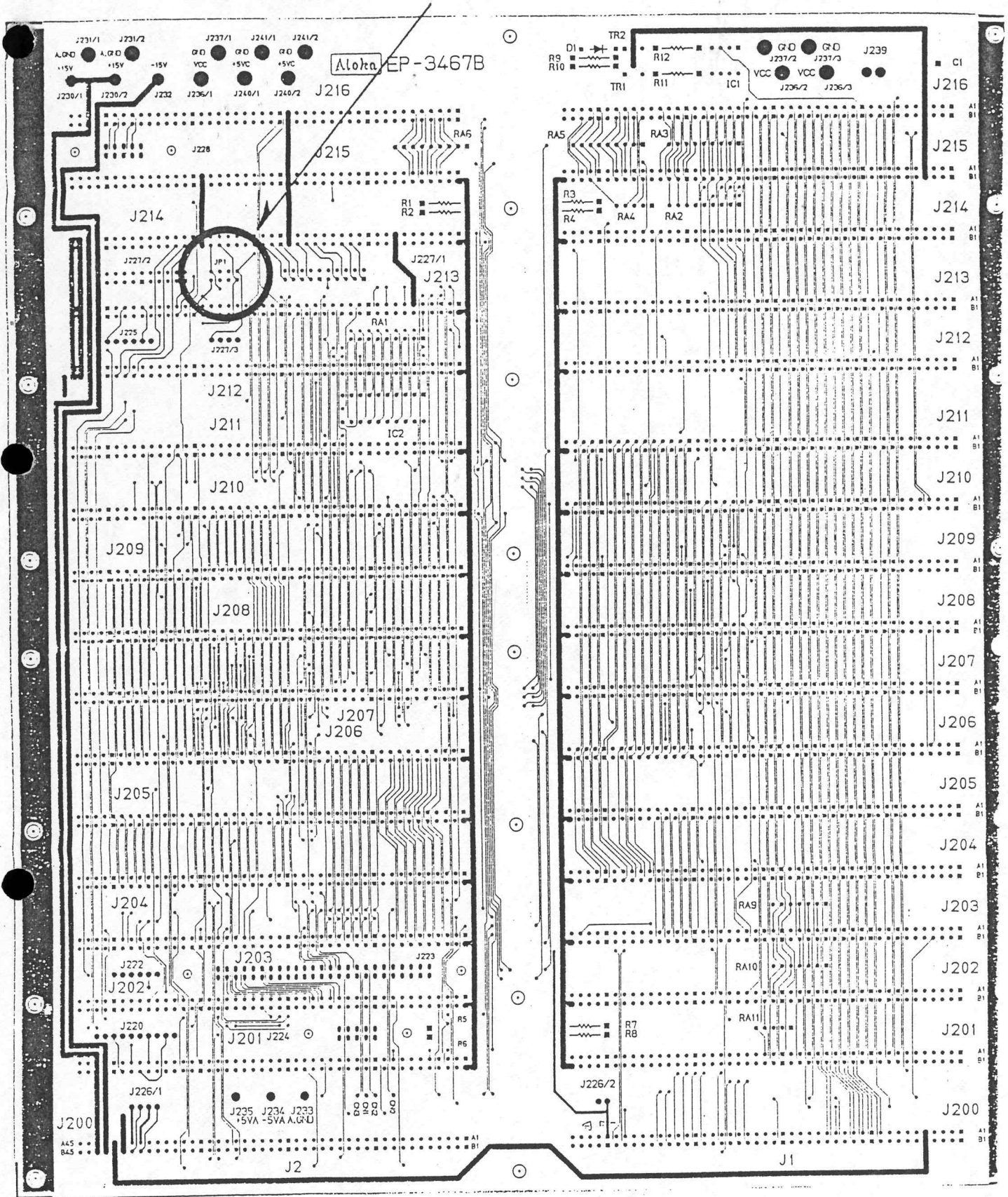
印は交換PCB。 印は追加PCB。
 for replacement for additional installation



ショートプラグの取り外し
Take off short plugs.

4つのショートプラグをすべて外す
Take off all 4 short plugs.

14/16



DSC Mother Board.

DSCユニットの右側のPCBを数枚抜き、マザーボード上のショートプラグ(上図)を4つすべて外す。

Take out several PCB's of the DSC unit, and take off all 4 short plugs on the mother board.(see above schematics)

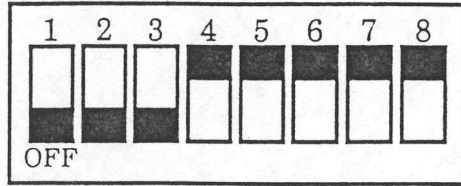
4 パネルスイッチの設定

4 Set the digital switch on main control

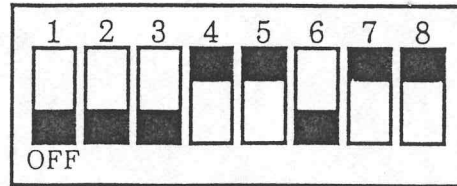
15/11

国内、一般貿易向け
For all countries except USA

UGR-680STDが接続されている場合
In case UGR-680STD is installed

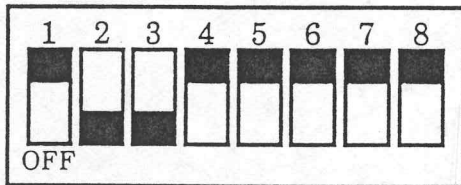


UGR-680STDが接続されていない場合
In case UGR-680STD is not installed

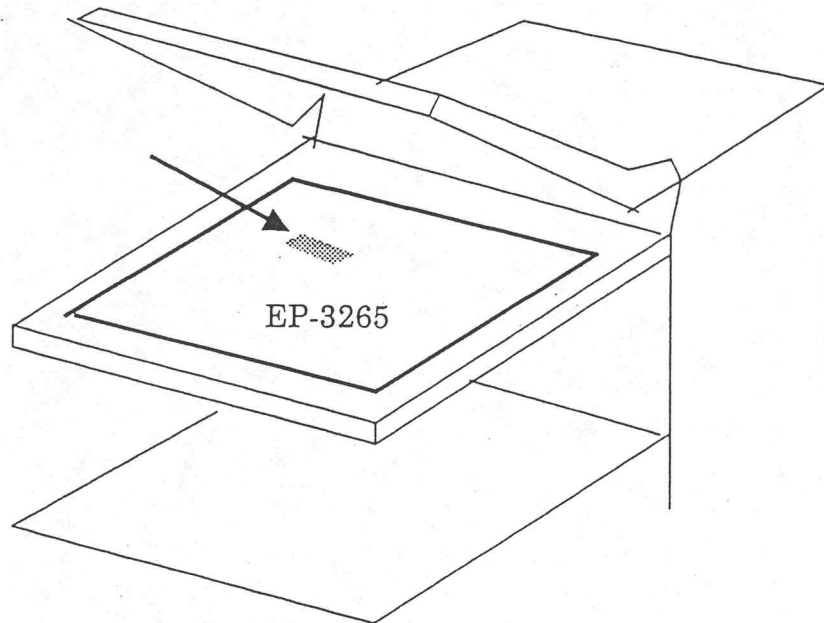
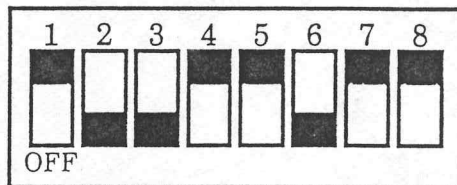


Aloka USAおよびCorometrics向け
For Aloka USA and Corometrics

UGR-680STDが接続されている場合
In case UGR-680STD is installed



UGR-680STDが接続されていない場合
In case UGR-680STD is not installed



5 動作確認

電源を投入し、*PRESET+6*を押してRAMの内容を一旦全てクリアーする。

SSD-680EX/STDの取扱い説明書を参考にカラー機能に関して動作確認を行う。

全てのカラー機能の動作が正常であることを確認した後、全てのパネルを取りつける。

16/11

5 Check Performance

After the modification is done, power on and press *PRESET+6* to clear RAM.

According to the operation manual of SSD-680EX/STD, check all the performance of color function.

If you find no problem, put on all the cover panels.

13-1 Appliance of Parts List

This Parts List consists of the parts for technical service and maintenance. Therefore, the parts model name (PARTS No.) is only valid to the technical support. When you order the parts shown in the List, please apply to our technical support section.

Before you find the parts with this Parts List, please note that nobody can use any description in this List for the other purpose.

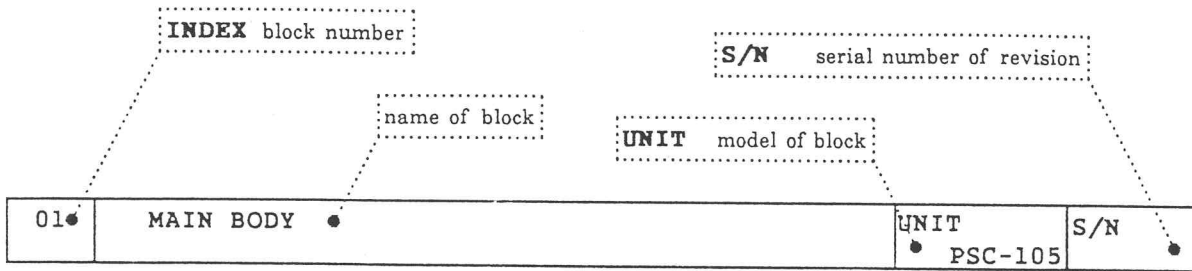
13-2 Outline of Parts List

This Parts List shows many parts which are selected for the technical support and maintenance, and made with the Illustrations and Lists. These parts are selected with one of the basis as below,

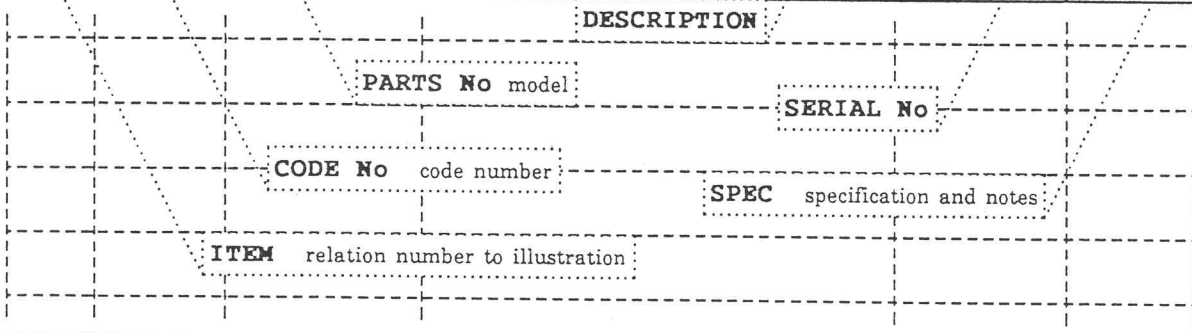
- ▶ For the surface of the equipment such as Cover and Connector
- ▶ Machinery and things to be broken without difficulty
- ▶ Operation panel including the Knob and Switch
- ▶ Cables
excluding one soldered to the other part directly.
- ▶ PCB
please refer to the History which has been issued separately, because almost of the PCBs has the revisions.
- ▶ The things to be replaced frequently such as the variable resistor for the panel
- ▶ General small parts such as screws and cable clamps
The location are not shown in the illustration.
- ▶ Things to be needed additionally for the technical support

13-3 Explanation of Parts List

This Parts List is divided by some blocks (INDEX), and each block consists of the Illustration and List.



ITEM	CODE No	PARTS No	DESCRIPTION	SERIAL No	SPEC
1	A140058	SM-105-MM	CASTER FRONT WITH LOCK		
2	A120026	PSC-105#7	INTERMEDIATE DECK COVER	~91M15621	
2	A120027	PSC-105#7B	INTERMEDIATE DECK COVER	91M15622~	
3	A800041	L-CABLE-216	CABLE:J705-J607		OPTION



21	A120033	PSC-105#8	PROBE HOLDER		
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* means ASSEMBLY PARTS.
アッセンブリーパーツ

comments for the assembly parts

INDEX The number of the division for each Parts List (Illustrations and Lists). This is indicated in the illustration for whole equipment at the beginning.

UNIT The name of this block (or unit) indicated by **INDEX**. If the same block or unit will be revised, it will be distinguished with this and next **S/N**.

S/N If the same block or unit will be revised, it will be distinguished with **UNIT**, and this shows the beginning of production change.

ITEM Relation numbers between Illustration and List.

CODE No Code number applied one by one to each parts. However, at this time (Apr.-'93), it is not acceptable to order.

PARTS No Parts number.

SERIAL No Applied serial number.
If it shows "XXXXX~", the part is available to the serial number or after. On the other side, "~XXXXX" means valid to the serial number and before. If the blank, it is not depended on the serial number.

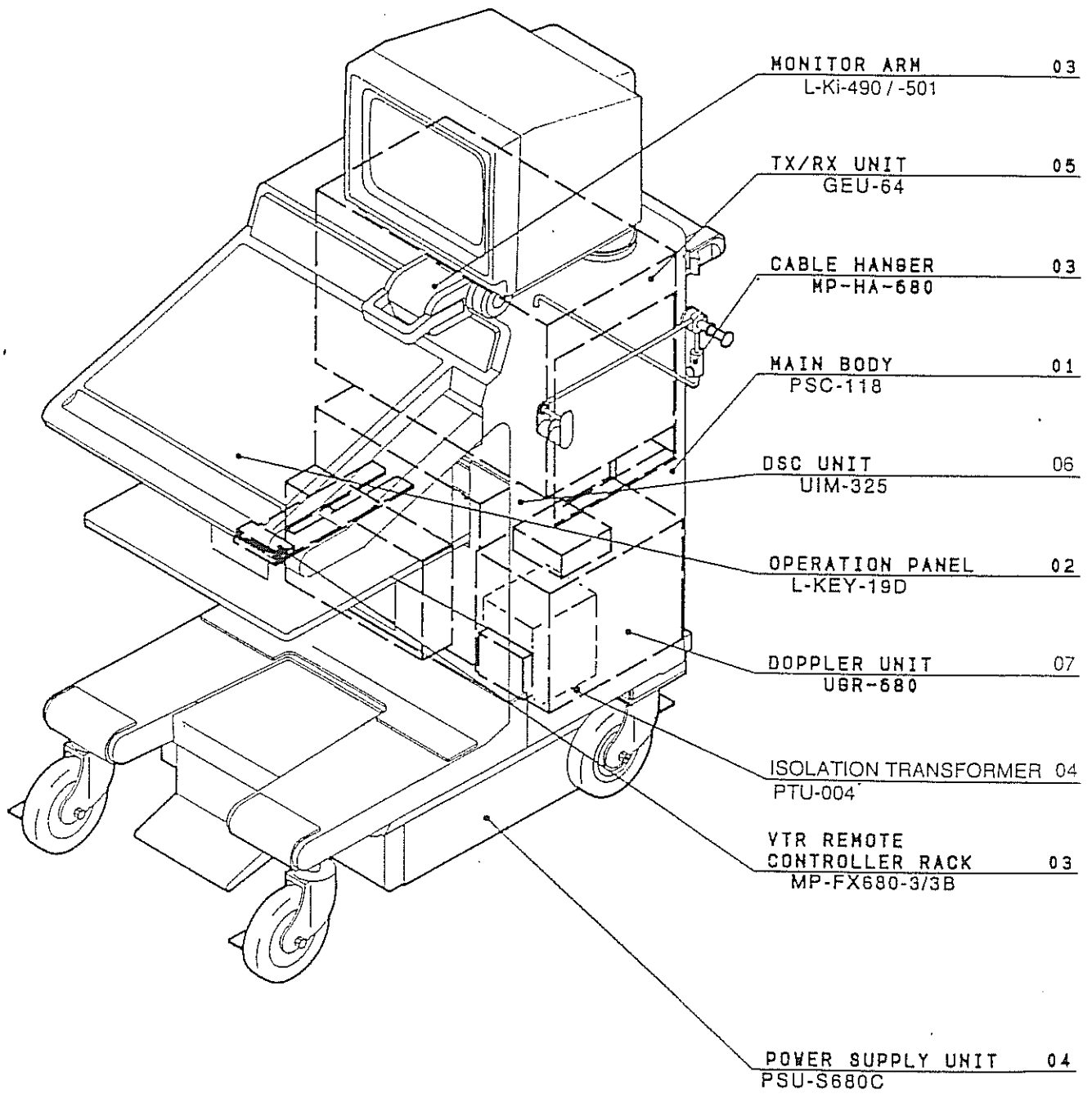
SPEC The specification, some differences on shipment, and the other remarks are shown.

13-4 Attention

- Prohibition to use both previous and current format of Parts List.
In the current one, the model names of some parts are deferent from previous.
- Reference with "History" for the order of PCBs.
This Parts List does not show the PCB version (or not follow the each revision). Therefore, when you order the PCBs, please see the "History" issued separately.

13-5 Parts List

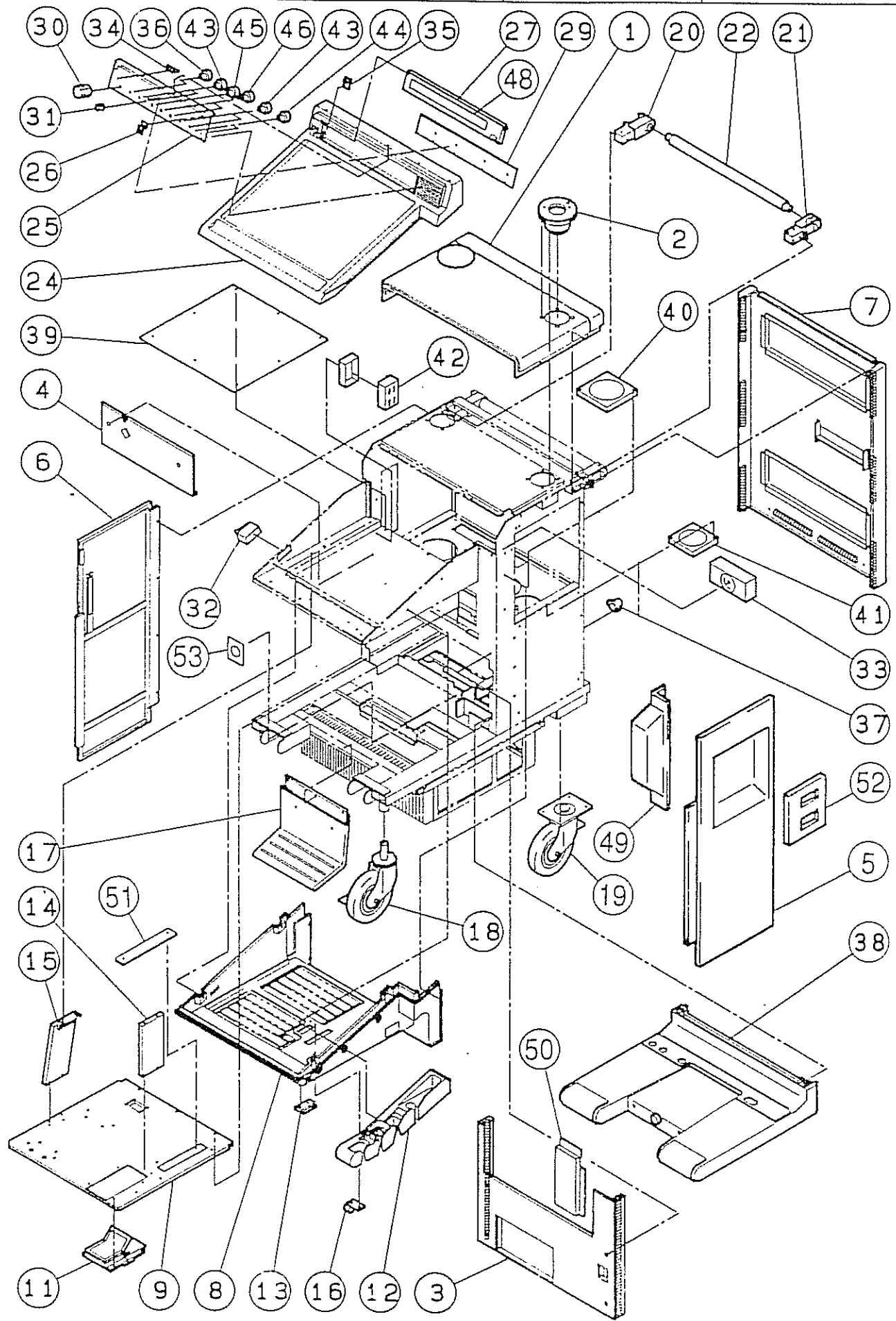
SECTION 13 PARTS LIST



CABLES SEE
INDEX 08

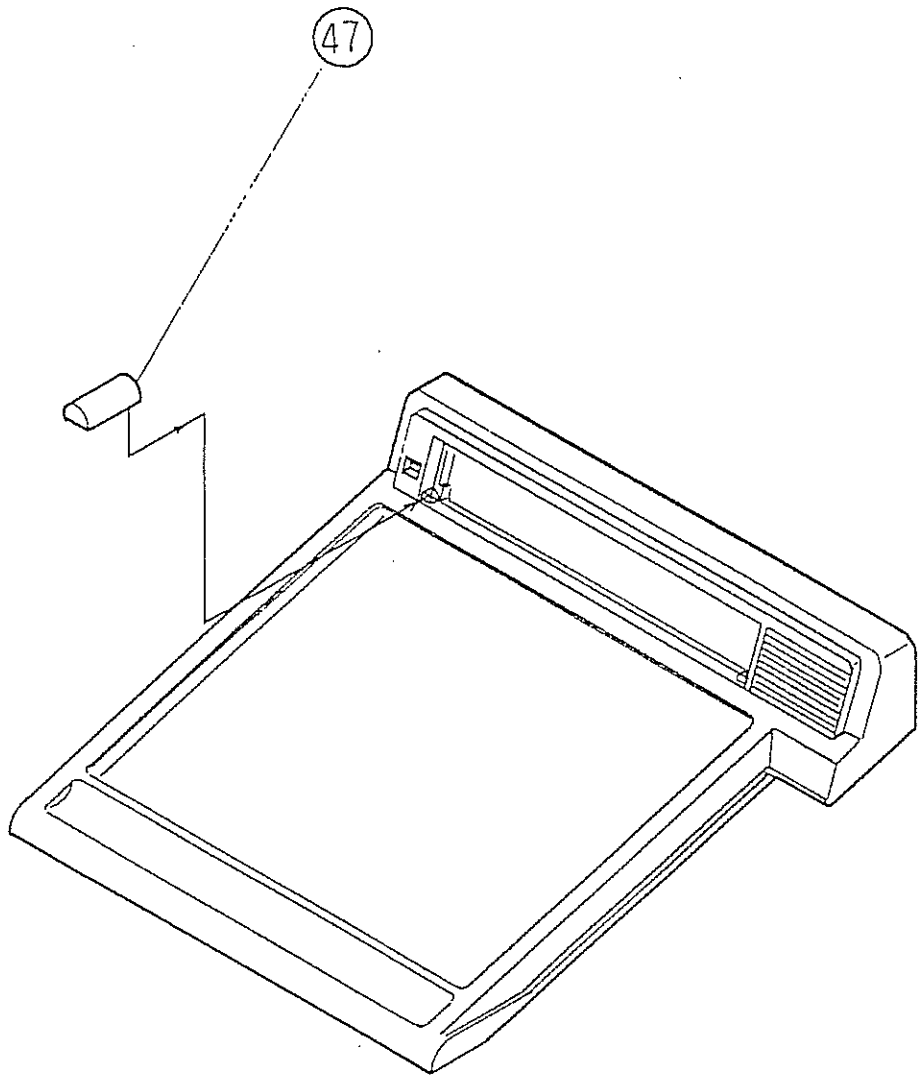
SCREWS & SMALL PARTS
SEE INDEX 09

01	MAIN BODY:	UNIT PSC-118	S/N
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SSD-680EX C101

01	MAIN BODY	UNIT PSC-118	S/N
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01	MAIN BODY	UNIT PSC-118	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
1	*A200379	SAP-680-01-01	COVER:TOP		EXCEPT USA
1	*A200529	SAP-680-01-01 -A. A. ≒	COVER:TOP		FOR USA(A. A)
1	*A200530	SAP-680-01-01 -CORO	COVER:TOP		FOR USA(CORO.)
2	*A200380	SAP-680-01-02	BASE:MONITOR ARM		
3	*A200531	SAP-680EX-01-03	COVER:FRONT		EXCEPT USA
3	*A200532	SAP-680EX-01-03 -A. A	COVER:FRONT		FOR USA(A. A)
3	*A200533	SAP-680EX-01-03 -CORO	COVER:FRONT		FOR USA(CORO.)
4	*A200384	SAP-680-01-04	COVER:INTERMEDIATE		
5	*A200534	SAP-680EX-01-05	COVER:RIGHT		
6	*A200535	SAP-680EX-01-06	COVER:LEFT		
7	*A200536	SAP-680EX-01-07	COVER:REAR		EXCEPT USA
7	*A200537	SAP-680EX-01-07 -A. A	COVER:REAR		FOR USA(A. A)
7	*A200538	SAP-680EX-01-07 -CORO	COVER:REAR		FOR USA(CORO.)
8	*A200539	SAP-680EX-01-08	COVER:PANEL, BOTTOM		
9	*A200540	SAP-680EX-01-09	DECK:INTERMEDIATE		
11	*A200392	SAP-680-01-11	JELL BOTTLE HOLDER		
12	A120003	PSC-108#18	PROBE HOOK		
13	A110008	PSC-108#33	RAIL:REMOTE CONTROL RACK		
14	A110009	PSC-108#52	INTERMEDIATE DECK ARM(1)		
15	*A200393	SAP-680-01-15	INTRMEDIATE DECK ARM(2)		
16	A140018	B-1075	HINGE		
17	A120107	MP-FX680EX-1#1	FOOT REST		
18	A140011	SSC-150-CB	CASTER :FRONT		

* means ASSEMBLY PARTS.
アッセンブリーパーツ

01	MAIN BODY	UNIT PSC-118	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
19	A150001	L-Ki-232	CASTER :REAR		
20	*A200541	SAP-680EX-01-20	HANDLE ARM :RIGHT		
21	*A200542	SAP-680EX-01-21	HANDLE ARM :LEFT		
22	A110002	PSC-108#28	HANDLE		
24	*A200554	SAP-680EX-01-24	COVER: PANEL	~	
25	*A200543	SAP-680EX-01-25	BLIND PANEL		
26	*A200399	SAP-680-01-26	SPRING:BLIND DOOR		
27	*A200544	SAP-680EX-01-27	BLIND DOOR		EXCEPT CORO.
29	A800738	EP-2512*	PCB:BLIND PANEL		
30	A510000	SP-4107u-1	KNOB		
31	A510013	SP-4108	KNOB		
32	A611063	L-S-59	SWITCH:POWER		
33	A624004	SS-433	SPEAKER		
34	A800739	EP-2510*	PCB:PHONE JACK		
35	A800740	EP-3143*	PCB		
36	A623033	RV16YN20SC5kΩ	VOLUME:AUDIO VOLUME		
37	A601000	D8-701B-00	INDEPENDENT CONNECTOR:J302		
38	*A200545	SAP-680EX-01-38	COVER:BASE		
39	A800742	EP-3265*	PCB:MAIN CONTROL		
40	A625003	109S-086	FAN		
41	A625004	109S-096	FAN		
42	A601001	WK-3004	AC RECEPTACLE:J320, 321		
43	A623034	RV12YP20SB5kΩ	VOLUME:AGC(B, M), ECOH ERASE		

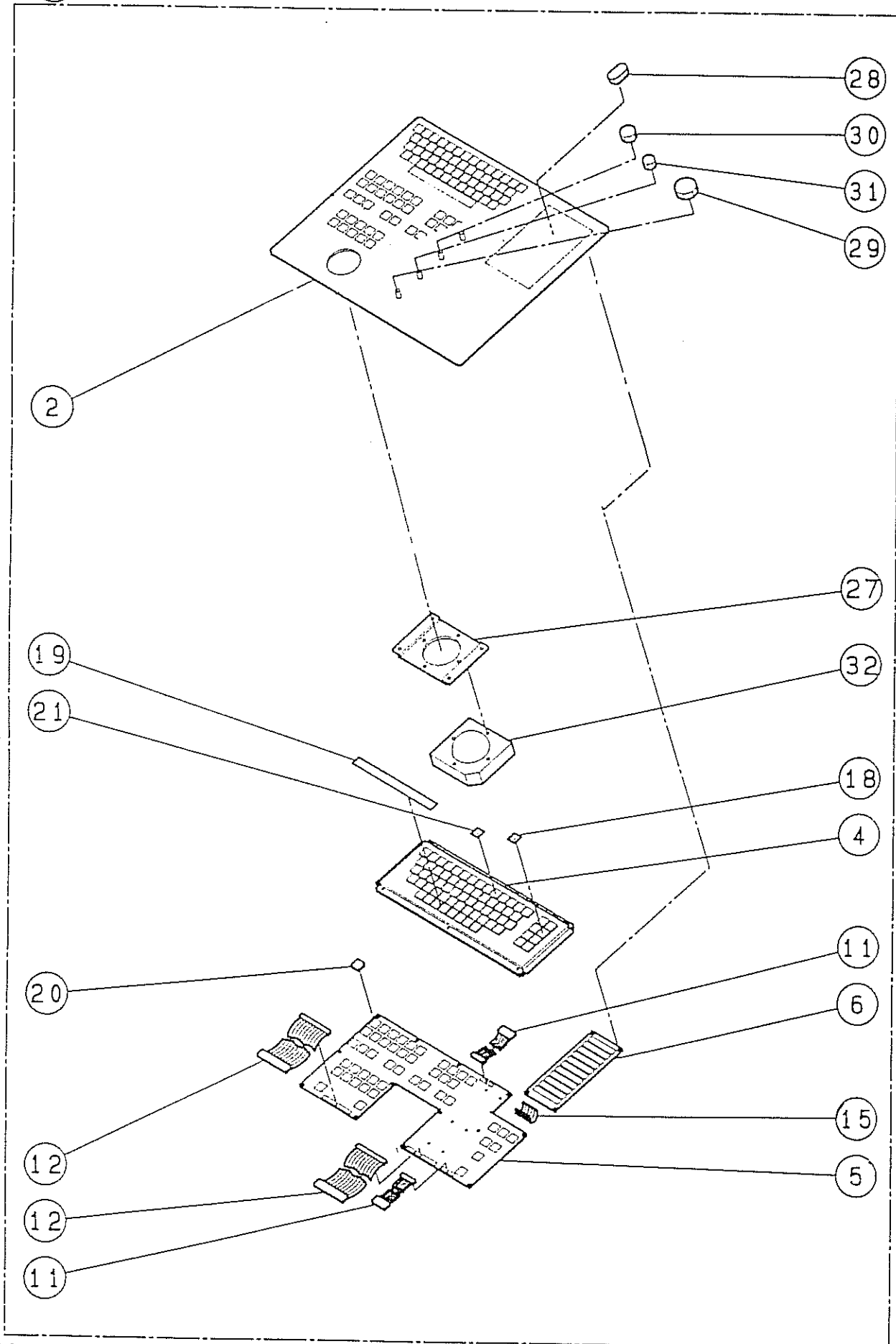
* means ASSEMBLY PARTS.
アッセンブリーパーツ

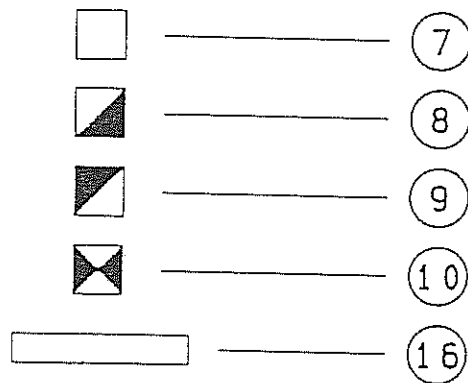
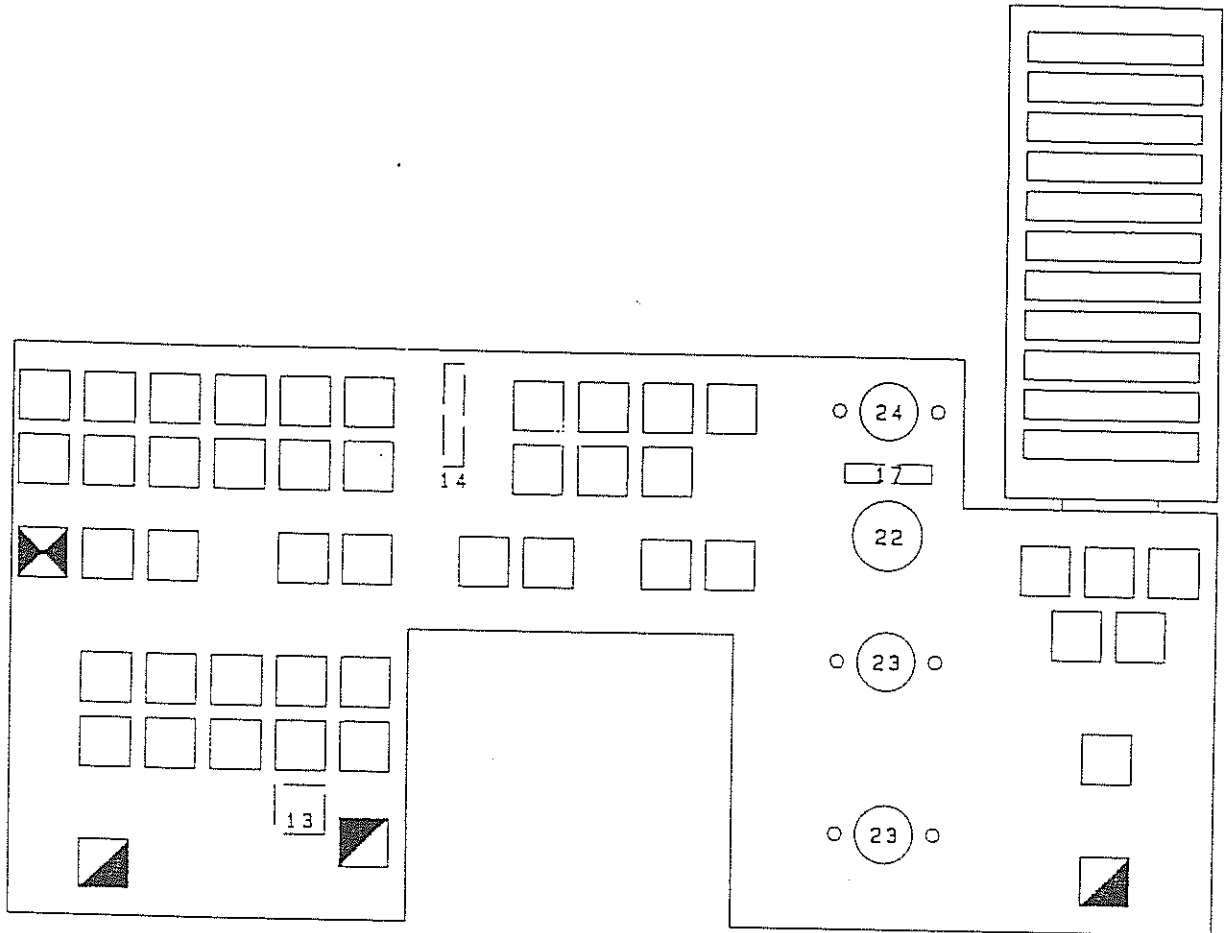
01	MAIN BODY	UNIT PSC-118	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
44	A611053	D-2012B	SWITCH:FTC, POS/NEG, INT/EXT		
45	A611064	L-S-52	SWITCH:SWEEP SPEED		
46	A611065	L-S-53	SWITCH:CONTRAST (B, M)		
47	A120100	PSC-108#60	STOPPER		
48	A600096	P-32-680-CORO	NAME PLATE		For USA (CORO.)
49	A110142	PSC-118#67	DUCT		
50	A110143	PSC-118#69	JB COVER		
51	A110144	SAP-680EX-01-51	COVER:INTERMEDIATE DECK		
52	A110145	PSC-118#32	COVER: COSMETIC, CONNECTOR	~21M08512	
53	A600032	PSC-108#56	LABEL: INDEPENDENT		

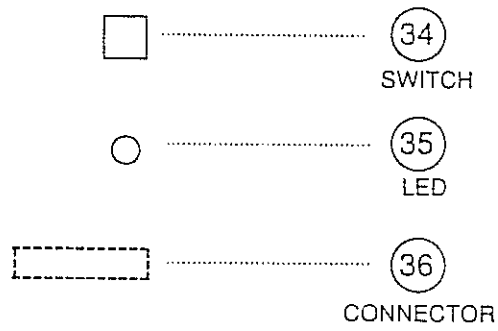
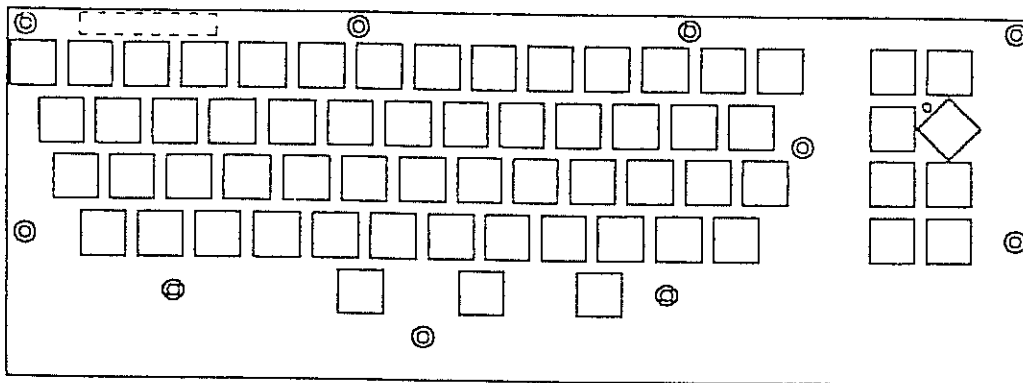
* means ASSEMBLY PARTS.
アッセンブリーパーツ

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02	OPERATION PANEL	UNIT L-KEY-26	S/N
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02	OPERATION PANEL	UNIT L-KEY-19D/26	S/N
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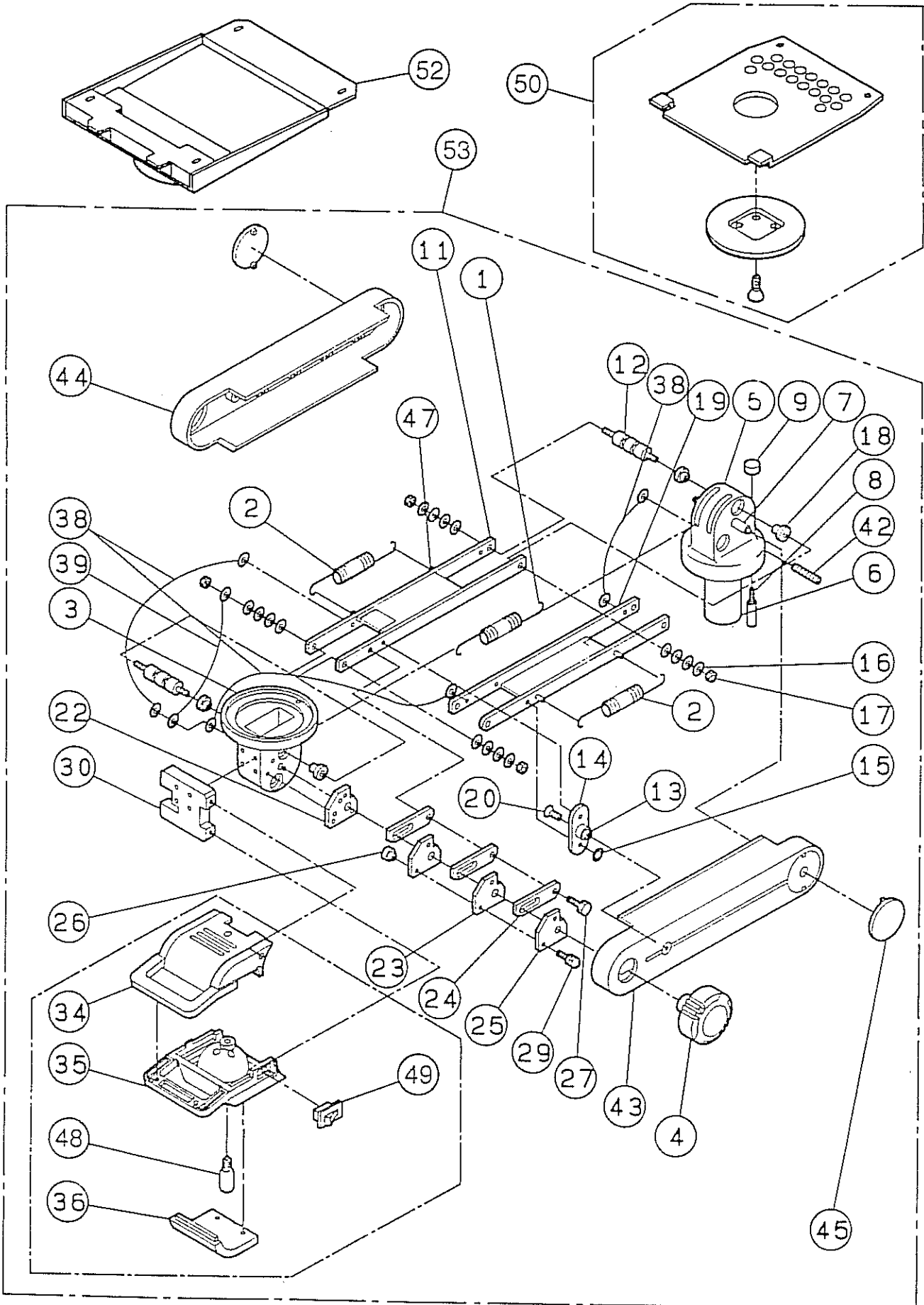
ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
1	*A200555	L-KEY-19D	PANEL FULL ASSEMBLY		
2	*A200556	SAP-680EX-02-02	PANEL SHEET		
4	*A200162	L-KEY-26	FULL KEY BOARD ASSY		
5	A800987	EP-2960	PCB:SW		
6	A800744	EP-3182	PCB:RV		
7	A611002	A3FA-101-0	SWITCH(ORANGE)		
8	A611003	A3FA-401-Y	SWITCH(YELLOW)		
9	A611004	A3FA-401-0	SWITCH(ORANGE)		
10	A611005	A3FA-101-G	SWITCH(GREEN)		
11	*A200409	L-KEY-19#19	CABLE ASSY: J363, J362		
12	*A200410	L-KEY-19#18	CABLE ASSY: J360, J361		
13	A601003	5046-06A	CONNECTOR: J365		
14	A601002	5046-04A	CONNECTOR: J391		
15	*A200411	L-KEY-19C#20	JUMPER CABLE		
16	A623000	EVA-UBH-S15-B13	RV:STC		
17	A601006	3429-6002LCSC	CONNECTOR: J364		
18	*A200412	L-KEY-19C#26	KEY BUTTON:RED		
19	*A200413	L-KEY-19C#24	KEY BUTTON:SPACE		
20	*A200414	L-KEY-19C#16	KEY BUTTON:WHITE		
21	*A200415	L-KEY-19C#15	KEY BUTTON:CLEAR		
22	A611001	SRM-1-01-11	ROTARY SWITCH		
23	A623001	RV20YP1-23S-B1K	VARIABLE RESISTOR ROTARY		
24	A623002	RV20YP1-23S-B5K	VARIABLE RESISTOR ROTARY		

* means ASSEMBLY PARTS.
アッセンブリーパーツ

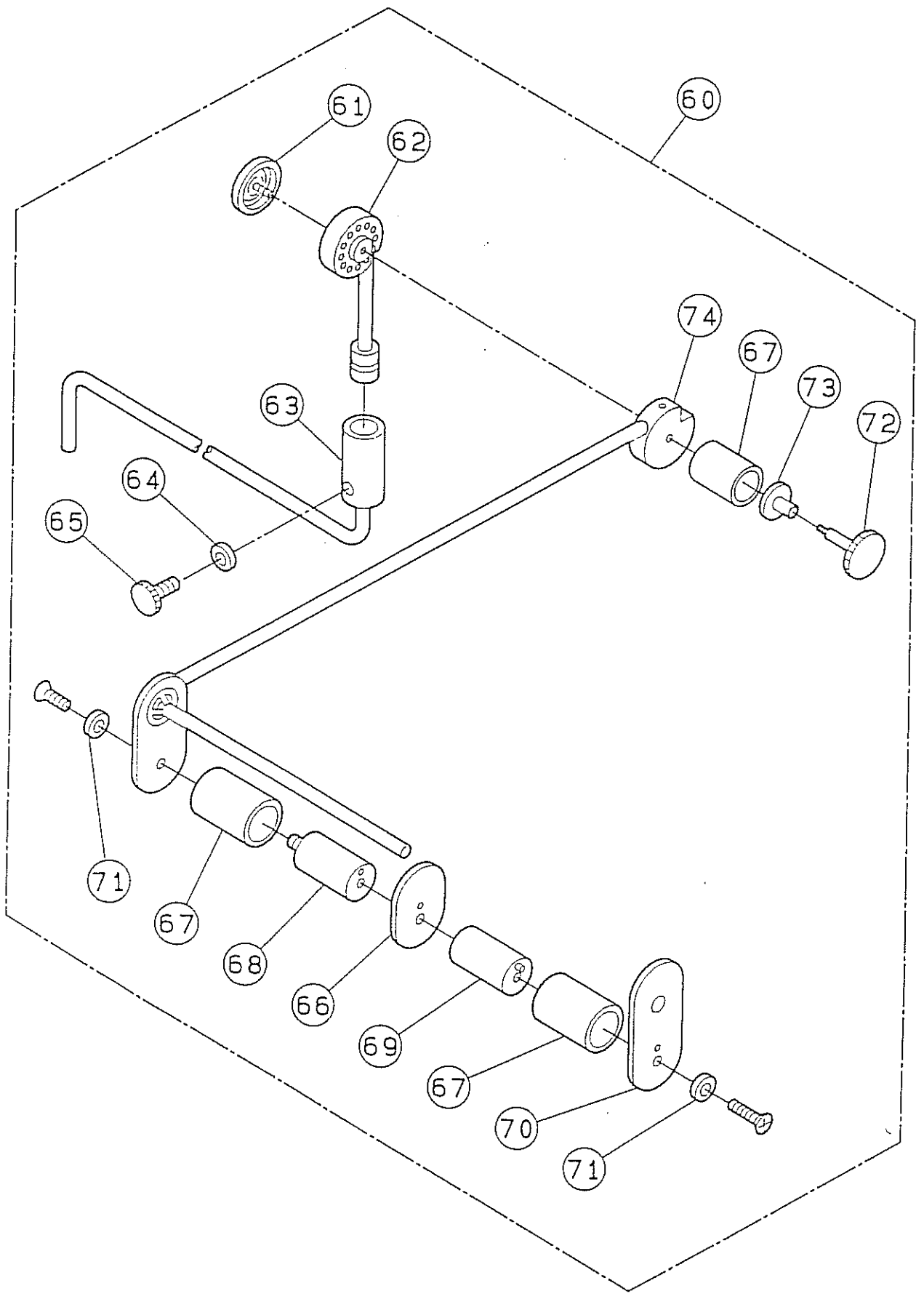
02	OPERATION PANEL	UNIT L-KEY-19D/26	S/N
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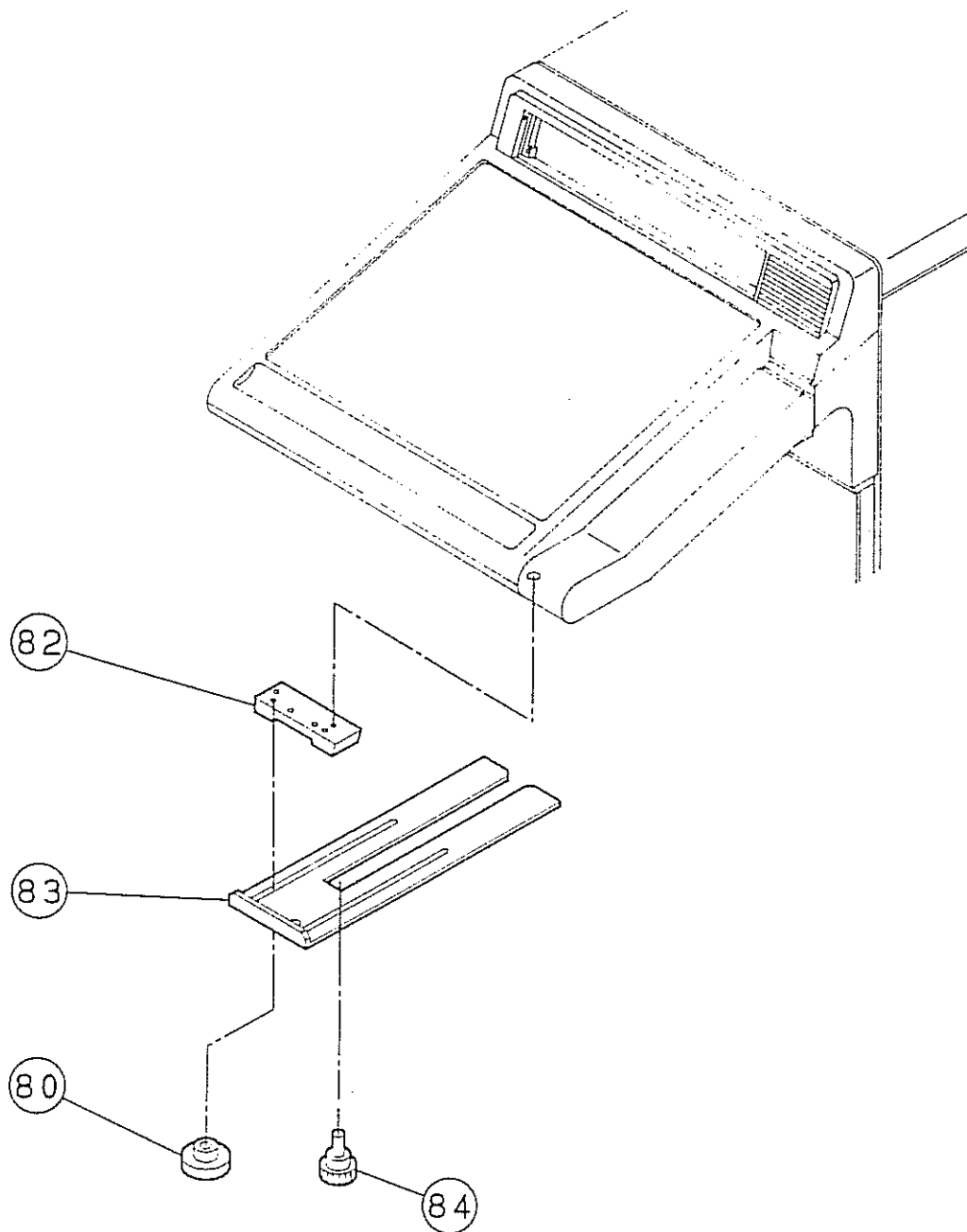
ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
27	A100186	PSC-105#25	TRACK BALL MOUNTING PLATE		
28	A510003	SP-4103-uB	KNOB:STC		
29	A510002	SP-4104	KNOB		
30	A510011	SP-4106	KNOB		
31	A510012	SP-4107-1	KNOB		
32	A618000	L-TB-1B	TRACK BALL		
34	A611013	B3F-1050	KEY SWITCH(without KEY-TOP)		
35	A616014	EBR3432S	LED		
36	A601087	3428-6002LCSC	CONNECTOR		

* means ASSEMBLY PARTS.
アッセンブリーパーツ



03	CABLE HANGER	UNIT MP-HA-680	S/N
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03	MACHINERY	UNIT	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
1	A150045	L-Ki-279#1	MAIN EXTENSION SPRING		
2	A150011	L-Ki-279#2	SUB EXTENSION SPRING		
2	*A200416	L-Ki-279B#2	SUB EXTENTION SPRING		
3	*A200546	L-Ki-263B#3	MONITOR MOUNTING BRACE		FOR 12' TV
3	*A200547	L-Ki-501#3	MONITOR MOUNTING BRACE		FOR 10' TV
4	A150027	L-Ki-279#4	KNOB		
5	A150035	L-Ki-279#5	BASE		
6	A150039	L-Ki-279#6	SUPPORT		
7	A150040	L-Ki-279#7	COVER FIXING SHAFT		
8	A150041	L-Ki-279#8	LOCK PIN		
9	A150042	L-Ki-279#9	LOCK PIN KNOB		
11	A150002	L-Ki-279#11	LINK(A)		
12	A150003	L-Ki-279#12	HOOK SHAFT		
13	A150004	L-Ki-279#13	COVER FIXING BOSS		
14	A150005	L-Ki-279#14	COVER FIXING BRACE		
15	A150006	L-Ki-279#15	WASHER		
16	A150007	L-Ki-279#16	CONICAL SPRING WASHER		
17	A150008	L-Ki-279#17	NUT		
18	A150009	L-Ki-279#18	BUSH		
19	A150010	L-Ki-279#19	LINK(B)		
20	A150012	L-Ki-279#20	SCREW		
22	A150013	L-Ki-279#22	SPACER PLATE		
23	A150014	L-Ki-279#23	FRICTION PLATE		

* means ASSEMBLY PARTS.
アッセンブリーパーツ

03	MACHINERY	UNIT	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
24	A150015	L-Ki-279#24	FRICITION LINK		
25	A150016	L-Ki-279#25	TOP PLATE		
26	A150017	L-Ki-279#26	BOSS		
27	A150018	L-Ki-279#27	BOLT		
29	A150019	L-Ki-279#29	SCREW :ANK2. 6#15		
30	A150021	L-Ki-279#30	HANDLE COVER MOUNTING BRACE		
34	A150022	L-Ki-279#34	HANDLE COVER:UPPER		
35	A150023	L-Ki-279#35	HANDLE COVER:LOWER		
36	A150024	L-Ki-279#36	SCREEN		
38	A150025	L-Ki-279#38	GROUND WIRE(A)		
39	A150026	L-Ki-279#39	GROUND WIRE(B)		
42	A150028	L-Ki-279#42	BALL PLUNGER		
43	A150029	L-Ki-279#43	RIGHT COVER		
44	A150030	L-Ki-279#44	LEFT COVER		
45	A150031	L-Ki-279#45	CAP		
47	A150032	L-Ki-279#47	HOCK PIN		
48	A150076	L-Ki-263#35	LAMP		
49	A150075	L-Ki-263#36	SWITCH		
50	*A200548	SAP-680EX-03-50	TILT TABLE		FOR 12' TV
52	A000011	MP-1P05B	TILT TABLE		FOR 10' TV
53	*A200549	L-Ki-409	MONITOR ARM ASSY		100V
53	*A200550	L-Ki-501	MONITOR ARM ASSY		115V, 220V
60	A800256	MP-HA680	CABLE HANGER FULL ASSY		

* means ASSEMBLY PARTS.
アッセンブリーパーツ

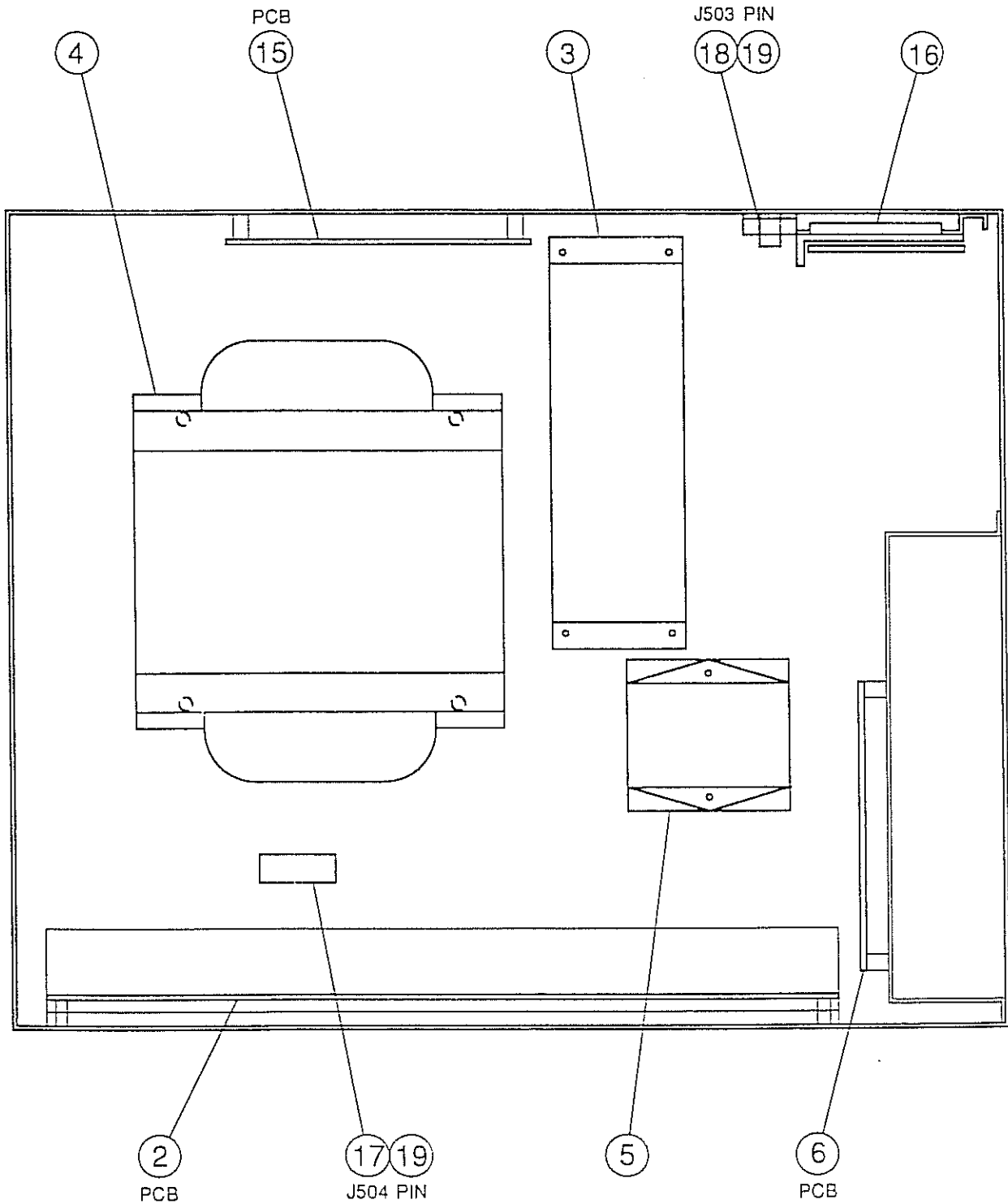
03	MACHINERY	UNIT	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
61	A120005	MP-HA600#2-4	CAP		
62	*A200557	SAP-600-04-11	JOINT ROD (2)		
63	*A200417	SAP-680-03-63	JOINT ROD (1)		
64	A110021	MP-HA600#1-6	CUSHION		
65	A110020	MP-HA600#1-5	LOCK KNOB		
66	A110029	MP-HA600#3-9	PARTITION PLATE		
67	A110024	MP-HA600#3-2	ROLLER(1)		
68	A110027	MP-HA600#3-7	SHAFT(1)		
69	*A200558	SAP-600-04-03	SHAFT(2)		
70	A110022	MP-HA600#3-10	MOUNTING BRACE		
71	A110023	MP-HA600#3-11	SURFACE WASHER		
72	A110026	MP-HA600#3-4	LOCK KNOB		
73	A110025	MP-HA600#3-3	ROLLER(2)		
74	*A200418	SAP-680-03-74	JOINT ASSY(C)		
80	A110013	MP-FX680-3#1	SPACER		
82	A110014	MP-FX680-3#2	MOUNTING BLOCK		
83	*A200551	SAP-680EX-03-83B	SLIDE PLATE		MP-FX680-3B
84	A140023	KS15*10A	KNOB		

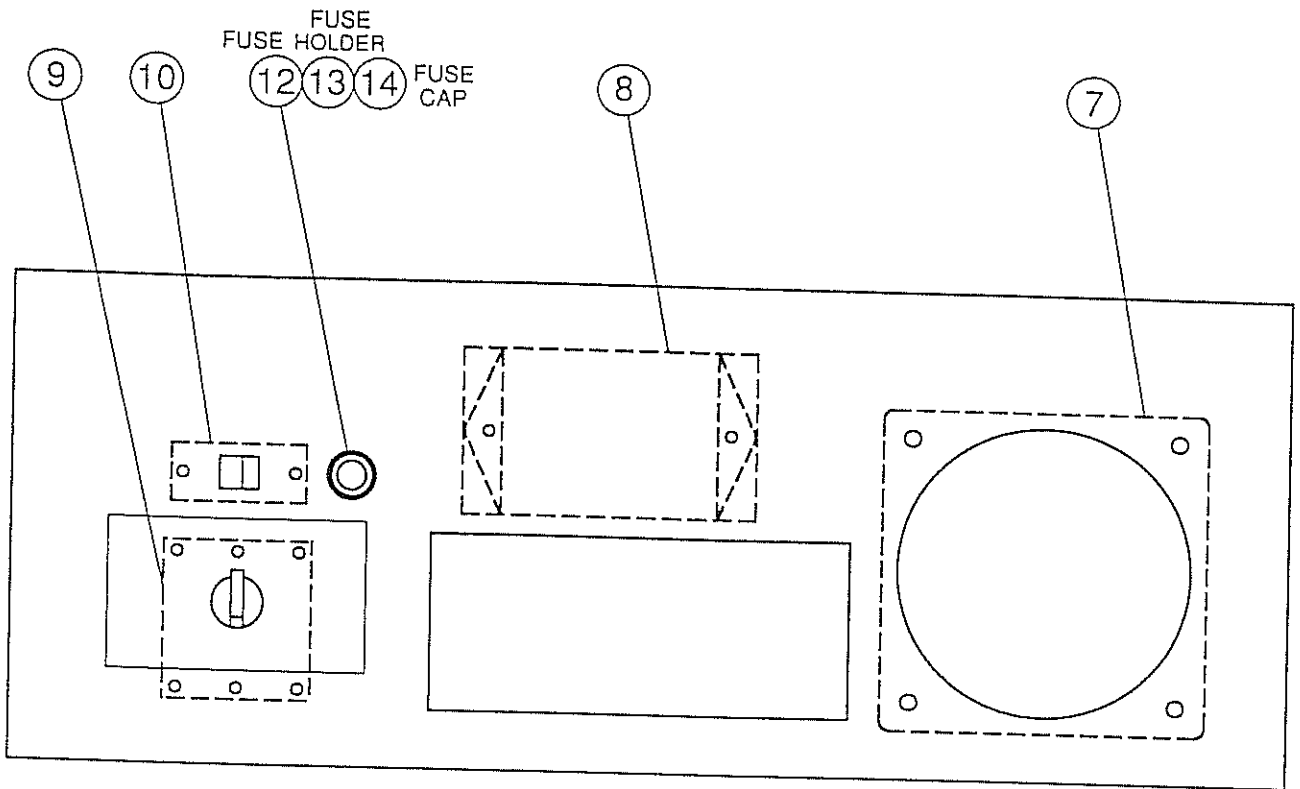
* means ASSEMBLY PARTS.
アッセンブリーパーツ

04	POWER SUPPLY UNIT	UNIT PSU-S680C	S/N
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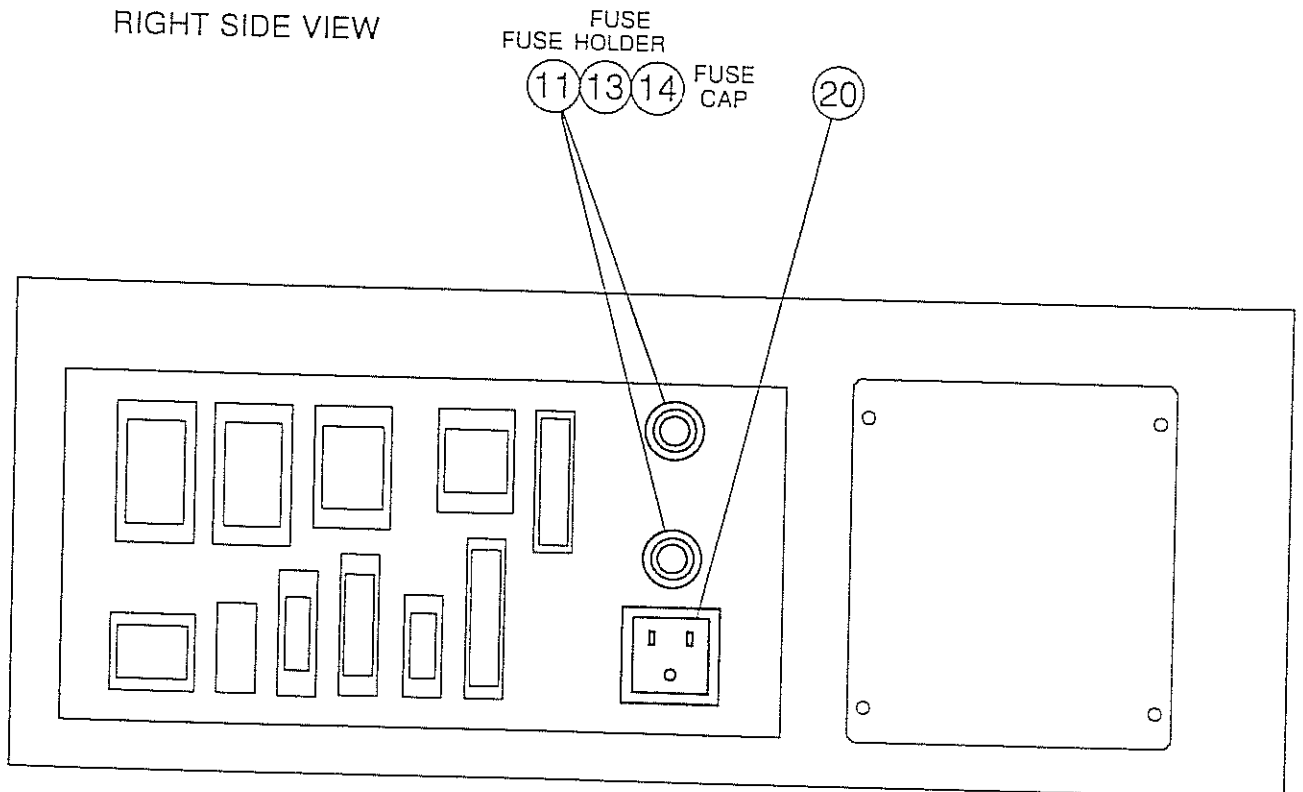
① UNIT ASSY



LEFT SIDE VIEW

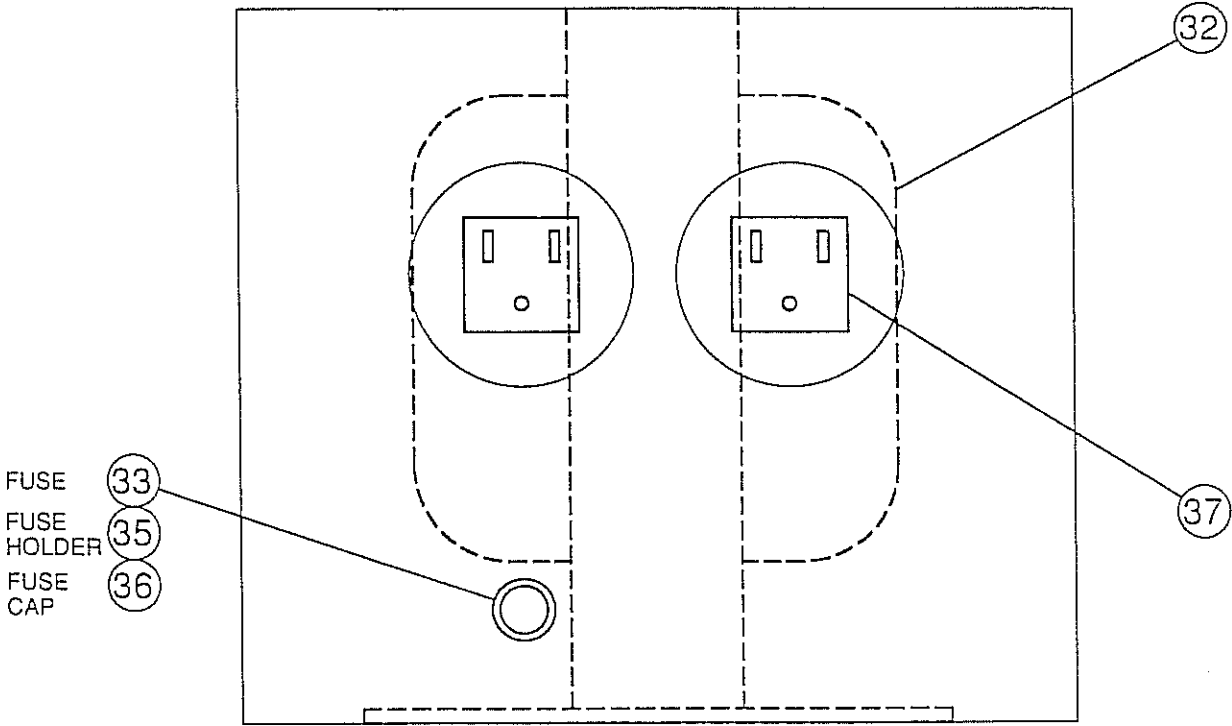


RIGHT SIDE VIEW



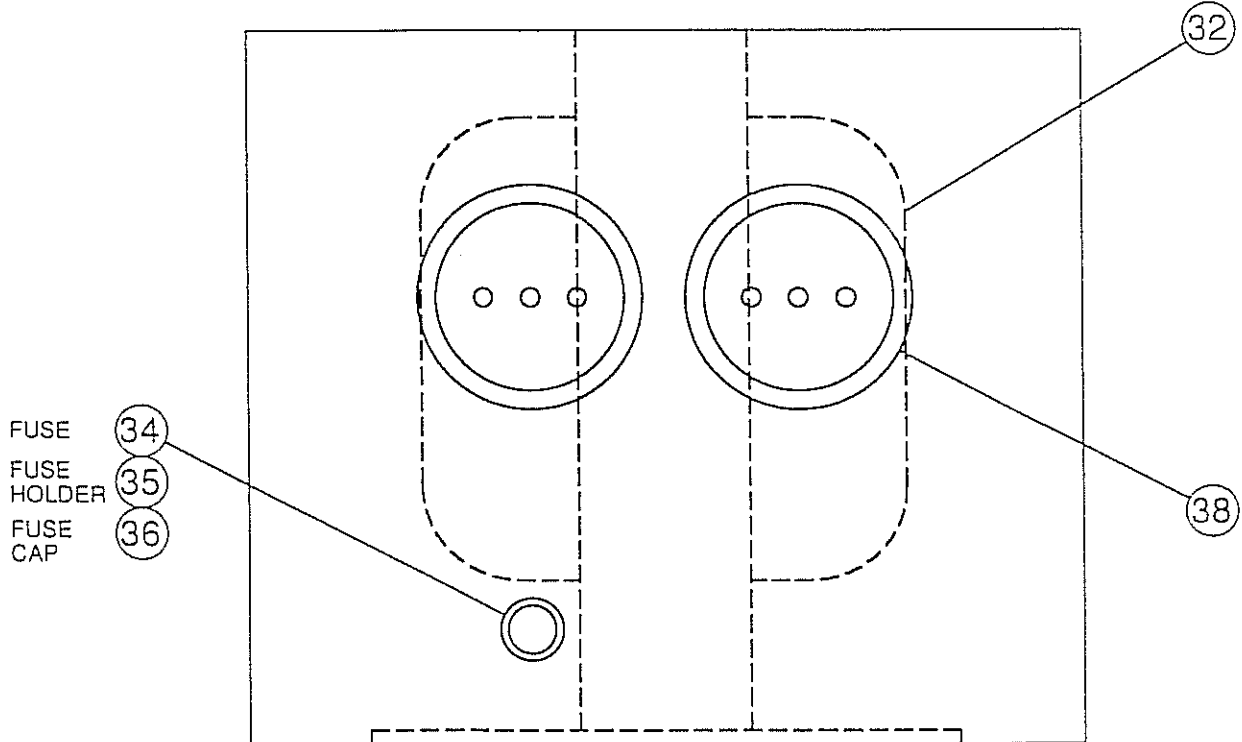
04	ISOLATION TRANSFORMER	UNIT PTU-004	S/N
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③① UNIT ASSY (100V)



- ③③ FUSE
- ③⑤ FUSE HOLDER
- ③⑥ FUSE CAP

③② UNIT ASSY (200V)



- ③④ FUSE
- ③⑤ FUSE HOLDER
- ③⑥ FUSE CAP

04	POWER SUPPLY UNIT	UNIT PSU-S680C	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
1	A000012	PSU-S680C	UNIT ASSY		
2	A800988	EP-3240*	PCB		
3	A030019	HK12-5/A	SWITCHING POWER SUPPLY		
4	A606028	M-T-231	ISOLATION TRANSFORMER		
5	A606016	MBW-1205-22	LINE FILTER		
6	A800989	EP-3535*	PCB		
7	A625021	109P0924M406	FAN		
8	A606017	MAS-1220-33	LINE FILTER		
9	A621035	UB2-XLN-111-108E-15, 108E-15,108-6	BREAKER		
10	A611062	SU110A-11	VOLTAGE SELECTOR		
11	A621049	313 002	FUSE:F2, F501		
12	A621050	313 001	FUSE:F502		
13	A621022	FEU031-1673	FUSE HOLDER		
14	A621023	FEK031-1661	FUSE CAP		
15	A800421	EP-2922B	PCB		
16	A030020	SSG010-15	SWITCHING POWER SUPPLY		
17	A601019	1-480703-0	CONNECTOR: J504		
18	A601015	1-480764-0	CONNECTOR: J503		
19	A601077	350547-1	PIN CONTACT		
20	A601016	AC-G10BB44	AC OUTLET		
30	A030001	PTU-004	ISOLATION TRANSFORMER ASSY		FOR 100V
31	A030001	PTU-004	ISOLATION TRANSFORMER ASSY		FOR 200V
32	A606034	M-T-133B	ISOLATION TRANSFORMER		

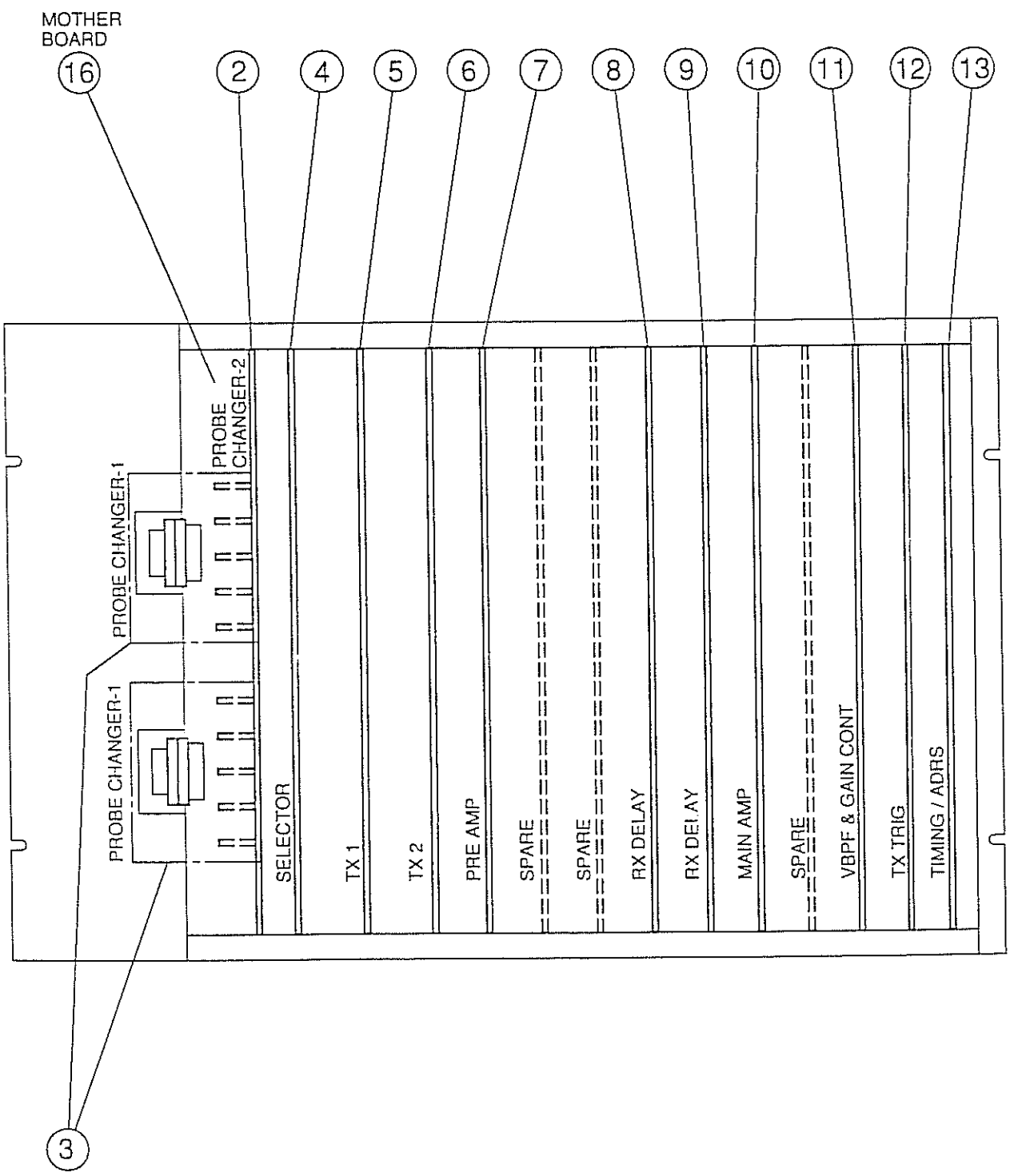
* means ASSEMBLY PARTS.
アッセンブリーパーツ

04	POWER SUPPLY UNIT	UNIT PSU-S680C	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
33	A621047	326.01 0	FUSE		FOR 100V
34	A621048	313.005	FUSE		FOR 200V
35	A621022	FEU031-1673	FUSE HOLDER		
36	A621023	FEK031-1661	FUSE CAP		
37	A601016	AC-G10BB44	AC OUTLET		FOR 100V
38	A601058	418037	AC OUTLET		FOR 200V

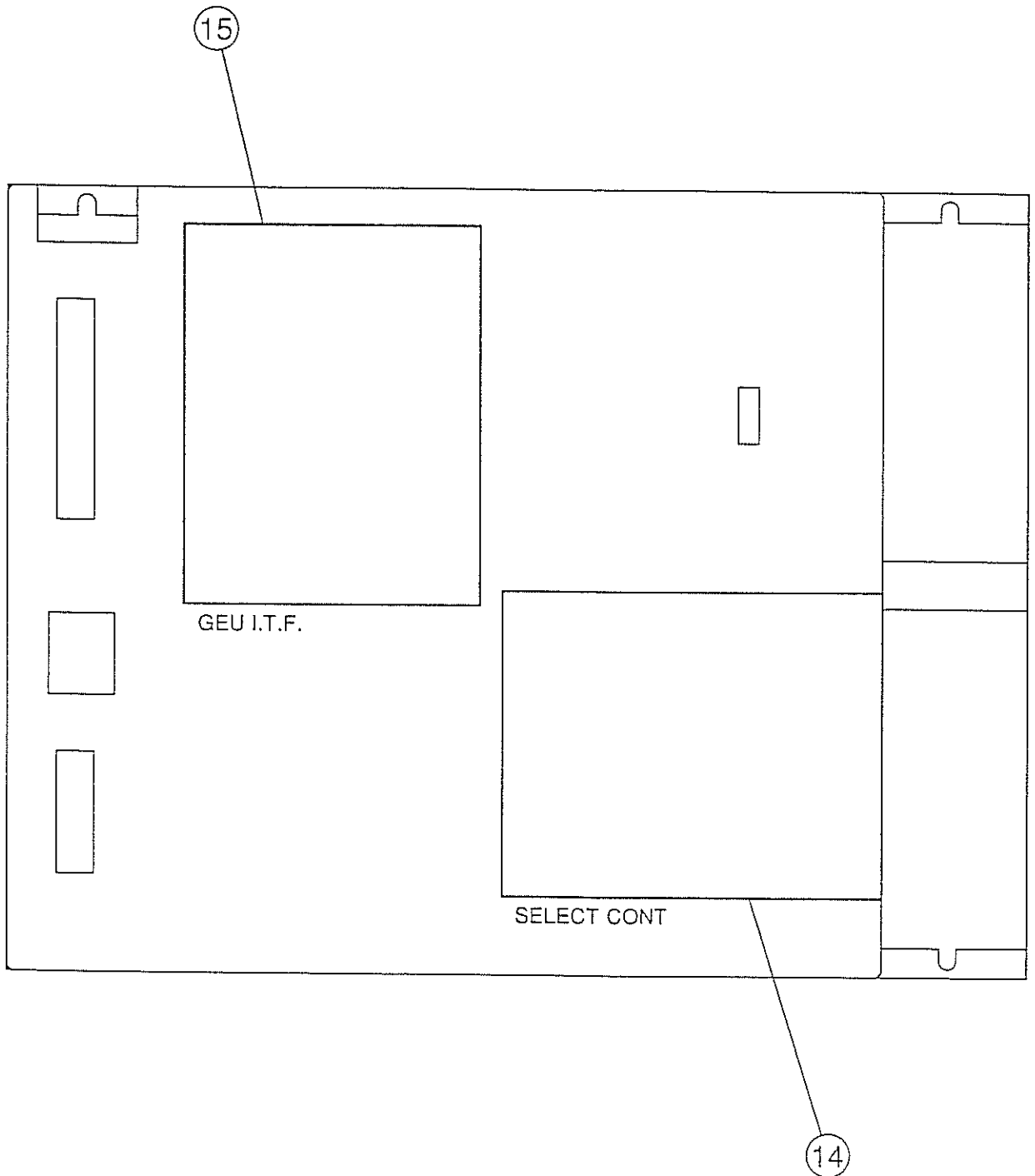
* means ASSEMBLY PARTS.
アッセンブリーパーツ

① UNIT ASSY



05	PCB UNIT	UNIT GEU-64	S/N
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MOTHER BOARD SIDE



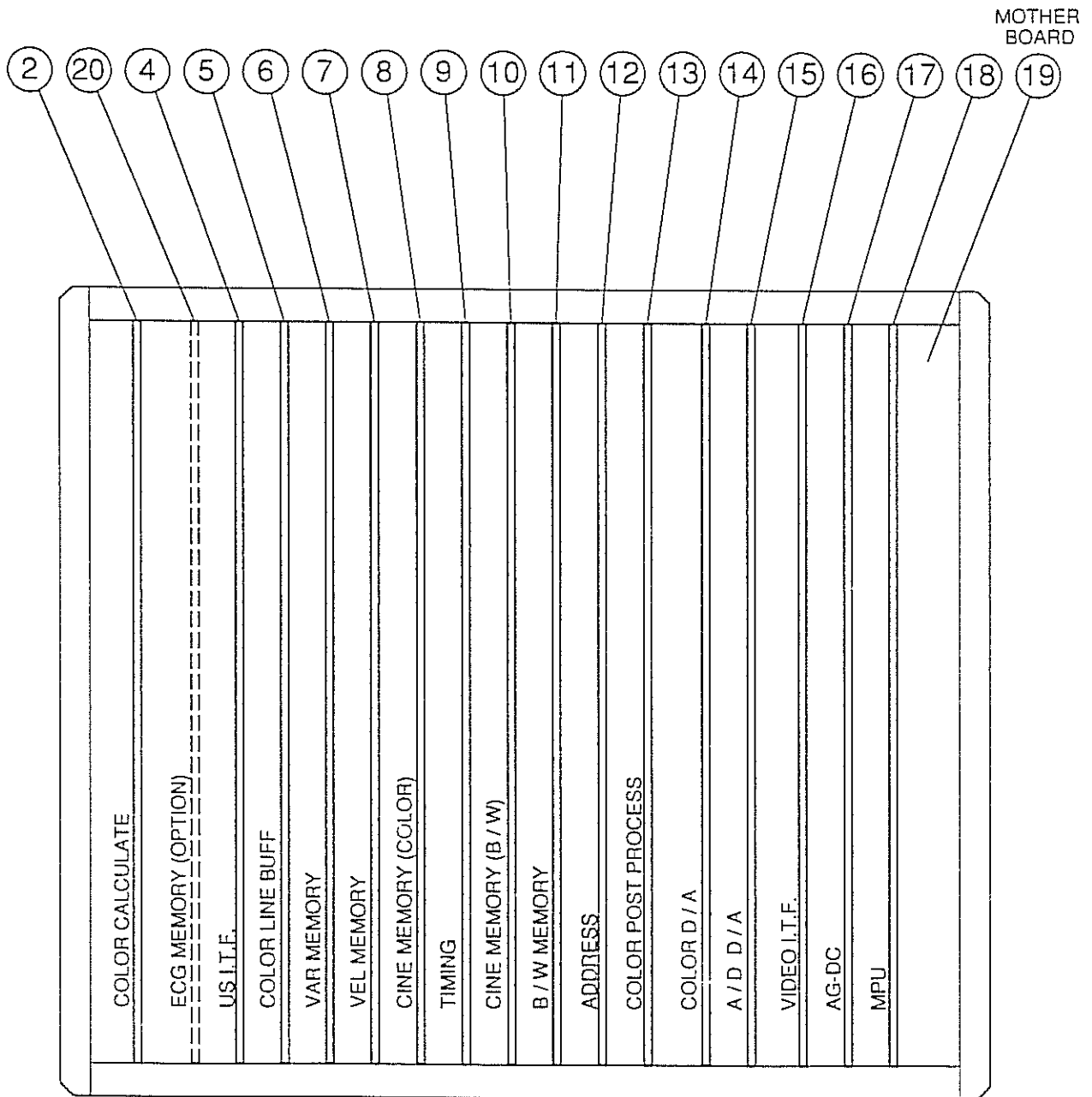
05	PCB	UNIT	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
1	A000013	GEU-64	UNIT ASSY		
2	A800950	EP-3454	PCB:PROBE CHANGER-2		
3	A800951	EP-3453 Σ	PCB:PROBE CHANGER-1		
4	A800952	EP-3455	PCB:SELECTOR		
5	A800953	EP-3456	PCB:TX 1		
6	A800954	EP-3457	PCB:TX 2		
7	A800955	EP-3458	PCB:PRE AMP		
8	A800956	EP-3459	PCB:RX DELAY		
9	A800956	EP-3459	PCB:RX DELAY		
10	A800957	EP-3461	PCB:MAIN AMP & COLOR I.T.F		
11	A800958	EP-3463	PCB:GAIN CONT		
12	A800959	EP-3464	PCB:TX TRIG		
13	A800960	EP-3465	PCB:TIMING/ADRS		
14	A800961	EP-3452	PCB:SELECT CONT		
15	A800962	EP-3525	PCB:GEU I.T.F.		
16	A800963	EP-3466	PCB:MOTHER BOARD		

* means ASSEMBLY PARTS.
アッセンブリーパーツ

06	PCB UNIT	UNIT UIM-325	S/N
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① UNIT ASSY



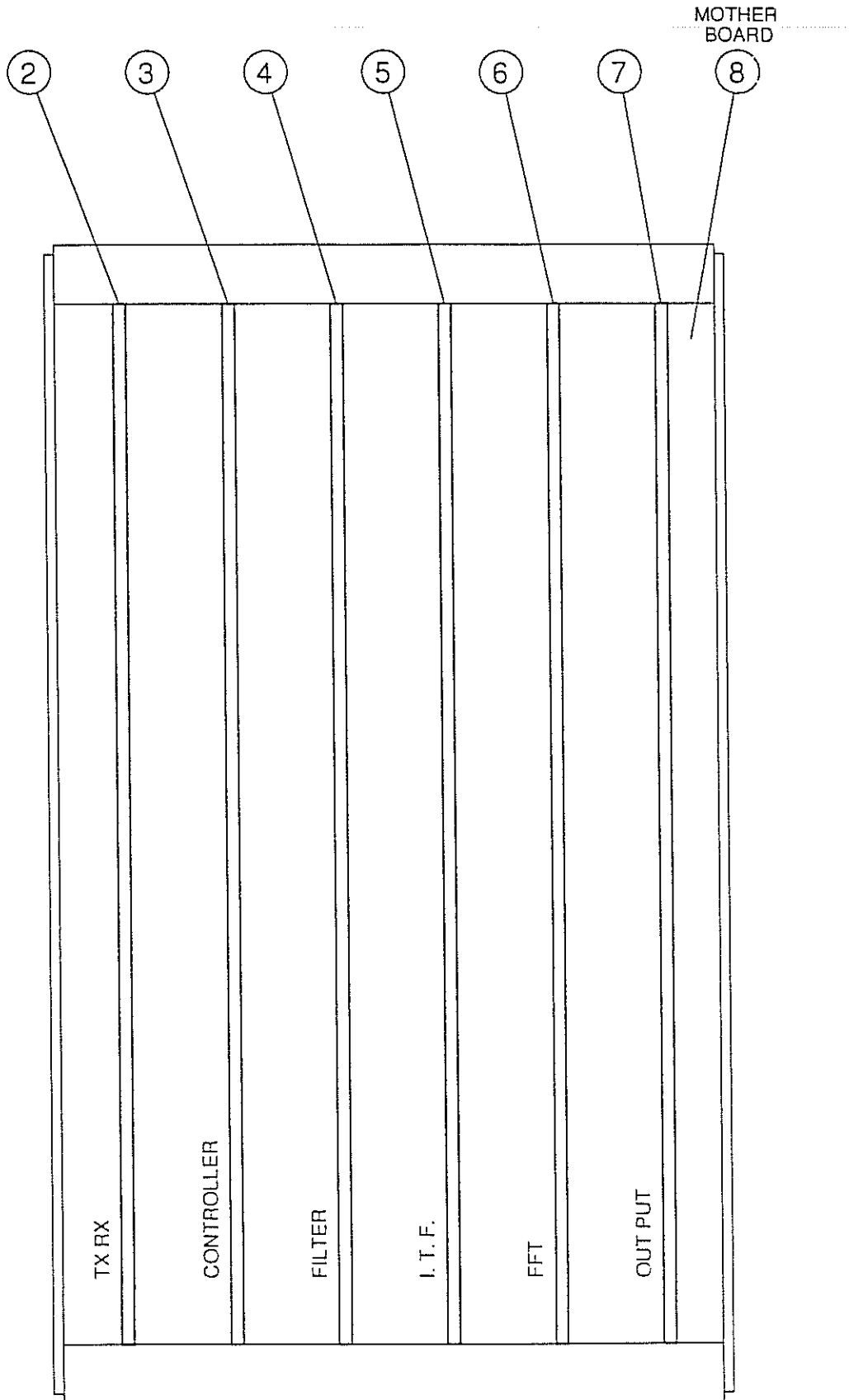
06	PCB	UNIT	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
1	A800964	UIM-325	UNIT ASSY		
2	A800965	EP-5100	PCB:COLOR CALCULATE		
4	A800966	EP-3477	PCB:US I. T. F		
5	A800150	EP-3115	PCB:COLOR LINE BUFF		
6	A800967	EP-2213-1	PCB:VAR MEMORY		
7	A800149	EP-2213	PCB:VEL MEMORY		
8	A800968	EP-3238	PCB:CINE MEMO(COLOR)		
9	A800969	EP-3620	PCB:TIMING		
10	A800970	EP-3237	PCB:CINE MEMO(B/W)		
11	A800971	EP-3247	PCB:B/W MEMORY		
12	A800972	EP-3236	PCB:ADDRESS		
13	A800152	EP-3114	PCB:COLOR POST PROCES		
14	A800973	EP-2651-2	PCB:COLOR D/A		
15	A800919	EP-2729	PCB:A/D D/A		
16	A800927	EP-3443	PCB:VIDEO I. T. F.		FOR NTSC
16	A800927	EP-3443	PCB:VIDEO I. T. F.		FOR PAL
17	A800929	EP-2629	PCB:AG-DC		
18	A800167	EP-2913-1	PCB:MPU		
19	A800974	EP-3467	PCB:MOTHER BOARD		
20	A800975	EP-2841	PCB:ECG MEMORY		FOR PEU-680B

* means ASSEMBLY PARTS.
アッセンブリーパーツ

07	PCB UNIT	UNIT UGR-680	S/N
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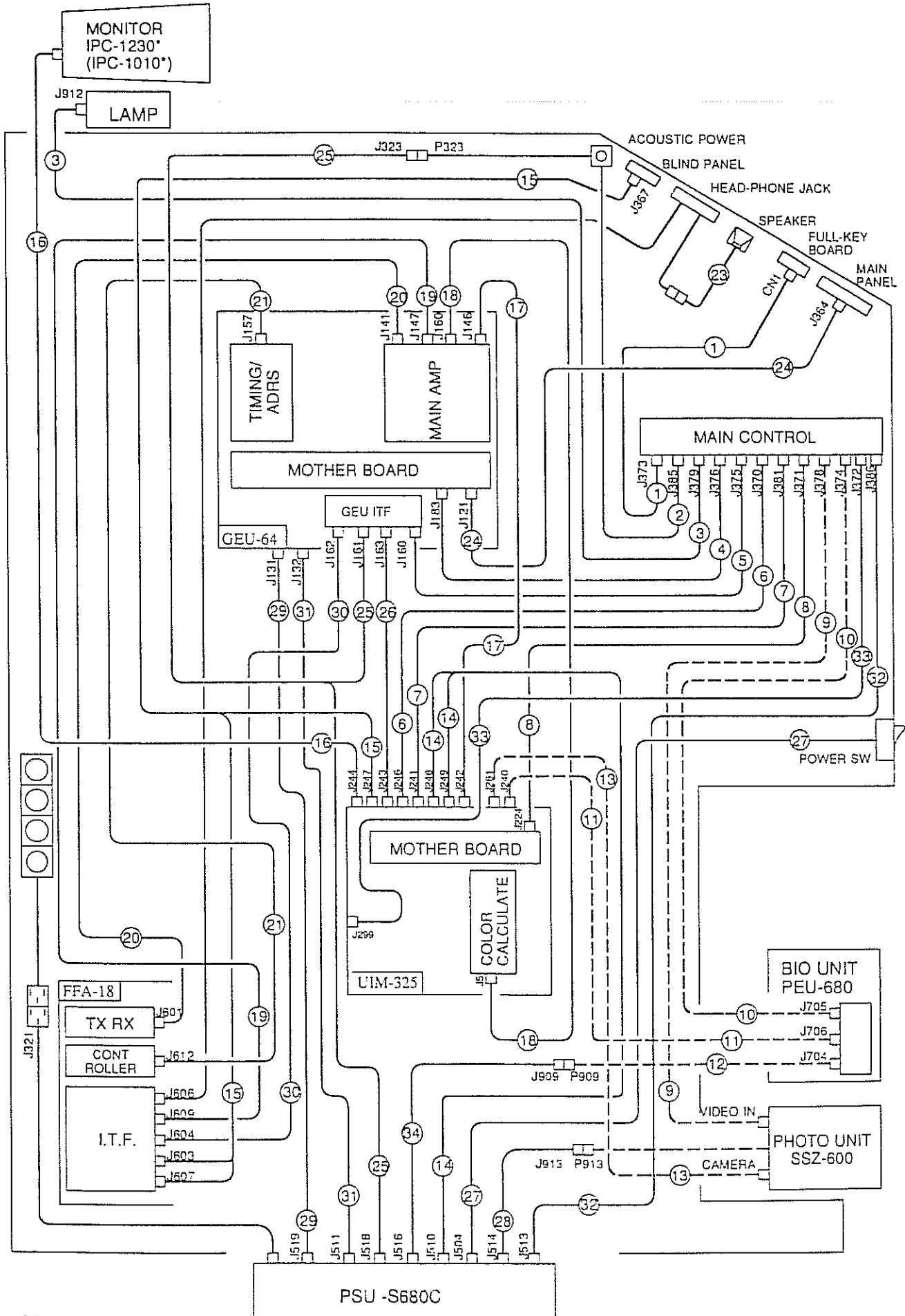
① UNIT ASSY



07	PCB	UNIT	S/N
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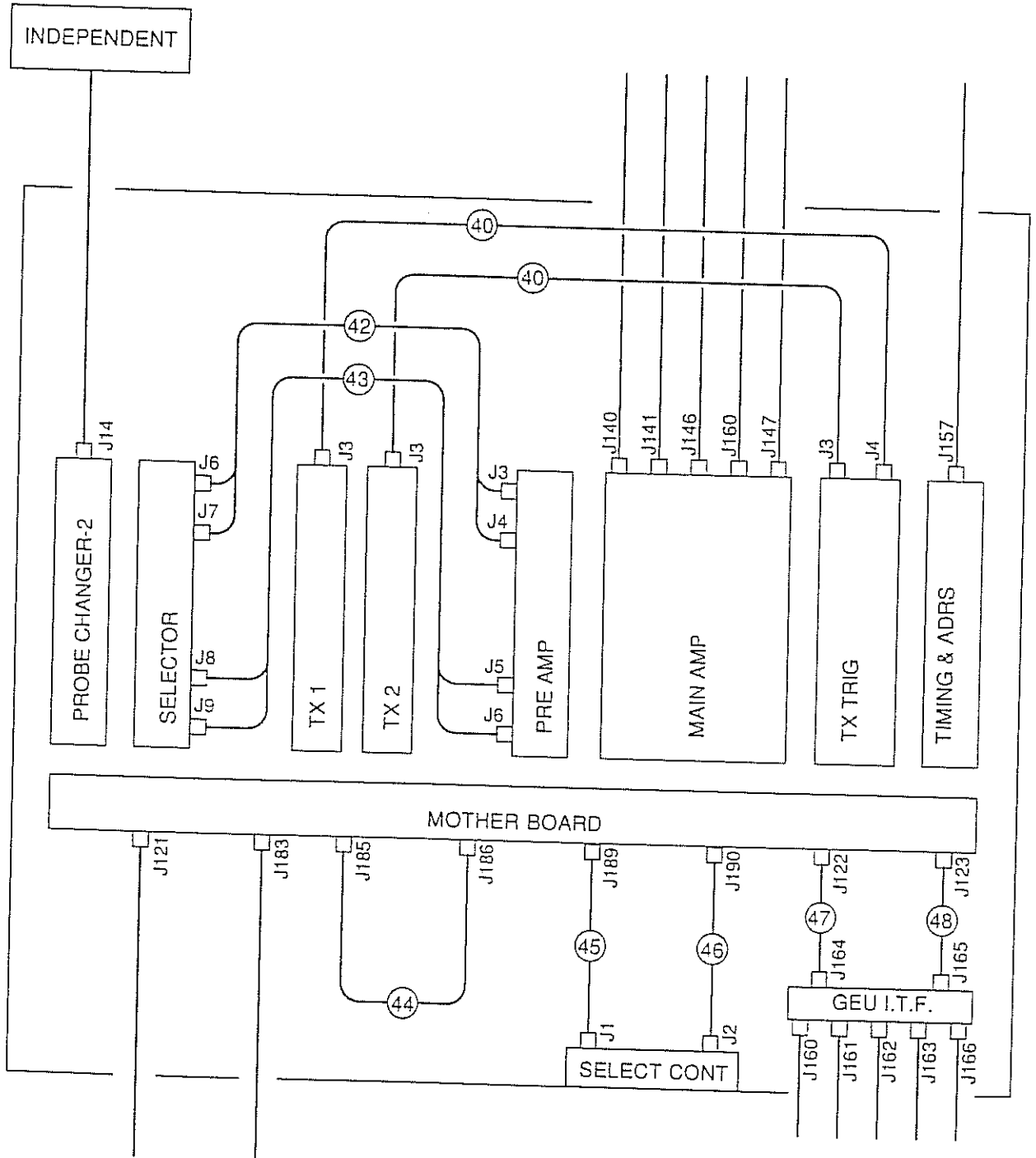
ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
1	A800976	UGR-680	UNIT ASSY		
2	A800977	EP-3260	PCB:TX, RX		
3	A800939	EP-2810	PCB:CONTROLLER		
4	A800978	EP-3259	PCB:FILTER		
5	A800941	EP-2812	PCB:I. T. F.		
6	A650003	NJK-196A-FFT	PCB:FFT BOARD		
7	A800990	NJK-196A-OUT PUT	PCB:OUT PUT BOARD		
8	A800178	EP-2808	PCB:MOTHER BOARD		

* means ASSEMBLY PARTS.
アッセンブリーパーツ :



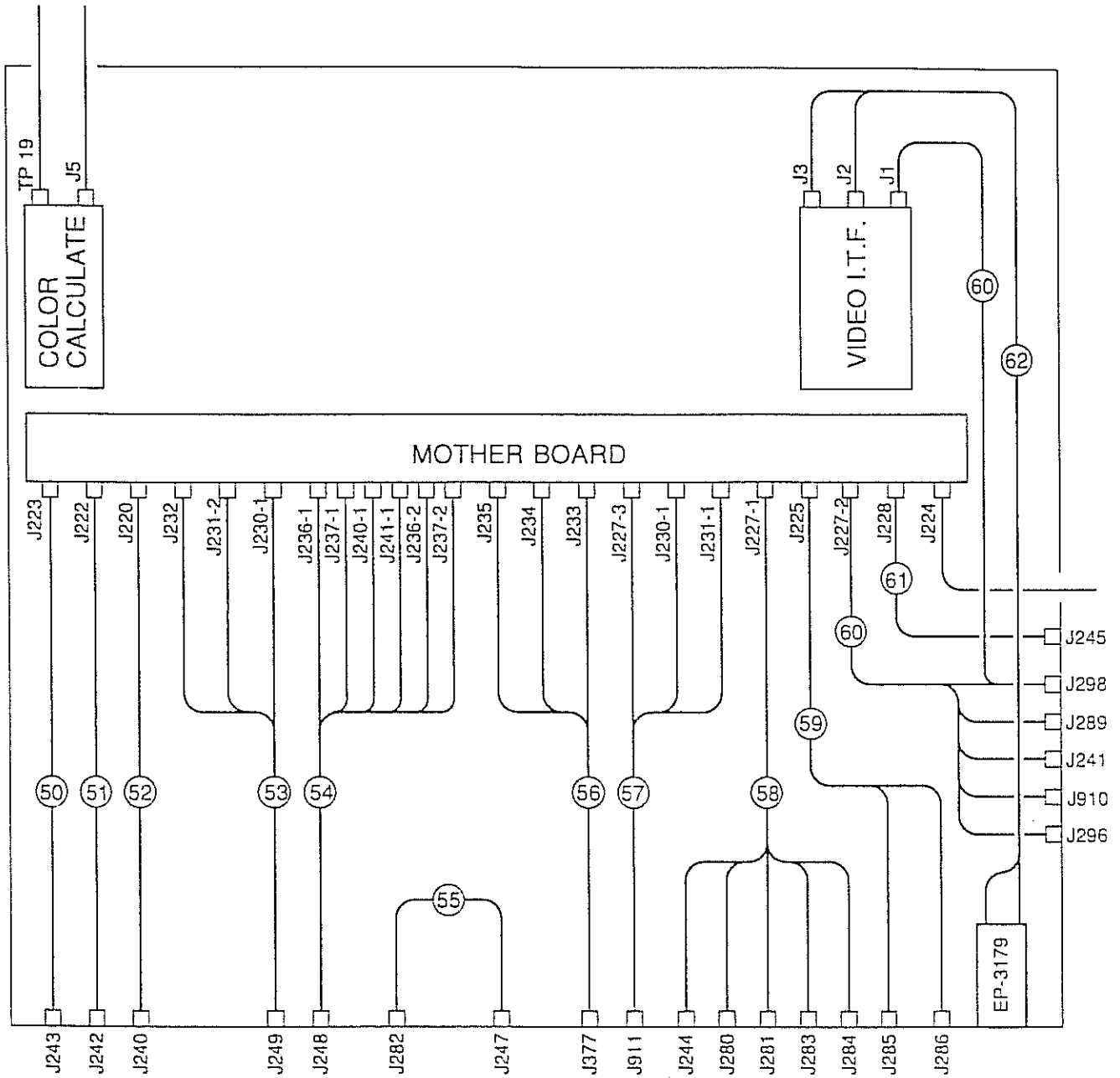
08	CABLE	UNIT GEU-64	S/N
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TX / RX UNIT : GEU-64

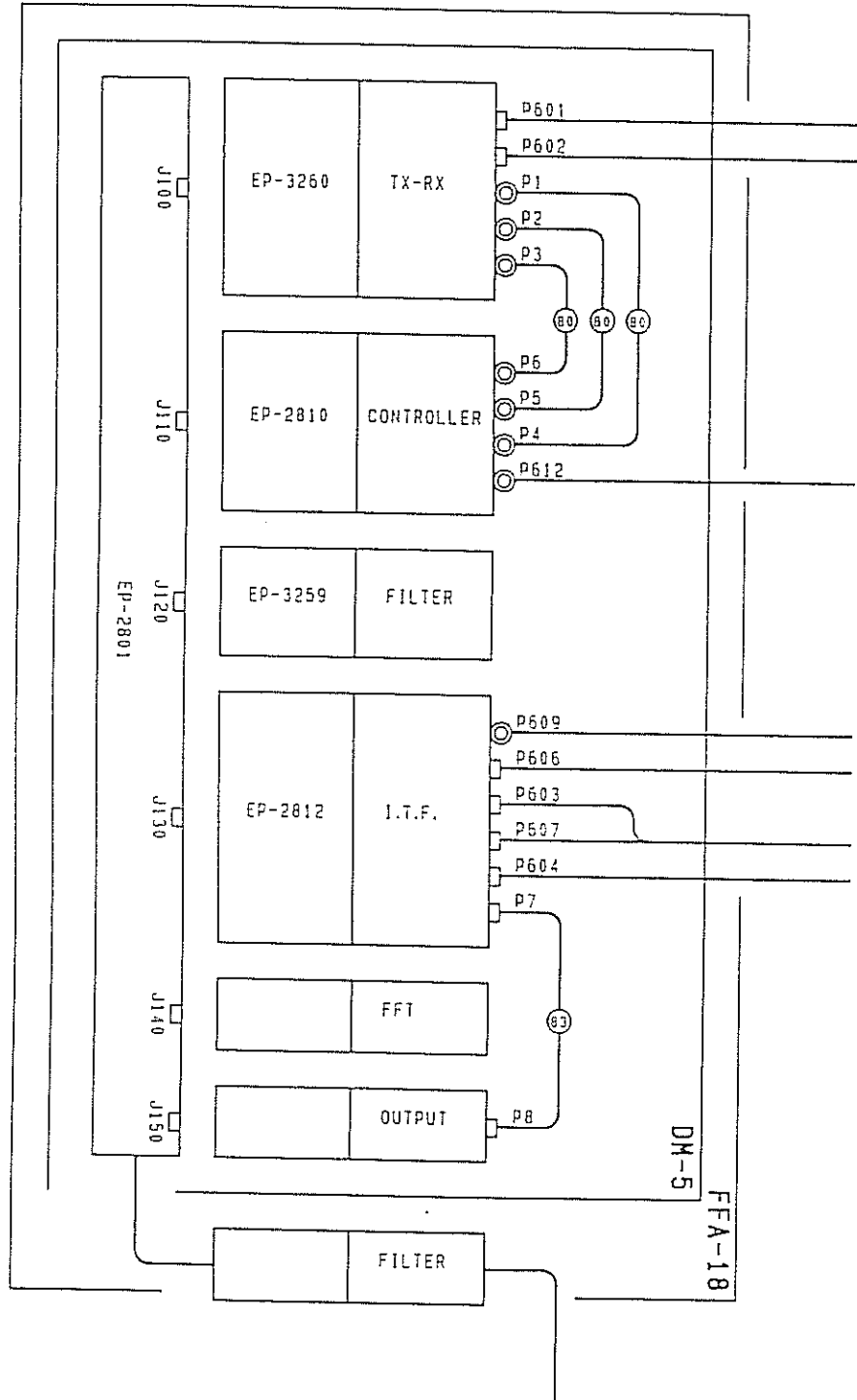


08	CABLE	UNIT UIM-325	S / N
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DSC UNIT : UIM-325



DOPPLER UNIT
UGR-680



08	CABLE	UNIT	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
1	A800213	CO-PSC108-L-06	CABLE: J373-CN1	~	
2	A800991	CO-PSC-108-D-09	CABLE: J385-J323, ACOUSTIC POWER	~	
3	A800992	CO-PSC118-A 12	CABLE: J379-J912, LAMP	~	
4	A800993	CO-GEU64-J05	CABLE: J183-J376	~	
5	A800994	CO-GEU64-G04	CABLE: J375-J160	~	
6	A800216	CO-PSC108-P-08	CABLE: J370-J246	~	
7	A800215	CO-PSC108-F-08	CABLE: J381-J241	~	
8	A800995	CO-PSC108-J-08B	CABLE: J371-J224	~	
9	A800218	CO-PSC108-E-15	CABLE: J378-P700, CAMERA	~	
10	A800996	CO-PSC-108-K-04	CABLE: J705-J374	~	
11	A800997	CO-PSC-108-M-08	CABLE: J706-J240	~	
12	A800225	CO-PEU680-A-02	CABLE: J704-P909	~	
13	A800227	CO-PSC108-Q-05	CABLE: J281-J703, VIDEO IN	~	
14	A800998	CO-L-PS-40-F-07	CABLE: J510-J248, J249	~	
15	A800223	CO-PSC108-S-18	CABLE: J603-J367, 247-J607	~	
16	*A200560	L-CABLE301-16	CABLE: J244-P1000, MONITOR	~	
17	A800999	CO-GEU64-S-10	CABLE: J242-J146	~	
18	A801000	CO-GEU64-F05	CABLE: J5-J160	~	
19	A800799	CO-GEU50-K-10	CABLE: J147-J609	~	
20	A800798	CO-GEU50-J-08	CABLE: J601-J141	~	
21	A800234	CO-GEU50-N-10	CABLE: J612-J157	~	
23	A801001	CO-PSC108-H08	CABLE: J342-SPEAKER	~	
24	A301002	CO-GEU50-W-08	CABLE: J364-J121	~	

* means ASSEMBLY PARTS.
アッセンブリーパーツ

08	CABLE	UNIT	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
25	A800797	CO-PSC-108-A-13	CABLE: J518-J161, J323	~	
26	A800979	CO-GEU-50Y-4	CABLE: J163-J243		
27	A801003	CO-LPS-40-E-14	CABLE: J504-S300, SW	~	
28	A800228	CO-LPS40-H-10	CABLE: J913-J514	~	
29	A801004	CO-LPS-40-G-12	CABLE: J519-J131	~	
30	*A200561	L-CABLE-177-11	CABLE: J604-J162	~	
31	A801005	CO-LPS-40-B-13	CABLE: J511-J132		
32	A800217	CO-LPS40-A-12	CABLE: J386-J513	~	
33	*A200552	L-CABLE-341	CABLE: J299-J372		
34	A800226	CO-LPS40-D-12	CABLE: J909-J516	~	
40	*A200562	L-CABLE-392	CABLE: J3-J4, J3-J3	~	
42	A801006	CO-GEU64-A05	CABLE: J6, J7-J3, J4	~	
43	A801007	CO-GEU64-B05	CABLE: J8, J9-J5, J6	~	
44	A801008	CO-GEU64-M01	CABLE: J185-J186	~	
45	A801009	CO-GEU64-Q02	CABLE: J1-J189	~	
46	A801010	CO-GEU64-R02	CABLE: J2-J190	~	
47	A801011	CO-GEU64-K04	CABLE: J122-J164	~	
48	A801012	CO-GEU64-L04	CABLE: J123-J165	~	
50	A800804	CO-UIM324-D-05	CABLE: J223-J243	~	
51	A800803	CO-UIM324-C-04	CABLE: J222-J242	~	
52	A800801	CO-UIM324-A-04	CABLE: J220-J240	~	
53	A800810	CO-UIM324-J-04	CABLE: J249-J230-2, J231-2, J232	~	
54	A800809	CO-UIM324-I-04	CABLE: J248-J236, J237-2, J236-1, J237-1, J240-1, J241-1	~	

* means ASSEMBLY PARTS.
アッセンブリーパーツ

08	CABLE	UNIT	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
55	A800812	CO-UIM324-M-03B	CABLE: J247-J282	~	
56	A801013	CO-UIM325-A-04	CABLE: J377-J233, J234, J235	~	
57	A800246	CO-UIM324-O-08	CABLE: J911, J231-1, J230-1, J227-3	~	
58	A801014	CO-UIM324-L-06C	CABLE: J227-1-J280, J281, J283, J284, J244	~	
59	A800805	CO-UIM324-E-04	CABLE: J225-J286, J285	~	
60	A800815	CO-UIM324-N-04B	CABLE: J241-J910, J289, J-298, J1, J277-2, J296	~	
61	*A200563	L-CABLE-175	CABLE: J228-J245	~	
62	A800816	CO-UIM324-P-05	CABLE: J3, J2-EP-3179	~	
80	A800207	NCS-3305	CABLE: J1-J4, J2-J5, J3-J6	~	
83	A800208	L-CABLE-222-06	CABLE: J7-J8	~	

* means ASSEMBLY PARTS.
アッセンブリーパーツ

09	SCREWS & SMALL PARTS	UNIT	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
	A341325	3T3*2.5	SCREW HEXAGONAL:3T3*2.5		
	A341304	3T3*4	SCREW HEXAGONAL:3T3*4		
	A341408	3T4*8	SCREW HEXAGONAL:3T4*8		
	A301306	ANK3*6	SCREW:ANK3*6		
	A301308	ANK3*8	SCREW:ANK3*8		
	A301418	ANK4*18	SCREW:ANK4*18		
	A140092	ARC-68-A-14	CABLECLAMP:INDEX 03		
	A342616	B6*16	BOLT HEXAGONAL:B6*16		
	A342620	B6*20	BOLT HEXAGONAL:B6*20		
	A342820	B8*20	BOLT HEXAGONAL:B8*20		
	A316306	BK3*6	SCREW:BK3*6		
	A303310	BNK3*10	SCREW:BNK3*10		
	A304316	BNK3*16Bs	SCREW:BNK3*16Bs		
	A303320	BNK3*20	SCREW:BNK3*20		
	A303330	BNK3*30	SCREW:BNK3*30		
	A303306	BNK3*6	SCREW:BNK3*6		
	A304306	BNK3*6Bs	SCREW:BNK3*6Bs		
	A303308	BNK3*8	SCREW:BNK3*8		
	A304308	BNK3*8Bs	SCREW:BNK3*8Bs		
	A303412	BNK4*12	SCREW:BNK4*12		
	A304408	BNK4*8Bs	SCREW:BNK4*8Bs		
	A140089	CKN-07	CABLECLAMP:INDEX 01		
	A306306	CNK3*6	SCREW:CNK3*6		

* means ASSEMBLY PARTS.
アッセンブリーパーツ

09	SCREWS & SMALL PARTS	UNIT	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
	A306308	CNK3*8	SCREW:CNK3*8		
	A305308	CNK3*8Bs	SCREW:CNK3*8Bs		
	A306410	CNK4*10	SCREW:CNK4*10		
	A306425	CNK4*25	SCREW:CNK4*25		
	A306408	CNK4*8	SCREW:CNK4*8		
	A140093	CV-100	CABLECLAMP:INDEX 05		
	A140094	CV-200	CABLECLAMP:INDEX 05, 06		
	A622007	FCN3010	CABLECLAMP:INDEX 05		
	A347406	HB4*6	SCREW:HB4*6		
	A347516	HB5*16	SCREW:HB5*16		
	A140095	KD-3N	CABLECLAMP:INDEX 04		
	A140065	KD-6N	CABLECLAMP:INDEX 05, 04		
	A381103	N3	NUT HEXAGONAL:N3		
	A381703	N3Bs	NUT HEXAGONAL:N3Bs		
	A381104	N4	NUT HEXAGONAL:N4		
	A381106	N6	NUT HEXAGONAL:N6		
	A311310	NK3*10	SCREW:NK3*10		
	A312310	NK3*10Bs	SCREW:NK3*10Bs		
	A311312	NK3*12	SCREW:NK3*12		
	A312312	NK3*12Bs	SCREW:NK3*12Bs		
	A311316	NK3*16	SCREW:NK3*16		
	A311325	NK3*25	SCREW:NK3*25		
	A311305	NK3*5	SCREW:NK3*5		

* means ASSEMBLY PARTS.
アッセンブリーパーツ

09	SCREWS & SMALL PARTS	UNIT	S/N
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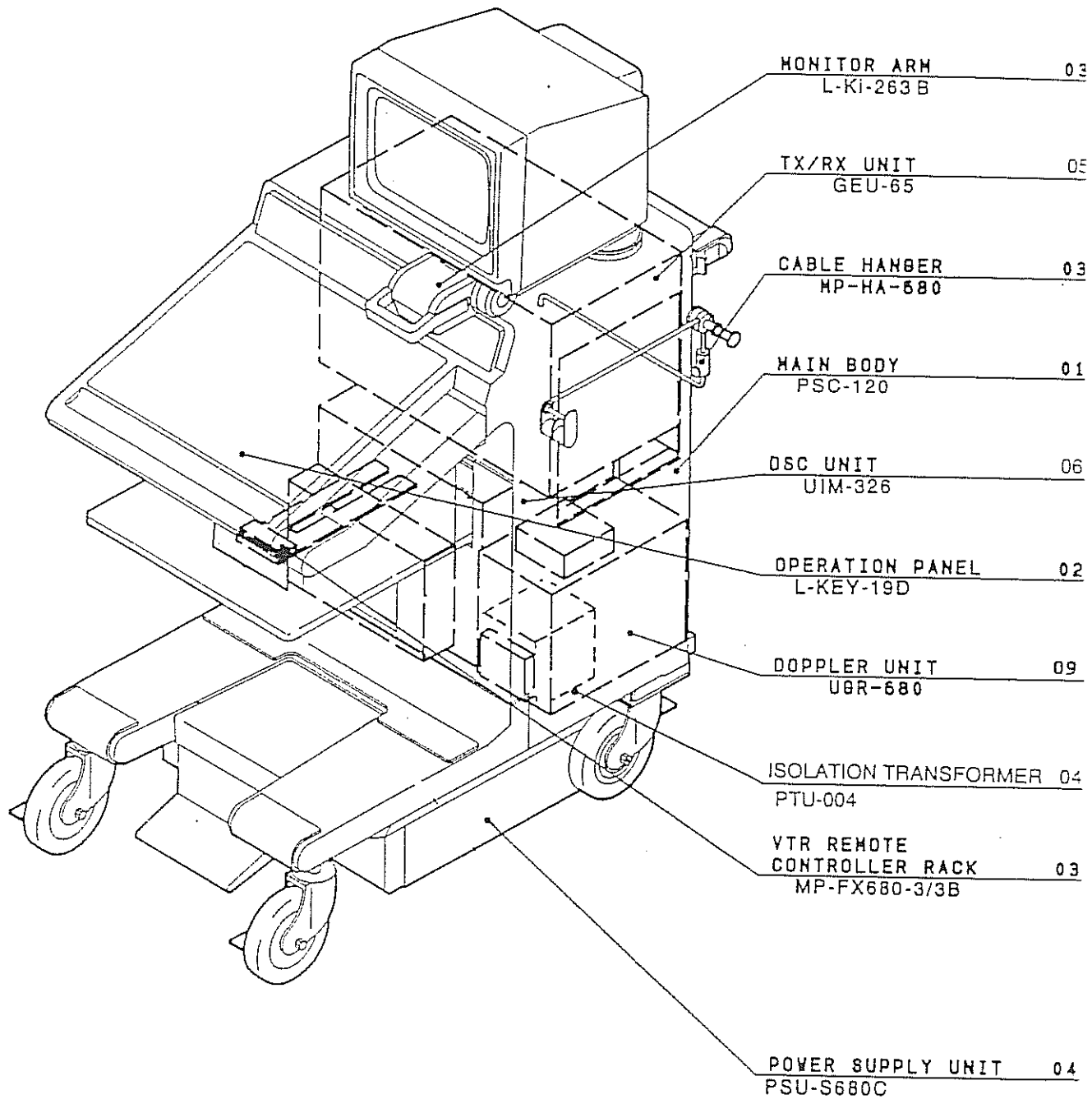
ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
	A311308	NK3*8	SCREW:NK3*8		
	A383203	PW3	WASHER:PW3		
	A383204	PW4	WASHER:PW4		
	A321310	S3*10	SCREW FLAT HEAD:S3*10		
	A322310	S3*10Bs	SCREW FLAT HEAD:S3*10Bs		
	A321312	S3*12	SCREW FLAT HEAD:S3*12		
	A322316	S3*16Bs	SCREW FLAT HEAD:S3*16Bs		
	A321325	S3*25	SCREW FLAT HEAD:S3*25		
	A321330	S3*30	SCREW FLAT HEAD:S3*30		
	A321306	S3*6	SCREW FLAT HEAD:S3*6		
	A322306	S3*6Bs	SCREW FLAT HEAD:S3*6Bs		
	A321308	S3*8	SCREW FLAT HEAD:S3*8		
	A322308	S3*8Bs	SCREW FLAT HEAD:S3*8Bs		
	A321410	S4*10	SCREW FLAT HEAD:S4*10		
	A321412	S4*12	SCREW FLAT HEAD:S4*12		
	A321415	S4*15	SCREW FLAT HEAD:S4*15		
	A321406	S4*6	SCREW FLAT HEAD:S4*6		
	A321408	S4*8	SCREW FLAT HEAD:S4*8		
	A383303	SW3	WASHER:SW3		
	A384003	SW3Bs	WASHER:SW3Bs		
	A383304	SW4	WASHER:SW4		
	A383305	SW5	WASHER:SW5		
	A383306	SW6	WASHER:SW6		

* means ASSEMBLY PARTS.
アッセンブリーパーツ

09	SCREWS & SMALL PARTS	UNIT	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
	A140091	TR-16-8-16	CABLECLAMP:INDEX 01		
	A140090	TRCC-23-11-14	CABLECLAMP:INDEX 01, 03		
	A622000	UL-13	CABLECLAMP:INDEX 01, 05		
	A622001	UL-23	CABLECLAMP:INDEX 01		
	A383112	W12	WASHER:W12		
	A383103	W3	WASHER:W3		
	A383105	W5	WASHER:W5		
	A381306	W6	WASHER:W6		

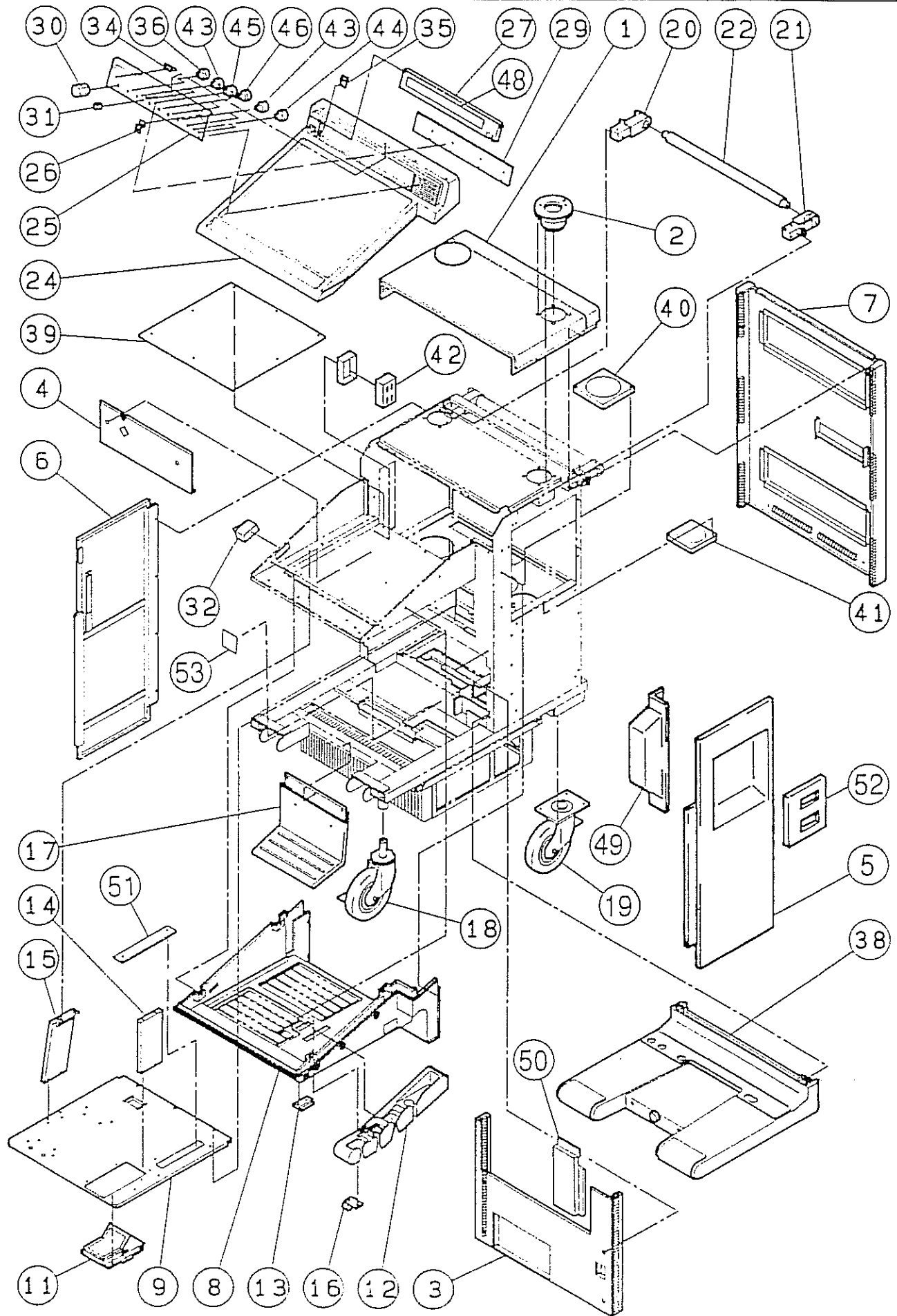
* means ASSEMBLY PARTS.
アッセンブリーパーツ



CABLES SEE
INDEX 07

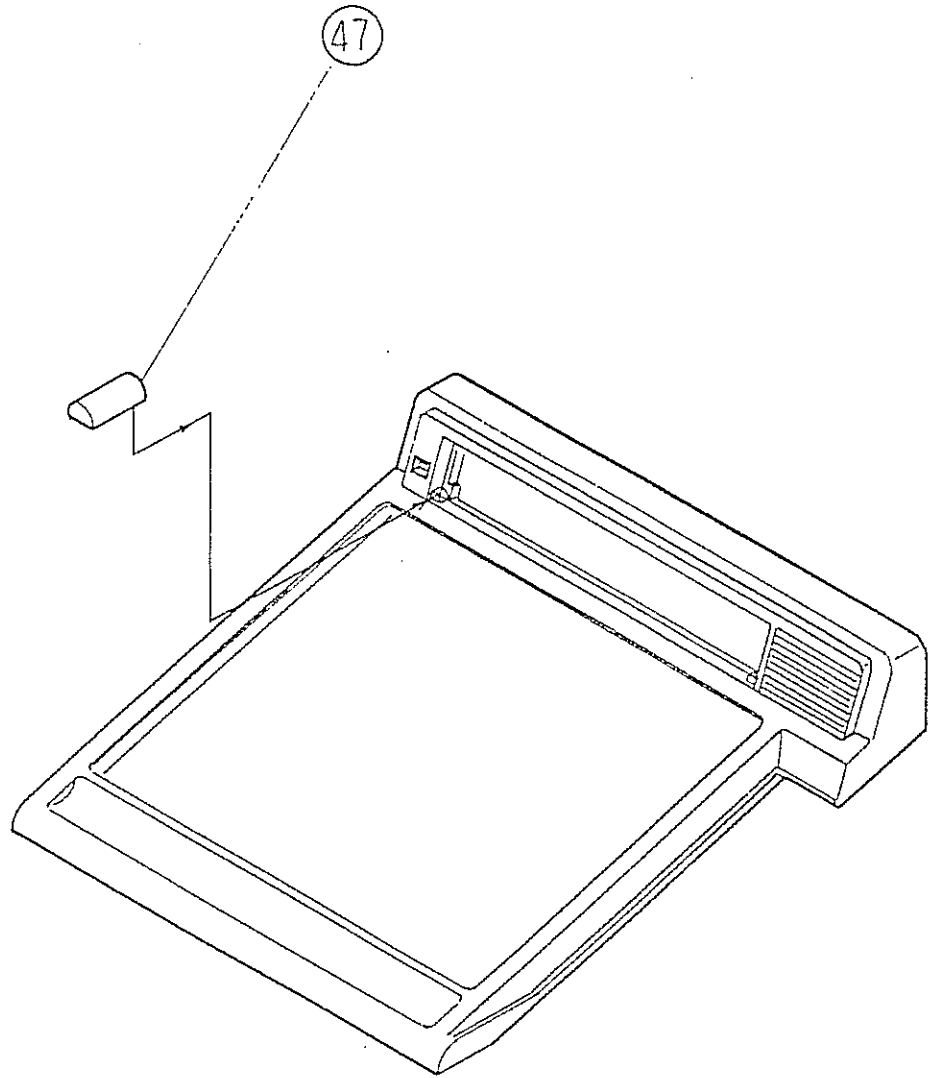
SCREWS & SMALL PARTS
SEE INDEX 08

01	MAIN BODY:	UNIT PSC-120	S/N
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SSD-680STD 0101

01	MAIN BODY	UNIT PSC-120	S/N
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01	MAIN BODY	UNIT PSC-120	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
1	*A200379	SAP-680-01-01	COVER:TOP		EXCEPT USA
1	*A200529	SAP-680-01-01 -A. A.	COVER:TOP		FOR USA(A. A)
1	*A200530	SAP-680-01-01 -CORD	COVER:TOP		FOR USA(CORO.)
2	*A200564	SAP-680STD-01-02	BASE:MONITOR ARM		
3	*A200531	SAP-680EX-01-03	COVER:FRONT		EXCEPT USA
3	*A200532	SAP-680EX-01-03 -A. A.	COVER:FRONT		FOR USA(A. A)
3	*A200533	SAP-680EX-01-03 -CORD	COVER:FRONT		FOR USA(CORO.)
4	*A200384	SAP-660-01-04	COVER:INTERMEDIATE		
5	*A200534	SAP-680EX-01-05	COVER:RIGHT		
6	*A200535	SAP-680EX-01-06	COVER:LEFT		
7	*A200536	SAP-680EX-01-07	COVER:REAR		EXCEPT USA
7	*A200537	SAP-680EX-01-07 -A. A.	COVER:REAR		FOR USA(A. A)
7	*A200538	SAP-680EX-01-07 -CORD	COVER:REAR		FOR USA(CORO.)
8	*A200539	SAP-680EX-01-08	COVER:PANEL, BOTTOM		
9	*A200540	SAP-680EX-01-09	DECK:INTERMEDIATE		
11	*A200392	SAP-680-01-11	JELL BOTTLE HOLDER		
12	A120003	PSC-108#18	PROBE HOOK		
13	A110008	PSC-108#33	RAIL:REMOTE CONTROL RACK		
14	A110009	PSC-108#52	INTERMEDIATE DECK ARM(1)		
15	*A200393	SAP-680-01-15	INTRTMEDIATE DECK ARM(2)		
16	A140018	B-1075	HINGE		
17	A120107	MP-FX680EX-1#1	FOOT REST		
18	A140011	SSC-150-CB	CASTER :FRONT		

* means ASSEMBLY PARTS.
アッセンブリーパーツ

01	MAIN BODY	UNIT PSC-120	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
19	A150001	L-Ki-232	CASTER :REAR		
20	*A200541	SAP-680EX-01-20	HANDLE ARM :RIGHT		
21	*A200542	SAP-680EX-01-21	HANDLE ARM :LEFT		
22	A110002	PSC-108#28	HANDLE		
24	*A200554	SAP-680EX-01-24	COVER: PANEL	~	
25	*A200543	SAP-680EX-01-25	BLIND PANEL		
26	*A200399	SAP-680-01-26	SPRING:BLIND DOOR		
27	*A200553	SAP-680STD-01-27	BLIND DOOR		EXCEPT CORO.
29	A800733	EP-2512*	PCB:BLIND PANEL		
30	A510000	SP-4107u-1	KNOB		
31	A510013	SP-4108	KNOB		
32	A611063	L-S-59	SWITCH:POWER		
34	A800739	EP-2510*	PCB:PHONE JACK		
35	A800740	EP-3143*	PCB		
36	A623033	RV16YN20SC5kΩ	VOLUME:AUDIO VOLUME		
38	*A200545	SAP-680EX-01-38	COVER:BASE		
39	A800742	EP-3265*	PCB:MAIN CONTROL		
40	A625003	109S-086	FAN		
41	A625004	109S-096	FAN		
42	A601001	WK-3004	AC RECEPTACLE: J320, 321		
43	A623034	RV12YP20SB5kΩ	VOLUME:AGC(B, M), ECOH ERASE		
44	A611053	D-2012B	SWITCH:FTC, POS/NEG, INT/EXT		
45	A611064	L-S-52	SWITCH:SWEEP SPEED		

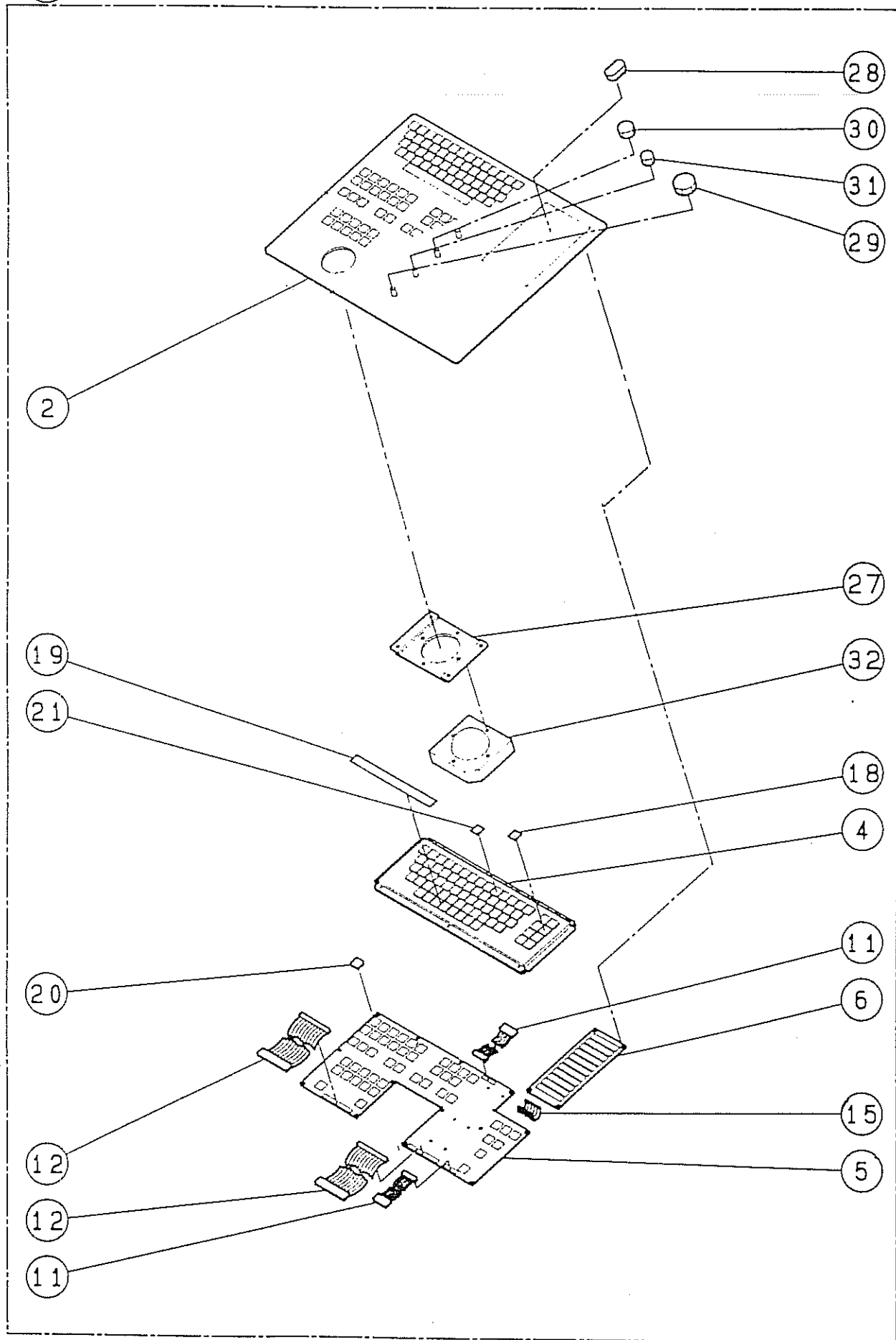
* means ASSEMBLY PARTS.
アッセンブリーパーツ

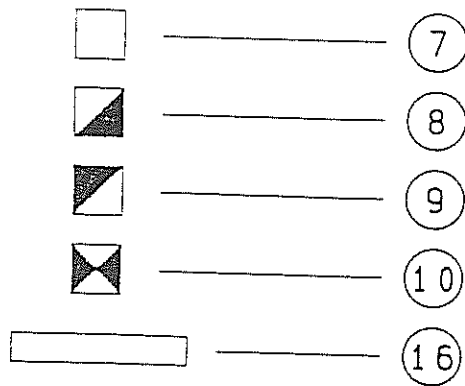
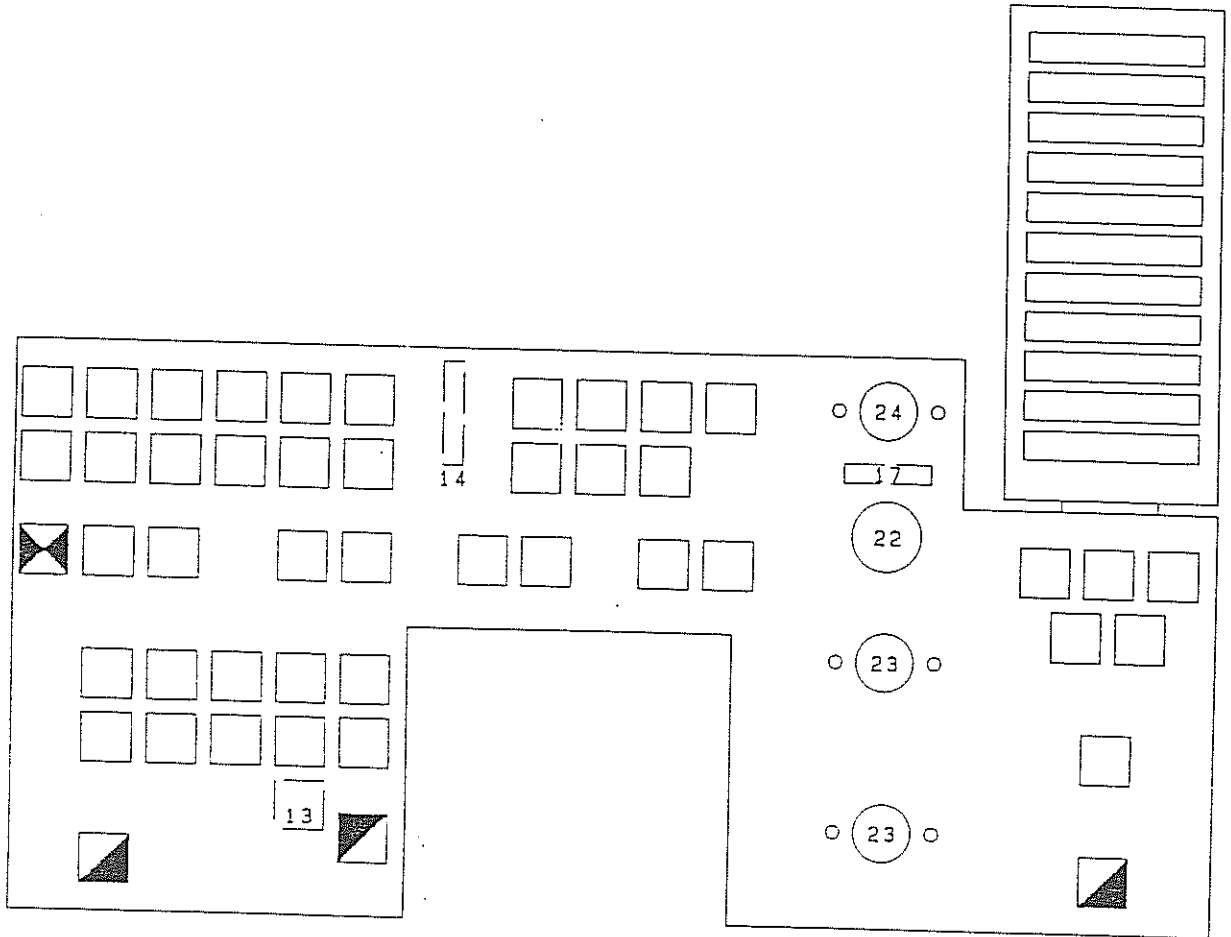
01	MAIN BODY	UNIT PSC-120	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
46	A611065	L-S-53	SWITCH: CONTRAST (B, M)		
47	A120100	PSC-108#60	STOPPER		
48	A600096	P-32-680-CORO	NAME PLATE		FOR USA (CORO.)
49	A110142	PSC-118#67	DUCT		
50	A110143	PSC-118#69	JB COVER		
51	A110144	SAP-680EX-01-51	COVER: INTERMEDIATE DECK		
52	A110145	PSC-118#32	COVER: COSMETIC, CONNECTOR	~21M08251	
53	A600110	PSC-120#73	LABEL		

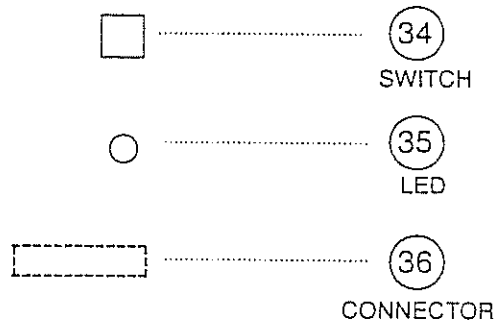
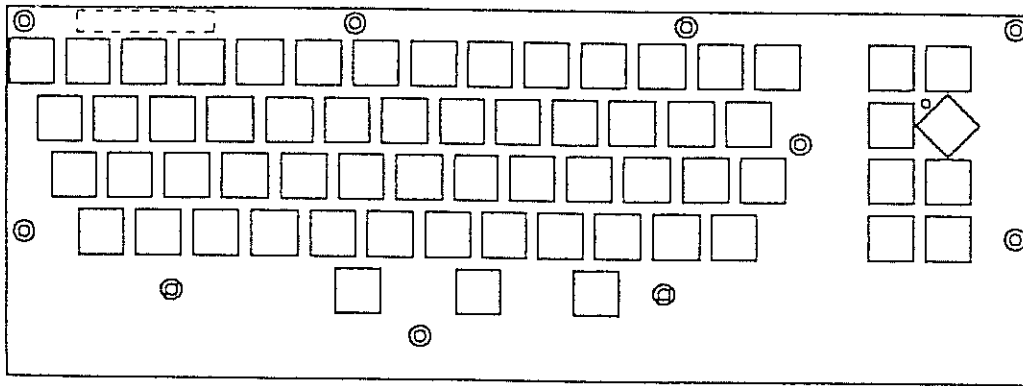
* means ASSEMBLY PARTS.
アッセンブリーパーツ

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02	OPERATION PANEL	UNIT L-KEY-26	S / N
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02	OPERATION PANEL	UNIT L-KEY-19D/26	S/N
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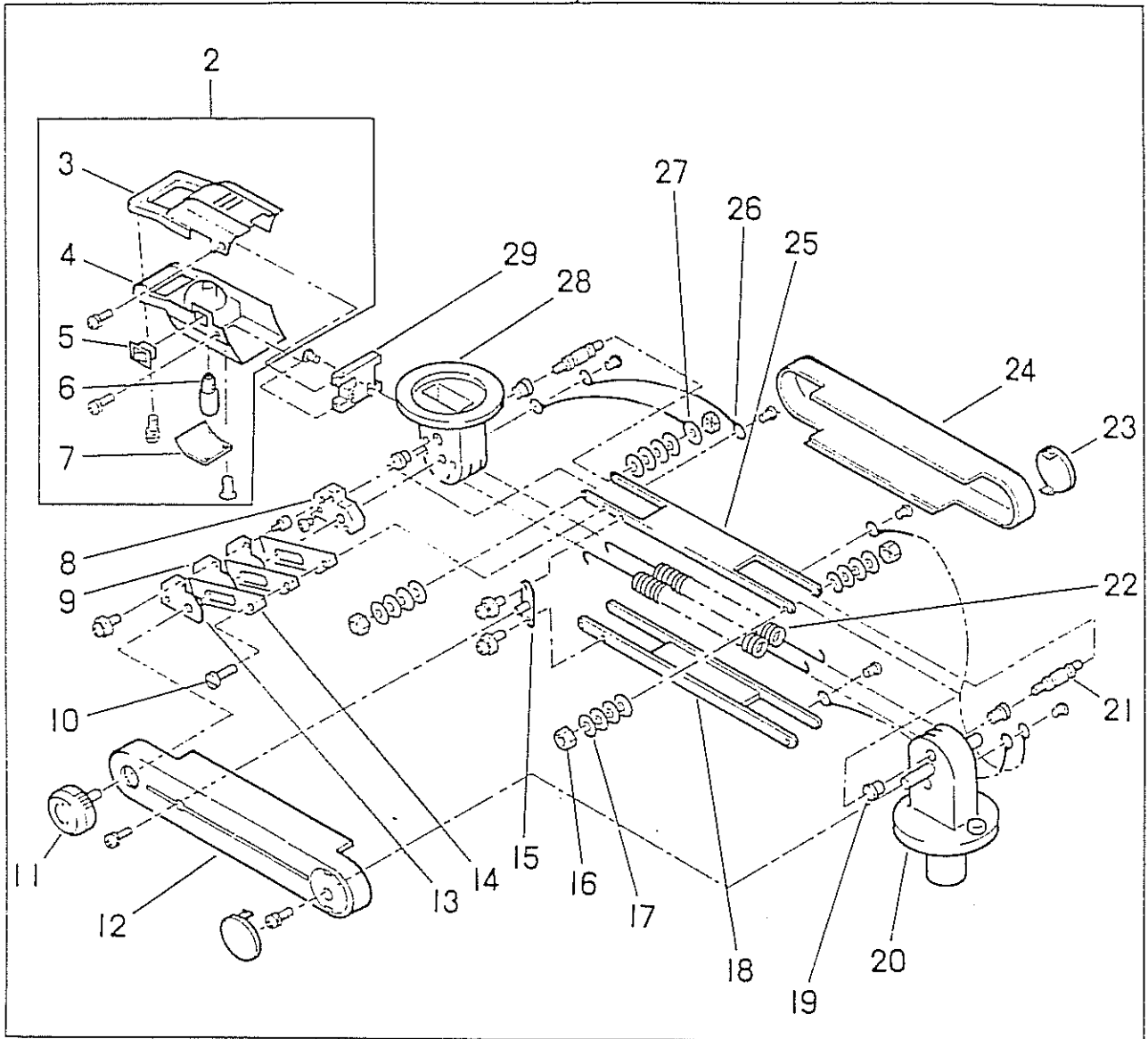
ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
1	*A200555	L-KEY-19D	PANEL FULL ASSEMBLY		
2	*A200556	SAP-680EX-02-02	PANEL SHEET		
4	*A200162	L-KEY-26	FULL KEY BOARD ASSY		
5	A801015	EP-2960*	PCB:SW		
6	A801016	EP-3182*	PCB:RV		
7	A611002	A3FA-101-0	SWITCH(ORANGE)		
8	A611003	A3FA-401-Y	SWITCH(YELLOW)		
9	A611004	A3FA-401-0	SWITCH(ORANGE)		
10	A611005	A3FA-101-G	SWITCH(GREEN)		
11	*A200409	L-KEY-19#19	CABLE ASSY: J363, J362		
12	*A200410	L-KEY-19#18	CABLE ASSY: J360, J361		
13	A601003	5046-06A	CONNECTOR: J365		
14	A601002	5046-04A	CONNECTOR: J391		
15	*A200411	L-KEY-19C#20	JUMPER CABLE		
16	A623000	EVA-UBH-S15-B13	RV:STC		
17	A601006	3429-6002LCSC	CONNECTOR: J364		
18	*A200412	L-KEY-19C#26	KEY BUTTON:RED		
19	*A200413	L-KEY-19C#24	KEY BUTTON:SPACE		
20	*A200414	L-KEY-19C#16	KEY BUTTON:WHITE		
21	*A200415	L-KEY-19C#15	KEY BUTTON:CLEAR		
22	A611001	SRM-1-01-11	ROTARY SWITCH		
23	A623001	RV20YP1-23S-B1K	VARIABLE RESISTOR ROTARY		
24	A623002	RV20YP1-23S-B5K	VARIABLE RESISTOR ROTARY		

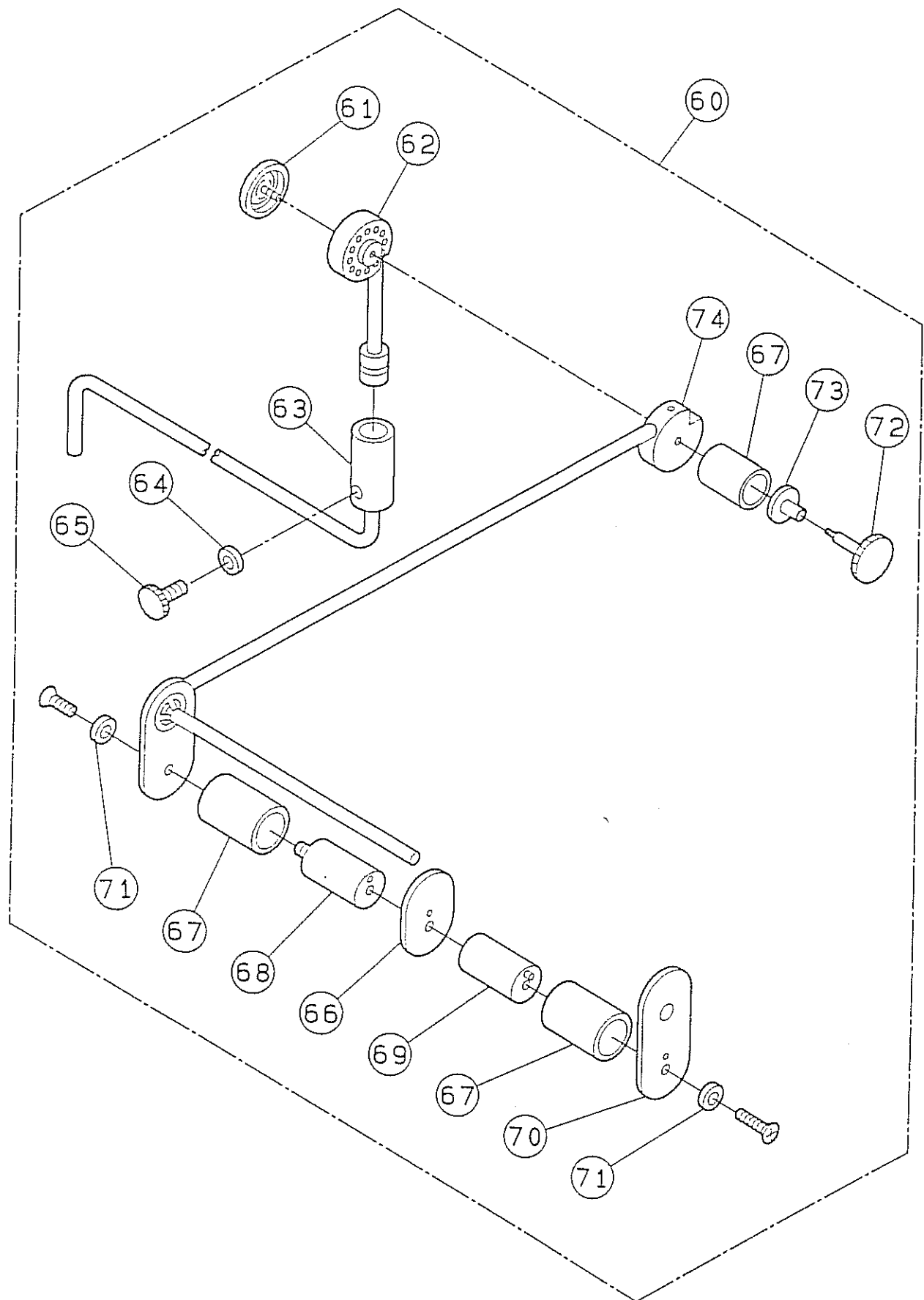
* means ASSEMBLY PARTS.
アッセンブリーパーツ

02	OPERATION PANEL	UNIT L-KEY-19D/26	S/N
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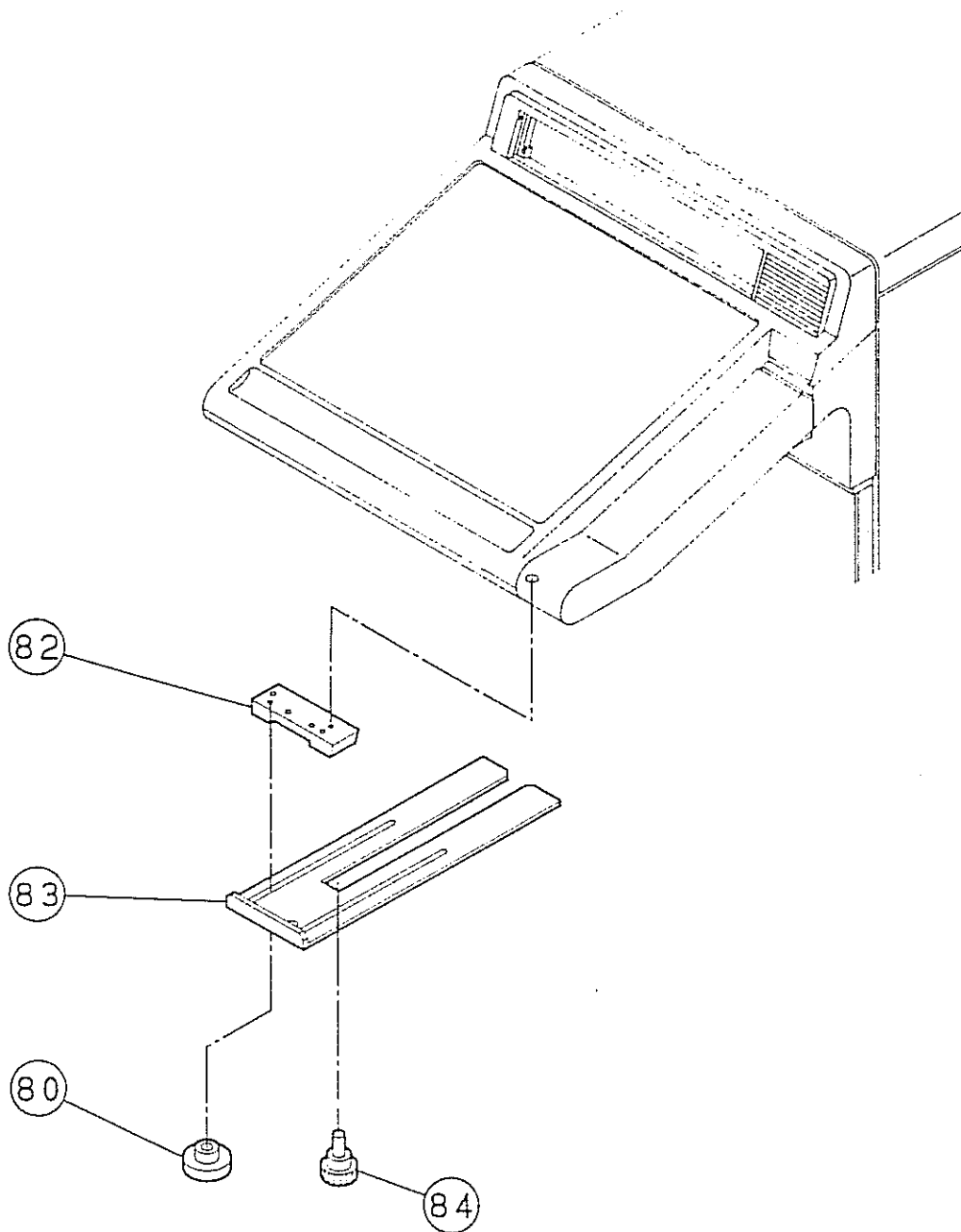
ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
27	A100186	PSC-105#25	TRACK BALL MOUNTING PLATE		
28	A510010	SP-4103UB	KNOB:STC		
29	A510002	SP-4104	KNOB		
30	A510011	SP-4106	KNOB		
31	A510012	SP-4107-1	KNOB		
32	A618000	L-TB-1B	TRACK BALL		
34	A611013	B3F-1050	KEY SWITCH(without KEY-TOP)		
35	A616014	EBR3432S	LED		
36	A601087	3428-6002LCSC	CONNECTOR		

* means ASSEMBLY PARTS.
アッセンブリーパーツ





03	VTR REMOTE CONTROLLER RACK	UNIT MP-FX-680-3B	S/N
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03	MACHINERY	UNIT	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
1	A150071	L-Ki-263B	MONITOR ARM ASSY	~	
2	A150072	L-Ki-263LAMP	LAMP ASSY		
3	A150073	L-Ki-263#37	COVER : LAMP, UPPER		
4	A150074	L-Ki-263#38	COVER : LAMP, LOWER		
5	A150075	L-Ki-263#36	SWITCH		
6	A150076	L-Ki-263#35	LAMP		
7	A150077	L-Ki-263#51	SCREEN		
8	A150078	L-Ki-263#20	SPACER		
9	A150079	L-Ki-263#21	FRICTION PLATE		
10	A150080	L-Ki-263#25	FRICTION LINK MOUNTING BOLT		
11	A150081	L-Ki-263#49	KNOB		
12	A150082	L-Ki-263#39	COVER : RIGHT		
13	A150083	L-Ki-263#23	MOUNTING BRACE		
14	A150084	L-Ki-263#22	FRICTION LINK	~	
15	A150085	L-Ki-263#11	COVER MOUNTING POST	~	
16	A150086	L-Ki-263#15	NUT	~	
17	A150087	L-Ki-263#14	WASHER	~	
18	A150088	L-Ki-263#17	LINK(B)	~	
19	A150089	L-Ki-263#16	BUSHING	~	
20	A150090	L-Ki-263#5	BASE	~	
21	A150091	L-Ki-263#10	PIN	~	
22	A150093	L-Ki-263B#1	EXTENSION SPRING	~	
23	A150094	L-Ki-263#41	CAP	~	

※ means ASSEMBLY PARTS.
アッセンブリーパーツ

03	MACHINERY	UNIT	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
24	A150095	L-Ki-263#40	COVER:LEFT	~	
25	A150096	L-Ki-263#9	LINK(A)	~	
26	A150097	L-Ki-263#46	GROUNDING WIRE (A)	~	
27	A150098	L-Ki-263#47	GROUNDING WIRE (B)	~	
28	A150099	L-Ki-263#2	MOUNTING BRACE	~	
29	A150100	L-Ki-263#29	LAMP COVER MOUNTING BRACE	~	
60	A800256	MP-HA680	CABLE HANGER FULL ASSY		
61	A120005	MP-HA600#2-4	CAP		
62	*A200130	SAP-600-4-11	JOINT ROD (2)		
63	*A200417	SAP-680-03-63	JOINT ROD (1)		
64	A110021	MP-HA600#1-6	CUSHION		
65	A110020	MP-HA600#1-5	LOCK KNOB		
66	A110029	MP-HA600#3-9	PARTITION PLATE		
67	A110024	MP-HA600#3-2	ROLLER(1)		
68	A110027	MP-HA600#3-7	SHAFT(1)		
69	*A200235	SAP-600-4-3	SHAFT(2)		
70	A110022	MP-HA600#3-10	MOUNTING BRACE		
71	A110023	MP-HA600#3-11	SURFACE WASHER		
72	A110026	MP-HA600#3-4	LOCK KNOB		
73	A110025	MP-HA600#3-3	ROLLER(2)		
74	*A200418	SAP-680-03-74	JOINT ASSY(C)		
80	A110013	MP-FX680-3#1	SPACER		
82	A110014	MP-FX680-3#2	MOUNTING BLOCK		

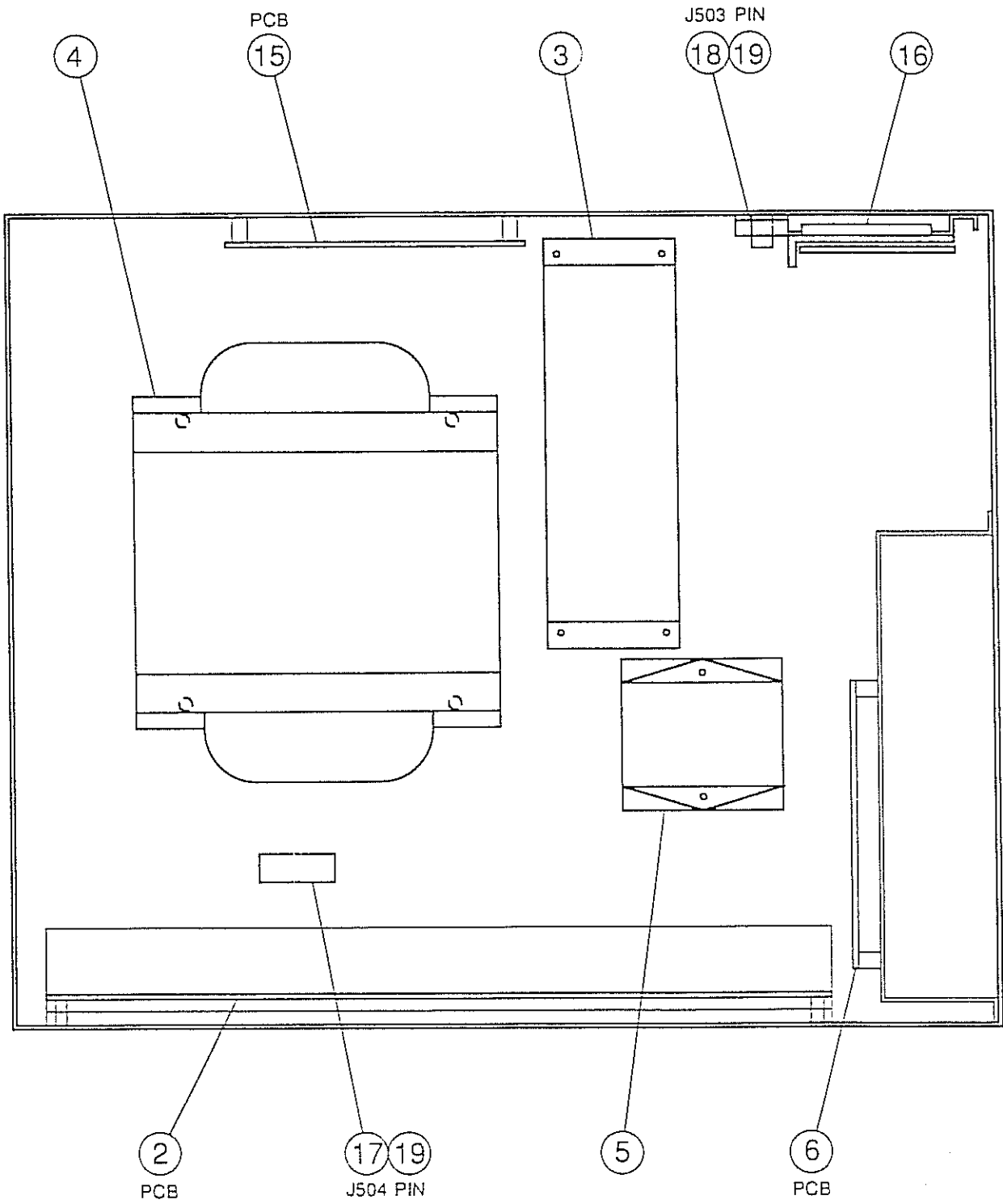
03	MACHINERY	UNIT	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
83	*A200551	SAP-680EX-03-83B	SLIDE PLATE		MP-FX680-3B
84	A140023	KS15*10A	KNOB		

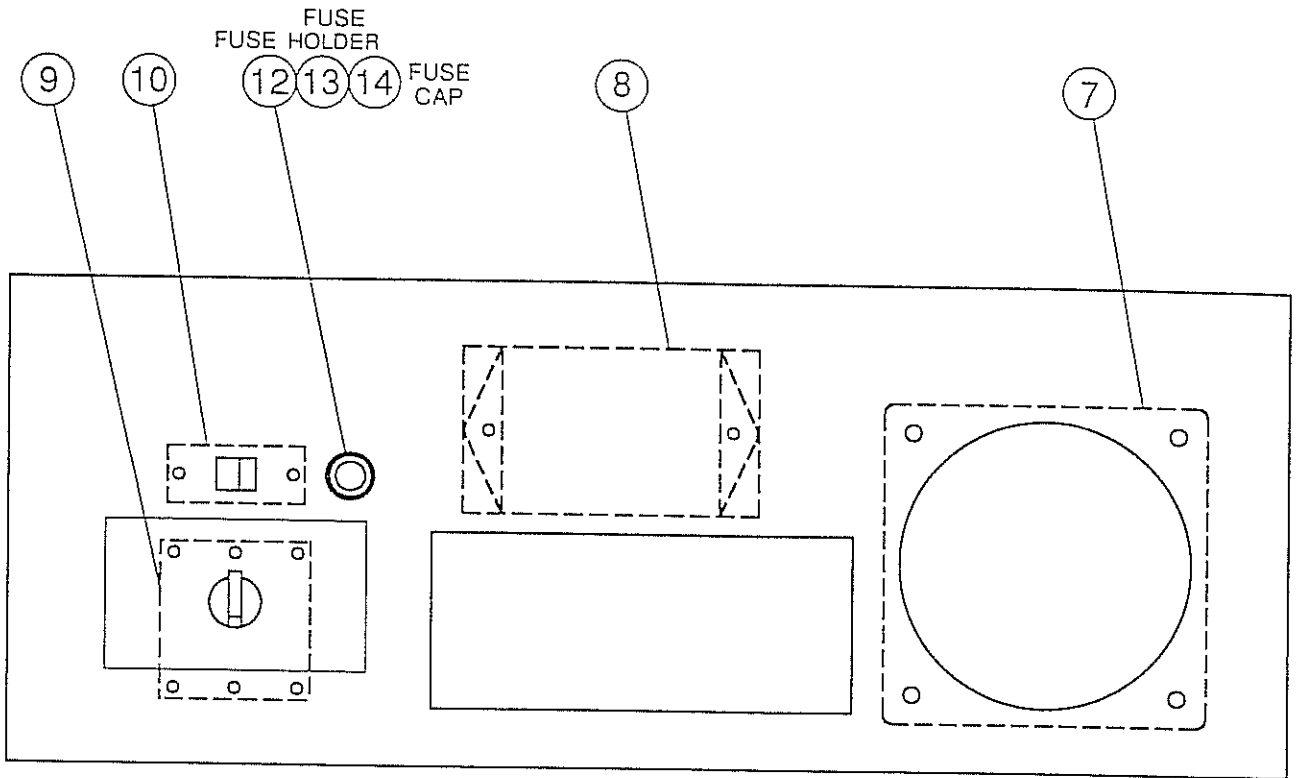
* means ASSEMBLY PARTS.
アッセンブリーパーツ :

04	POWER SUPPLY UNIT	UNIT PSU-S680C	S / N
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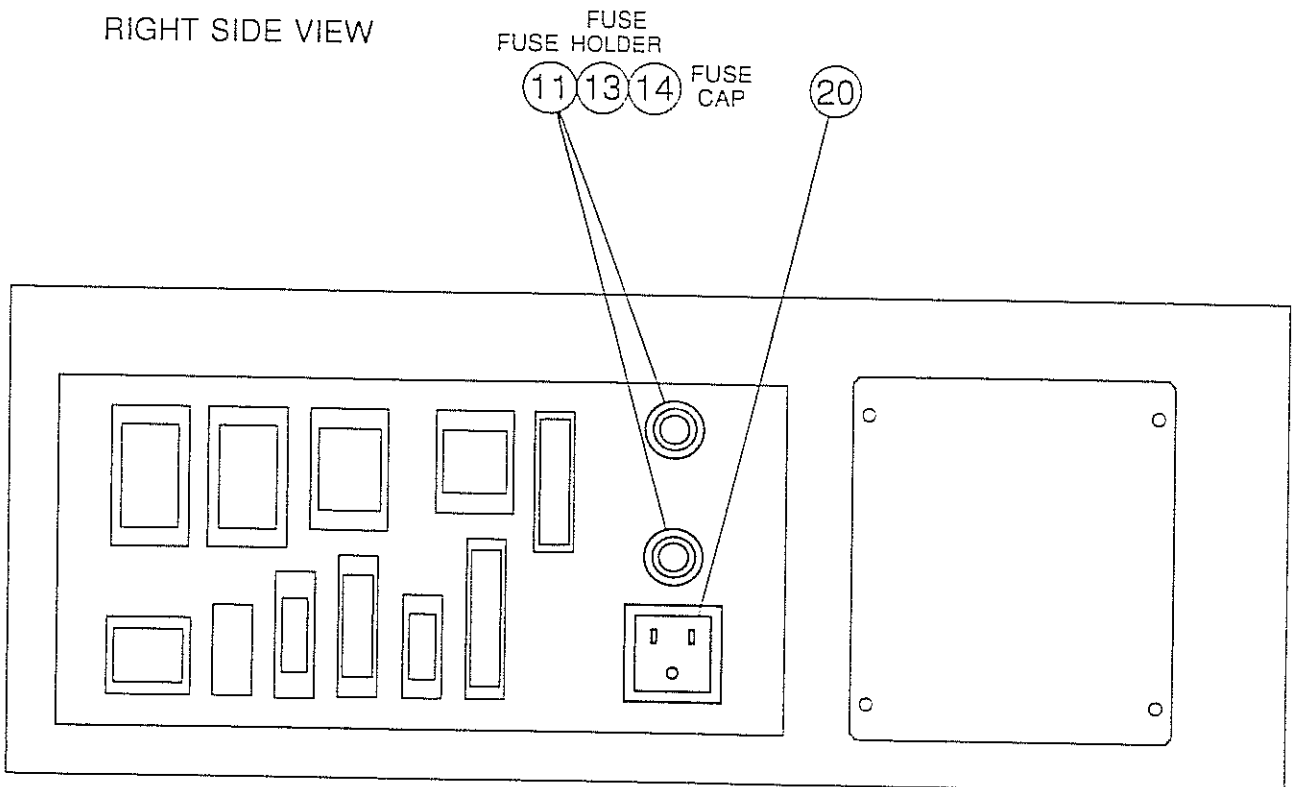
① UNIT ASSY



LEFT SIDE VIEW

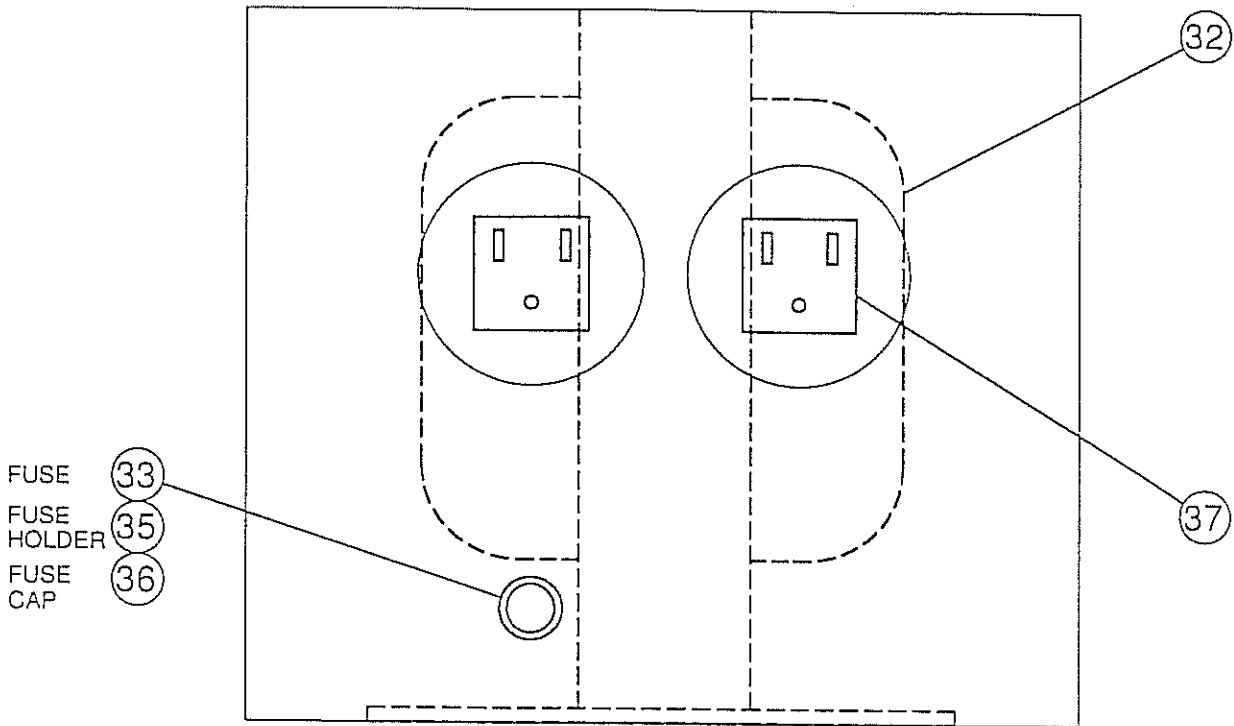


RIGHT SIDE VIEW

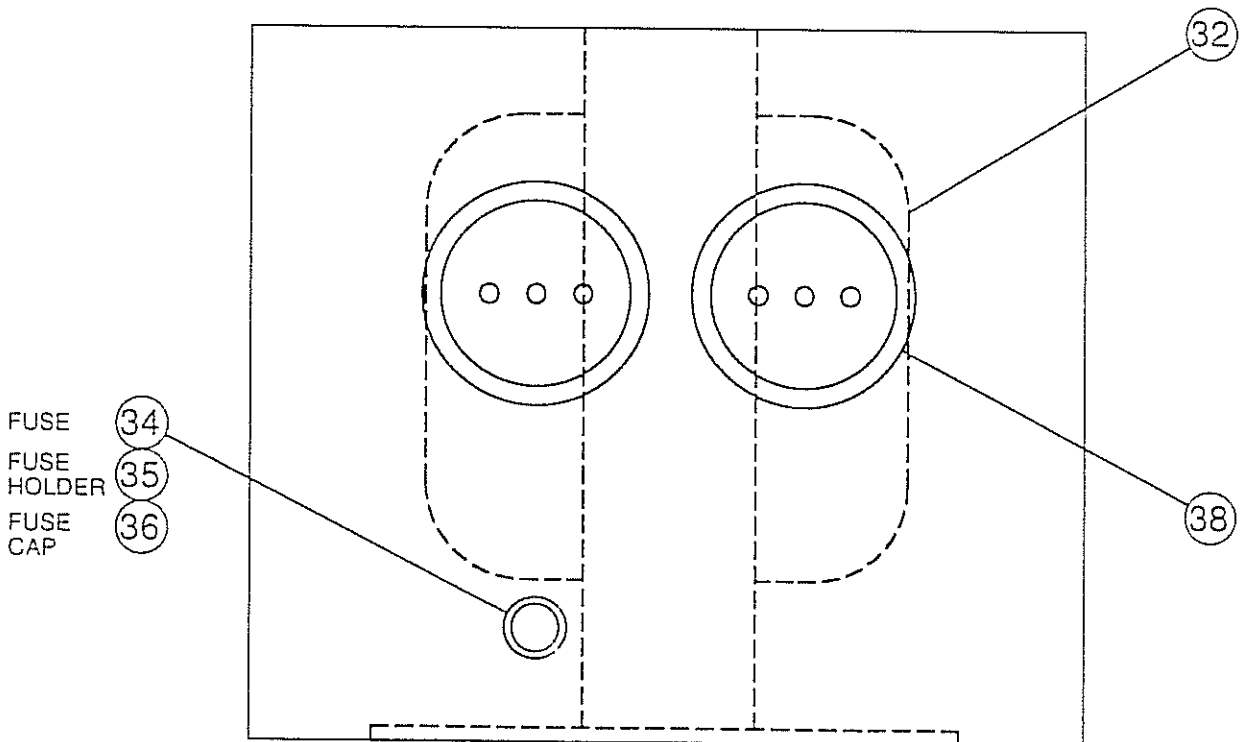


04	ISOLATION TRANSFORMER	UNIT PTU-004	S/N
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③⑩ UNIT ASSY (100V)



③⑪ UNIT ASSY (200V)



04	POWER SUPPLY UNIT	UNIT PSU-S680C	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
1	A000012	PSU-S680C	UNIT ASSY		
2	A800745	EP-3240B	PCB	~	
3	A030019	HK12-5/A	SWITCHING POWER SUPPLY	~	
4	A606028	M-T-231	ISOLATION TRANSFORMER	~	
5	A606016	MBW-1205-22	LINE FILTER	~	
6	A800989	EP-3535*	PCB	~	
7	A625021	109P0924M406	FAN	~	
8	A606017	MAS-1220-33	LINE FILTER	~	
9	A621035	UB2-XLN-111-108E-15, 108E-15,108-6	BREAKER	~	
10	A611062	SU110A-11	VOLTAGE SELECTOR	~	
11	A621049	313 002	FUSE:F2, F501	~	
12	A621050	313 001	FUSE:F502	~	
13	A621022	FEU031-1673	FUSE HOLDER	~	
14	A621023	FEK031-1661	FUSE CAP	~	
15	A801017	EP-2922*	PCB	~	
16	A030020	SSG010-15	SWITCHING POWER SUPPLY	~	
17	A601019	1-480703-0	CONNECTOR: J504	~	
18	A601015	1-480764-0	CONNECTOR: J503	~	
19	A601077	350547-1	PIN CONTACT	~	
20	A601016	AC-G10BB44	AC OUTLET	~	
30	A030001	PTU-004	ISOLATION TRANSFORMER ASSY		FOR 100V
31	A030001	PTU-004	ISOLATION TRANSFORMER ASSY		FOR 200V
32	A606034	M-T-133B	ISOLATION TRANSFORMER		

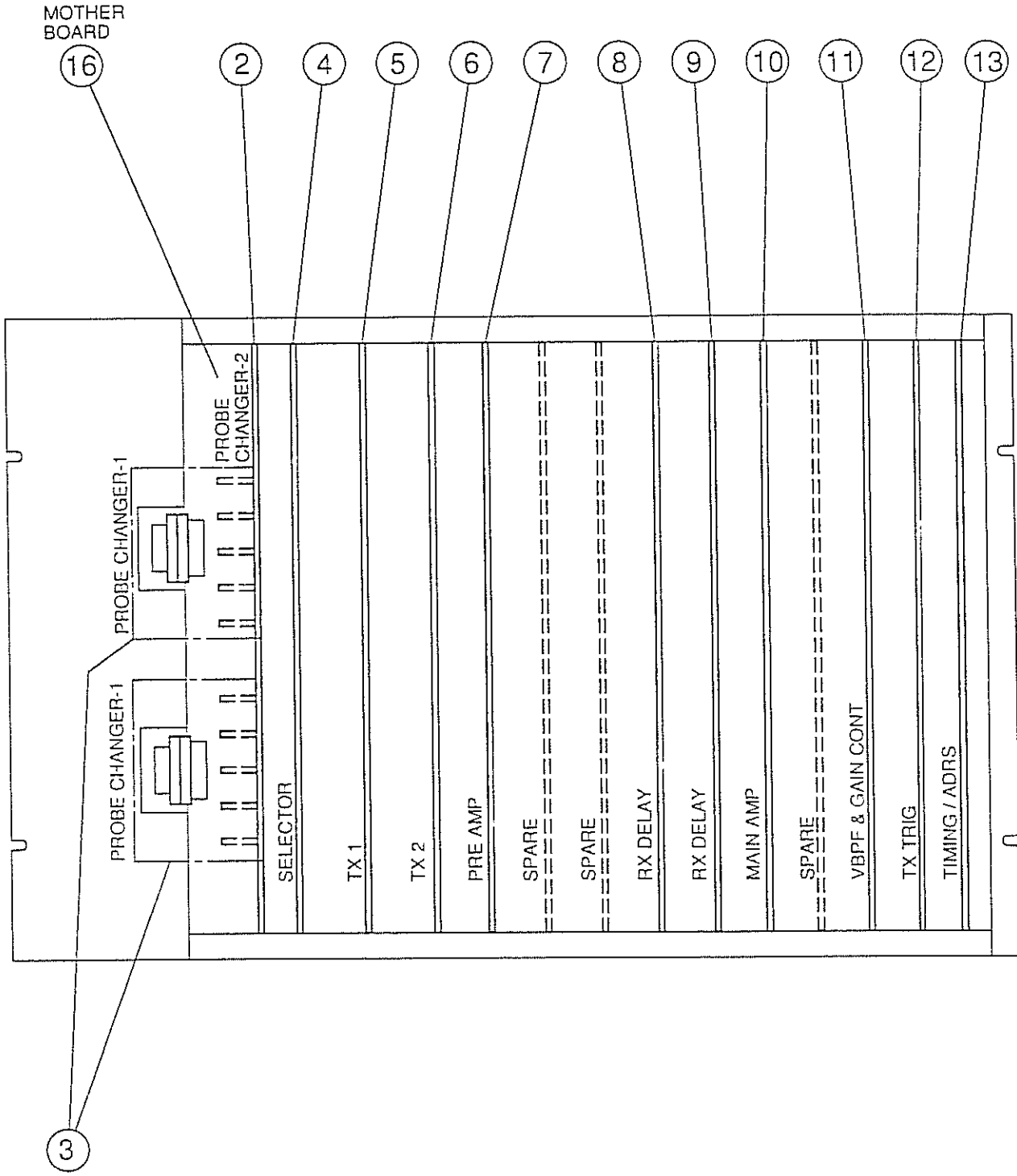
* means ASSEMBLY PARTS.
アッセンブリーパーツ

04	POWER SUPPLY UNIT	UNIT PSU-S680C	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
33	A621047	326.01 0	FUSE		FOR 100V
34	A621048	313.005	FUSE		FOR 200V
35	A621022	FEU031-1673	FUSE HOLDER		
36	A621023	FEK031-1661	FUSE CAP		
37	A601016	AC-G10BB44	AC OUTLET		FOR 100V
38	A601058	418037	AC OUTLET		FOR 200V

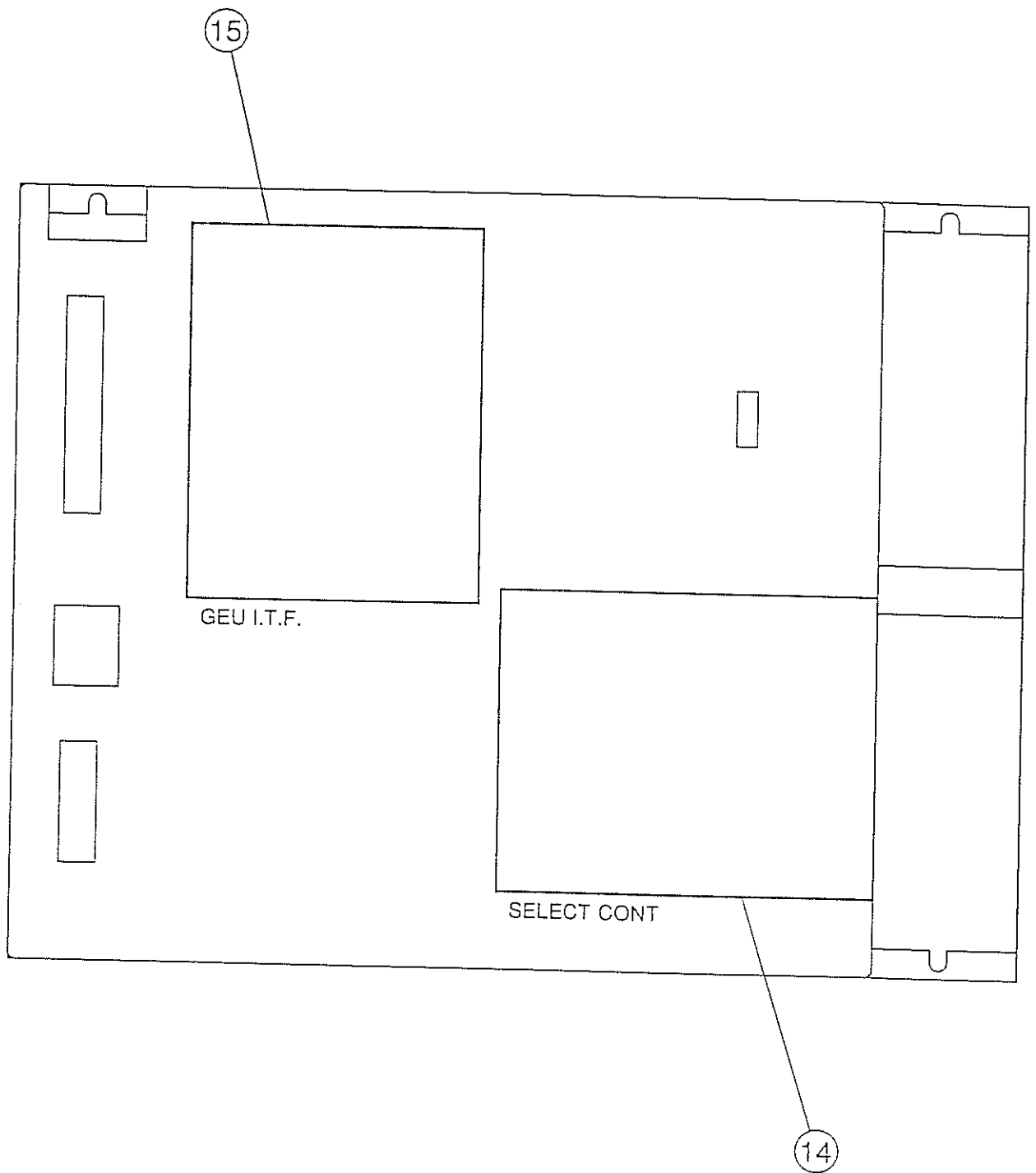
* means ASSEMBLY PARTS.
アッセンブリーパーツ

① UNIT ASSY



05	PCB UNIT	UNIT GEU-65	S/N
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MOTHER BOARD SIDE



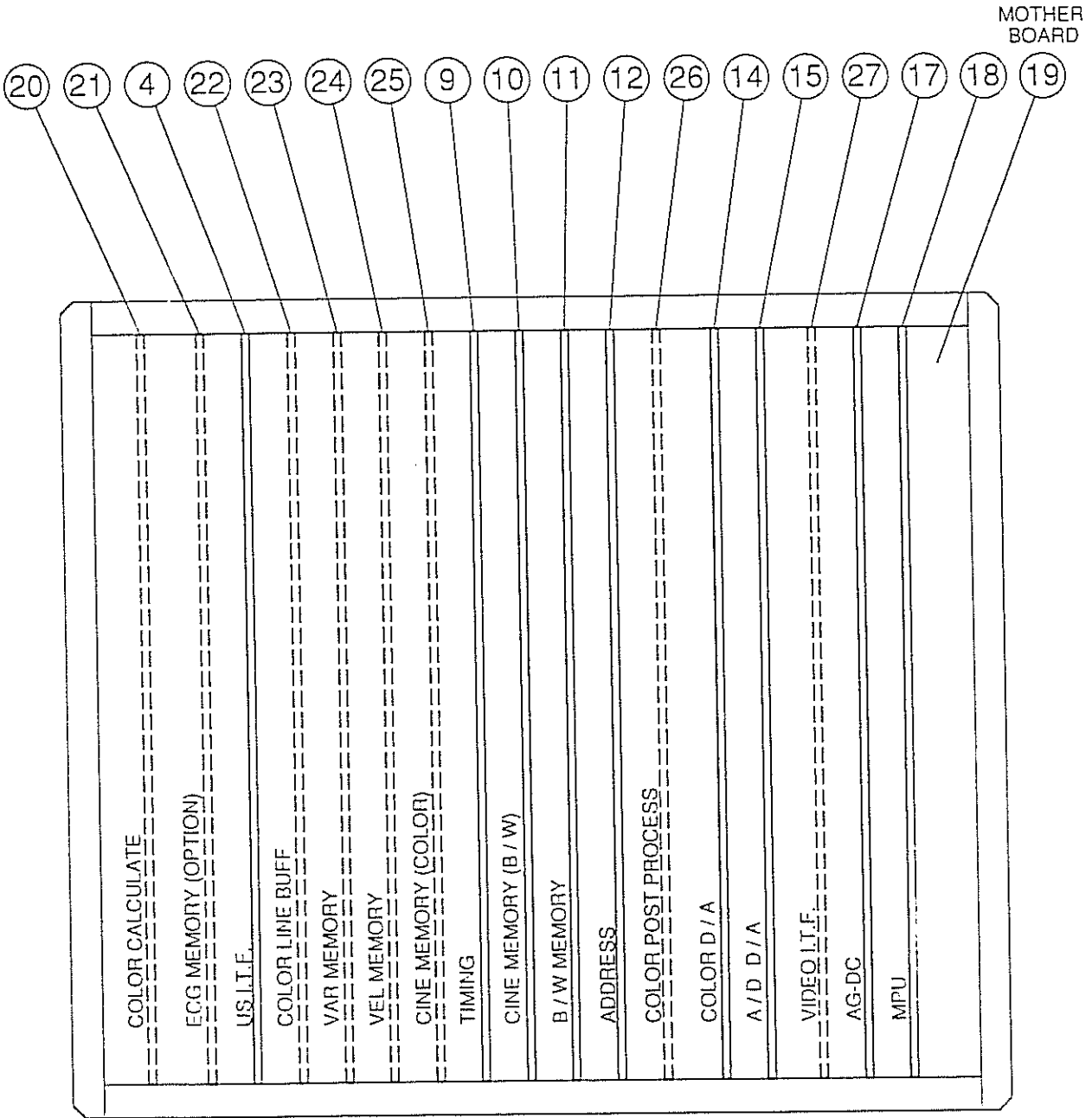
05	PCB	UNIT	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
1	A000014	GEU-65	UNIT ASSY		
2	A800950	EP-3454	PCB:PROBE CHANGER-2		
3	A800951	EP-3453 Σ	PCB:PROBE CHANGER-1		
4	A800952	EP-3455	PCB:SELECTOR		
5	A800953	EP-3456	PCB:TX 1		
6	A800954	EP-3457	PCB:TX 2		
7	A800955	EP-3458	PCB:PRE AMP		
8	A800956	EP-3459	PCB:RX DELAY		
9	A800956	EP-3459	PCB:RX DELAY		
10	A800980	EP-3461-2	PCB:MAIN AMP		
11	A800958	EP-3463	PCB:GAIN CONT		
12	A800959	EP-3464	PCB:TX TRIG		
13	A800960	EP-3465	PCB:TIMING/ADRS		
14	A800961	EP-3452	PCB:SELECT CONT		
15	A800962	EP-3525	PCB:GEU I. T. F.		
16	A800963	EP-3466	PCB:MOTHER BOARD		

* means ASSEMBLY PARTS.
アッセンブリーパーツ

06	PCB UNIT	UNIT UIM-326	S/N
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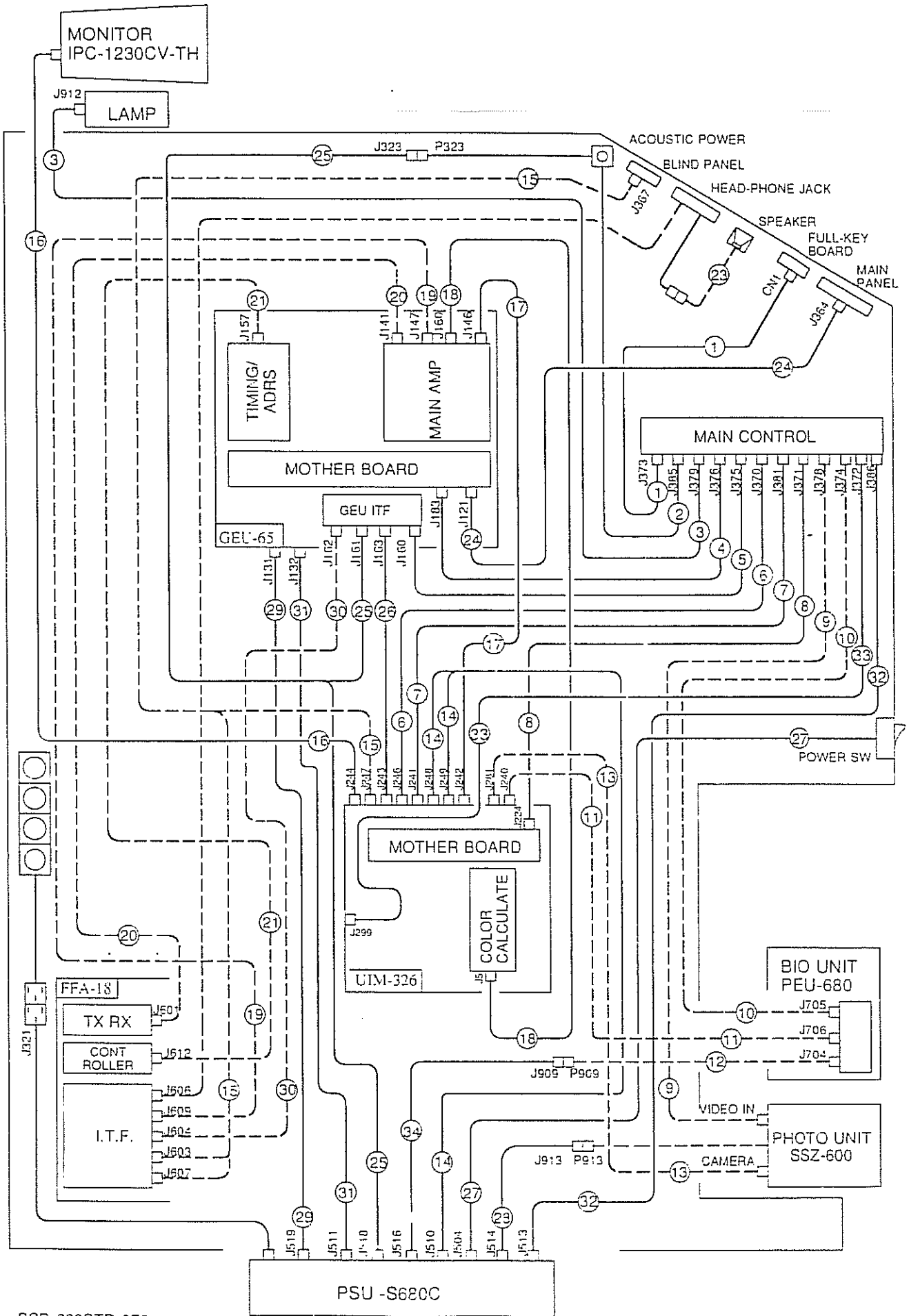
① UNIT ASSY



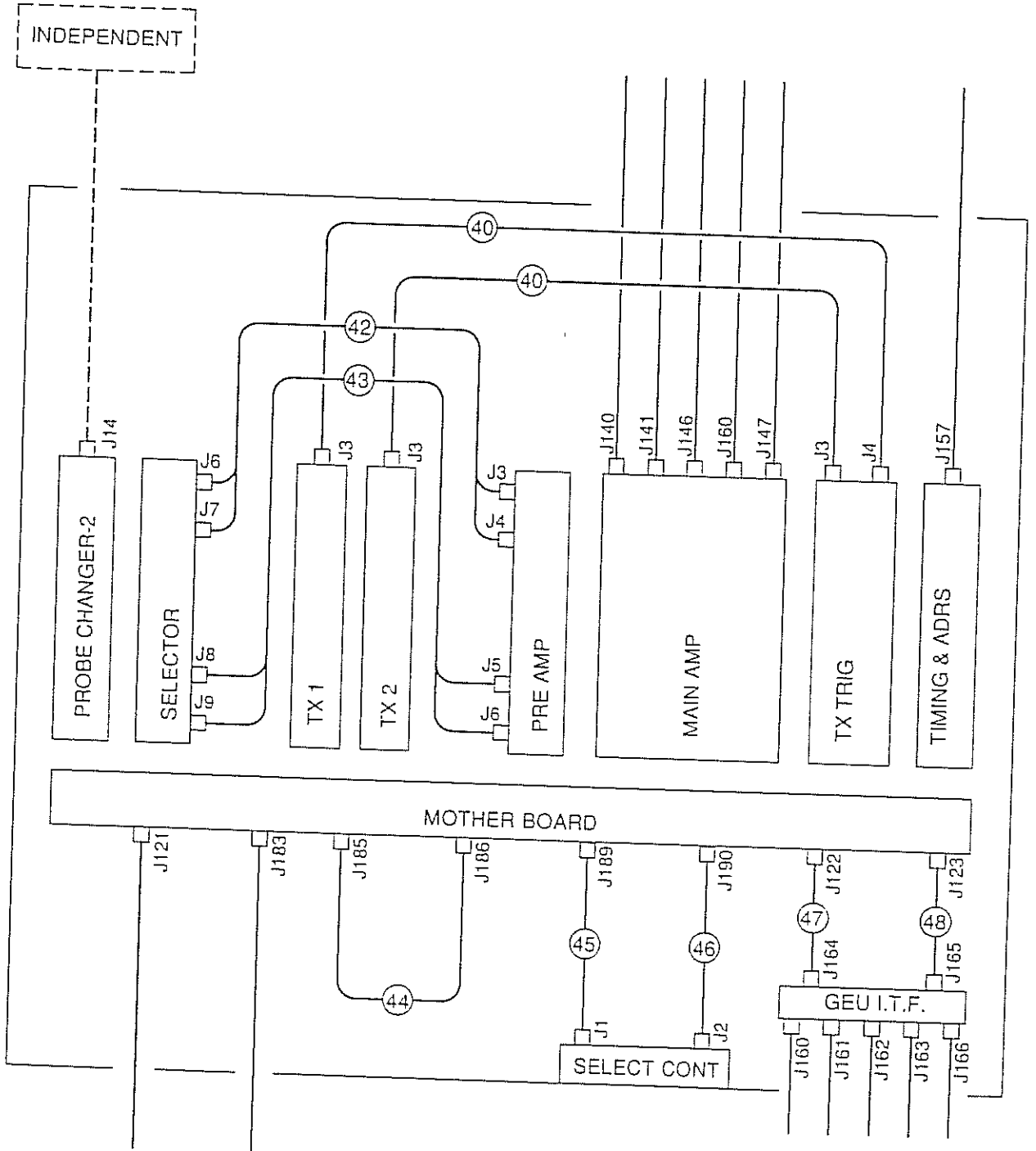
06	PCB	UNIT	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
1	A000015	UIM-326	UNIT ASSY		
4	A800966	EP-3477	PCB:US I. T. F		
9	A800969	EP-3620	PCB:TIMING		
10	A800970	EP-3237	PCB:CINE MEMO(B/W)		
11	A800971	EP-3247	PCB:B/W MEMORY		
12	A800972	EP-3236	PCB:ADDRESS		
14	A800981	EP-2651-3	PCB:COLOR D/A		
15	A800982	EP-2729-7	PCB:A/D D/A		
17	A800929	EP-2629	PCB:AG-DC		
18	A800983	EP-2913	PCB:MPU		
19	A800974	EP-3467	PCB:MOTHER BOARD		
20	A800965	EP-5100	PCB:COLOR CALCULATE		FOR CFM-680
21	A800975	EP-2841	PCB:ECG MEMORY		FOR PEU-680B(O
22	A800150	EP-3115	PCB:COLOR LINE BUFF		FOR CFM-680
23	A800967	EP-2213-1	PCB:VAR MEMORY		FOR CFM-680
24	A800149	EP-2213	PCB:VEL MEMORY		FOR CFM-680
25	A800968	EP-3238	PCB:CINE MEMO(COLOR)		FOR CFM-680
26	A800152	EP-3114	PCB:COLOR POST PROCES		FOR CFM-680
27	A800984	EP-3443-1	PCB:VIDEO I. T. F.		FOR CFM-680(PA
27	A800985	EP-3443-2	PCB:VIDEO I. T. F.		FOR CFM-680(NT

* means ASSEMBLY PARTS.
アッセンブリーパーツ

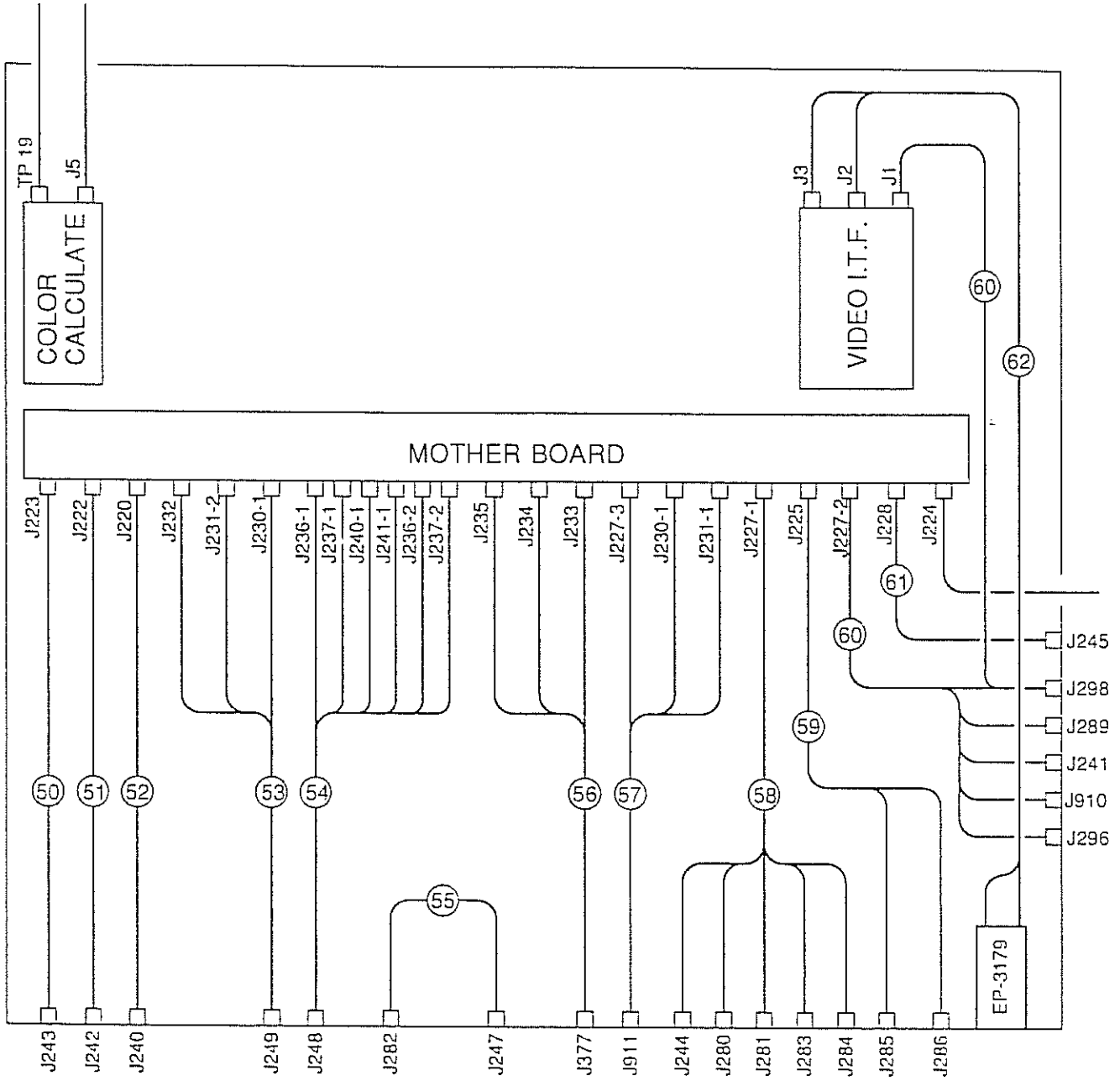


TX / RX UNIT : GEU-65



07	CABLE	UNIT UIM-326	S : N
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DSC UNIT : UIM-326



07	CABLE	UNIT	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
1	A800213	CO-PSC108-L-06	CABLE: J373-CN1	~	
2	A800991	CO-PSC-108-D-09	CABLE: J385-J323, ACOUSTIC POWER	~	
3	A800992	CO-PSC118-A 12	CABLE: J379-J912, LAMP	~	
4	A800993	CO-GEU64-J05	CABLE: J183-J376	~	
5	A800994	CO-GEU64-G04	CABLE: J375-J160	~	
6	A800216	CO-PSC108-P-08	CABLE: J370-J246	~	
7	A800215	CO-PSC108-F-08	CABLE: J381-J241	~	
8	A800995	CO-PSC108-J-08B	CABLE: J371-J224	~	
9	A800218	CO-PSC108-E-15	CABLE: J378-P700, CAMERA	~	
10	A800996	CO-PSC-108-K-04	CABLE: J705-J374	~	
11	A800997	CO-PSC-108-M-08	CABLE: J706-J240	~	
12	A800225	CO-PEU680-A-02	CABLE: J704-P909	~	
13	A800227	CO-PSC108-Q-05	CABLE: J281-J703, VIDEO IN	~	
14	A800998	CO-L-PS-40-F-07	CABLE: J510-J248, J249	~	
15	A800223	CO-PSC108-S-18	CABLE: J603-J367, 247-J607	~	
16	*A200560	L-CABLE301-16	CABLE: J244-P1000, MONITOR	~	
17	A800999	CO-GEU64-S-10	CABLE: J242-J146	~	
18	A801000	CO-GEU64-F05	CABLE: J5-J160	~	
19	A800799	CO-GEU50-K-10	CABLE: J147-J609	~	
20	A800798	CO-GEU50-J-08	CABLE: J601-J141	~	
21	A800234	CO-GEU50-N-10	CABLE: J612-J157	~	
23	A801001	CO-PSC108-H08	CABLE: J342-SPEAKER	~	
24	A801002	CO-GEU50-W-08	CABLE: J364-J121	~	

* means ASSEMBLY PARTS.
アッセンブリーパーツ

07	CABLE	UNIT	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
25	A800797	CO-PSC-108-A-13	CABLE: J518-J161, J323	~	
26	A801018	CO-GEU-50Y-04	CABLE: J163-J243		
27	A801003	CO-LPS-40-E-14	CABLE: J504-S300, SW	~	
28	A800228	CO-LPS40-H-10	CABLE: J913-J514	~	
29	A801004	CO-LPS-40-G-12	CABLE: J519-J131	~	
30	*A200561	L-CABLE-177-11	CABLE: J604-J162	~	
31	A801005	CO-LPS-40-B-13	CABLE: J511-J132		
32	A800217	CO-LPS40-A-12	CABLE: J386-J513	~	
33	*A200552	L-CABLE-341	CABLE: J299-J372		
34	A800226	CO-LPS40-D-12	CABLE: J909-J516	~	
40	*A200562	L-CABLE-392	CABLE: J3-J4, J3-J3	~	
42	A801006	CO-GEU64-A05	CABLE: J6, J7-J3, J4	~	
43	A801007	CO-GEU64-B05	CABLE: J8, J9-J5, J6	~	
44	A801008	CO-GEU64-M01	CABLE: J185-J186	~	
45	A801009	CO-GEU64-Q02	CABLE: J1-J189	~	
46	A801010	CO-GEU64-R02	CABLE: J2-J190	~	
47	A801011	CO-GEU64-K04	CABLE: J122-J164	~	
48	A801012	CO-GEU64-L04	CABLE: J123-J165	~	
50	A800804	CO-UIM324-D-05	CABLE: J223-J243	~	
51	A800803	CO-UIM324-C-04	CABLE: J222-J242	~	
52	A800801	CO-UIM324-A-04	CABLE: J220-J240	~	
53	A800810	CO-UIM324-J-04	CABLE: J249-J230-2, J231-2, J232	~	
54	A800809	CO-UIM324-I-04	CABLE: J248-J236, J237-2, J236-1, J237-1, J240-1, J241-1	~	

* means ASSEMBLY PARTS.
アセンブリパーツ

07	CABLE	UNIT	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
55	A800812	CO-U1M324-M-03B	CABLE: J247-J282	~	
56	A801013	CO-U1M325-A-04	CABLE: J377-J233, J234, J235	~	
57	A800246	CO-U1M324-O-08	CABLE: J911, J231-1, J230-1, J227-3	~	
58	A801014	CO-U1M324-L-06C	CABLE: J227-1-J280, J281, J283, J284, J244	~	
59	A800805	CO-U1M324-E-04	CABLE: J225-J286, J285	~	
60	A800815	CO-U1M324-N-04B	CABLE: J241-J910, J289, J-298, J1, J277-2, J296	~	
61	*A200563	L-CABLE-175	CABLE: J228-J245	~	
62	A800816	CO-U1M324-P-05	CABLE: J3, J2-EP-3179	~	

* means ASSEMBLY PARTS.
アッセンブリーパーツ

08	SCREWS & SMALL PARTS	UNIT	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
	A341254	3T2. 5#4	SCREW HEXAGONAL:3T2. 5#4		
	A341304	3T3#4	SCREW HEXAGONAL:3T3#4		
	A341408	3T4#8	SCREW HEXAGONAL:3T4#8		
	A301306	ANK3#6	SCREW:ANK3#6		
	A301308	ANK3#8	SCREW:ANK3#8		
	A301418	ANK4#18	SCREW:ANK4#18		
	A140092	ARC-68-A-14	CABLECLAMP:INDEX 03		
	A342616	B6#16	BOLT HEXAGONAL:B6#16		
	A342620	B6#20	BOLT HEXAGONAL:B6#20		
	A342820	B8#20	BOLT HEXAGONAL:B8#20		
	A316306	BK3#6	SCREW:BK3#6		
	A303310	BNK3#10	SCREW:BNK3#10		
	A304316	BNK3#16Bs	SCREW:BNK3#16Bs		
	A303320	BNK3#20	SCREW:BNK3#20		
	A303330	BNK3#30	SCREW:BNK3#30		
	A303306	BNK3#6	SCREW:BNK3#6		
	A304306	BNK3#6Bs	SCREW:BNK3#6Bs		
	A303308	BNK3#8	SCREW:BNK3#8		
	A304308	BNK3#8Bs	SCREW:BNK3#8Bs		
	A303412	BNK4#12	SCREW:BNK4#12		
	A304408	BNK4#8Bs	SCREW:BNK4#8Bs		
	A140089	CKN-07	CABLECLAMP:INDEX 01		
	A306306	CNK3#6	SCREW:CNK3#6		

* means ASSEMBLY PARTS.
アッセンブリーパーツ

08	SCREWS & SMALL PARTS	UNIT	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
	A306308	CNK3*8	SCREW:CNK3*8		
	A305308	CNK3*8Bs	SCREW:CNK3*8Bs		
	A306410	CNK4*10	SCREW:CNK4*10		
	A306425	CNK4*25	SCREW:CNK4*25		
	A306408	CNK4*8	SCREW:CNK4*8		
	A140093	CV-100	CABLECLAMP:INDEX 05		
	A140094	CV-200	CABLECLAMP:INDEX 05, 06		
	A622007	FCN3010	CABLECLAMP:INDEX 05		
	A347406	HB4*6	SCREW:HB4*6		
	A347516	HB5*16	SCREW:HB5*16		
	A140095	KD-3N	CABLECLAMP:INDEX 04		
	A140065	KD-6N	CABLECLAMP:INDEX 05, 04		
	A381103	N3	NUT HEXAGONAL:N3		
	A381703	N3Bs	NUT HEXAGONAL:N3Bs		
	A381104	N4	NUT HEXAGONAL:N4		
	A381105	N6	NUT HEXAGONAL:N6		
	A311310	NK3*10	SCREW:NK3*10		
	A312310	NK3*10Bs	SCREW:NK3*10Bs		
	A311312	NK3*12	SCREW:NK3*12		
	A312312	NK3*12Bs	SCREW:NK3*12Bs		
	A311316	NK3*16	SCREW:NK3*16		
	A311325	NK3*25	SCREW:NK3*25		
	A311305	NK3*5	SCREW:NK3*5		

* means ASSEMBLY PARTS.
アッセンブリーパーツ

08	SCREWS & SMALL PARTS	UNIT	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
	A311308	NK3*8	SCREW:NK3*8		
	A383203	PW3	WASHER:PW3		
	A383204	PW4	WASHER:PW4		
	A321310	S3*10	SCREW FLAT HEAD:S3*10		
	A322310	S3*10Bs	SCREW FLAT HEAD:S3*10Bs		
	A321312	S3*12	SCREW FLAT HEAD:S3*12		
	A322316	S3*16Bs	SCREW FLAT HEAD:S3*16Bs		
	A321325	S3*25	SCREW FLAT HEAD:S3*25		
	A321330	S3*30	SCREW FLAT HEAD:S3*30		
	A321306	S3*6	SCREW FLAT HEAD:S3*6		
	A322306	S3*6Bs	SCREW FLAT HEAD:S3*6Bs		
	A321308	S3*8	SCREW FLAT HEAD:S3*8		
	A322308	S3*8Bs	SCREW FLAT HEAD:S3*8Bs		
	A321410	S4*10	SCREW FLAT HEAD:S4*10		
	A321412	S4*12	SCREW FLAT HEAD:S4*12		
	A321415	S4*15	SCREW FLAT HEAD:S4*15		
	A321406	S4*6	SCREW FLAT HEAD:S4*6		
	A321408	S4*8	SCREW FLAT HEAD:S4*8		
	A383303	SW3	WASHER:SW3		
	A384003	SW3Bs	WASHER:SW3Bs		
	A383304	SW4	WASHER:SW4		
	A383305	SW5	WASHER:SW5		
	A383306	SW6	WASHER:SW6		

* means ASSEMBLY PARTS.
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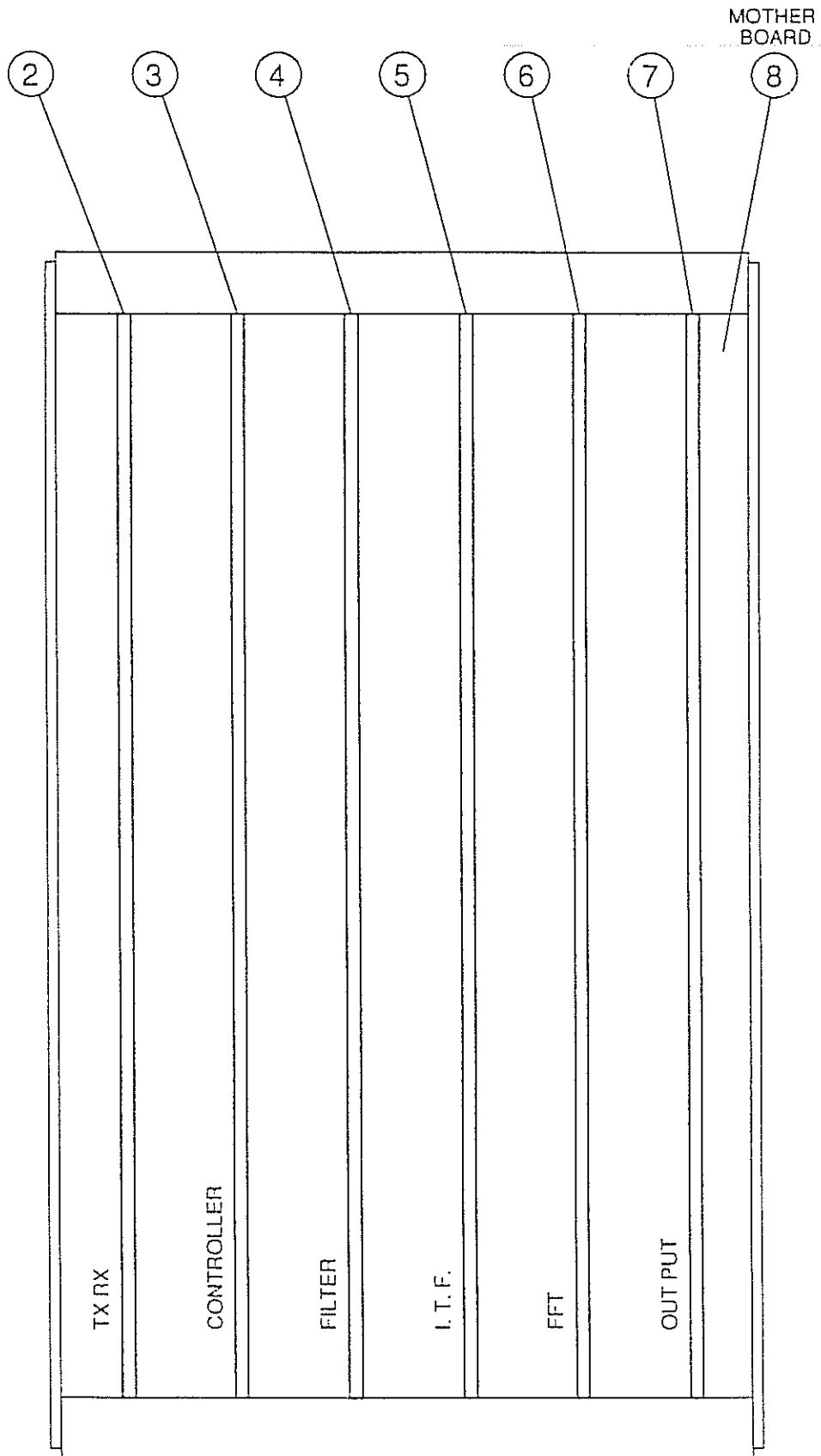
08	SCREWS & SMALL PARTS	UNIT	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
	A140091	TR-16-8-16	CABLECLAMP:INDEX 01		
	A140090	TRCC-23-11-14	CABLECLAMP:INDEX 01, 03		
	A622000	UL-13	CABLECLAMP:INDEX 01, 05		
	A622001	UL-23	CABLECLAMP:INDEX 01		
	A383112	W12	WASHER:W12		
	A383103	W3	WASHER:W3		
	A383105	W5	WASHER:W5		
	A381306	W6	WASHER:W6		

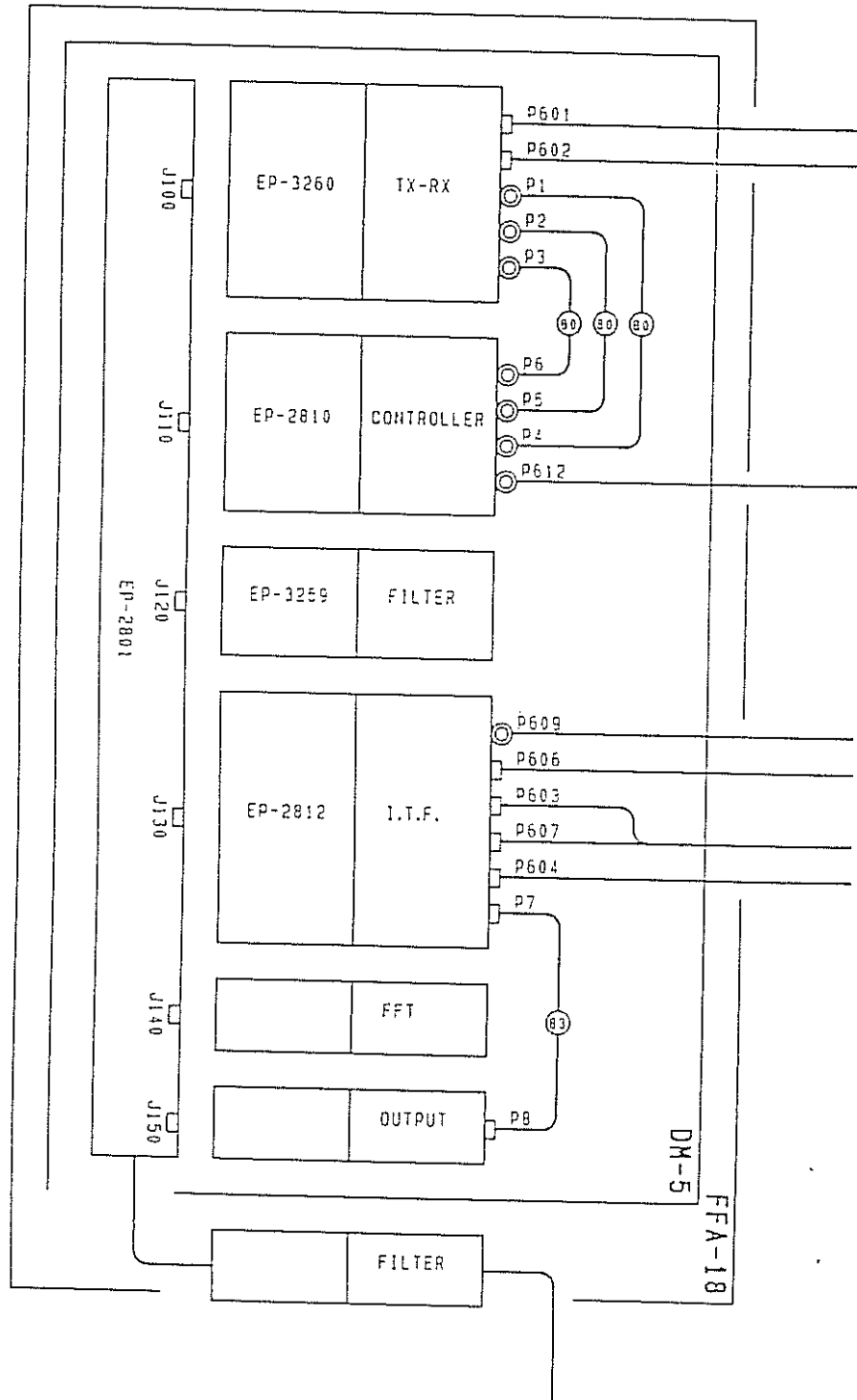
* means ASSEMBLY PARTS.
アッセンブリーパーツ

09	PCB UNIT	UNIT UGR-680	S/N
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① UNIT ASSY



DOPPLER UNIT
UGR-680



09	DOPPLER UNIT	UNIT UGR-680	S/N
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ITEM	CODE NO.	PARTS NO.	DESCRIPTION	SERIAL NO.	SPEC.
1	A800976	UGR-680	UNIT ASSY		
2	A800977	EP-3260	PCB:TX, RX		
3	A800986	EP-2810-3	PCB:CONTROLLER		
4	A800978	EP-3259	PCB:FILTER		
5	A800941	EP-2812	PCB:I. T. F.		
6	A650003	NJK-196A-FFT	PCB:FFT BOARD		
7	A800990	NJK-196A-OUT PUT	PCB:OUT PUT BOARD		
8	A800178	EP-2808	PCB:MOTHER BOARD		
80	A800207	NCS-3305	CABLE:J1-J4, J2-J5, J3-J6	~	
83	A800208	L-CABLE-222-06	CABLE:J7-J8	~	

* means ASSEMBLY PARTS.
アッセンブリーパーツ

14-1 Outline of system

14-1-1 Features

In addition to high quality of black/white image, the flow of blood is displayed in color at high sensitivity. At the same time of blood flow display in color, analysis of blood flow velocity can be made by the conventional doppler spectrum method. Compact and light-weight color-doppler equipment for abdominal use. It is the very convenient equipment with color-doppler, suited for general clinical examinations.

14-1-2 Main applications

General abdominal examinations

For observing blood flow in the liver and peripheral blood vessels.

General obstetric and gynecologic examinations

For observing blood flow in the uterus and/or fetus.

General urogenital examinations

For observing blood flow in the kidney.

Peripheral vessel examinations

For observing blood flow in carotid artery and jugular vein, hands and feet.

Others

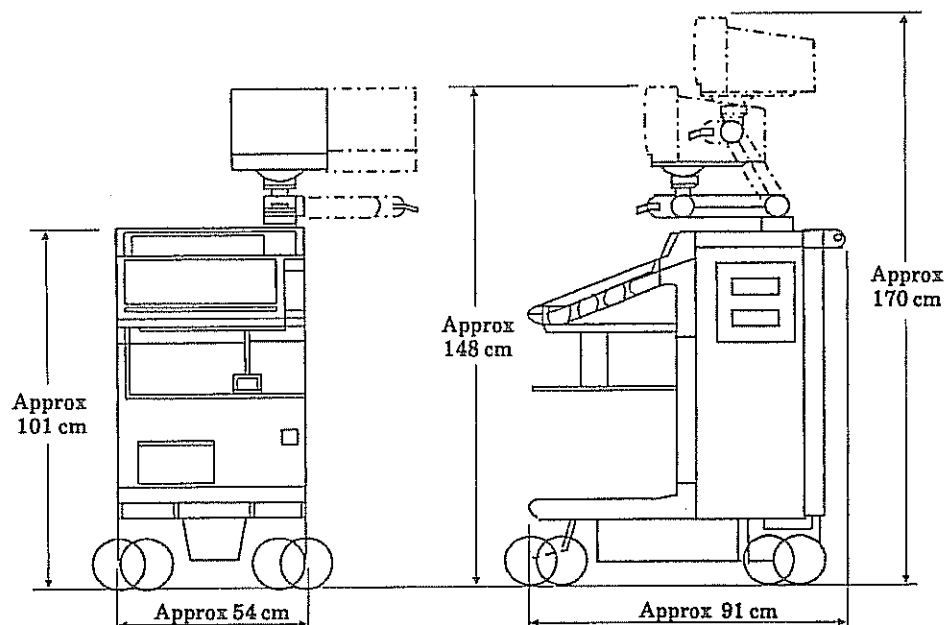
For examinations during operation, for the trans-eshophageal examinations, etc.

14-1-3 Type

Type and grade of protection against electrical shocks

Class I, BF type

14-1-4 Dimensions



14-2 System Components

Standard Components

Main unit	SSD-680EX (incl. Monitor IPC-1010 (NTSC) or IPC-1010V (PAL))
Probe	UST-959-3.5 (Electronic convex probe) <small>Abdominal region use, Visual field 60°, Curvature 60R</small>
Isolation transformer	PTU-004

Optional Accessories

B/W monitor	DIS-4 (incl. following components) 1) IP-1230B-TH(NTSC) or IP-1230BV-TH(PAL) 2) Mounting arm 1 set
ECG signal display unit	PEU-680B (incl. following components) 1) Body : EU-5026 2) PCB : EP-2841* 3) Cables
B/W camera	SSZ-600BU (for NTSC) SSZ-600BUV (for PAL) (-P : POLAROID, -35 ; 35mm camera)
B/W printer	SSZ-305 (100~120V) SSZ-305E (200~240V)
Color camera	SSZ-203 (-PA : Polaroid Auto, -FA : Fuji, -P : Polaroid Manual, -35 : mm camera)
Color Echo Copier	SSZ-700 (NTSC) SSZ-700E (PAL) Fixture : MP-2728
Multi format camera	SSZ-111
Foot switch	MP-2614

Optional probes

Electronic convex sector probes

- UST-958-7.5 Peripheral Vascular
- UST-960-5 Pediatric abdomen
- UST-961-5 Neurosurgery
- UST-962-5 Transesophageal
- UST-964P-5 OB/GYN/IVF (Transvaginal)
- UST-965-3.5 Heart
- UST-966-3.5 Abdomen, OB/GYN, Heart
- UST-967-5 Neonatal head
- UST-968P-5 Neurosurgery (burr-hole puncture)
- UST-969-5 Neurosurgery
- UST-970-7.5 Neurosurgery, Peripheral Vascular
- UST-667P-5 End-fire transrectal puncture

Electronic linear probes

- UST-5042-3.5 General abdomen
- UST-5043P-3.5 Puncture
- UST-5518-7.5 Peripheral Vascular
- UST-5525-7.5 Steered linear for Peripheral Vascular
- UST-5817-5 Pediatrics
- UST-576T-7.5 Intraoperative (T-shape)
- UST-577-7.5 Small part
- UST-5523-7.5 Laparoscopic

Electronic Convex sector / Linear probe

- UST-666-5/7.5 Prostate (Transrectal/ bi-plane)

Independent CW Doppler probe

- UST-2262-2 CW spectral Doppler

15-1 Specification

- | | | |
|---|--|---|
| 1 | Power supply | 100V (50/60Hz), 115V (50/60Hz), 220V (50/60Hz)
1000VA maximum |
| 2 | Weight | Approx. 155 kg |
| 3 | Viewing monitor | 10" color TV monitor (R, G, B input) |
| 4 | Scanning method | Linear electronic scan
Convex electronic scan
Independent (for CW) |
| 5 | Number of probes attachable simultaneously | 2 probes + Independent |
| 6 | Image display | B, 2B, 3B, 4B and respective blood flows displayed in color
B/M, B/D, B flow/D (simultaneous and alternate display)
M, D |
| 7 | Transmit/Receive unit | |
| a | Number of circuits | Max. 120 |
| b | Number of blocks oscillated simultaneously | Max. 48 |
| c | Transmitting method | B/W picture : Single
Color, doppler : Burst for color line and PW doppler
(Single for B/W line) |
| d | Focus | Electronic focus (Tx. 4 stages, Rx. 16 stages) |
| 8 | Image memory | 512×512×6bit <u>×3</u> (for B/W image, Velocity, and Variance use)
and Cine memory |
| 9 | External output | Four B/W composite outputs
Two R, G, B, SYNC outputs
Two NTSC or PAL outputs
One doppler sound audio output
One Y/C output for S-VHS VTR
One RS232C output |

10 Functions

- 1) General matters of image display
 - a Polarity of image Positive/negative reversible(for M and Doppler image only)
 - b Direction of displayed image Changeable in UP/DWN and RIGHT/LEFT directions
 - c Automatic display information
 - Name of hospital
 - Date and time
 - * Probe frequency
 - * B/W gain (B)
 - * Transmission power (Rate indicated)
 - * Contrast (B, M)
 - Number of B-picture frames (Color mode only)
 - Active mark
 - Direction mark
 - Position location (when position is shifted)
 - Display scale marks (Vertical & horizontal marks at 1 cm or 5 cm steps)
 - Focus information (Set value and depth)
 - * Maximum doppler velocity (Doppler mode only, corrected angle value)
 - Velocity marks (Doppler mode only, at 10 cm/s or 50 cm/s steps)
 - Time mark (M or doppler mode only, at 0.5 sec steps)
 - Doppler incidence angle (When setting of angle)
 - Spectrum invert (when invert is made)
 - Maximum color flow velocity (Color mode only)
 - R-wave delay (when setting of synchronism of heartbeats)
 - Heart rate (when ECG signal is input)
 - Gray scale bar
 - Color bar (Flow mode only)
 - * mark items can be erased.
 - d ID display Max. 8 characters × 4 lines (NTSC)
Max. 19 characters × 2 lines (PAL)
 - e Comment display Max. 52 characters × 32 lines (NTSC)
Max. 44 characters × 32 lines (PAL)
 - f Auxiliary display Body marks

ABDOMEN	4 marks
OB/GY	7 marks
HEAD	5 marks
BREAST	3 marks

 Selectable marks for sample picture
 Selectable by trackball

 Puncture Guide line 1-line display (correspondence to each angle)
 - g Word display

ABDOMEN	10 words
(ANOTATION) OB/GY	10 words
PV	10 words
Other	10 words

 All words are those of registered by the user.

- h PRESET 5 kinds of preset can be set up by the user.
Maximum four of probes specified for each preset can be selected.
Giving priority to measurements and voluntary arrangement of them possible.
- 2) B/W image adjustments
- a GAIN Continuously variable with volume (B and M independent)
 - b STC 11-stage slide volume (B and M in common)
 - c CONTRAST 7-stage rotary switch (B and M independent)
 - d AGC Continuously variable with volume (B and M independent)
 - e PRE-PROCESS 4 stages (B and M in common)
 - f POST-PROCESS 4 stages (B and M in common)
 - g Frame correlation OFF / LOW / HIGH selectable
 - h Magnifying power of display $\times 0.75, \times 1, \times 1.5, \times 2$ (B and flow in common)
 - i Zoom function Maximum $\times 2$ (1B and 1B flow only)
For M, maximum $\times 2$ by WINDOW magnification possible.
 - j Shift of POSITION B and M (Impossible during flow)
 - k ECHO ERASE M only
 - l FTC B and M
 - m Sweep Speed 4 stages (M and DOP in common)
 - n GAMMA Monitor (View gamma) 3 types, Camera (Photo gamma) 3 types
- 3) Color image adjustments
- Pre-process
- a GAIN Continuously variable with volume
 - b Magnifying power $\times 0.75, \times 1, \times 1.5, \times 2$ (B and flow in common)
 - c Speed range ± 3 cm/s (7MHz, PRF 0.5kHz)
to ± 131 cm/s (3.5MHz, PRF 12kHz)
 - d PRF 0.5, 0.75, 1, 1.25, 1.5, 2, 3, 4, 6, 8, 12kHz
 - e AVERAGE LOW (8 times), MID (12 times), HIGH (14 times)
HORI (8times) selectable
 - f WALL FILTER LOW / MID1 / MID2 / HIGH selectable
 - g Frame correlation OFF / LOW / MID / HIGH selectable
 - h Zoom function Maximum $\times 2$
 - i Display area selection Selection of 25%, 35%, 50%, or 80% against B/W display area is possible. Shifting the display area right or left and trimming the bottom side possible.
Color display area is able to follow up PW sample volume.
 - j Spacial filter OFF / LOW / MID / HIGH selectable
 - k Line density 2 types
 - l Application selection 2 types (abdominal and cardiac use)
- Post-process
- m Selection of display color Velocity dispersion indication 2 types
Velocity emphasis indication 2 types (Enhance 5 types)
Dispersion indication
 - n EDGE process Giving priority to B/W display or to color display
 - o REJECT Maximum 15/31 levels (common to toward flow and away flow)

- 4) Doppler image adjustments
 - a Indication Power spectrum only
 - b GAIN Continuously variable with volume (AGC action)
 - c PW velocity range ± 5 cm/s (7MHz, PRF 1kHz)
to ± 273 cm/s (3.5MHz, PRF 25kHz)
Automatically set to HPRF mode.
 - d CW speed range up to approx. 10 m/s
 - e WALL FILTER 50, 100, 200, 400, 800Hz
 - f SAMPLE VOLUME 1, 2, 3, 5, 10mm (PW only)
 - g PRE-COMP 4 stages
 - h REJECT 0~14
 - i BASE LINE SHIFT 64 stages
 - j INVERT function available
 - k SWEEP SPEED 4 stages (common to M)
 - l Indication unit m/s, cm/s, kHz
- 5) Others
 - a ECG synchronization When connected to ECG signal display unit (PEU-680B)
- 6) Measurements
 - a Number of calipers 4 types
 - b B-mode measurements
 - DIST Distance measurement
 - AREA-T Area and circumference : Tracing method
 - AREA-E Area and circumference : Ellipse approximation method
 - VOL Volume measurement
 - OB Obstetrical calculation : Incorporates obstetrics report function
 - HIST Histogram : Trace method, box method
 - RATIO Ratio calculation
 - %STEN Stenosis ratio calculation
 - c M-mode measurements
 - DIST Distance, time, and velocity
 - %STEN Stenosis ratio calculation
 - RATIO Ratio calculation
 - H-RATE Heart rate measurement
 - POMBO Left ventricle function calculation : POMBO formula
 - TEICH Left ventricle function calculation : TEICHHOLZ formula
 - d DOP-mode measurement
 - VEL Velocity measurement
 - F-VOL Stroke volume, cardiac output calculation
 - AVERG Average flow velocity calculation
 - ACCEL Acceleration measurement
 - PUL-IND Pulsatility index (Peripheral blood vessel calculation)
 - POU-IND Pourcelot index (Peripheral blood vessel calculation)
 - PATIO Ratio calculation
 - P-GRAD Pressure gradient (Valve orifice area calculation)

15-2 SYSTEM DESCRIPTION

15-2-1 Description of System

This equipment consists of the transmitter-receiver unit (GEU-64), the doppler unit (FFA-18), the DSC unit (UIM-325), the color operation unit (CFM-680), the system control unit, the panel including the keyboard and switches, the camera unit, the physiological signal unit (option), the foot switch (option), the monitor, and the power supply unit.

The TRANSMITTER-RECEIVER UNIT (GEU-64) generates timing signal, necessary for the doppler and color operation units, and timing signal for electronic scanning which controls repetition of transmission and receiving. The unit also amplifies the received signal, applies necessary image processing to the amplified signal, and sends the processed signal to the DSC.

The DOPPLER UNIT (FFA-18) performs frequency analysis of the received signal and then returns the signal to the transmitter-receiver unit (GEU-64). It has also the transmission circuit for CW doppler.

The COLOR OPERATION UNIT (CFM-680) performs frequency analysis of the received signal, converts the signal into a signal necessary for color display, and stores the signal data in Main memory and Cine memory. The stored data is read out in time with TV timing, converted to the RGB signal, and added to B/W signal.

The DSC UNIT (UIM-325) converts the ultrasound analog signal into the digital signal and stores the signal data in Main memory and Cine memory. The stored image data is read out in time of TV timing, treated by image processing (POST PROCESSING), and mixed with the character signal and color doppler signal to form the RGB signal which is input to the monitor.

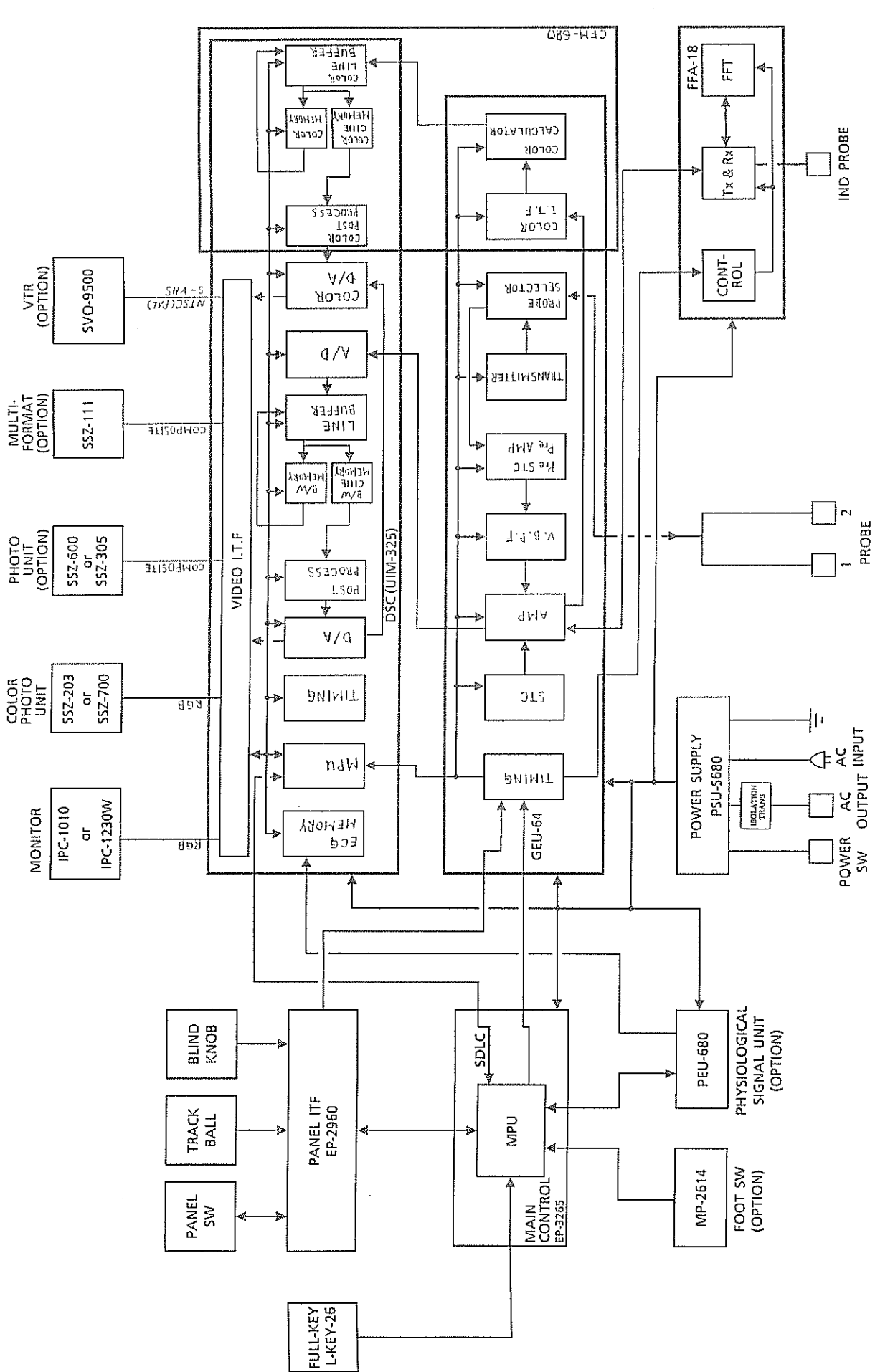
The SYSTEM CONTROL UNIT gathers the panel conditions (mode, magnification, etc.)

The KEYBOARD outputs the character information input with keys to the character generator in the DSC unit through the system control unit.

The CAMERA unit is SSZ-203 series or SSZ-700 which is used for taking color pictures by using the RGB signal; SSZ-600BU-P/35 in which a 3.5 inch TV monitor is combined with an Polaroid camera or 35-mm film camera; or SSZ-305 which uses a thermal head to allow high-speed hard copy of monitor picture to thermalprinting paper.

ECG SIGNAL DISPLAY UNIT (option) has the function of simultaneously displaying the ECG waveform on M- or B-mode image and the function of synchronizing the ECG.

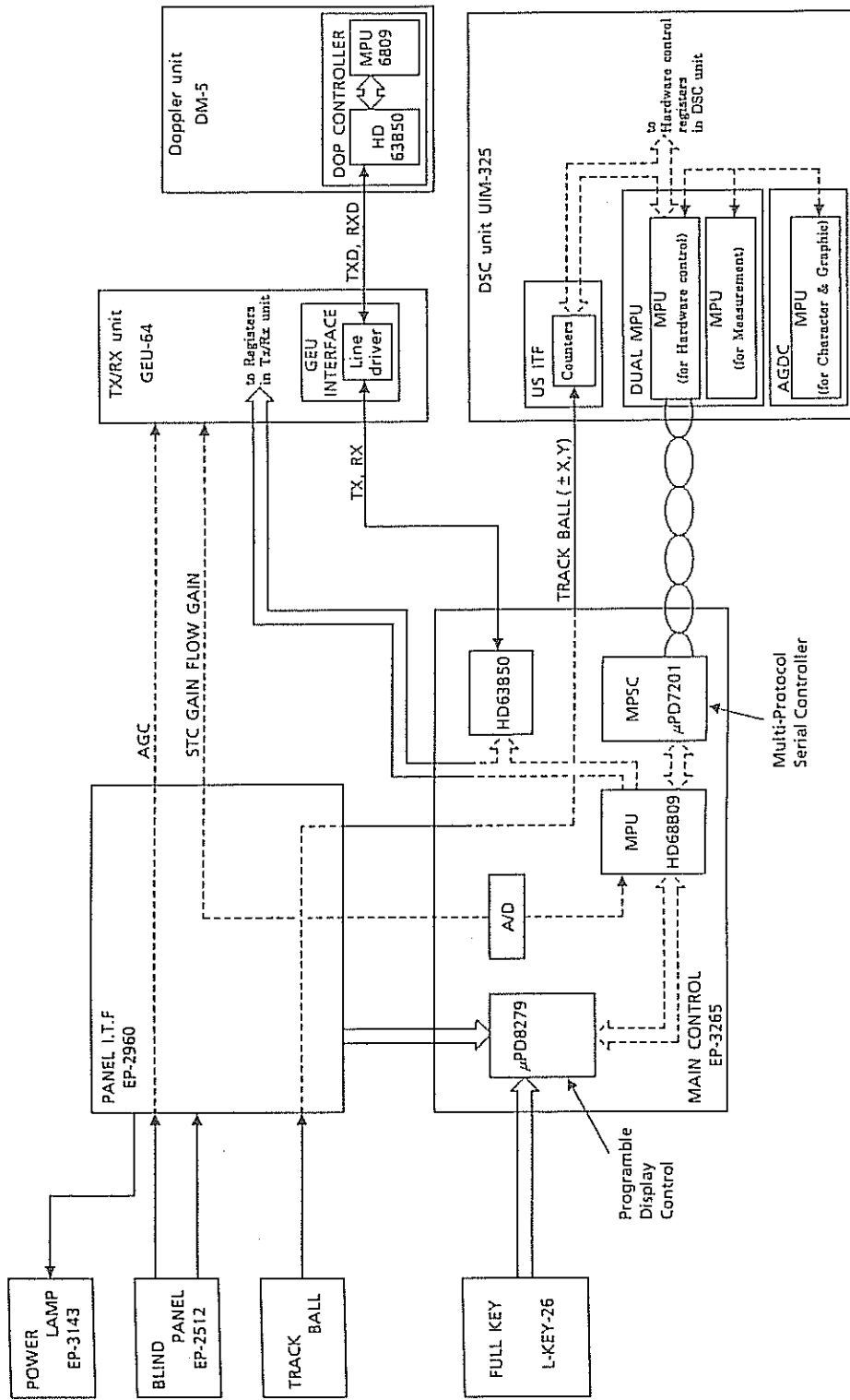
The POWER UNIT consists of the series power supply and switching power supply. Transmitter voltage can be adjusted with a knob in the blind panel.



Aloka	TITLE 名称	SYSTEM BLOCK	MODEL 形态	SSD-680EX	1 / 1
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15-2-2 Panel Information signal flow

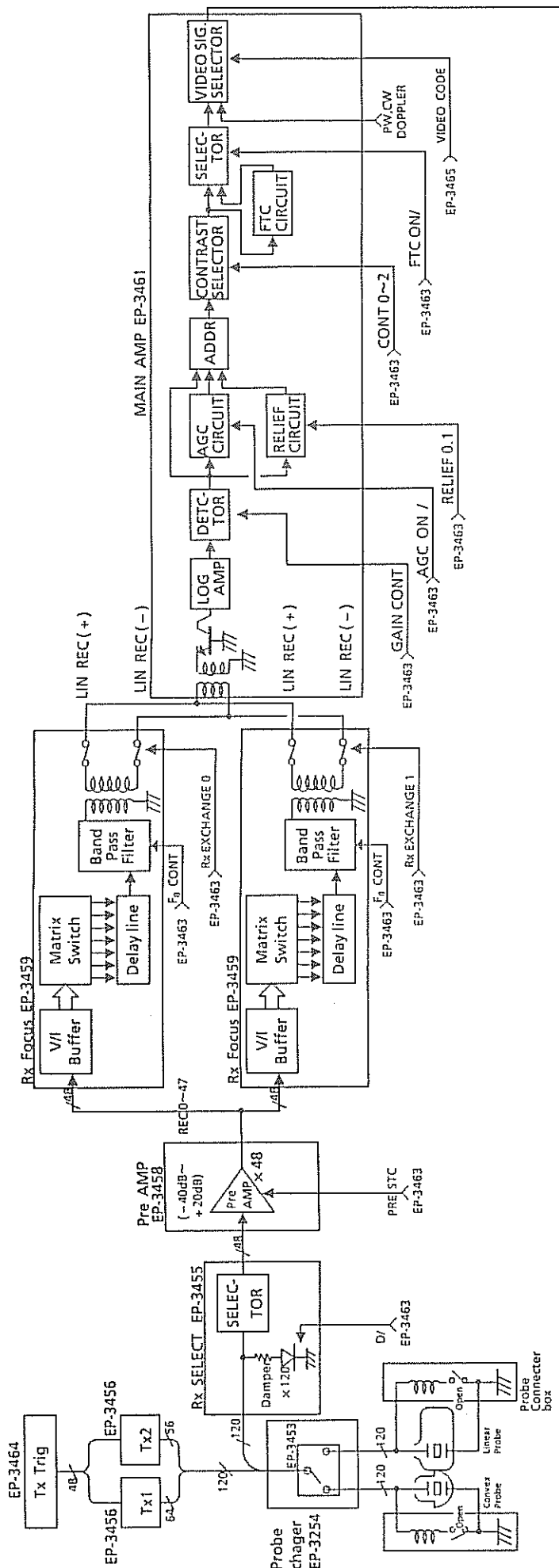
Each information given at the panel switches, track ball, control knobs, and keyboard is sent to the MAIN CONTROL PCB (EP-3265) . In EP-3265, the PANEL INFORMATION CONTROL MPU (68B09) receives information from the panel switches and keyboard through the PROGRAMMABLE KEYBOARD/DISPLAY CONTROL IC, and sends back the response signal through the LAMP DRIVER in the MAIN CONTROL PCB (EP-3265) so that the related LAMPS are turned on. There are three lines of GAIN signal. Two of the three lines send GAIN signal through the A/D converter to the DATA BUS which carries above-mentioned information signals together with the gain signal to the DSC UNIT (UIM-325). While the analog signals are sent, together with STC and AGC signals, directly to the TRANSMITTER-RECEIVER UNIT (GEU-64). Track-ball information ($\pm X, \pm Y$) is sent through the MAIN CONTROL PCB (EP-3265) to the DSC UNIT (UIM-325). The CONTRAST control signal is decoded and carried on the DATA BUS.



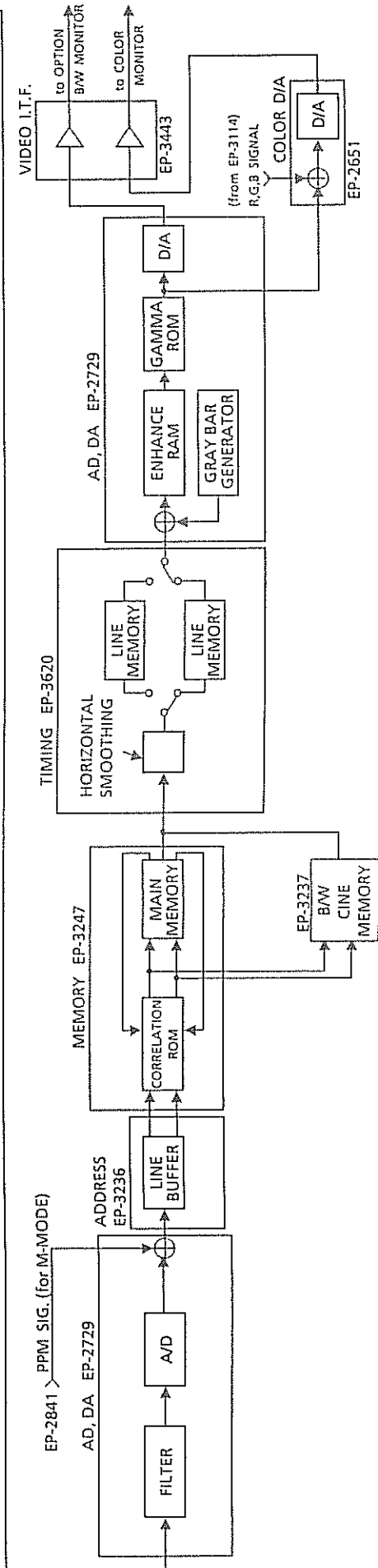
15-2-3 B/W signal flow

48 echo signal lines which the probe receives are selected from 120 lines in the RX SELECT (EP-3455), and amplified in the Pre AMP (EP-3458). The signal is then sent to the RX FOCUS (EP-3459) where dynamic focusing and variable-aperture focusing are made to bring the received echo into focus at intervals of approx. 1cm. EP-3459 has also the VBPF circuit which increases the resolution of short-distance echos by taking out rather high frequency component from echo signals and increases the sensitivity of long-distance echos by taking out rather low frequency component from echo signals. Then, the signal is sent to the MAIN AMP (EP-3461) where the signal from EP-3459 is received by an unbalancing trans and, after passing through the LOG AMP and DETECTOR circuit, the signal is processed by the PRE PROCESS circuit including the AGC, RELIEF, FTC circuit and CONTRAST selection circuit.

Then, the signal is sent to the A/D, D/A (EP-2729) in the DSC (UIM-325) for filtration and digital conversion, and the signal data is stored in the LINE BUFFER MEMORY in the ADDRESS (EP-3236). Then, the signal data is read out in time with write cycle of the MAIN MEMORY and is written in to the MAIN MEMORY (EP-3247) and the CINE MEMORY (EP-3237). Readout of the MAIN MEMORY and CINE MEMORY are synchronized with TV signal and readout of 16 pixels is made at the same time. Pixels read out from MAIN MEMORY are fed back for Frame correlation. Pixels read out from CINE MEMORY are brought in P-S conversion and then outputted as data for two lines. The upper-line data or the lower-line data is selected by the FIELD SWITCHING signal in the TIMING (EP-3620) and then smoothing is made in the horizontal direction of TV. SMOOTHING DATA is sent to the A/D, D/A (EP-2729) where addition of GRAY SCALE BAR, ENHANCE processing, are made. After that OVLV/ signal, SYNC signal, BLANK signal, and IMAGE AREA signal are added to data, it's converted to RGB signal, and D/A conversion is made at COLOR DA (EP-2651). Finally, the data is sent to the VIDEO ITF (EP-3443) and outputted to the color monitor.



15 : 11

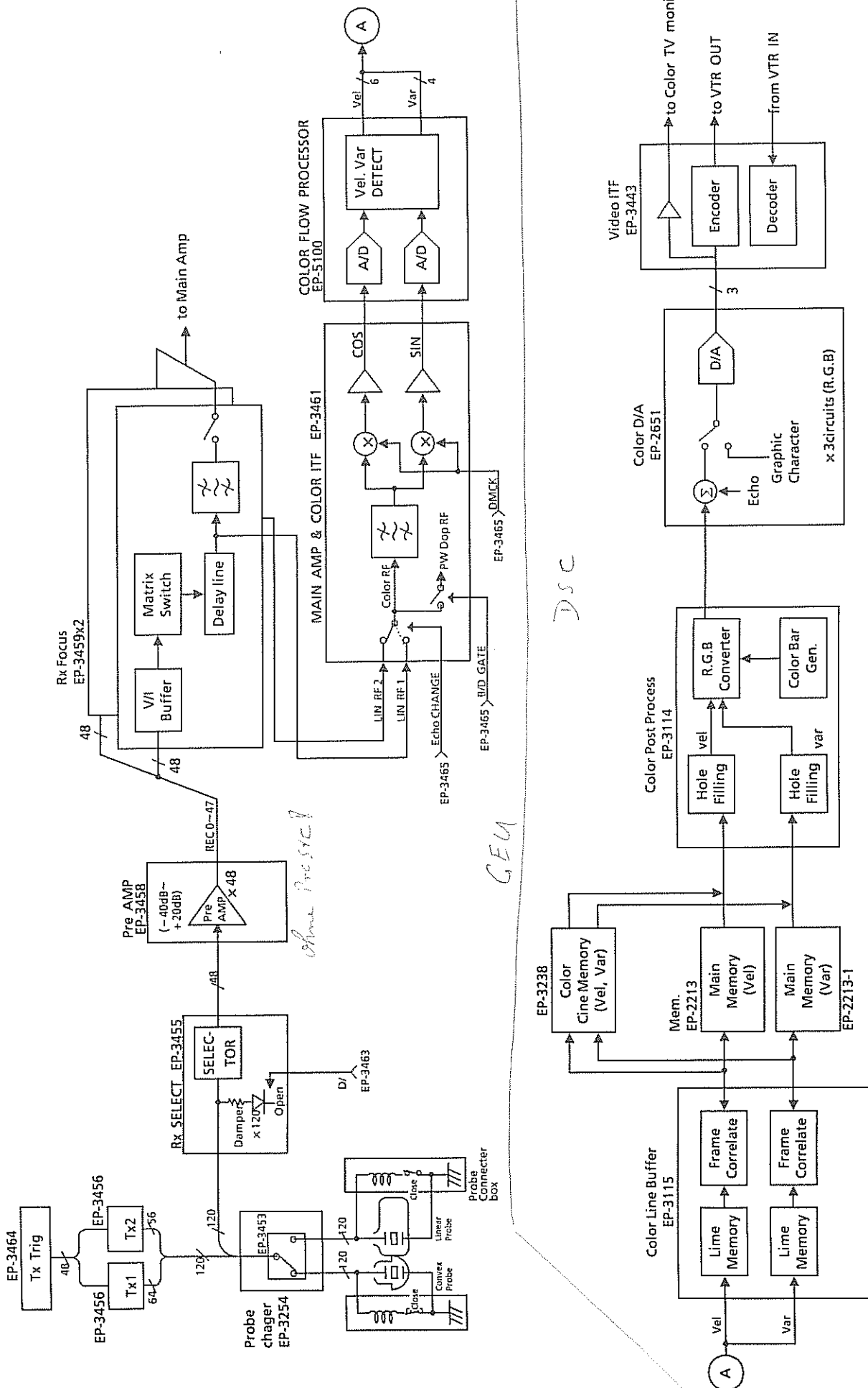


<p>Alcote</p>	<p>TITLE 名称</p> <p>BIW SIGNAL FLOW</p>	<p>MODEL 名称</p> <p>SSD-680EX</p>
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15-2-4 COLOR SIGNAL FLOW

In the color signal mode, the Tx-Rx signals are restricted to a narrow band width to increase color sensitivity. This is realized by interposing the coils in parallel with transducers and disconnecting the damping resistor in the receiver pre-stage. The coils having the fixed values suited to individual probes and of the quantity corresponding to the number of transducer elements are in the connector box. All coils are forcibly connected in the color signal mode by relays which are also installed in the connector box. The damping resistor is on the RX SELECT PCB, which is switched on or off by diode switch so that it is switched off only when color signal is transmitted and received. The Pre-STC by the Pre-Amp is kept released for the purpose of increasing S/N ratio by increase of amplification at the initial stage. The received signal which is delayed and added in the Rx Focus PCB is sent to the MAIN AMP & COLOR ITF board as LIN RF1 or LIN RF2 signal before VBPF. In the MAIN AMP & COLOR ITF board, the signals are alternately switched for color receiving focus and sent to Color ITF circuit. In Color ITF circuit, the signal is restricted in band width by the BPF set for the respective frequencies, and then divided into sine component and cosine component by quadrature detector. The signal is then sent to the CFM Processor after the variable-gain amplifier. In the CFM processor, the signal is brought in A/D conversion and then into digital calculation process for detection of Velocity and Variance data. Digital signal is sent to the DSC.

In the DSC, frame correlation is taken by the Color Line Buffer, and then Velocity and Variance data are written in the respective Main Memory and the respective Cine Memory in the form of ultrasound raster. Read out from Main Memory and Cine Memory is in the TV scanning method, so that conversion into color output R,G, and B is made, depending on values of velocity and variance, after smoothing by the Color Post Process. Finally, the signal is combined with the echo signal and graphic picture, and then converted into analog signal in the Color D/A PCB.

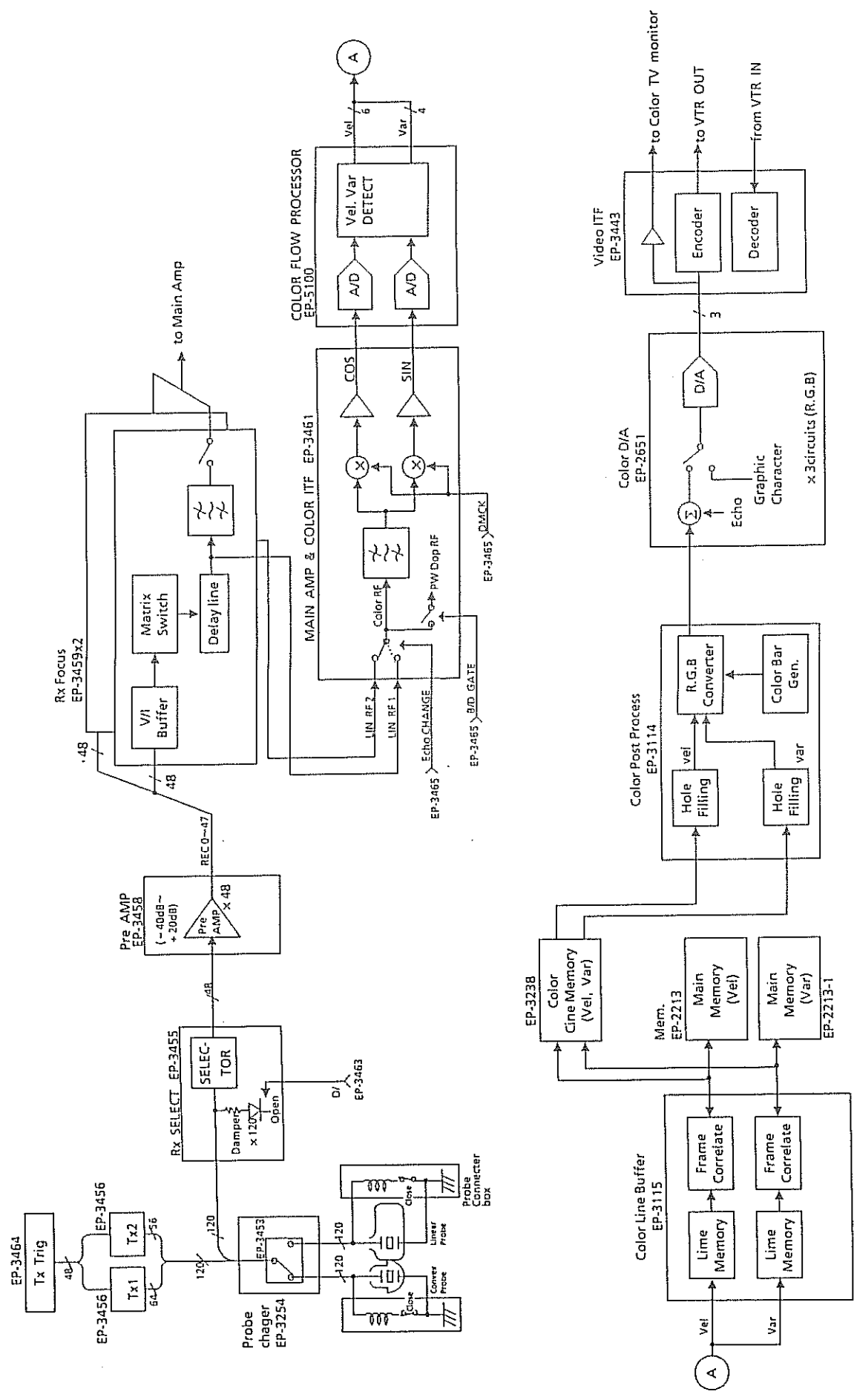


	TITLE 名称 COLOR SIGNAL FLOW	MODEL 形名 SSD-680EX	1 / 1
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15-2-5 PW (CW) SIGNAL FLOW

In the PW signal mode, the Tx-Rx system acts just like in the color signal mode. That is, connection of coils by relay action and disconnection of the damping resistor and pre-STC are made. Received signal is sent from the Rx Focus PCB to the doppler unit through the buffer in the Main Amp PCB, like in the case of the color signal mode.

In the Doppler Unit, received signal is restricted in band width by the Tx & Rx PCB, and then is processed by quadrature detector and, furthermore, by tracking and holding at the position suited to doppler sampling. After passing through the wall filter, the signal is filtered, depending on velocity range, and brought into A/D conversion in the Filter PCB. The signal is sent to the FFT PCB, where FFT and post-process are made, and then to the Interface PCB where the signal is brought into average process in the sweep direction and D/A conversion. Finally in the Main Amp PCB, the analog information signal alternates with echo signal.

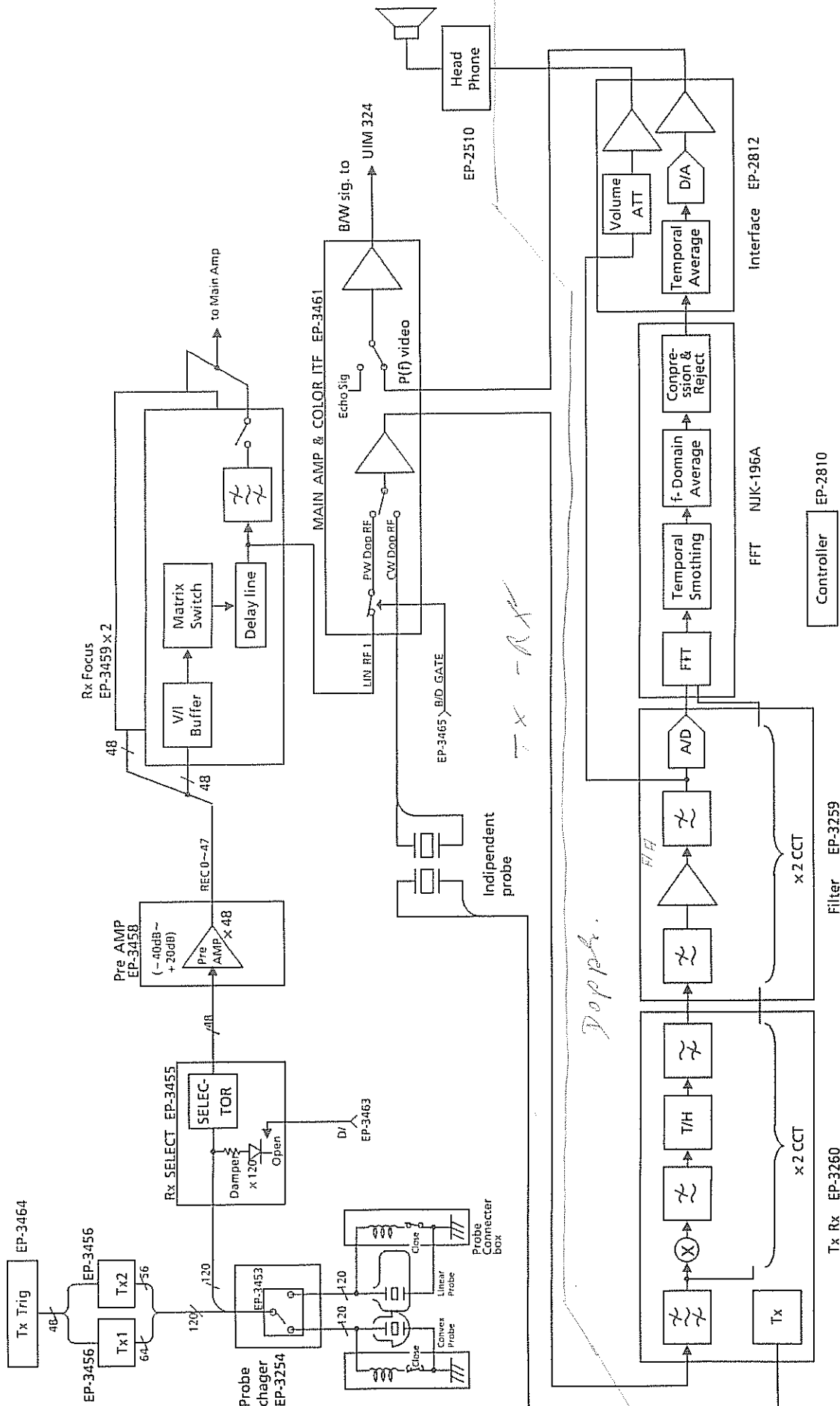


man

15-2-5 PW (CW) SIGNAL FLOW

In the PW signal mode, the Tx-Rx system acts just like in the color signal mode. That is, connection of coils by relay action and disconnection of the damping resistor and pre-STC are made. Received signal is sent from the Rx Focus PCB to the doppler unit through the buffer in the Main Amp PCB, like in the case of the color signal mode.

In the Doppler Unit, received signal is restricted in band width by the Tx & Rx PCB, and then is processed by quadrature detector and, furthermore, by tracking and holding at the position suited to doppler sampling. After passing through the wall filter, the signal is filtered, depending on velocity range, and brought into A/D conversion in the Filter PCB. The signal is sent to the FFT PCB, where FFT and post-process are made, and then to the Interface PCB where the signal is brought into average process in the sweep direction and D/A conversion. Finally in the Main Amp PCB, the analog information signal alternates with echo signal.



Doppel.

1/1	MODEL 名称 SSD-680EX	TITLE 名称 PW (CW) SIGNAL FLOW	Aloka
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15-2-6 DSC UNIT

(1) DSC specification

A. MEMORY CAPACITY 512×512×6BIT(1PCB)
(B/W, velocity, and variance data need the respective PCBs --Three PCBs in total)

B. PROCESSING

Update algorith Frame correlation Average
B/W, velocity, and variance are independent.
Velocity and Variance data calculation
Line interpolation Up to 11 points possible.
Gamma correction On monitor Setting possible by means of software
Camera Setting possible with ROM
Color post process Color rejection, Color display(4 kinds), Color enhance

C. PICTURE MAGNIFICATION (Write zoom) ×1, ×1.5, ×2, ×3

D. DISPLAY

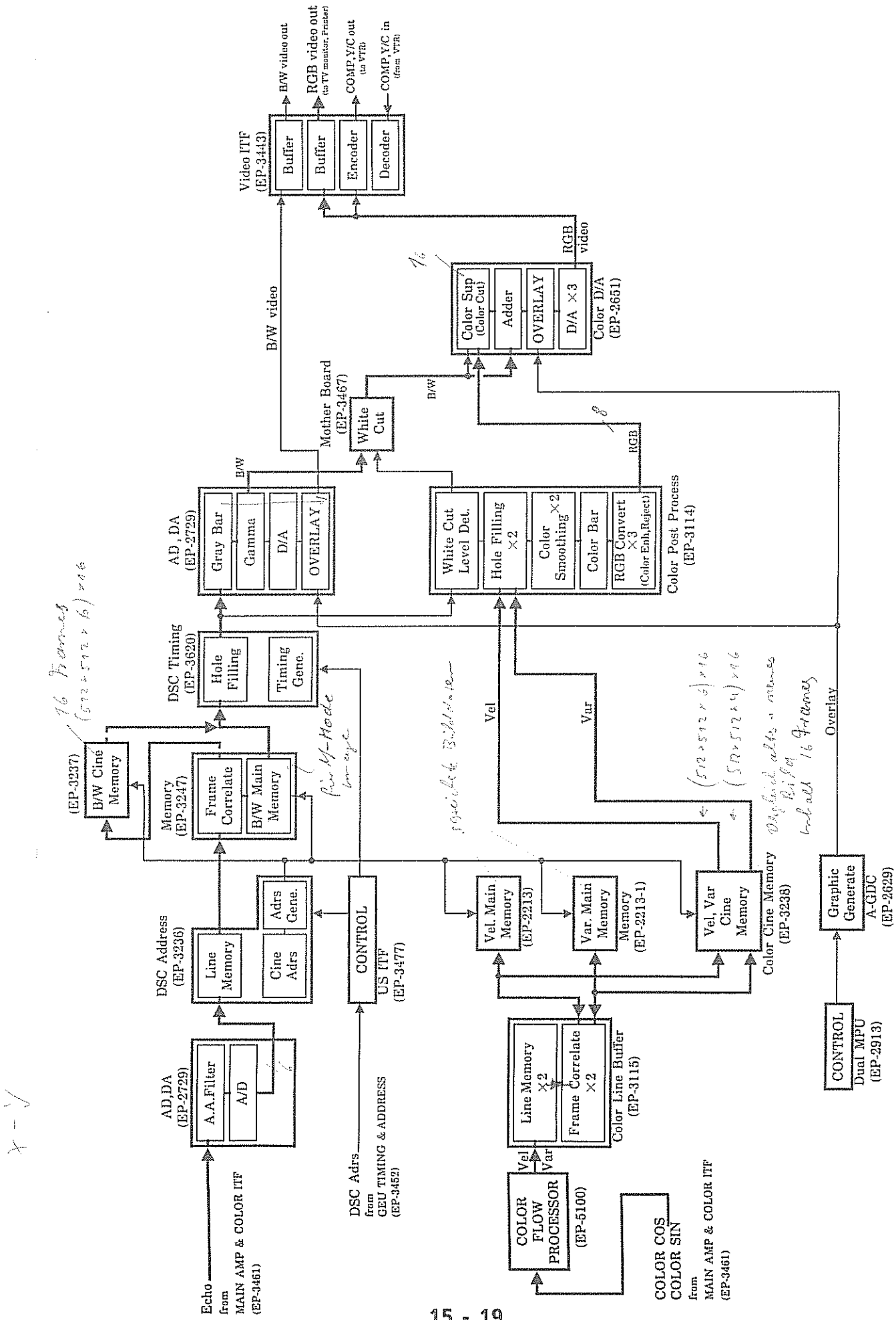
Gray scale bar 64 degrees
Color gray 16 degrees
Characters 52×32 (NTSC), 44×32 (PAL)
Graphic 640×480 dots (NTSC), 560×480 dots (PAL)

E. NUMBER OF IMAGES 1, 2, 3, 4 patterns possible
DISPLAYED (Multi image)

F. OUTPUT RGB 3 lines
Y/C 1 line (NTSC or PAL)
Composit Color 2 lines
B/W POST 4 line
NEGA 1 line

G. CINE MEMORY (One PCB is used for B/W, and one PCB is used for Velocity/Variance.)

Search for B mode 16 screens (When Store memory is off.)
Scroll for M,D mode Maximally 256 seconds image (When Store memory is off.)
Store memory 4 screens



Aloha	DSC Block Diagram	MODEL 名称 UIM-325 *	1 / 1
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act

(2) Principle of DSC operation

This DSC operates in the same manner (X-Y type) as the former 300 series DSC. The US video (analog signal) from the transmitter- receiver unit and the velocity, variance signals (digital signals) from the color calculator unit are temporarily stored in the memory, processed, and then outputted. Two kinds of output signals are the composite signal and RGB signal(for color display).

A. Writing to the memory

One US scanning line is handled as a vector, which is indicated by X_0 , Y_0 (origin), ΔX (X-direction component) and ΔY (Y-direction component). Write address is determined by the address counter of the ADDRESS PCB. Two independent counters are used; one for X-direction address and the other for Y-direction address. Data X_0 and Y_0 are the initial values of the respective address counters. In ADDRESS PCB clocks determined by ΔX and ΔY actuate those counters to update address.

On the other hand, US video signal is converted into digital signal by the A/D, D/A PCB and sent to the ADDRESS PCB, while velocity and variance signals from the COLOR Flow Processor PCB are sent to the COLOR LINE BUFFER PCB, and temporarily stored in the respective LINE BUFFER MEMORYs. The velocity and variance data are read out in time with the write cycle of the MEMORY PCB and written in to the MEMORY PCB and the CINE MEMORY PCB. In this case, velocity and variance data arrive the MEMORY PCB several μ sec later as compared with the arrival of the US video signal. (Analog delay caused by calculation time spent in the color calculator circuit and BPF of color ITF.) The US video signal and the velocity and variance signals are synchronized with each other during they stay in the LINE BUFFERS and they are outputted to the MEMORY PCB and the CINE MEMORY PCB in the same timing.

This DSC usually writes in two pixels every write cycle. Since 16 pixels surrounded with solid lines are the memory elements different from each other as shown in Fig. 20, it is possible to access 16 pixels simultaneously by feeding one kind of address. It is impossible to write in two pixels at the same time beyond the 16-pixel area surrounded with solid lines. In certain circumstances, only one pixel exists in the same area. Three MEMORY PCBs are used; they are for US video signal, velocity signal, and variance signal, respectively. The PCB for US video signal includes the frame correlation circuit in addition to the main memory.

B. Read from the memory

Read address is also generated in the ADDRESS PCB for 16 pixels simultaneously in time with the TV signal. The 16 pixels are those surrounded with solid lines as shown in Fig. 20. Read out pixels, after they are subjected to parallel-serial conversion, are outputted from the MEMORY PCB or the CINE MEMORY PCB as 2-line data. "In Timing" (for US video) and "Color post process" (for velocity and variance data), the upper and lower lines of output data are selected by the TV field selection signal, and then smoothing is made in the horizontal direction of TV signal. For Velocity and Variance data, Frame interpolation is made after the horizontal smoothing.

US smoothing data, to which the gray scale bar signal is added in the A/D, D/A PCB, are enhanced and then converted into analog data. Thereafter, the data is formed into the composite TV video signal by addition of the OVLY/signal (characters and graphic), sync signal, blank signal, and image area signal.

Velocity and variance smoothing data are converted into the RGB signal and, after additions of US data and OVLY/ signal in the COLOR D/A PCB, it is fed to the color monitor through the video ITF.

C. $X_0, Y_0, \Delta X, \Delta Y$

Data $X_0, Y_0, \Delta X, \Delta Y$ necessary for writing to the MEMORY depend on the magnification of image, etc. The table of those data is stored in the ROM of US ITF PCB. In this ROM, various conditions including magnification corresponding to the panel are set up by the CPU, and US address is set up as ROM address by the CPU. Output data ($X_0, Y_0, \Delta X, \Delta Y$) are sent to the ADDRESS PCB.

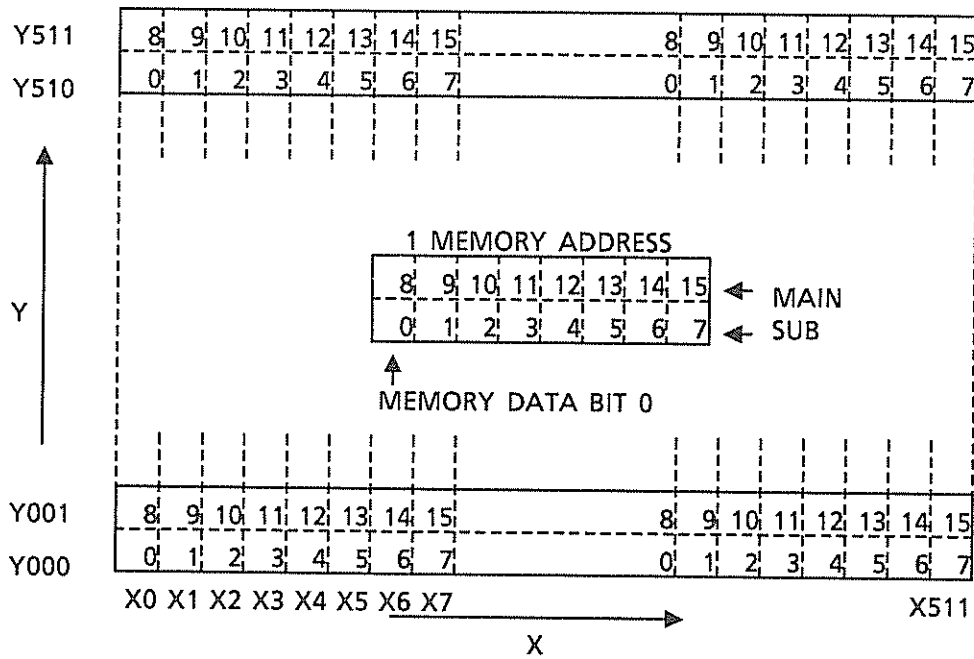
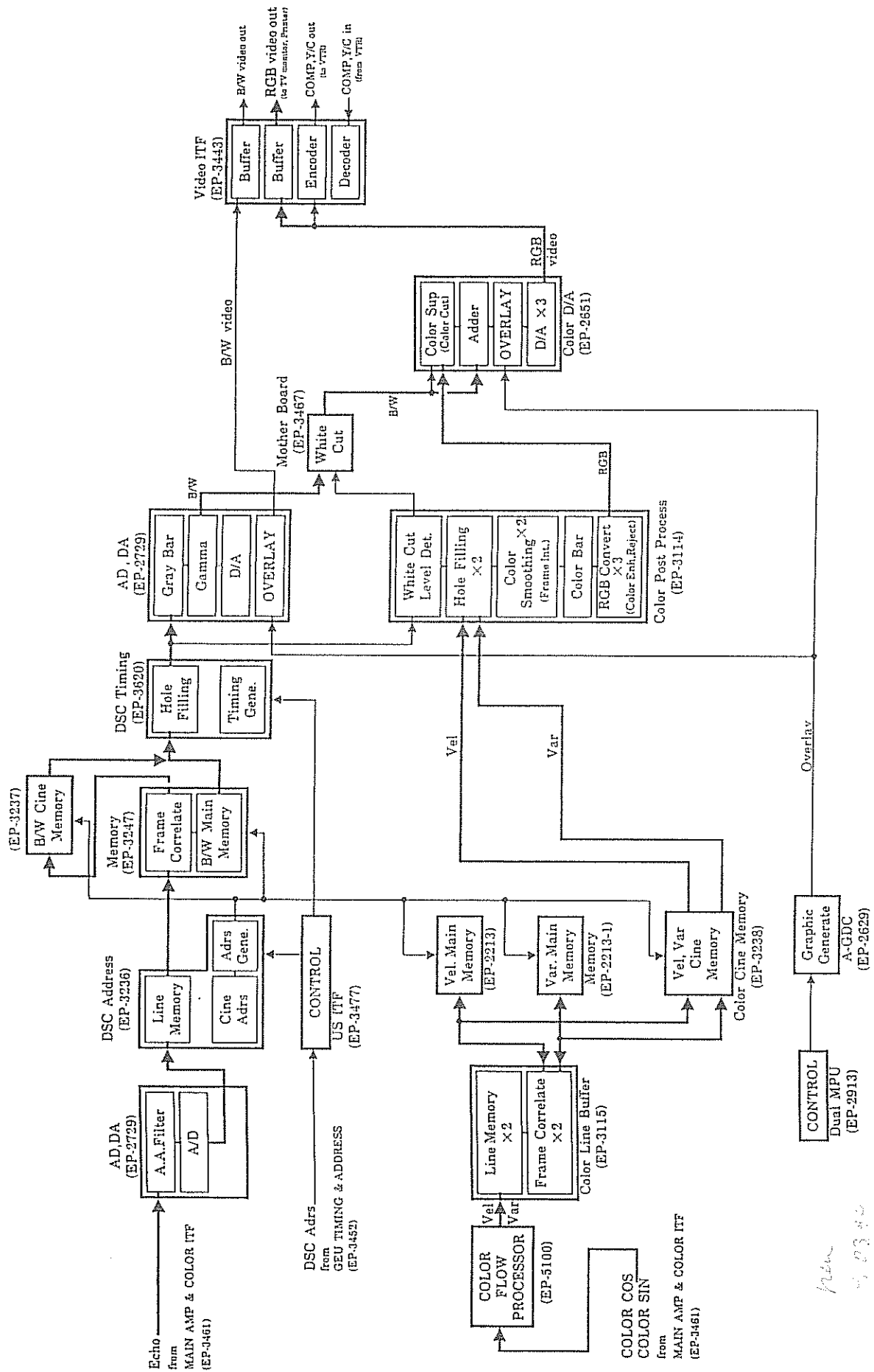


FIG. 20



16-1 EP-3265 MAIN CONTROL

1. General

This PCB equipped with HD68B09 (MPU) reads various kinds of information from the control panel, sends out instructions to the PSC unit and transmitter-receiver unit (GEU), and controls turning on or off of panel lamps. It also exchanges information with the doppler unit (through the GEU) and controls the physiological unit (option).

2. Operation

1) MPU (Micro Processing Unit)

The MPU uses HD68B09 (the speedup version of MC6809) which operates at 8 MHz of clock frequency.

2) PTM (Programmable Timer Module)

Using two LSIs HD68B40, the PTM serves as the R/R INTERRUPT TIMER, MPSC TRANSMITTER-RECEIVER CLOCK GENERATOR, and FIRO PROGRAMMABLE TIMER.

3) MPSC (Multi Protocol Serial Controller)

The MPSC using μ PD7201 exchanges signals with the PSC unit.

4) GEU INTERFACE

Depending on information given by panel switches, this interface sets up data to be sent to the transmitter-receiver unit.

5) FIPE (FIRQ Priority Encoder)

To increase interruption processing speed, FIPE finds the priority order of interruption, and loads vector address corresponding to interruption input on the ADDRESS BUS.

6) PROGRAMMABLE KEYBOARD/DISPLAY CONTROLLER

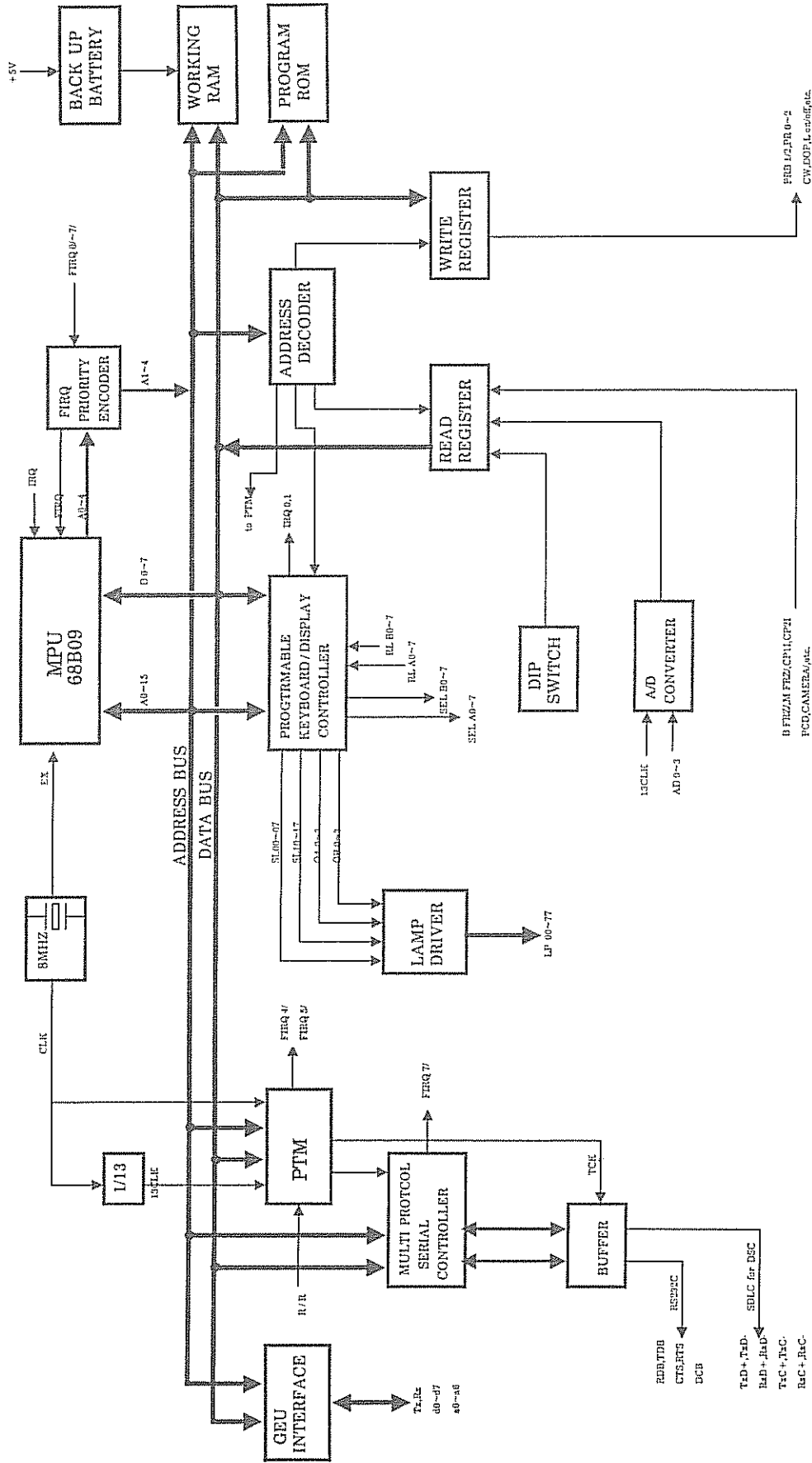
Using two LSIs μ PD8279, this controller receives information given by the panel switches and full-keyboard and controls turning on or off of panel lamps.

7) A/D CONVERTER

Converts analog gain data of B-mode and M-mode into digital data which the MPU reads in.

8) BACK-UP BATTERY

To back up the memory when power supply is cut off, a battery is connected to the WORKING RAM of this PCB.



Aloka	MAIN CONTROL	MODEL 形名 EP-3265	1 / 1
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16-2 EP-3454 PROBE SELECTOR
(including EP-3453 PROBE SELECT RELAY)

1. General

This board select PROBE 1 or PROBE 2.

2. Operation

1) Probe Selector

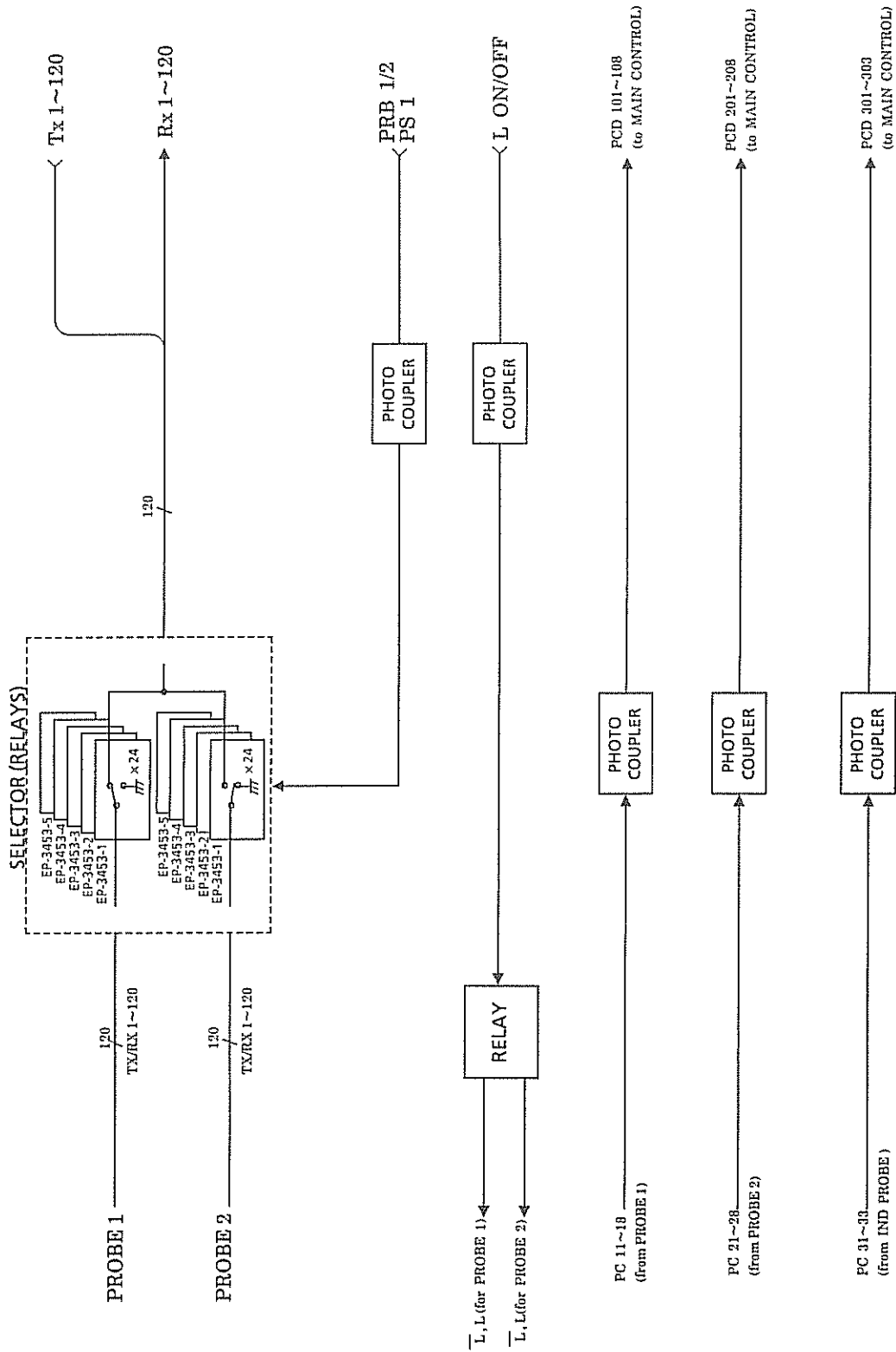
Selector to connect 120 Tx/Rx lines to PROBE 1 or PROBE 2. The relays are equipped on EP--3453.

2) L ON/OFF CONTROL circuit

This circuit output the control signal to turn on the coil inside probe, in PW doppler or Color doppler.

3) Photo coupler for reading Probe code

Probe codes form PROBE CONNECTOR 1, 2, and IND PROBE CONNECTOR pass through the photo couplers on this board, and are sent to MAIN CONTROL board.



EP-3453-1~5 各2枚ずつ合計10枚のPCBはEP-3454にコネクタで接続されています。
 10 PCBs, EP-3453-1~5 x 2, are mounted on one EP-3454 by the connectors.

Aloka	TITLE 名称 PROBE SELECTOR	MODEL 形名 EP-3454	1 / 1
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16-3 EP-3455 RX SELECT

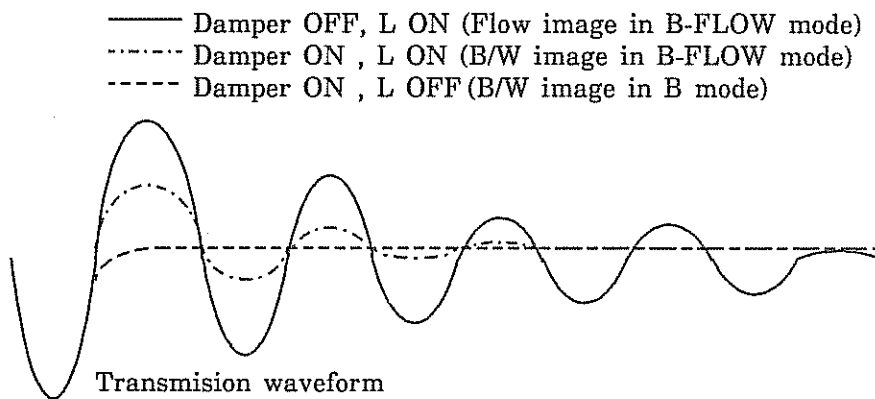
1. General

This PCB consists of the DAMPER circuit, the SELECTOR circuit for selecting 48 of 120 transducers total, and the SELECTOR CONTROL circuit.

2. Operation

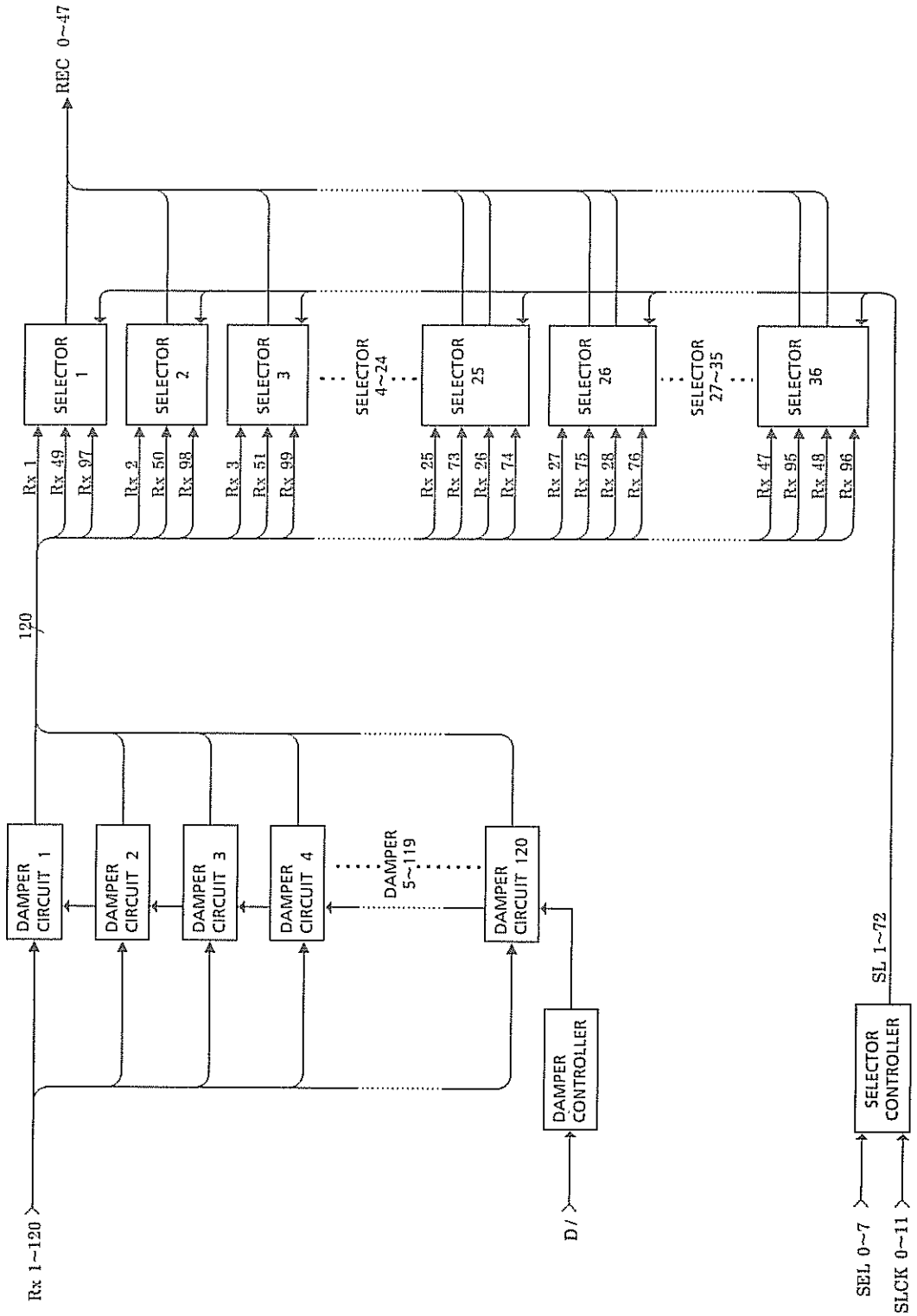
1) DAMPER circuit

- Damper ON : Increases the resolution in the direction of distance in B mode.
- Damper OFF : Increases the sensitivity in Doppler, flow mode.



2) SELECTOR, SELECTOR CONT circuit

This circuit is used for selecting 48 of 120 elements which are based on SEL 0~7, SCLK 0~11 from the Rx SELECT CONT.



1 / 1	MODEL 形名 EP-3455	TITLE 名称 RX SELECT	Aloca
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16-4 EP-3456 TX1

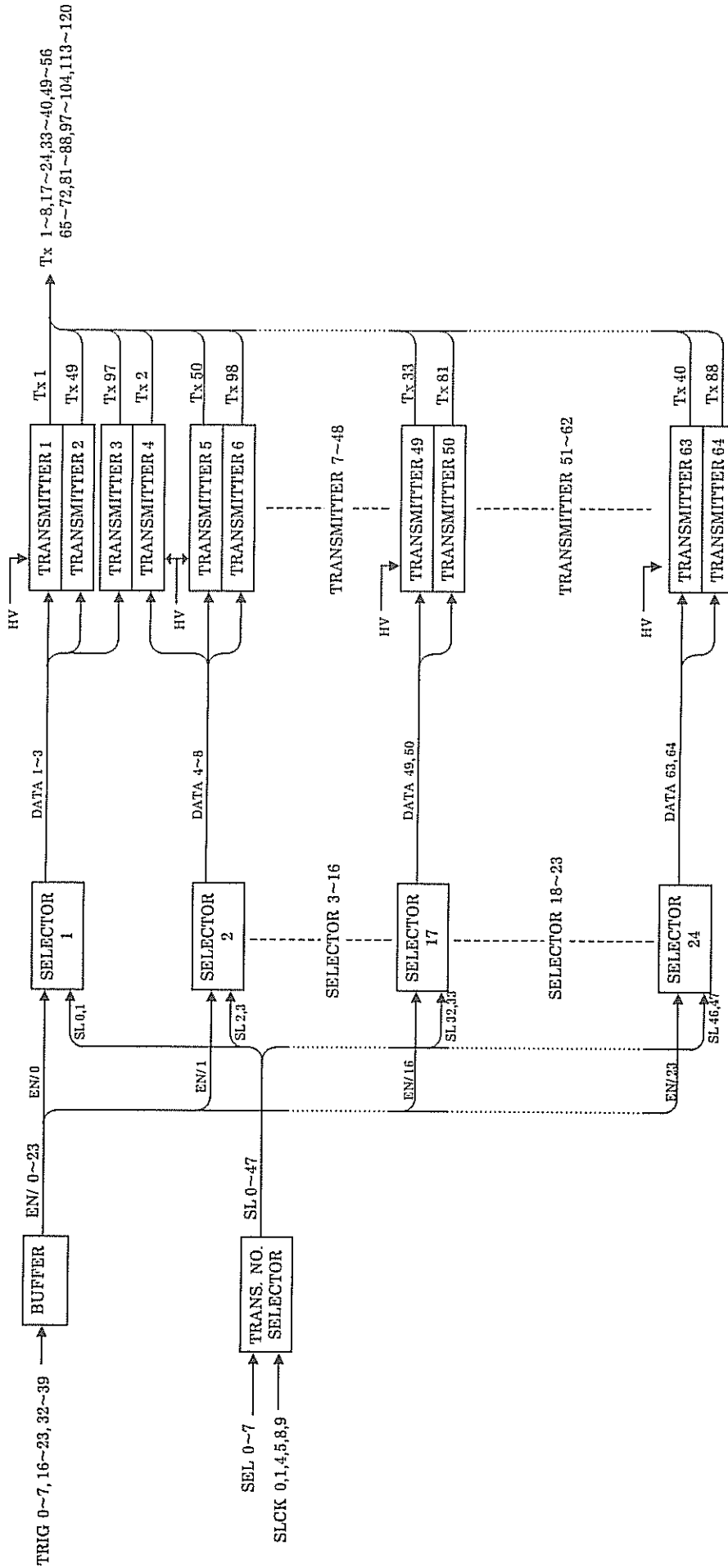
1. General

One set of two PCBs, EP-3456(TX1) and EP-3457(TX2), consists of 120 transmission pulse generators for oscillating transducers.

EP-3456(TX1) has 64 transmitters.

2. Operation

TRIG 0~47 from the Tx TRIGGER GENE are sent to the TRANSMITTER which is set by SEL 0~7 and SCLK 0~11 sent from the Rx SELECT CONT, to generate pulses for oscillating the transducer.



Aloka	TITLE 名称 TX 1	MODEL 型号 EP-3456	1 / 1
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16-5 EP-3457 TX 2

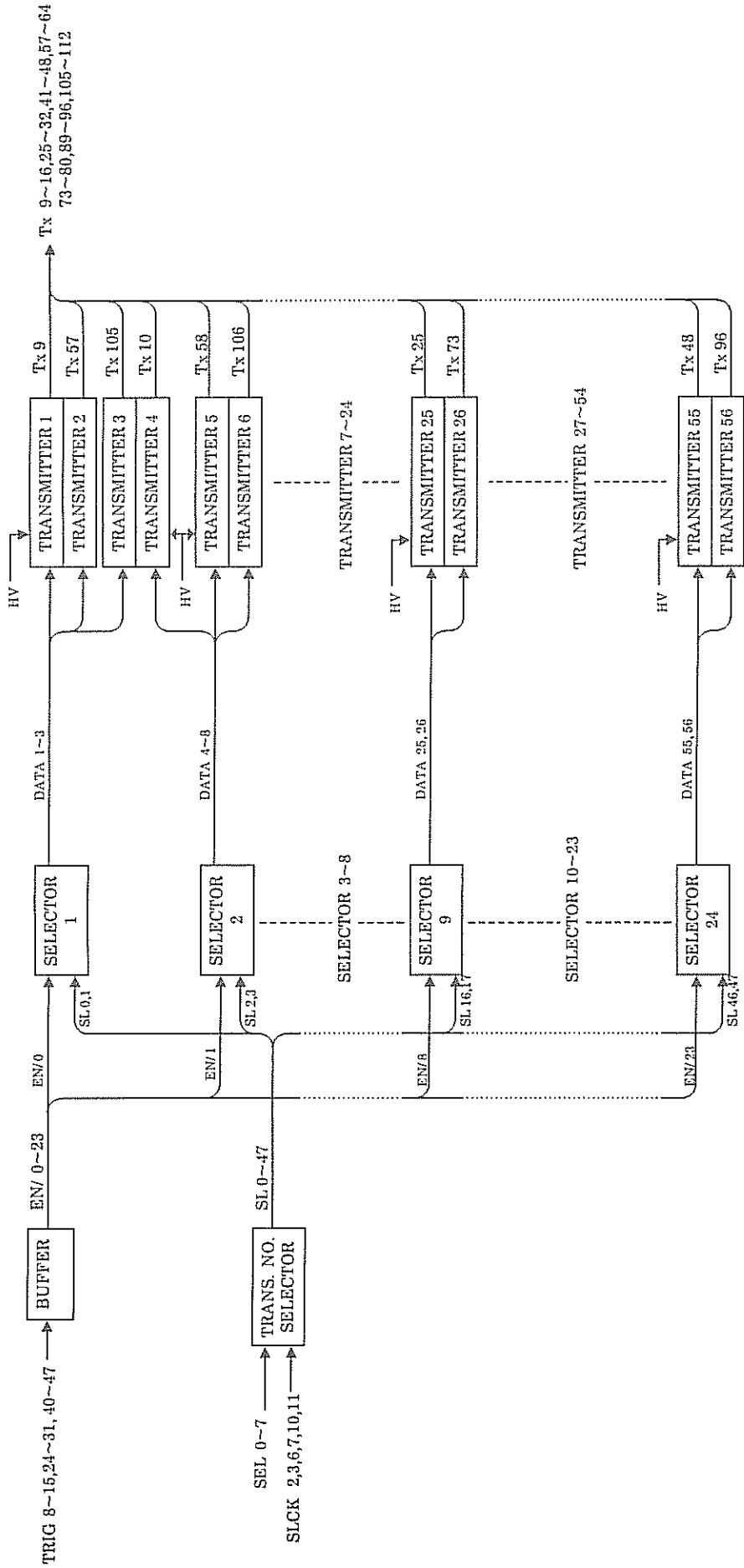
1. General

One set of two PCBs, EP-3456(TX1) and EP-3457(TX2), consists of 120 transmission pulse generators for oscillating transducers.

EP-3457(TX2) has 56 transmitters.

2. Operation

TRIG 0~47 from the Tx TRIGGER GENE are sent to the TRANSMITTER which is set by SEL 0~7 and SCLK 0~11 sent from the Rx SELECT CONT, to generate pulses for oscillating the transducer.



Aloka	TITLE 名称 TX 2	MODEL 形态 EP-3457	1 / 1
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16-6 EP-3458 Pre AMP

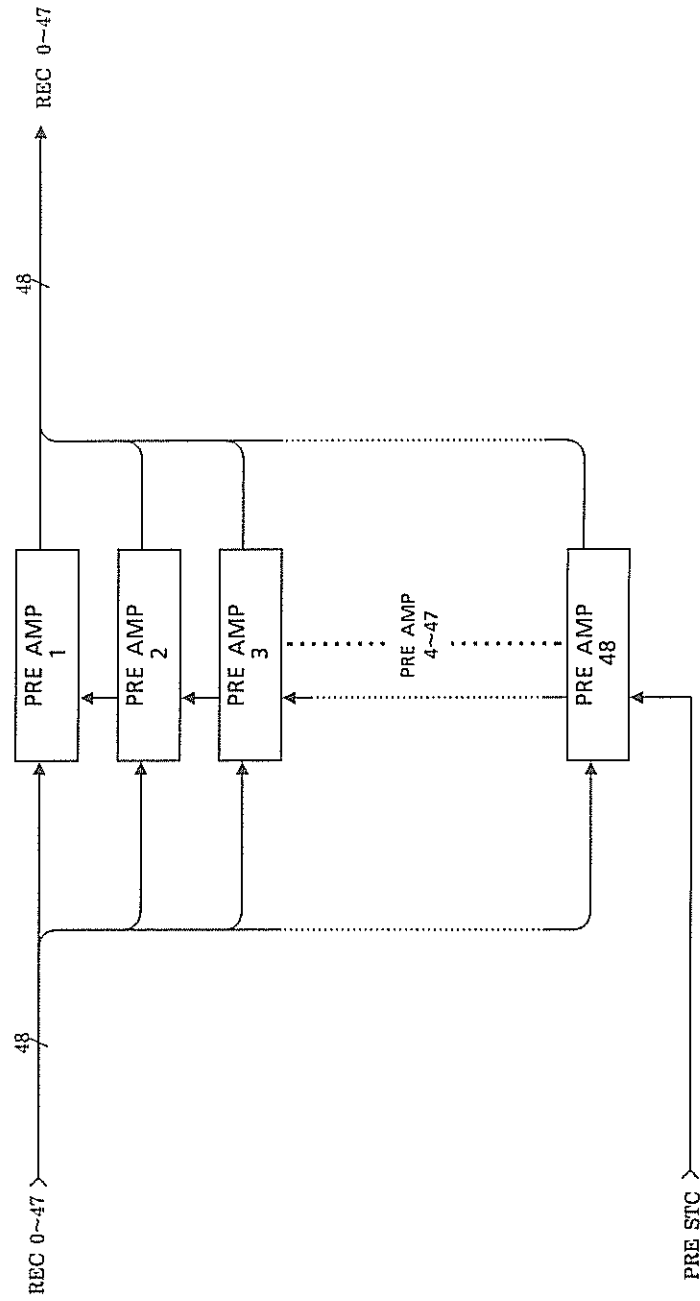
1. General

It consists of 48 Pre Amp circuits.

2. Operation

Receive signal from the Rx SELECTOR is amplified by 20 dB in this PCB. Since strength of echo signal is weak as distance increases, the Pre STC controls the amplification rate of AMP so that it increases as distance increases.

(In Color and Doppler mode, however, the Pre STC is not used to avoid decreasing sensitivity.)



1 / 1	MODEL 形名 EP-3458	TITLE 名称 Pre AMP	Aloha
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16-7 EP-3459 RX FOCUS

1. General

Two PCBs used for dynamic focus of received signal consist of five blocks, namely,

- 1) IN-VI-BUFFER, 2) MATRIX SWITCH and MATRIX SWITCH CONTROLLER,
- 3) DELAY-LINE, 4) VARIABLE BAND PASS FILTER, and 5) TRANSFORMER.

2. Operation

1) IN-VI-BUFFER block

Converts voltage of received echos (REC 0 to 47) into the respective current which flows through the MATRIX SWITCH to the DELAY LINE.

2) MATRIX SWITCH and MATRIX SWITCH CONTROLLER block

48-line signals receive from the IN-VI-BUFFER block need respective proper delays to get Rx FOCUS effects. The MATRIX SWITCH selects a proper terminal of DELAY LINE for each of received signals so that the optimum delay is given to each signal.

The MATRIX SWITCH is a CROSS POINT SWITCH board in which 48 input signals are switched to 48 output signals. The board has a built-in CONTROL MEMORY circuit which controls the desired switching actions of the input and output cross points. So, 48 input signals are outputted to the DELAY LINE through the desired output terminals.

It is possible to take out only the necessary signals by controlling the MATRIX SWITCH operation so that unnecessary signal input terminals are selectively kept OPEN. This control operation is needed for variable-aperture receiving.

By eight times repetitions of this write-in cycle up to No.8, to which output line are connected sixteen input lines is set in the elements.

3) DELAY LINE

Consists of the DELAY LINE (DL1 to DL10), INTERSTAGE BUFFER (DL11 to DL14), and BUFFER.

The DELAY LINE give the signal delay of 25 ns per tap and 2.0 μ s in total of 10 delay lines, making correction of signal phase possible. Each LINE of 48 signals received can be connected to one of 48 taps of DELAY LINE. Current addition output is converted by the BUFFER into voltage which is sent to V.B.P.F.

4) VARIABLE BAND PASS FILTER

The V.B.P.F. is a synchronizing FILTER having the series resonance part and parallel resonance part. By scanning the For CONT signal voltage from high voltage to low voltage during time corresponding to one line of supersound, the capacity of the variable capacitor diode is controlled so that pass band characteristic is varied from high frequency to low frequency continuously. SCAN width of the pass band depends on frequency of the probe used.

5) TRANSFORMER

Output signal from the V.B.P.F. is sent to the TRANSFORMER for equilibrium conversion. Then, video output signal from two boards of Rx FOCUS PCB is switched over by the Rx ECHO, 1 and sent to the MAIN AMP PCB.

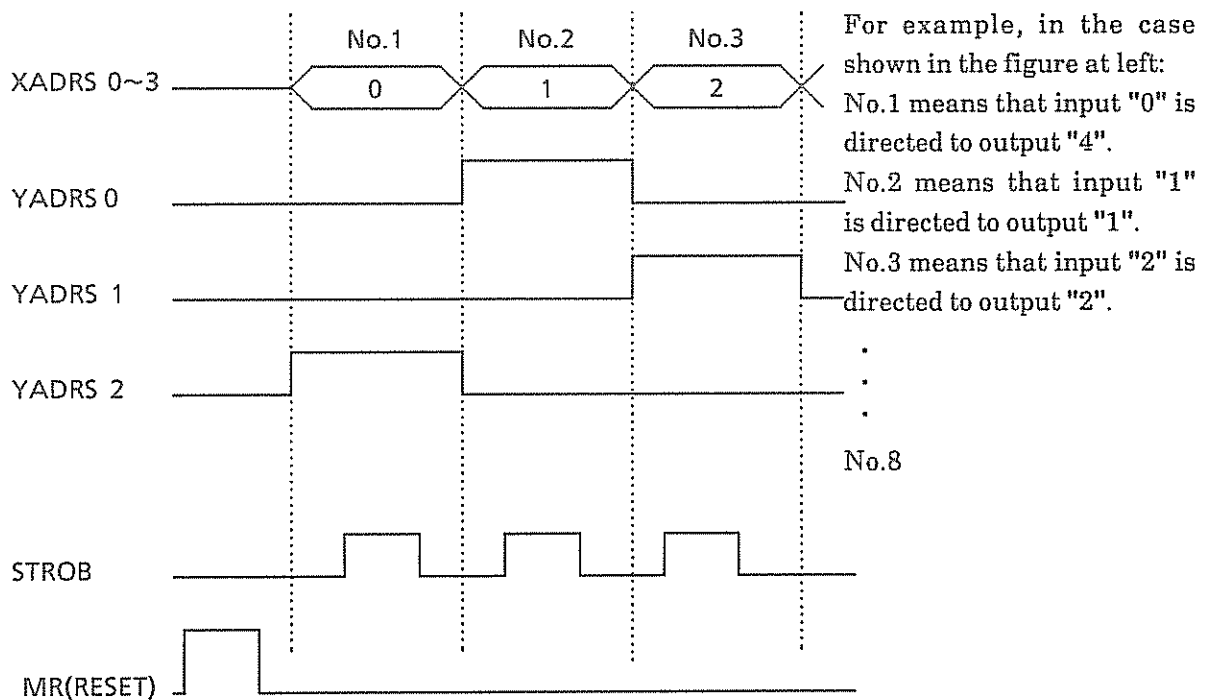
«MATRIX SWITCH CONTROLLER»

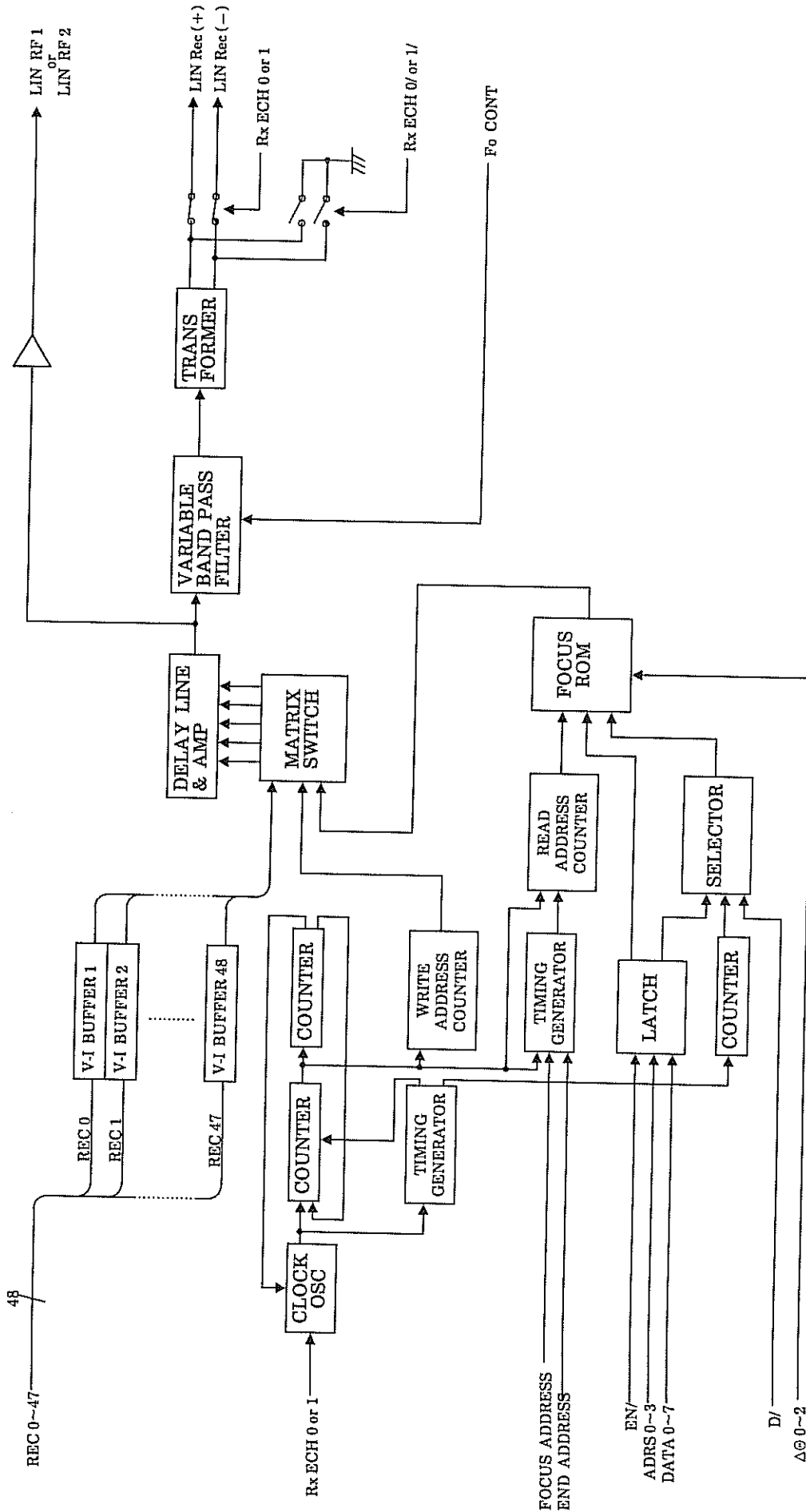
This circuit outputs the CONTROL signal which changes over the MATRIX SWITCH to give 48 lines of echos received the different levels of delay, respectively.

«MATRIX SWITCH MT8816 AP»

The element having 16×8 MATRIX SWITCHES and CONTROL MEMORY is used for 16 input signals and 8 output signals in this PCB. Five kinds of control signals (MR, STROB, DATA, XADRS 0-3, and YADRS 0-2) are used to control the CONTROL MEMORY in this element.

- MR : Resets the CONTROL MEMORY (All OFF).
- YADRS 0~2 : Selects one of eight output lines.
- XADRS 0~3 : Selects one of 16 input lines.
- STROB : Latches ADDRESS in MATRIX SWITCH
- DATA : Turns the selected SWITCH on or off.





<p>Aloka</p>	<p>TITLE 名称 RX FOCUS</p>	<p>MODEL 形号 EP-3459</p>
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16-8 EP-3461 MAIN AMP & COLOR ITF

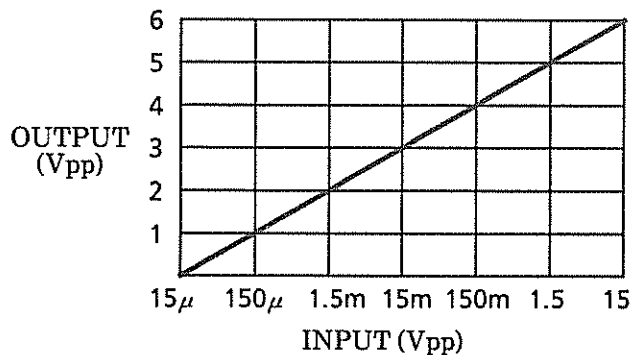
1. General

This PCB has the function of processing the signals received from the VBPF in the RX FOCUS (EP-3459) before sending the signals to the DSC, the function of selecting either color or PW doppler signal, and the COLOR ITF circuit converting the received signal into the signal which COLOR FLOW PROCESSOR board (EP-5100) needs.

2. Operation

1) LOG AMP

LINREC (-), (+) output from the V.B.P.F. of the Rx FOCUS unit is input through the TRANSFORMER to the LOG AMP, which outputs the LOG compressed signal. The LOG AMP consists of two sets of IF AMP (+ 30dB) AND BUFFER ATTENUATOR (- 30dB) and of the LOGALITHMIC AMPLIFIER. Total dynamic range is 120 dB. Input/output characteristic is shown below.



2) DETECTOR

Output signal from the LOG AMP is 22dB amplified by the DIFFERENTIAL AMP and then detected by the DETECTOR.

3) GAIN CONT ADDER

Output signal from the DETECTOR is GAIN-controlled by the ADDER. The level of GAIN is dependent on the level of input GAIN CONT signal from the GAIN CONTROL. The scale factor is 20 dB/V.

4) PRE-PROCESSOR

This circuit for processing the received echo signals has the AGC, RELIEF, FTC, and CONTRAST functions.

5) VIDEO AMP

After processing in the PRE-PROCESSOR, received echo signals are amplified by the INVERTING AMPLIFIER and then sent to the DSC through the BUFFER.

6) DOPPLER SIGNAL SELECTOR

Doppler RF signal from EP-3459 is switched to either the RF signal for B mode (color) or the RF signal for D mode (PW). The RF signal switched to D mode is switched with the RF signal of IND probe to select either one which is to be sent to the doppler unit through the equilibrium circuit.

7) COLOR ITF

① BAND PASS FILTER circuit

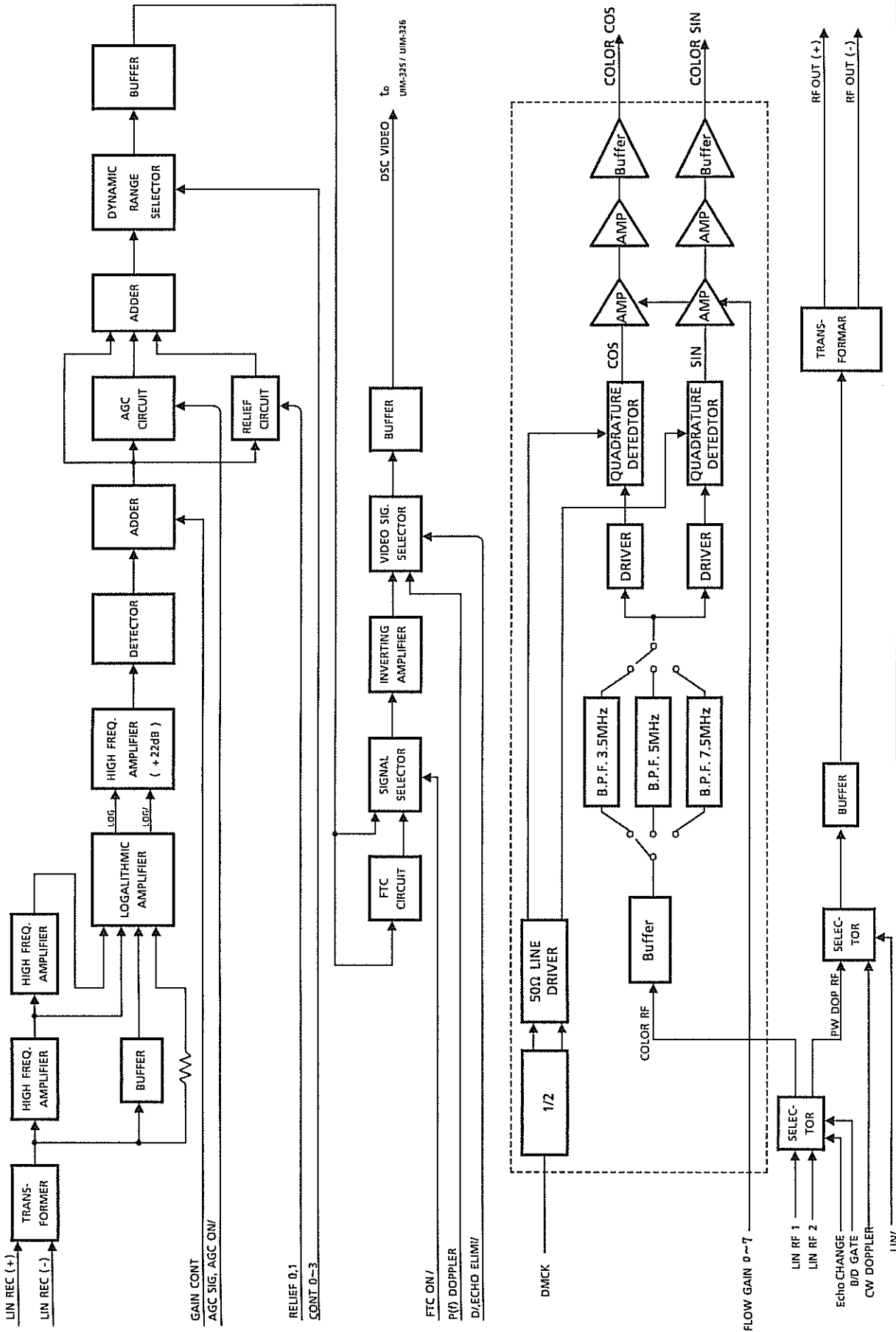
The 30 dB/oct band pass filter is for a frequency of "center frequency for each probe" ± 1 MHz, which allows only the signal needed for color information to pass through it. Three kinds of Band Pass Filter (3.5 MHz, 5 MHz, and 7 MHz filters) are available.

② QUADRATURE DETECTOR circuit

Received signal passed through Band Pass Filter is quadrature-detected to get COLOR SIN and COS signals, using two-line signals - CARRIER SIN and COS - which differ 90 °C in phase from each other with reference to the clock of probe center frequency (3.5 MHz, 5 MHz, or 7 MHz) by DMCK.

③ AMP circuit

Amplifies the detected two-line signals to a level necessary for sending those signals to EP-5100.



1 / 1
MODEL 名称 EP-3461
TITLE 名称 MAIN AMP & COLOR IF
Aloha

EP-3461* -1 : SSD-680EX用、被褥内の部品取り付け
 For SSD-680EX, Parts in the dot line are mounted.
 EP-3461* -2 : SSD-680STD用、被褥内の部品なし
 For SSD-680STD, Parts in the dot line are not mounted.

16-9 EP-3463 VBPF & GAIN CONTROL

1. General

This PCB consists of the F0 CONT signal generating circuit, PRE STC signal generating circuit, STC signal generating circuit, GAIN signal generating circuit, Flow Gain CONT circuit, Rx Echo change signal generating circuit, and data-from-MAIN-CONTROL latching circuit.

2. Operation

1) F0 CONT signal generating circuit

Generates "F0 CONT" signal used for controlling the Variable Band Pass Filter.

2) PRE STC signal generating circuit

Generates the PRE STC signal used for suppressing the close-distance echo signal level which is sent to the PRE AMP in the Pre AMP board.

3) STC signal generating circuit

Generates the STC signal corresponding to setting of the STC volume on the panel.

4) GAIN signal generating circuit

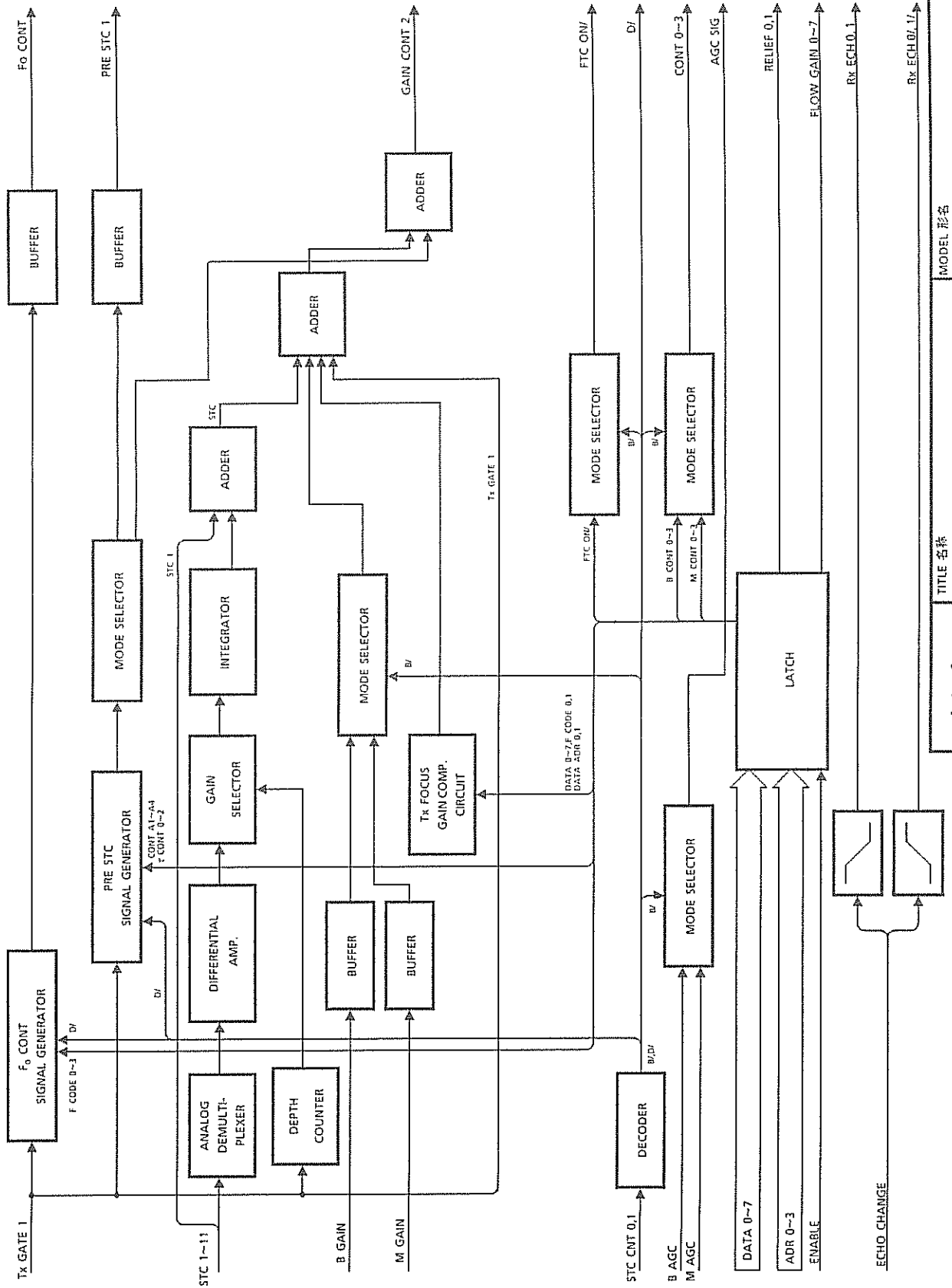
Switches over the B-GAIN signal and M-GAIN signal to each other in conformity with the selected mode. This GAIN signal, the above-mentioned STC signal and PRE STC signal, and the GAIN correction signal at the time of dynamic focus sum up to "GAIN CONT 2" which is outputted to the "MAIN AMP & COLOR ITF" PCB.

5) Data-from-MAIN-CONTROL latching circuit

Receives data from the MAIN CONTROL through the "GEU INTERFACE" PCB and sets up the condition in this PCB. Data such as "FTC ON/", "CONT 0-3", and "RELIEF 0, 1" are temporarily latched in this PCB before they are outputted to the "MAIN AMP & COLOR ITF" PCB.

6) Rx ECHO CHANGE signal generating circuit

This circuit outputs the control signals Rx ECH 0, 1 to alternately exchange "the setting of delay time" and "the reception operation" in two systems of RX FOCUS boards (EP-3459).



1 / 1	
Aloka	TITLE 名称 VBPF & GAIN CONTROL
EP-3463	MODEL 形名

16-10 EP-3464 TX TRIGGER GENE

1. General

This PCB has the circuit necessary for generating transmission triggers TRIG 0 to 47. Transmission delay time which electronic FOCUS needs in also generated by this PCB.

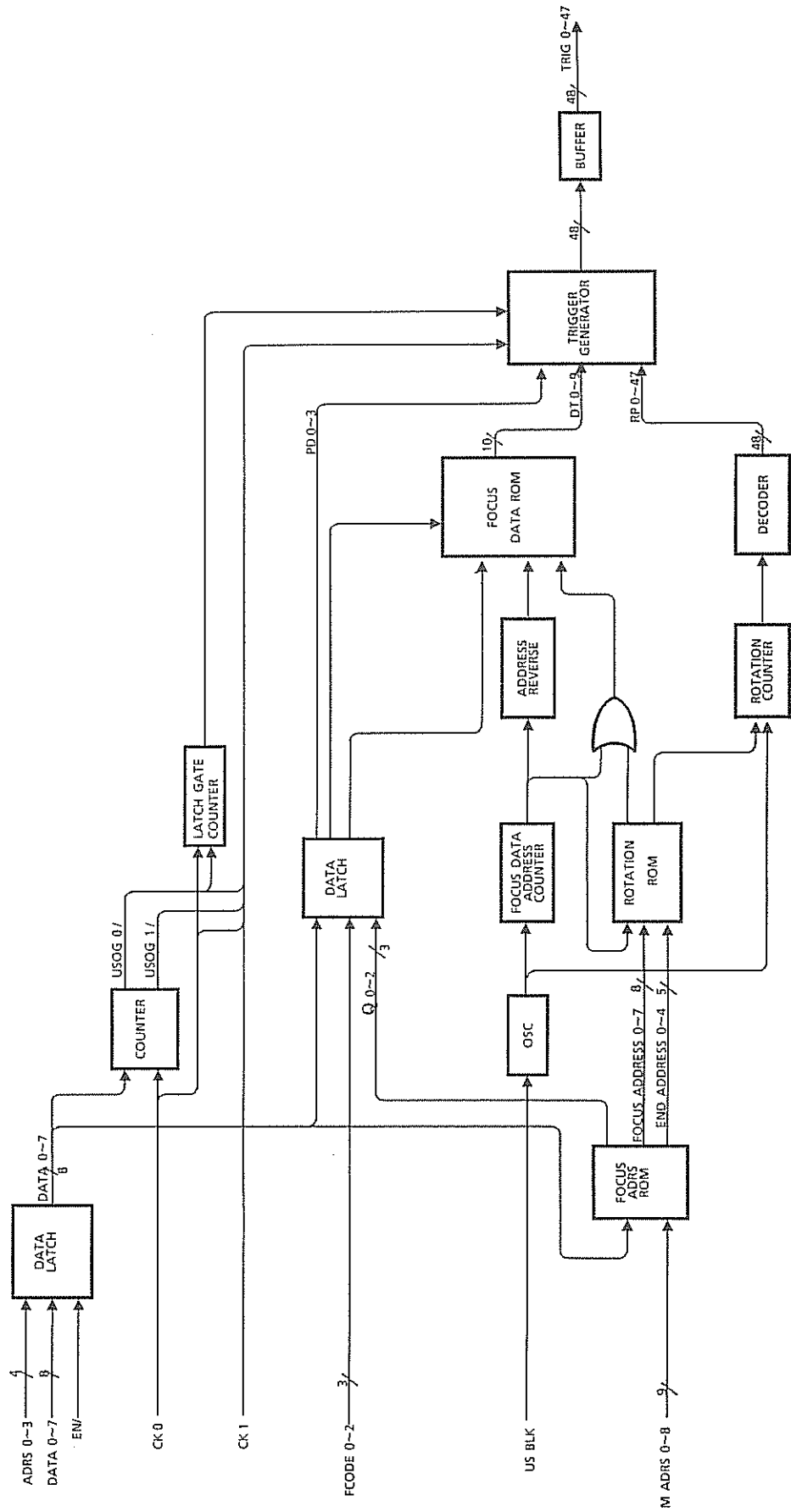
2. Operation

1) FOCUS DATA ROM

This ROM determines delay time of transmission triggers to be applied to 48 transmission circuits. Output data (DT 0 to 9) of this ROM are ratched in the trigger generator by signal ENA and signals ADRS 0 to 3.

2) TRIGGER GENERATOR

This circuit compares information from the FOCUS DATA ROM with CK 0, 1 count output and, when the two are equal, outputs a pulse as the transmitter triger.



Aloka	TITLE 名称 TX TRIGGER GENE	MODEL 形名 EP-3464	1 / 1
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16-11 EP-3465 GEU TIMING & ADDRESS

1. General

This PCB consists of the timing signal generating part and the address generating part.

2. Operation

1) Timing signal generating part

- SYSTEM GATE GENE.

Signals generated here are SYSGT, USBLK and DOPRATE which are the basis of equipment operation.

- SYSTEM CONT GATE GENE.

Signals generated here on the basis of SYSGT control the movement of various parts of equipment.

- DFAREA GENE.

The DF AREA signal and ECHO CHANGE signal are generated here.

- DOP CONT SIG GENE.

The DOTCLK and UNBLK signals are generated here.

- CFM CONT SIG GENE.

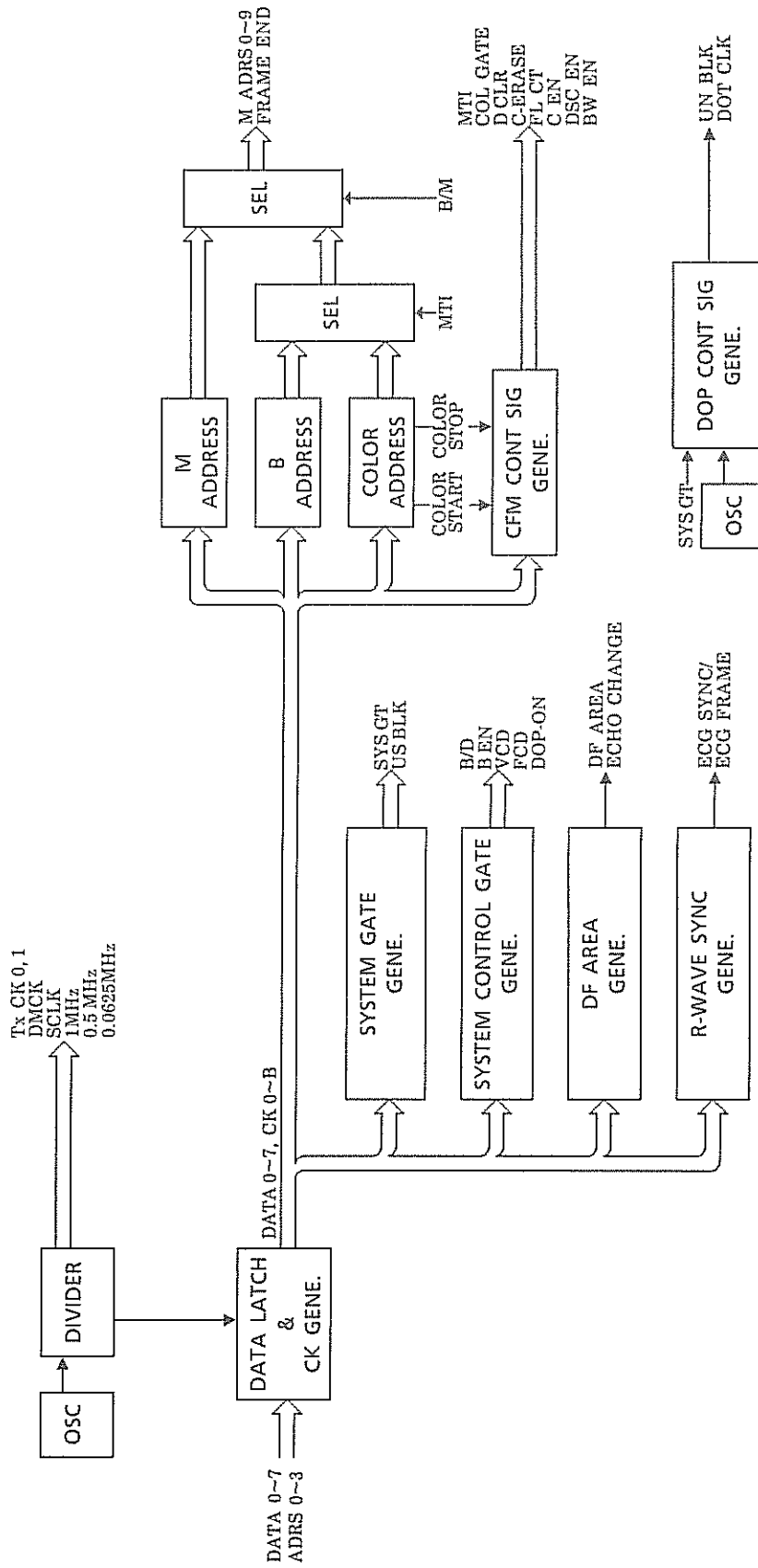
Signals generated here control the operation of various parts of equipment in color mode.

- R-WAVE SYNC GENE.

Generates the R-wave synchronizing signal when ECG signal display unit is connected.

2) Address generating part

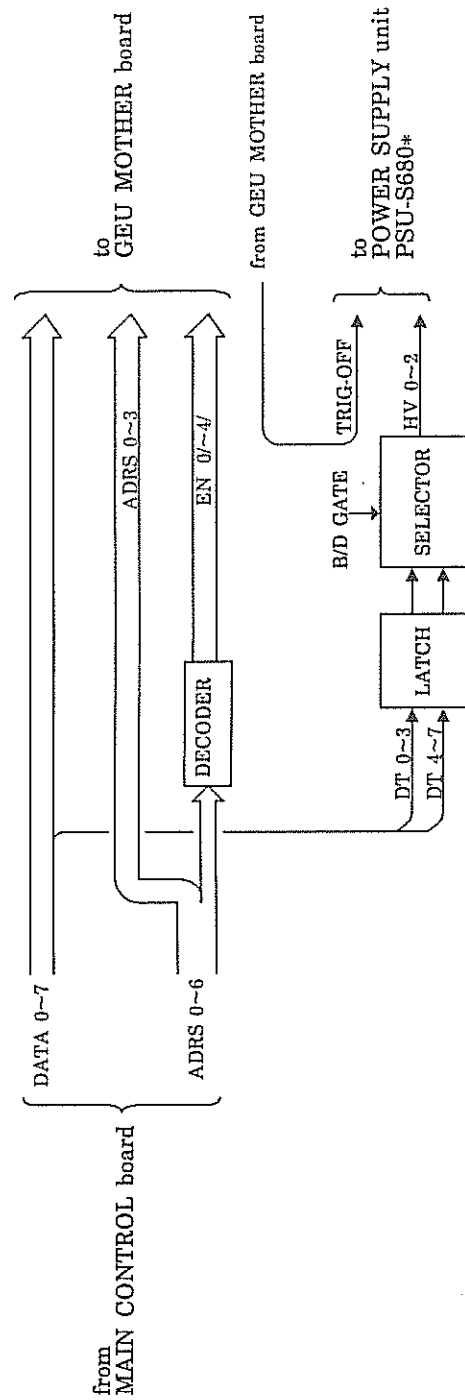
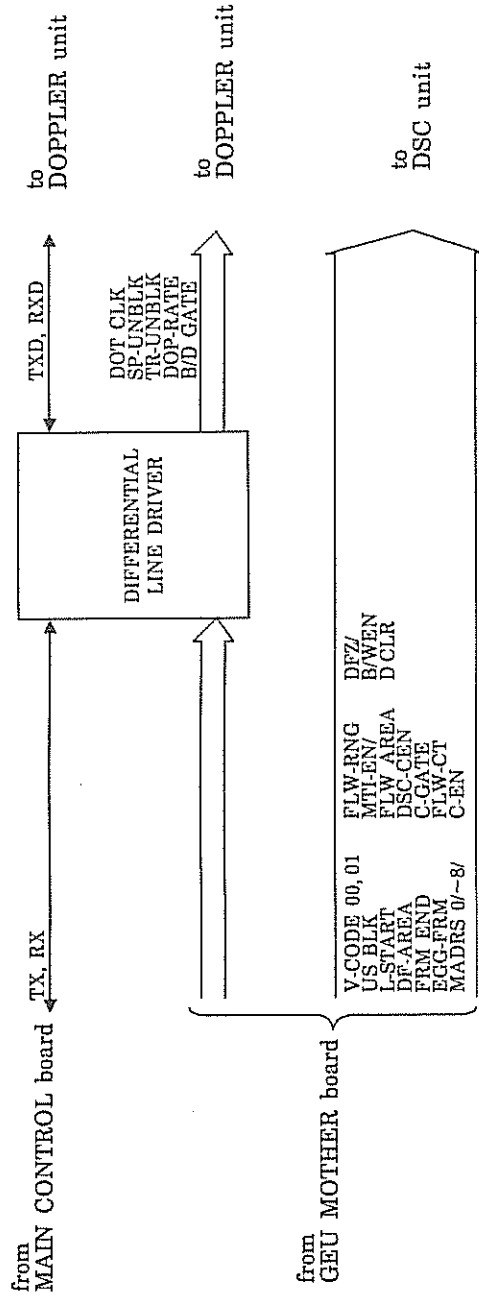
Signals M ADDRESS, B ADDRESS, and COLOR ADDRESS are generated here and sent to various parts.



Aloka	TITLE 名称 GEU TIMING & ADDRESS	MODEL 型号 EP-3465	1 / 1
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16-12 EP-3525 GEU INTERFACE

- 1) Through this PCB, the timing signal, control signal, and address, generated by the GEU TIMING & ADDRESS (EP-3465) in the GEU, are sent to the DSC and DOP.
- 2) Through this PCB, register data from the MAIN CONTROL (EP-3265) is sent to the GEU. Also, the HV control signal is sent to the power supply unit (PSU-S680) from this PCB.



1/1	MODEL 形名	GEU INTERFACE	EP-3525
Aloka	TITLE 名称	GEU INTERFACE	EP-3525

16-13 EP-3452 RX SELECT CONT

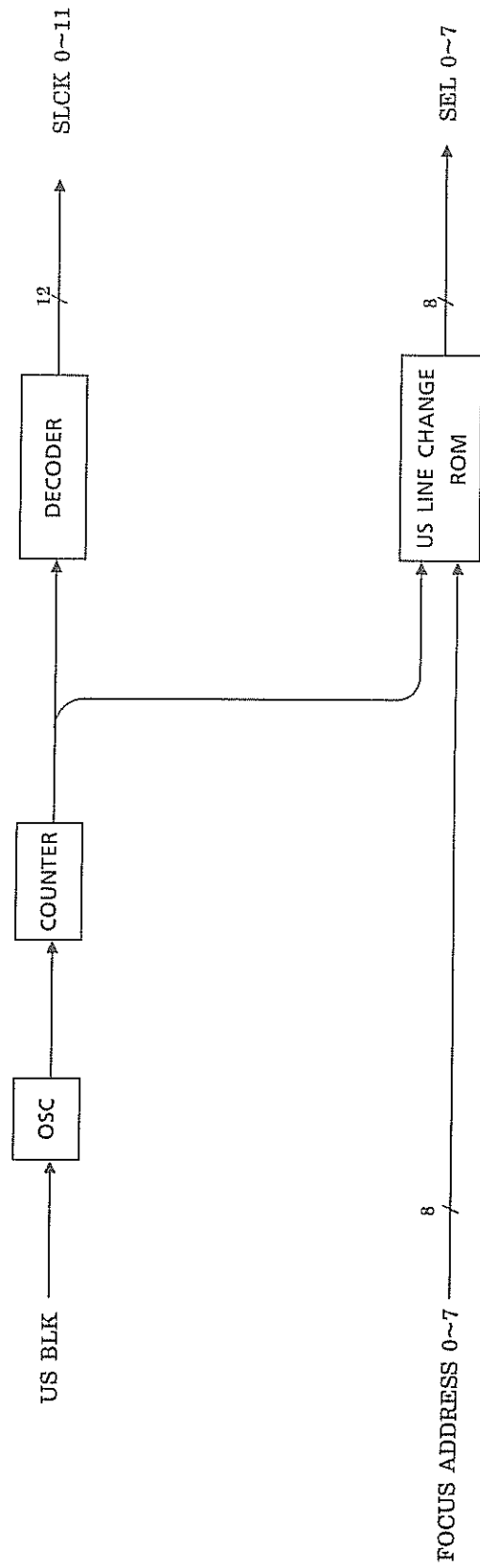
1. General

This control circuit is used for selecting a transducer number.

2. Operation

On the basis of FOCUS ADDRESS data, it determines which transducers to be selected (normally 48 blocks) during BLK time of US BLK signal.

This SELECT signal is sent to Rx SELECT (EP-3455) and TX1, TX2 (EP-3456, EP-3457).



Aloka	TITLE 名称 RX SELECT CONT	MODEL 形名 EP-3452	1 / 1
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16-14 EP-3247 B/W MEMORY

1. General

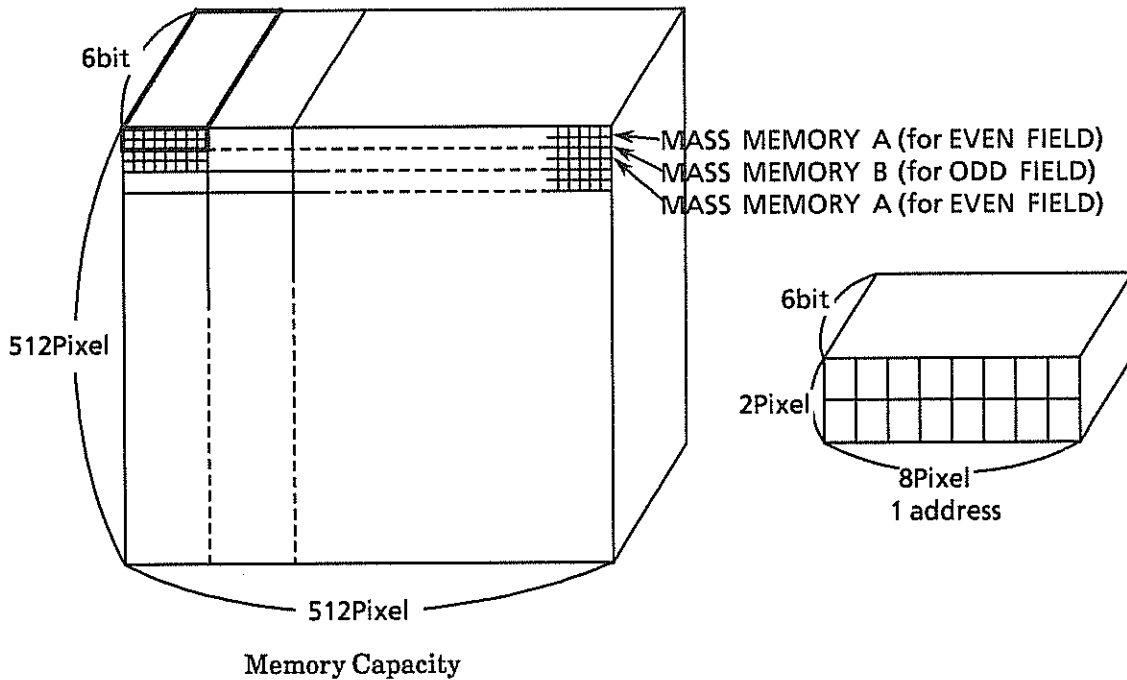
This PCB includes the mass memory for B/W having a capacity large enough to cover the whole area of ultrasound tomography image (512 pixels × 512 pixels × 6 bits). The PCB also includes the update ROM for frame correlation use.

2. Operation

1) MASS MEMORY

The mass memory consists of 32 chips of D-RAM ICs. The half of them (16 chips) have charge of 4 bits (0-3) and the remainder (16 chips) have charge of 2 bits (4 and 5) among 16 bits for gray-scale stages. (The remainder having charge of 2 bits is not in use.)

The arrangement of the memory is shown in the following Fig. Eight chips are arranged in the horizontal-scanning direction and two chips are in the vertical direction, so that total 16 pixels are included in one address.



Therefore, the whole tomography image is composed of 64 addresses in the horizontal direction and 256 addresses in the vertical direction.

① Writing in to memory (READ MODIFY WRITE)

To perform frame correlation, the mass memory operates in the RMW (Read Modify Write) cycle. To increase writing speed, access to two pixels in the same address is made simultaneously and writing of those two pixels is also made simultaneously.

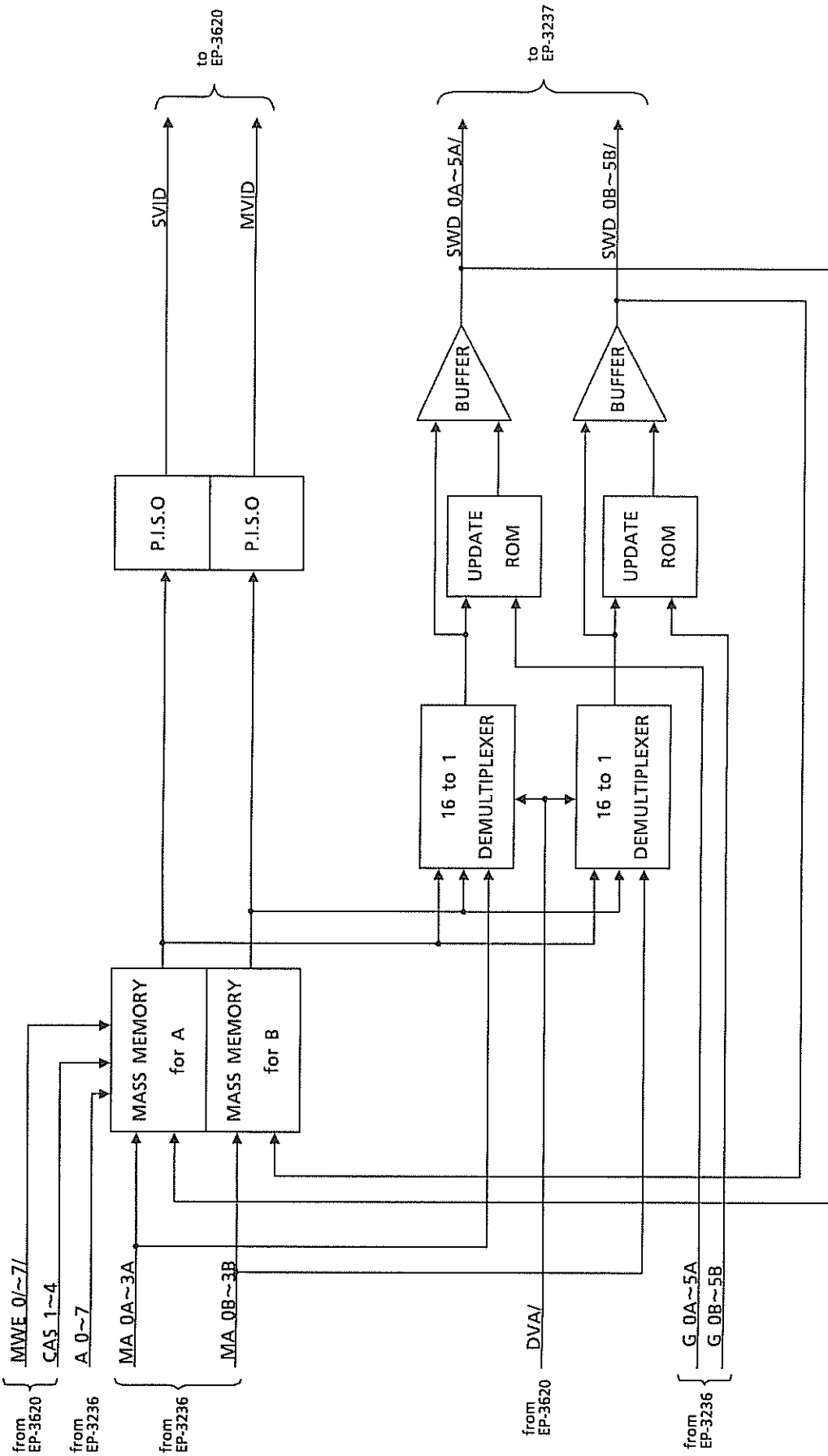
② Reading out from memory (PARALLEL READ)

To display data on the TV monitor, 16-pixel data (one pixel on each RAM chip) are read out from 16 RAM chips simultaneously for one address use.

The READ MODIFY WRITE cycle and the PARALLEL READ cycle are repeated alternately.

2) UPDATE ROM

The update ROM is for the purpose of getting correlation of data read out from the LINE BUFFER (new dat: G0A-G5A, G0B-G5B) with the old data on the same memory address (SRD0A-SBD5A, SBD0B-SBD5B), and is used in the time of frame correlation. The correlated data become the new data to be written in the memory. When there is no necessity of correlation (M-mode, etc.), new data are sent to the memory directly through the route bypassing the update ROM.



Alata	TITLE 名称 BIW MEMORY	MODEL 形名 EP-3247	1 / 1
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16-15 EP-3236 DSC ADDRESS

1. General

This PCB consists of the address generator circuit for writing in memory, address generator circuit for reading out of memory, address generator circuit for MPU Access, plane control circuit, off screen control circuit, X-Y calculator, LINE BUFFER, and MEMORY WRITE CONTROL.

2. Operation

1) Address Generator Circuits

A. WRITE ADDRESS

The address counter circuit for writing in memory generates X-, Y-direction addresses by means of the X-address counter and Y-address counter to use them as A0/~7/ to be sent to the "MEMORY" PCB. For "CINE MEMORY" PCB, a plane number is added to it in addition to X-, Y-direction addresses to get output CA0/~8/. The address counter initial values X0 and Y0 from the "US ITF" PCB are transferred by L DATA 0~7 for each line of ultrasound. Loading of L DATA 0~7 is timed by the DECODER. On the other hand, memory address (BT MAP/) used for MPU access to the memory has to be entered into the counter through the address bus, and therefore a selector is used to switch over the counter input line.

This DSC uses simultaneous writing of two pixels, which needs two kinds of address output per memory write cycle. The simultaneous writing beyond one block (8×2 pixels) is not made, however, those two address are same except the lower 3bits in X-direction and the lowest bit in Y-direction. Therefore two kinds of address, A(MA0A~MA3A) and B(MA0B~MA3B), are simultaneously output for MA00~MA03, and one kind of address is output for MA04~MA17. Also, XFULL A, B and YFULL A, B signals are generated to show whether two adjacent pixels are in the same block or not. If the first pixel causes this signal to become HIGH Level, no simultaneous writing of two pixels is made. So, this signal is used for judging whether writing of two pixels is made simultaneously or separately. To cope with unnecessary count of the address counter which takes place even when no simultaneous writing is made, X-latch and Y-latch are used for the respective address latches to hold addresses regarded as necessary according to the foregoing judgment, waiting for the next writing timing.

Accordingly, the write address MA04~17 has only one kind of output. The address MA04~17 uses a common line for both read address and write address. Output of write address is allowed by WRGT/ only when the memory is in the write cycle, so that read address and write address do not fall on the line at the same time. Output of read address is allowed by TV ADR/ only when the memory is in the read cycle.

B. READ ADDRESS

The READ ADDRESS COUNTER consists of the vertically-directional address counter and the horizontally-directional address counter.

The vertical address counter makes 512 counts per frame (2 fields) of TV scanning. The initial value of read address is sent out of MPU and is set to the counter for each field at VLOAD/ timing. Then DLHCK/signal is fed to the counter as a clock. This signal is a pulse clock which generates two pluses per 1H (one horizontal scanning), and therefore the counter counts up by two per 1H. This is attributed to interlaced scanning.

Among 10 bits of counter output, only RVA1~8 (MA10~17) are actually used for memory address. The lowest bit is used as YADR0 output to "TIMING." Since one-address data (corresponding to 16-pixel data) read out of MASS MEMORY is associated with 8 horizontal pixels and 2 vertical pixels, there is the necessity of selecting either the upper 8 pixels or the lower 8 pixels for display on the monitor. YADR0 is used for this selection operation. On the other hand, RVA8 is used as an area designation signal for the purpose of erasing either the upper or lower half of the screen during OFFSCREEN, ERASE.

The horizontal address counter is loaded by HRSET and operated by the 12MHz clock. The lower 3 bits is not fed as MEMORY ADDRESS and data output is made by shifting IMAGE DATA with SHIFT REGISTER.

At the time of Cine scrolling, OFFSET data is added to horizontal address (MA04~09) output from the gate array.

C. ACCESS ADDRESS

The address generator for MPU access consists of the X-address counter and the Y-address counter.

By setting X, Y address to this circuit, any optional pixel is designated on the memory and read/write from the MPU side becomes possible. The X-address counter is not only used as a register for specifying address, but also able to perform auto increment action to update the address each time when the MPU gains access to the memory.

Each address output utilizes the read/write address bus (MA00~17) in common. Output to the bus is synchronized with memory cycle only when the MPU issues an access instruction.

2) Plane Control Circuit

A. WRITE PLANE

FEND/ (in B mode), MEND/ (in M mode), or VLOAD/ (in Erase), any one is selected by the selector, and served as a plane clock. The plane clock increments counter output (LPCRA 0~3, RPCRA 0~3), which is converted by the PLANE CONVERSION RAM into actual write plane number. This feature is for the purpose of substituting a reserved non-write plane for a plane to be stored by rewriting data for the PLANE CONVERSION RAM in B mode storage. (Store of planes is made by DMA transfer in mode M, D, and by the above substitution operation for B or by DMA transfer for * in mode B/*.)

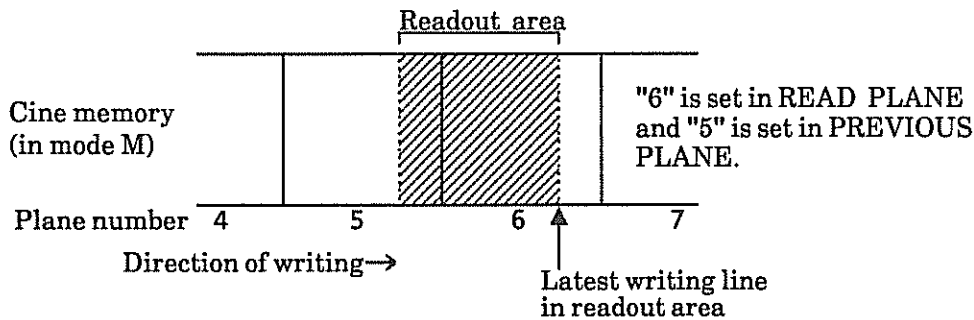
In realtime, plane number is used for both display and write. In realtime display, display frame is synchronized with TV frame, and DISP/WRITE PLANE SEL subtract 1 from the output of PLANE COUNTER not to display the plane which is on the way of writing. On the other hand, for write plane DISP/WRITE PLANE SEL outputs the data from PLANE COUNTER as it is.

B. READ PLANE

The read plane and write plane are switched over to each other by WRPLN/.

The MPU reads a write plane just before freezing and, on the basis of it, sets a read plane number on the READ PLANE register. Cine searching operation is also made by rewriting this register. In M, D mode, a read plane may extend over two planes in some cases. In such a case, a plane number with rather early coming data is set on the PREVIOUS PLANE, while a plane number with rather later coming data is set on the READ PLANE.

Example: When READ PLANE extends over #5 and #6



3) ERASE AREA Decision Circuit

When a writing area is determined (MULTI IMAGE), there is the necessity of using the same area for executing erase.

Since ERASE utilizes READ ADDRESS, ERASE ON/OFF must be decided depending on the value of READ ADDRESS. Basically, setting may be the same one as used for OFF SCRNB of writing (writable range). This setting is to be included in software.

4) X-Y Calculator

The X-Y calculator is used for calculating pixel boundary points, by generating LDLB/ NEW BOX/ pulses each time vector passes through a pixel boundary either in X- or Y-direction.

Two calculators are used: X-direction calculator and Y-direction calculator. They are identical in function and, therefore, only the function of the X-direction calculator is described below.

During blanking of echo video, or during "H" level of SWPON signal, ΔX (LDATA 0~7) from the "US ITF" PCB is set to the X-PIXEL BOUNDARY CALCULATOR. ΔX represents X component of a vector. That is, it is a value indicating an advance per unit time of a vector in X direction.

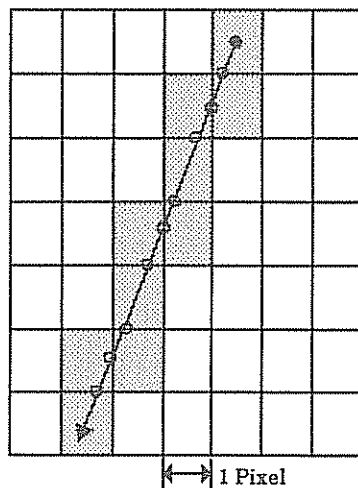
$X = X_0 + \Delta X \cdot t$ X, Y : Coordinates of vector t : time

$Y = Y_0 + \Delta Y \cdot t$ X_0, Y_0 : Initial coordinates of vector

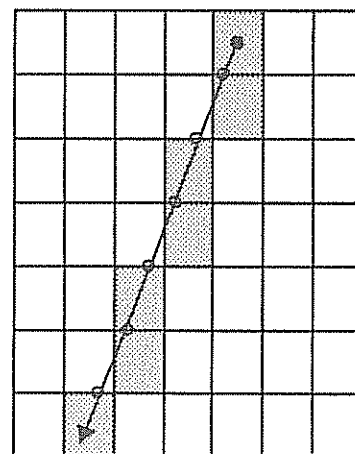
Since ΔX is 2-byte (16-bit) data, it is divided into two, H byte and L byte, which are set independently from each other. The calculator starts its action after SWPON/ signal turns to Low and DFC signal to High.

After a time set by ΔX passes, the calculator generates CARRY signal output which informs that a vector advances by 1 pixel in X direction. As far as DFC signal is Low, action of the calculator is kept stopped. Therefore, the signal of a vector can be stopped while the vector is out of the focus area.

Then, signals INC X, INC Y, and LDLB/ are generated by using X, Y CARRY signals. INC X, Y are counter enable signals which causes increment of the WRITE ADDRESS COUNTER by one in X- and Y-directions, respectively. LDLB/ is the LINE BUFFER write request output signal generated in pixel movement. Detection of a pixel boundary by a vector is in two ways, namely, the X-AND-Y method and the X-OR-Y method as illustrated below. In the illustration, a straight line represents vector. Mark \circ represents each position regarded as a position to which a pixel is moves and output of LDLB/ signal is made therein.



X-AND-Y method



X-OR-Y method

In this DSC, either the X-AND-Y method or the X-OR-Y method is selected depending on status of XCONT/, YCONT/ signals. (In SSD-680, only the X-OR-Y method can be used.) For the X-AND-Y method, a pixel is regarded as to be moved if a vector intersects either

X- or Y-boundary line of a pixel. On the other hand, for the X-OR-Y method, a pixel is regarded as to be moved only when a vector having an angle below 45° (nearer to vertical) intersects the Y-direction boundary or only when a vector having an angle 45° (nearer to horizontal) intersects the X-direction boundary.

5) LINE BUFFER

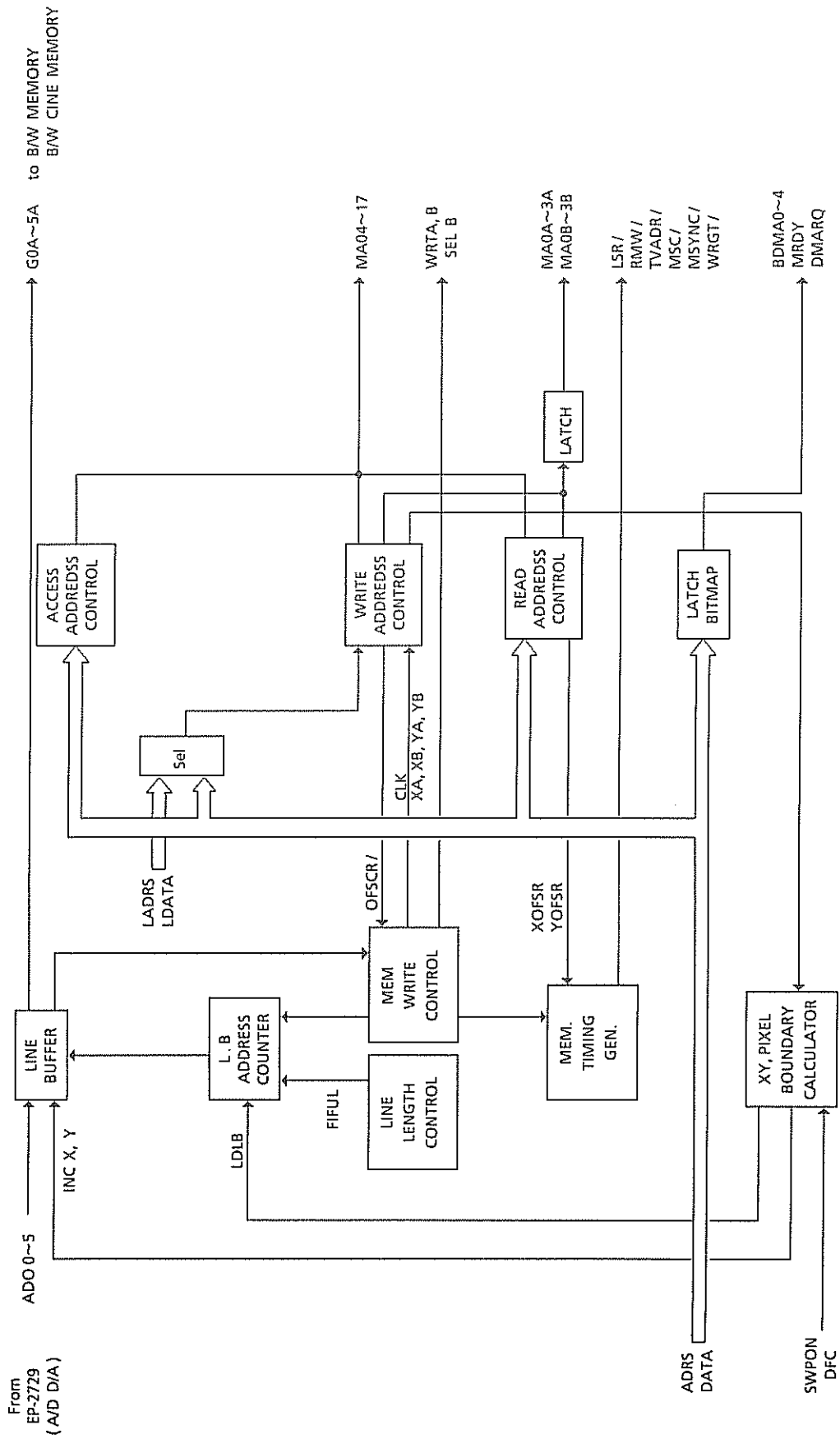
To cope with asynchronism in period between ultrasound repetition and TV scanning, the LINE BUFFER temporarily stores video signal ADO 0~5 sent out of the "A/D, D/A" PCB until arrival of writing timing of the MEMORY.

Up to one line of ultrasound is stored and read out from time on time. The BUFFER is FIFO (First-in, First-out) which allows readout in the same order as used for writing. Also, ICR X, Y are stored at the same time to indicate the direction of the array of pixels requiring writing of the next data. The readout/ write addresses of the LINE BUFFER are generated in the L.B ADDRESS COUNTER. Writing has precedence over readout. Readout is made in the intervals of writing and in time with writing cycle of the memory.

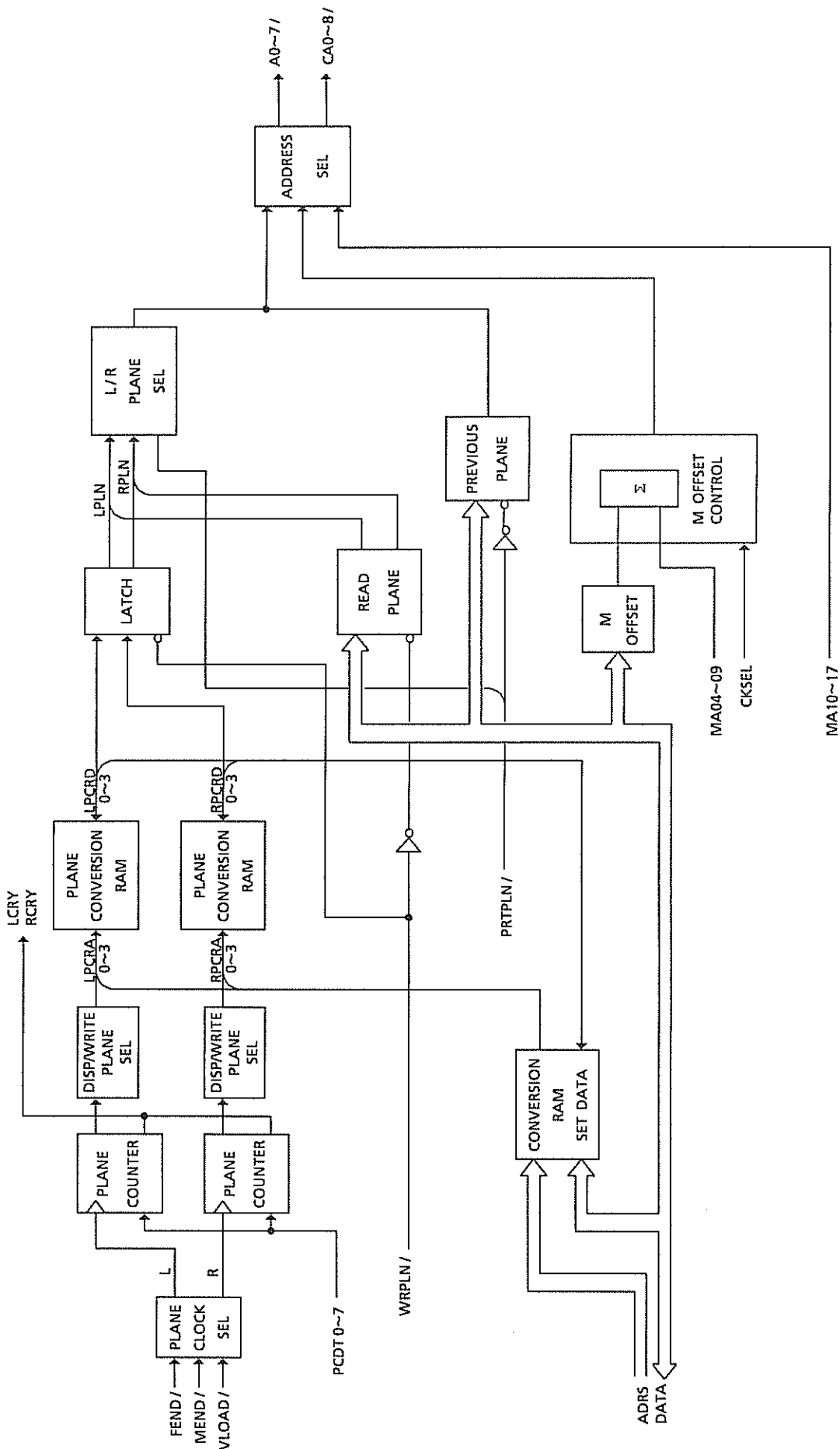
6) MEMORY WRITE CONTROL

The MEMORY WRITE CONTROL circuit controls writing on the memory, especially for determining whether simultaneous writing on two pixels is made or not. Simultaneous writing on two pixels is possible if both WRTA/ and WRTB/ are Low. Writing on a single pixel only is possible if either WRTA/ or WRTB/ is Low. In the case of simultaneous writing on two pixels, two kinds of MA00~03 are also generated.

Clock singles CLK XA, XB and CLK YA, YB are generated by waveform shaping of ICR X, Y singles (giving data to indicate which direction writing on the array of pixels is made next time) in time with writing cycle of the memory so that they are able to serve as the clock for the address counter.



Aloka	TITLE 名称 DSC ADDRESS	MODEL 形名 EP-3236	1 / 2
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Aloka	TITLE 名称	DSC ADDRESS	MODEL 形名	2 / 2
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16-16 EP-3620 DSC TIMING

1. General

This PCB consists of the timing generating circuit, horizontal smoothing circuit, line memory circuit, and memory timing control circuit

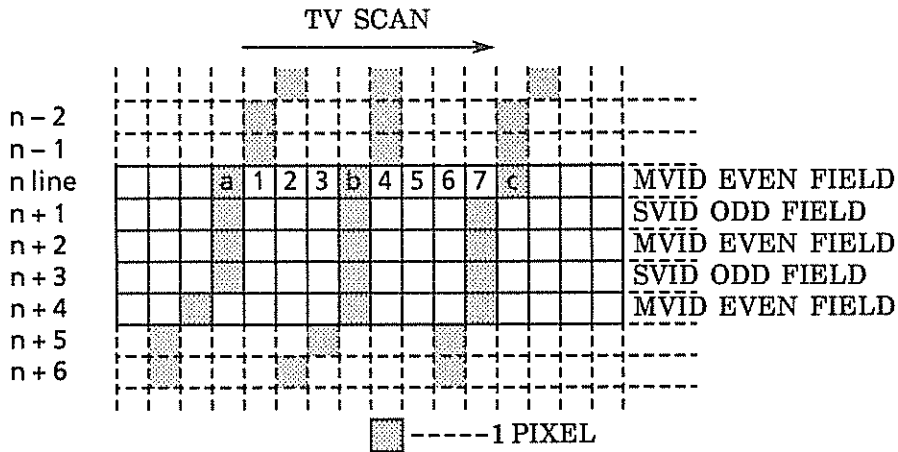
2. Operation

1) TIMING GENERATING CIRCUIT

With reference to the 12 MHz master clock which the crystal oscillator generates, the timing generating circuit generates the memory timing (horizontal timing and vertical timing), TV sync signal, etc. by means of the ROM based timing generation method.

2) HORIZONTAL SMOOTHING CIRCUIT

The pixels lacking in data completely, such as shown by numbers 1 to 7, are interpolated by filling "a", "b" and "c" with weighted data. Although filling up to 11 pixels maximum is possible by this circuit, the maximum number of pixels can be selected by software setting means.

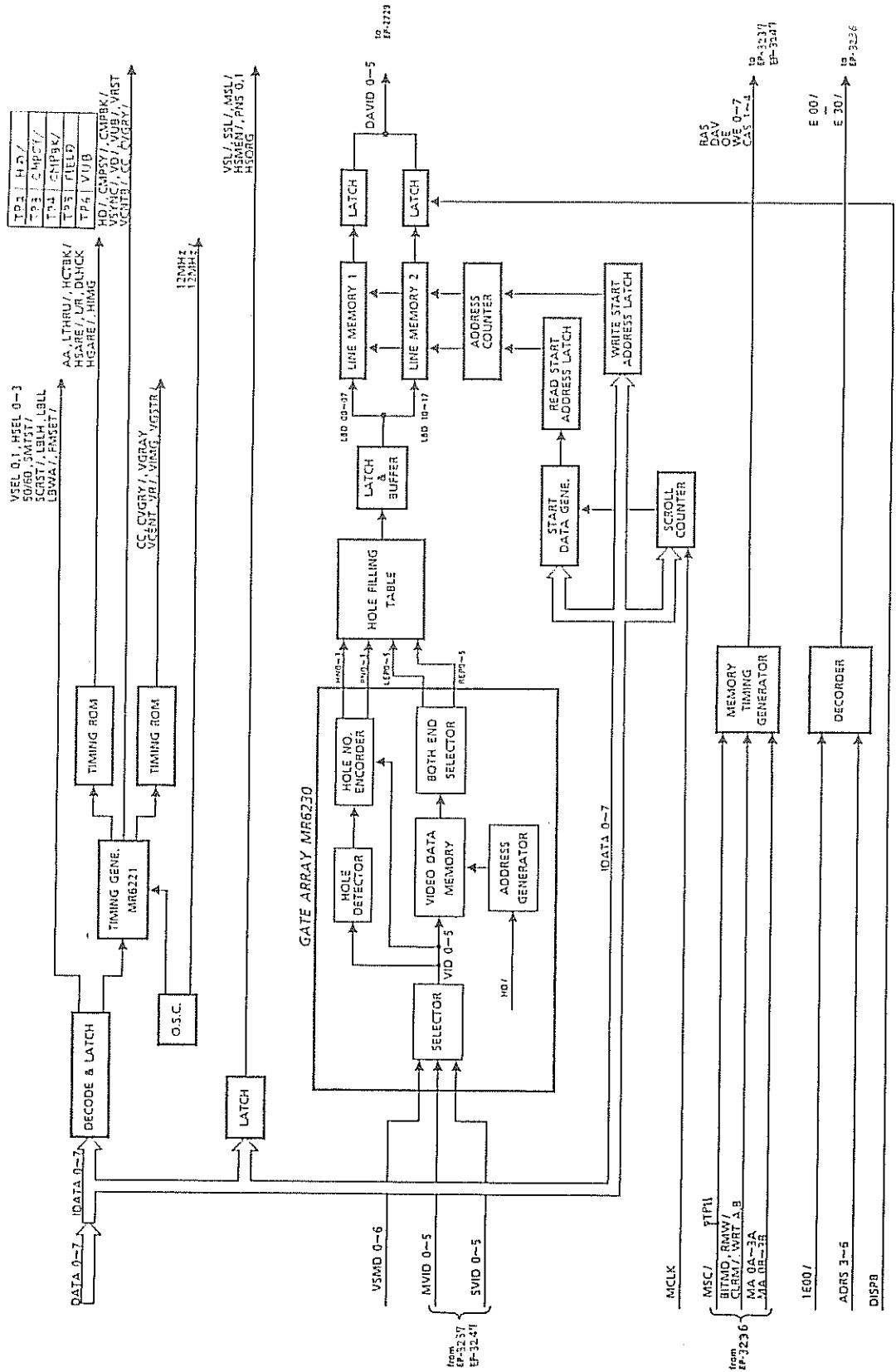


3) LINE MEMORY CIRCUIT

The line memory circuit is for the purpose of making M-mode scroll possible. while the address for starting writing in to the line memory being always kept constant, scroll is made by moving the reading start address.

4) MEMORY TIMING CONTROL

This circuit generates the timing signal necessary for the main memory to read or write data.



Aloka	TITLE 名称	DSC TIMING	MODEL 形名	EP-3620	1 / 1
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16-17 EP-2729 A/D , D/A

1. General

This PCB consists of the A/D CONVERTER, POST PROCESSOR, and D/A CONVERTER.

The A/D CONVERTER converts the analog video signal from the Tx & Rx UNIT into the digital video signal.

The POST PROCESSOR changes in brightness of video signals from the B/W MAIN MEMORY and B/W CINE MEMORY.

The D/A CONVERTER convertsthe digital video signal into the analog video signal, and after the TV synchronizing signal is added to it, outputs a B/W composit video signal for TV.

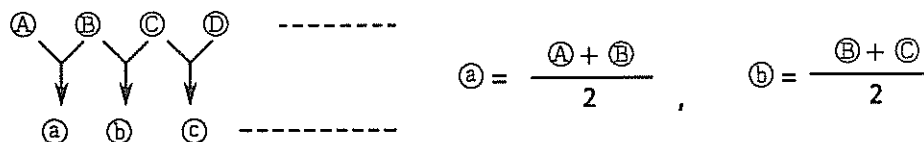
2. Principle of operation

1) A/D CONVERTOR

An ultrasonic echo is converted into digital signal.

2) LINE CORRELATOR (SSD-680EX does not use Line correlator.)

Line correclator outputs ultrasonic echoes after obtaining average between the first echo and the one transferred next.



A B, C, and D are true data indicating one ultrasonic. The output signal is the average of A and B.

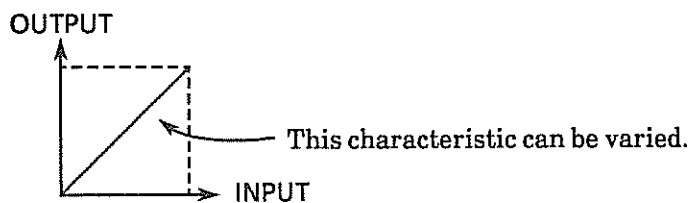
3) GRAY BAR GENERATOR

This circuit generates GRAY SCALE BAR to be displayed on the monitor.

4) POST PROCESS

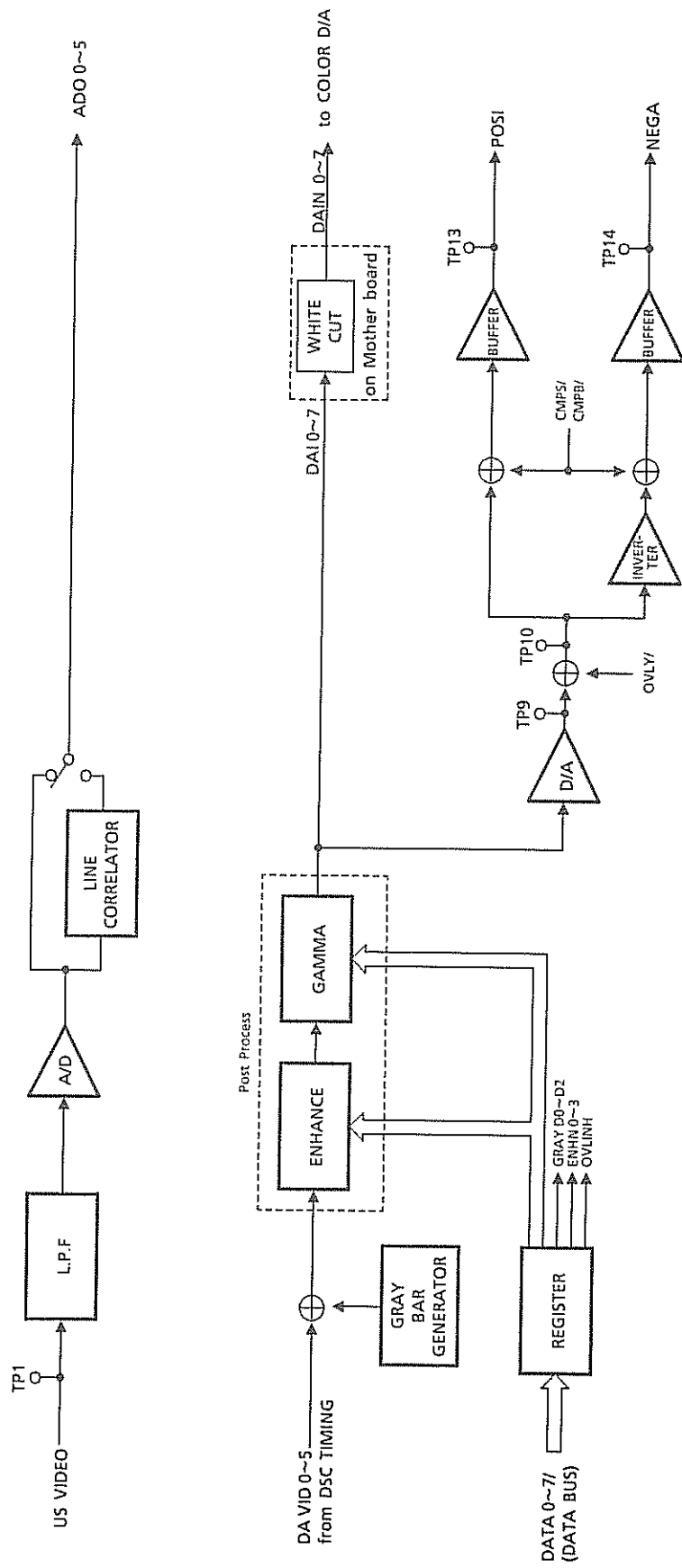
This circuit consists of ENHANCE and GAMMA.

This circuit is used to vary monitor brightness characteristics for echoes.



5) D/A CONVERTOR

This circuit generates TV SIGNAL for B/W.



<p>Aloka</p>	<p>TITLE 名称 AID, DIA</p>	<p>MODEL 形名 EP-2729</p>	<p>1 / 1</p>
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16-18 EP-2913 DUAL MPU

1. General

This PCB using two 8-bit MPUs (HD68B09) is roughly divided into two parts -- one is the DSC part which controls the DSC and periphery I/O and the other is the measuring part which takes part in measurement.

For communication between the two MPUs of this PCB and the MPU on the A-GDC board, a special system bus is used. Through that bus, information given at the control panel is sent to each MPU and, under the condition determined by given information, each MPU gives and takes information and data to and from various circuits through local buses.

2. Principle of operation

1) MPU (Micro Processing Unit)

Both the DSC control part and the measuring part have the individual MPUs (HD68B09) which operate at 8 MHz of clock frequency.

2) PTM (Programmable Timer Module)

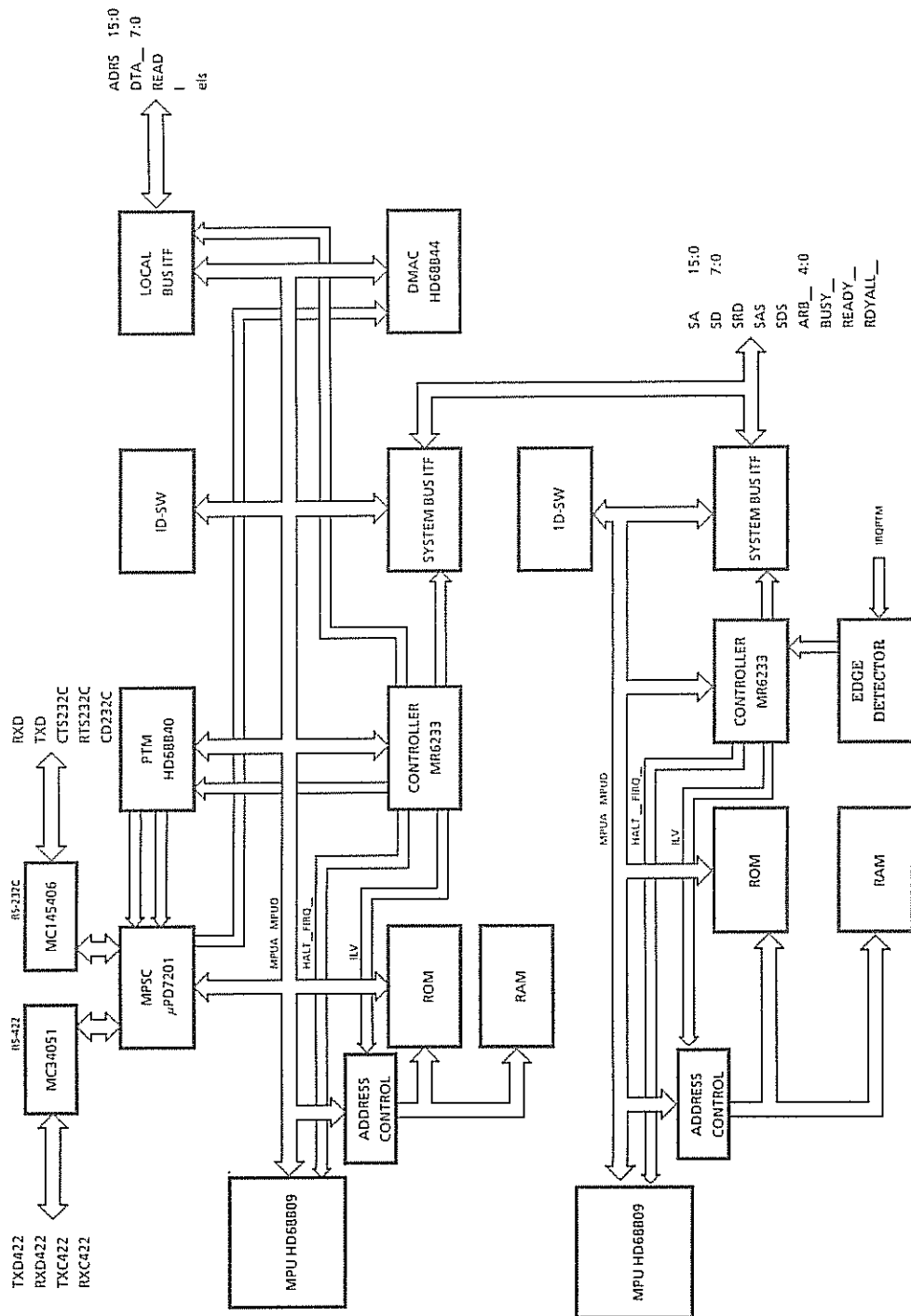
The DSC control part uses HD68B40 for its PTM. This LSI includes three independent programmable counters -- #1 counter is used for the MPSC transmission/receive clock B; #2 counter is used for the transmission clock of RS422 for external communication use; and #3 counter, to which 8 MHz clock is input, is used for the system timer of MPU.

3) MPSC (Multi Protocol Serial Controller)

The MPSC in the DSC control part has two independent serial interfaces.

4) SBI (System Bus Interface)

Both the DSC control part and measuring part have the individual system buses which are the bus lines supporting the multi-processors.



1/1	MODEL 形名	DUAL MPU	TITLE 名称
			Aloka
			EP-2913

16-19 EP-2629 AGDC

1. General

This PCB controls the character and graphic displays.

It consists of the following:

- 1) MPU
- 2) CHARACTER CONTROLLER
- 3) GRAPHIC CONTROLLER

2. Operation

1) The MPU has the following functions:

- MPU (Uses the speedup version of MC6809.)
- PROGRAM ROM (keeps 56K bytes ranging in address from \$20DD to \$FFFF for the ROM region.)
- SCRATCH RAM (Standard mounting of 8K-byte C-MOS SRAM)
- SBI (System Bus Interface used for communication with other MPUs)
- RTC (Real Time Clock used for 1-sec interval interruption to the MPU)
- PTM (Programmable Timer Module used mainly for display of 10-ms units of timer)
- ID-SW (ID Switch which is a 2-byte dip switch)
- LOCAL BUS (Outputs MPU's address data, etc. Graphic and character controllers are connected to this LOCAL BUS.)

2) CHARACTER CONTROLLER

Display format (Either A or B below is selected.)

- A. 64 characters (in a line) × 40 characters (in a column) × 2 pages; each character is composed of 10 × 12 dots
- B. 40 characters (in a line) × 30 characters (in a column) × 2 pages; each character is composed of 16 × 16 dots

The CHARACTER CONTROLLER has the following functions:

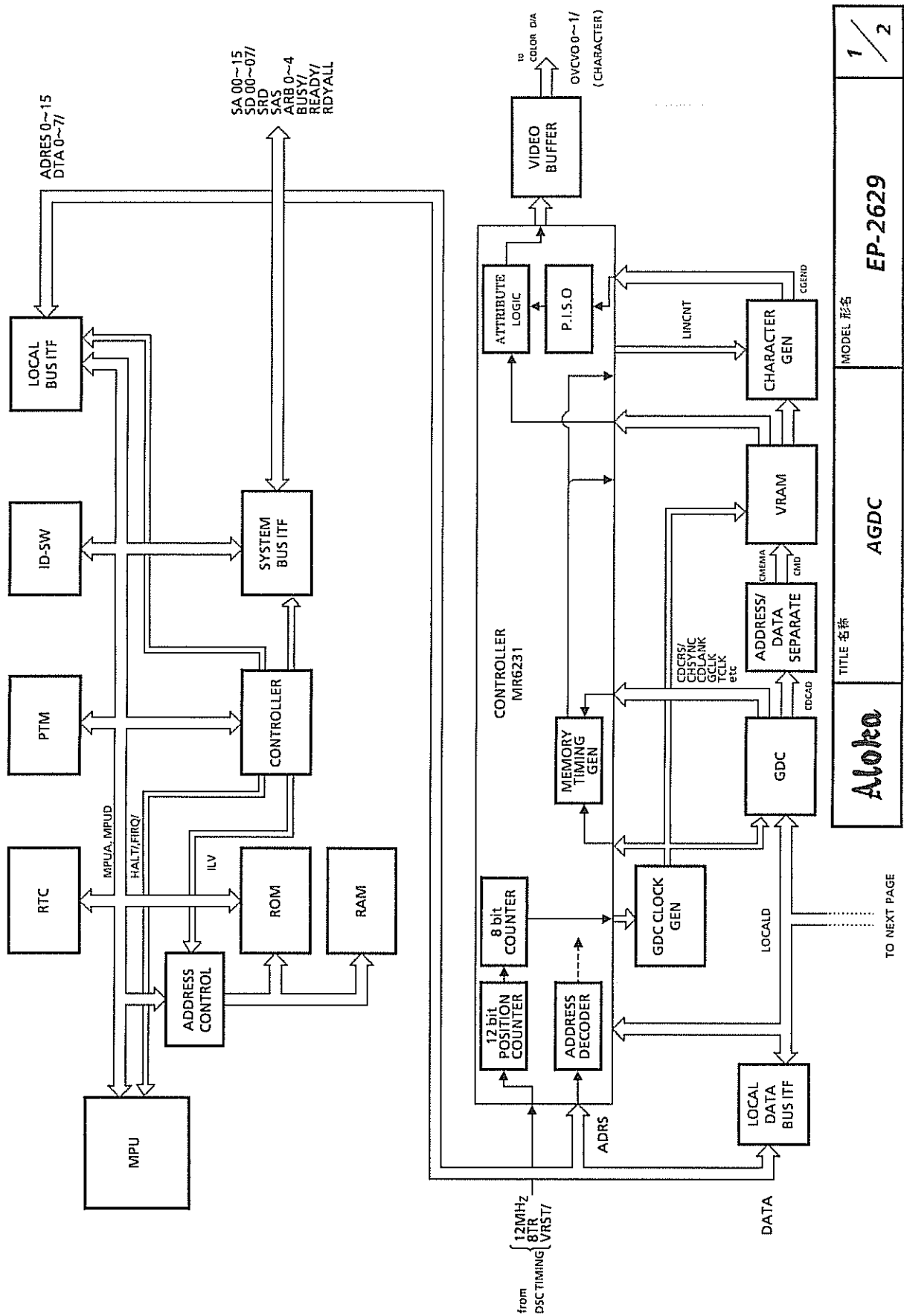
- CLOCK generation (To get synchronization with the DSC's system clock, the controller generates timing signals necessary for inside operations on receipt of the external VRST signal which indicates the start of 12 MHz system clock and TV display.)
- CONTROLLER (Generates memory's readout address in time with TV display timing. Reading and writing data from and to the memory at a command by the MPU.)
- DISPLAY MEMORY (Two 8-byte SRAMs are used.)
- CHARACTER GENERATOR (Data read out of the display memory is converted into video data by the character generating ROM.)
- VIDEO output (Output of the character generator is used for output signal for this PCB after the serial-parallel conversion, attribute addition, and synchronization with the system clock (12 MHz).)

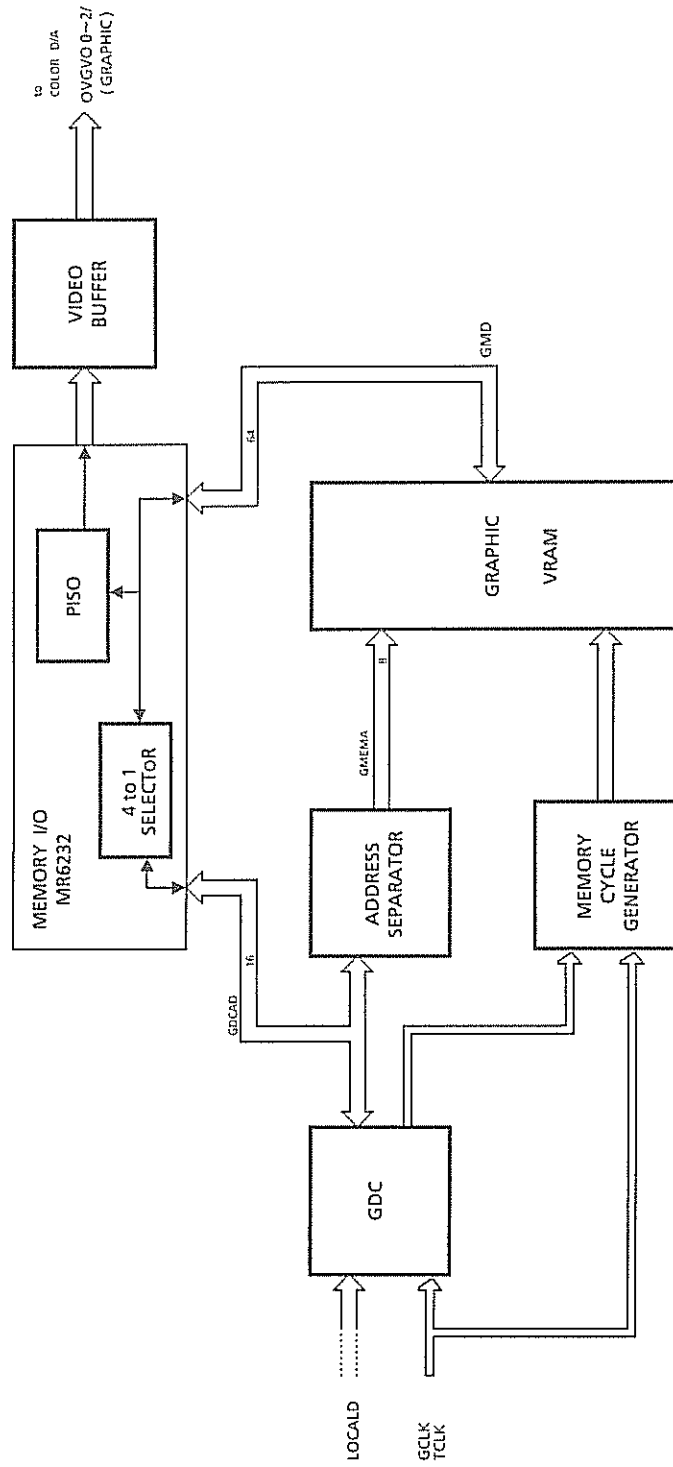
3) GRAPHIC CONTROLLER

Display format: 640×240 dots \times 4 pictures

The graphic controller has the following functions:

- CLOCK generation (Display timing is synchronized with DSC's TV timing.)
- CONTROLLER (Like the character part, a memory for graphic display is under control independent of the MPU's address space.)
- DISPLAY MEMORY (16 chips of $16K \times 4$ bits DRAM are used. 4 chips for each picture)
- VIDEO output (Data read out from DRAMs is outputted for 4 lines of video signals (GVO 0-3) after parallel-serial conversion.)





2 / 2	MODEL 形名 EP-2629	TITLE 名称 AGDC	Aloka
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16-20 EP-3477 US ITF

1. General

This PCB consists of the various kinds of circuit such as ROM TABLE, ECHO ERASE, M-MODE TIME MARKER, TRACK BALL READ, and OPTION BOARD DETECTION circuits, which hold information necessary for writing in US signal to the memory.

2. Operation

1) GEU INTERFACE

LSTAT/, FRENDD, and DFAREA which the GEU sends out are latched by 12 MHz of basic clock of DSC, and then sent to the various parts in DCS. VCD 0/ and 1/ are decoded and sent to the various parts in the PCB. DSCA 0 to 8 are sent to the ROM TABLE through the folding circuit.

2) ADDRESS DEODER & LATCH

Functions as the register which sets up the MPU about the current operational state of the equipment (MAG, PROBE, etc.)

3) ROM TABLE

Stores X0, Y0, ΔX and ΔY which determine the display format of supersound echo image. Those ROM data are sent to the "ADDRESS" PCB as LDAT 0 to 7 for each line during blanking of US.

4) M-MODE CONTROL

The X0 ADDRESS COUNTER for writing control in M-mode generates M addresses, one after another, which are sent to the "ADDRESS" PCB as LDAT 0 to 7. During M-mode, Y0 is set up by the MPU.

5) FREEZE CONTROL

Freeze control in B-mode and that in M(D)-mode are independent of each other. Freeze is executed at the end of frame in the case of B-mode, and at the end of US line in the case of M(D)-mode.

6) ECHO ERASE

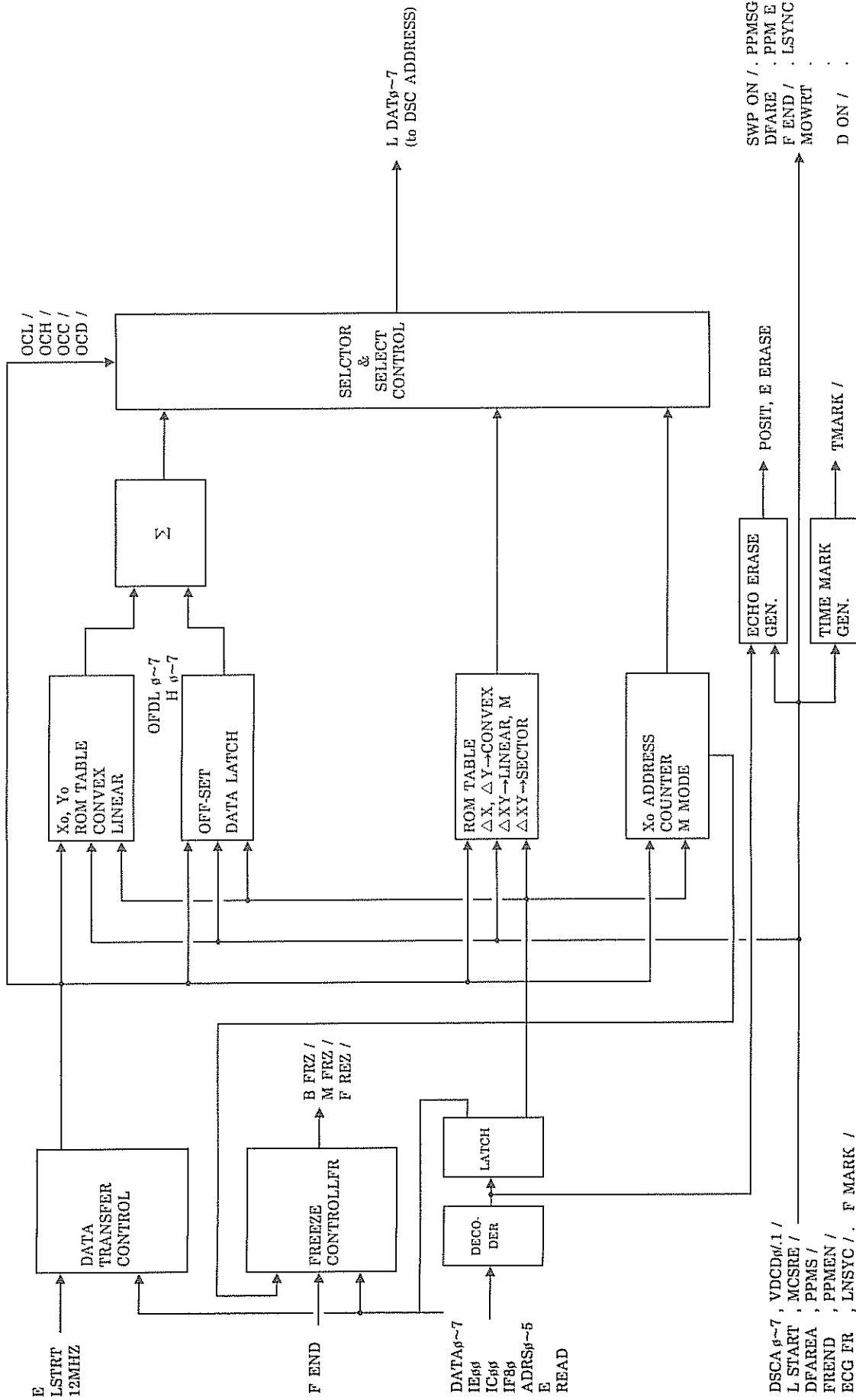
On the basis of the MPU set values, the ERASE signal is generated to define the area in which the echo is erased.

7) TIME MARKER

Generates TIME MARKERS for M-mode use having a width corresponding to two pixels, at intervals of 0.5 ms in the timeaxis direction and at intervals of 1 cm in the depth direction.

8) TRACK BALL COUNTER

Signals (XPLAS/, XMINS/, YPLAS/, YMINS/) from the TRACK BALL are counted up in the X- and Y-directions independent of each other, and the result is read in to the MPU.



1 / 1	MODEL 形名 EP-3477	TITLE 名称 US ITF	Aloka
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16-21 EP-2651 COLOR D/A

1. General

This PCB mixes the RGB color flow signal (digital signal) and the B/W echo signal together and converts the mixture into an analog output signal.

2. Principle of operation

1) COLOR SUPPRESSION

This circuit compares the MPU sets value and ultrasonic data, and stop a color signal when an ultrasonic video level exceeds the grade set by MPU.

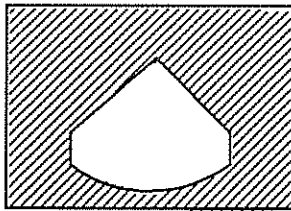
COLOR FLOW data is not displayed on the ultrasonic echo beyond the MPU set value.

2) ADDER

RGB signal (Information of V and δ) is mixed with ultrasonic data.

3) OUTER ULTRASOUND IMAGE CONTROLLER

This circuit controls the outside color of ultrasonic image area.



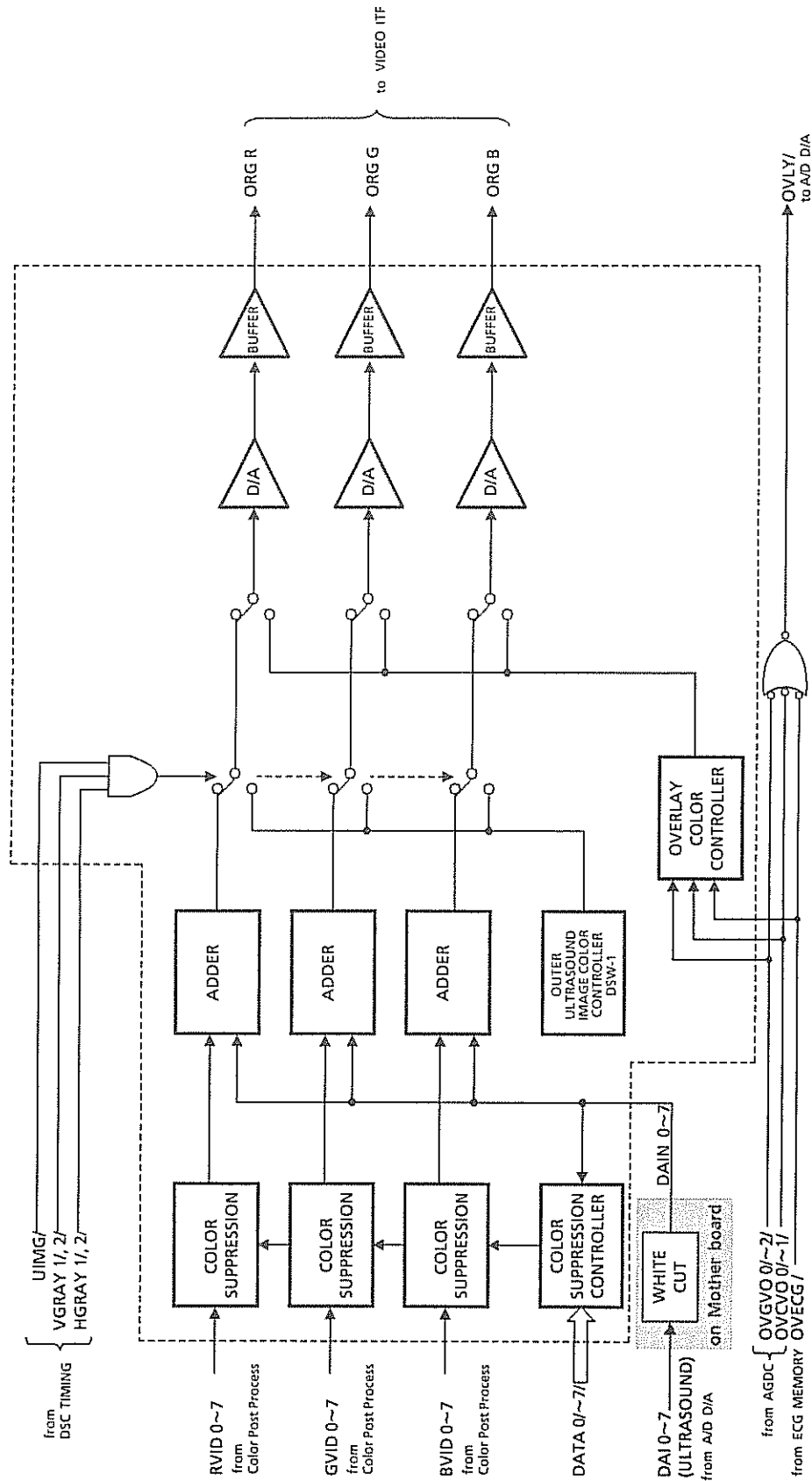
This circuit is controls the color of the shaded section.

4) EVERLAY COLOR CONTROLLER

This circuit determines color when graphic, charactor, ECG are displayed.

5) COLOR D/A

COLOR D/A converts digital RGB signal into analog RGB signal.



1 / 1
MODEL 形名 EP-2651
TITLE 名称 Alora
COLOR D/A

EP-2651#-4: SSD-680EX用、破線内の部品取り付け
 For SSD-680EX, Parts in the dot line are mounted.
 EP-2651#-3: SSD-680STD用、破線内の部品なし
 For SSD-680STD, Parts in the dot line are not mounted.

16-22 EP-3237 B/W CINE MEMORY

1. General

This PCB has a storage capacity of full tomography area (512 pixel × 512 pixel × 6 bits) × 16 screens and is used for B/W. Writing of data, similar to that of main memory, is made on the planes in order.

2. Operation

The mass memory consists of 32 D-RAM ICs, a half of which, 16 ICs. being in charge of 4 bits (0~3) of 6-bit gray scale, while the other 16 ICs. of 2 bits (4,5). (The remainder, 2 bits, is not in use.) In the memory, 8 chips are arrayed horizontally in 2 layers; total 16 pixels for each address. The full tomography is, therefore, formed by 64 addresses in the horizontal direction and 256 address in the vertical direction.(See EP-3247.) There are 16 planes of such a unit area.

1) Writing on memory (READ MODIFY WRITE)

RMW (Read Modify Write) cycle operation, like the main memory. To increase writing speed, access to and writing on two pixels in the same address are made simultaneously. Under control of CAS1~4, CA0~8 which are created by ADDRESS SELECT in EP-3236, writing on the planes is made in order.

Writing is made through the following planes:

When store function is ON : 1~12 planes

When store function is OFF : 1~16 planes

2) Readout from memory (PARALLEL READ)

Normally, readout is made from the main memory. When FREEZE is touched, however, CIN VID signal causes switch over to readout of the final image of CINE MEMORY in the switching circuit in the PC. In case of CINE operation, movement of the track ball is read out through software to select a read plane (which is in control of CAS1~4, CA0~8 created by ADDRESS SELECT in EP-3236).

To make display on the TV monitor, data (1 address data) of total 16 pixels, one pixel from each of 16 RAM CHIPS, are read out simultaneously.

The READ MODIFY WRITE cycle and the PARALLEL READ cycle alternate with each other repeatedly.

3) Operation when STORE MEMORY is ON

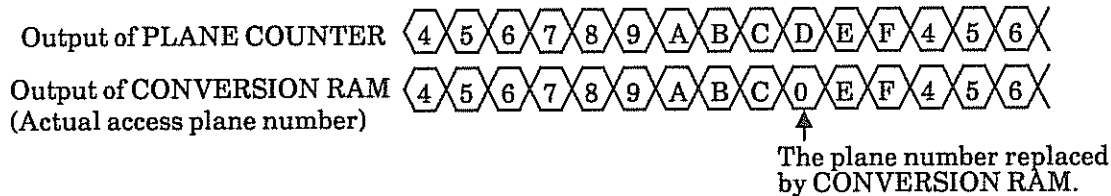
In the B mode, time-consuming DMA transfer is eliminated by substituting a reserved non-write plane for a plane to be stored.

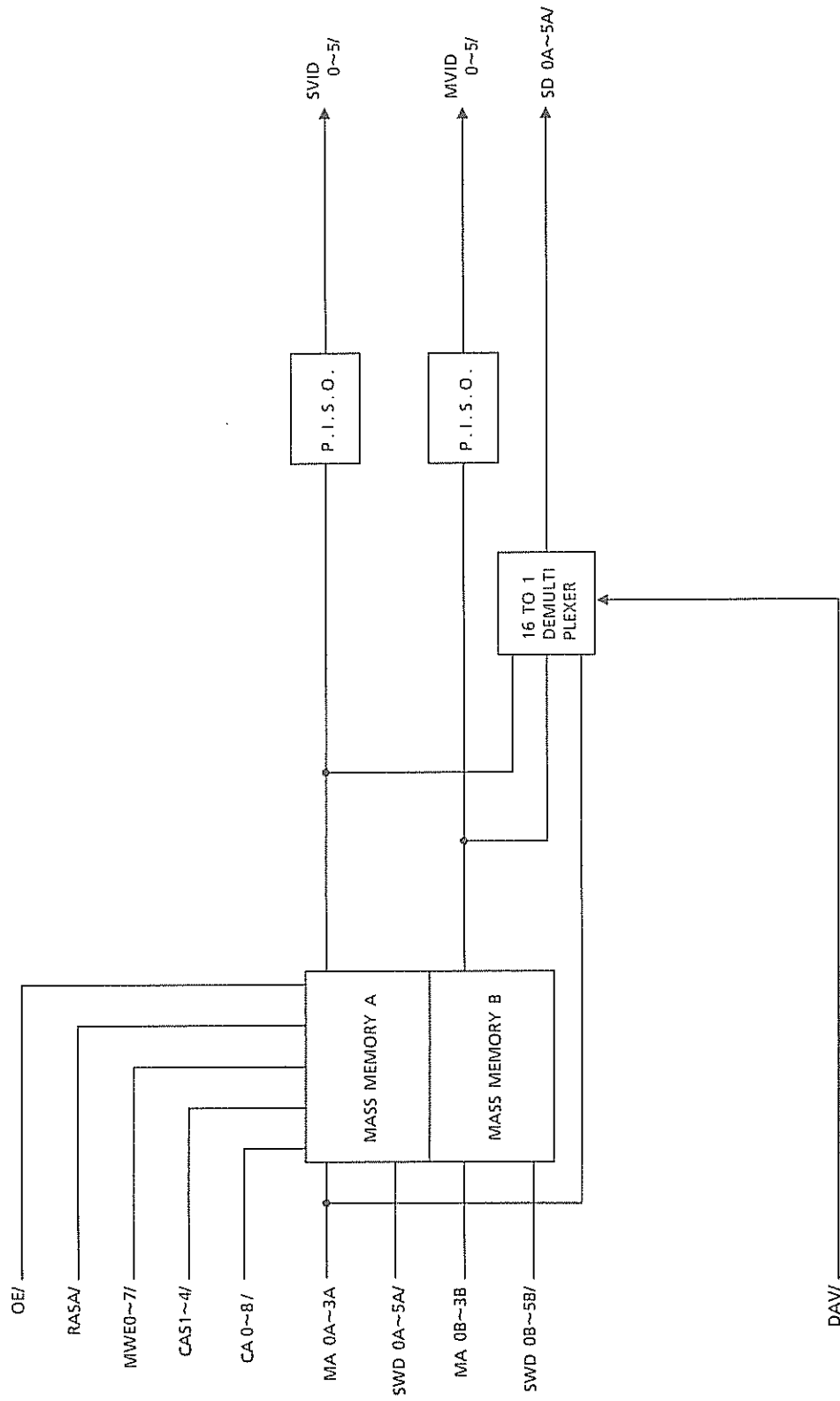
In M, D mode . . . DMA transfer

In B/* mode B: Operation above, *: DMA transfer

This operation is made by readout after rewriting data of PLANE CONVERSION RAM in EP-3236.

Example: After the image "D" in Cine memory is stored, "0" is used instead of "D".





<p>Aloka</p>	<p>TITLE 名称 BIW CINE MEMORY</p>	<p>MODEL 型号 EP-3237</p>	<p>1 / 1</p>
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16-23 EP-5100 COLOR FLOW PROCESSOR

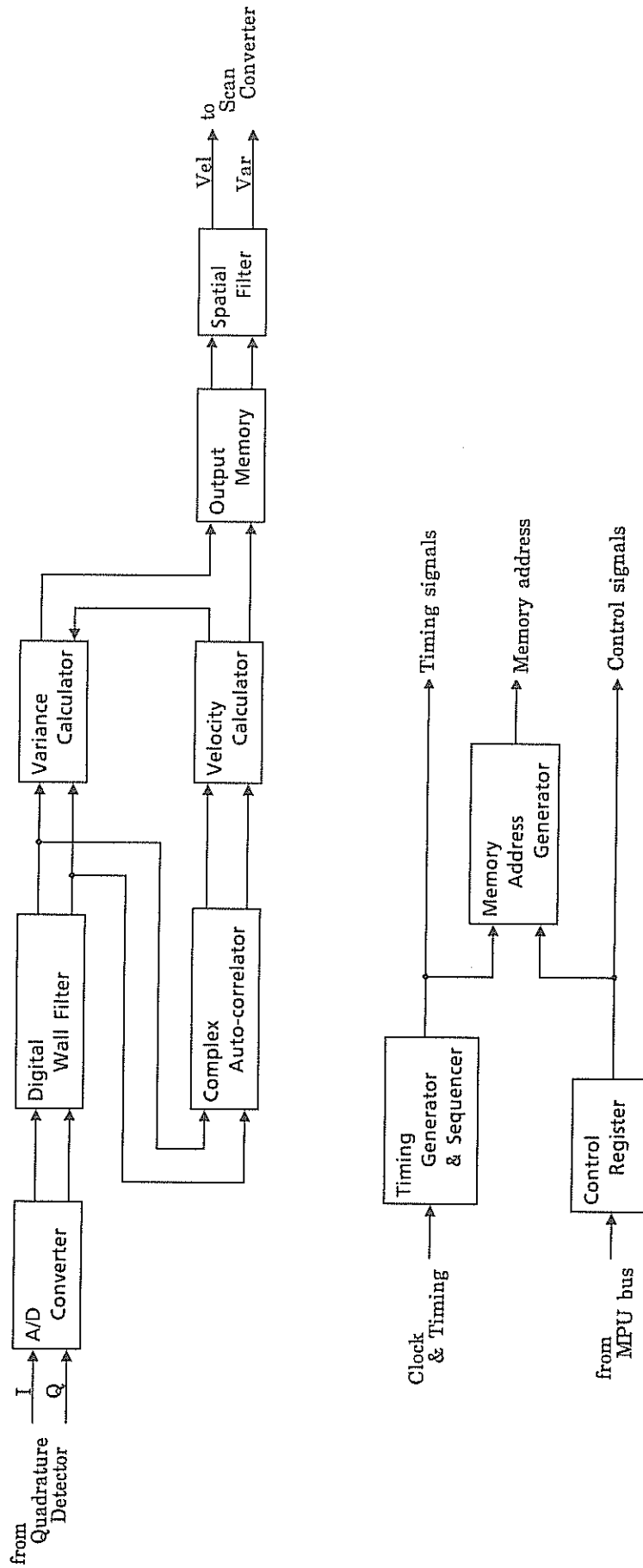
This unit converts the frequency shifts included in the ultrasound reception signal into color information which is to be displayed, as a two-dimensional image, on the B/W (B mode) picture.

The signal to be converted is an ultrasound signal received by the GEU-64. For that signal, velocity and turbulence (variance) are operated, respectively, on the basis of information stored in the internal ROM.

Output signal is sent to the DSC (UIM-325), where the signal and the ultrasonic B/W signal are synthesized and displayed.

Software control for this module is made by the CPU (in EP-2913) in the DSC. Additionally, this unit receives various kinds of control signal and basic clock from the GEU-64.

The unit has a single piece of PCB which is packed in the DSC.



Aloka	TITLE 名称 COLOR FLOW PROCESSOR	MODEL 形番 EP-5100	1 / 1
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16-24 EP-3115 COLOR LINE BUFFER

1. General

This PCB consists of the color test-pattern generating circuit, the color, B/W position correction delay signal generating circuit, the line buffer, and the interface for direct access to the memory from the CPU.

2. Operation

1) COLOR TEST-PATTERN GENERATING CIRCUIT

In this circuit, the velocity pattern and variance pattern are generated by the respective counters. The velocity pattern generator counts the LBF WE signal, while the variance pattern generator counts the SWPON/, (B-MODE), and MCLK (M-MODE). On receipt of a color-test ON signal (CTEST) from the MPU, the LATCH IC succeeding the test-pattern generating counter outputs data.

2) COLOR, B/W position correction delay signal generating circuit

In color signal operation, an analog delay occurs due to existence of the band pass filter preceding the detector in color ITF demodulation and the A.A. filter preceding digital conversion in the operational PCB, in addition to digital operational time necessary for velocity and variance. The amount of delay depends on frequency of the probe, inviting the necessity of alignment of color and B/W with each other for each frequency. This circuit is to synchronize the color data with the B/W data by giving a delay of several μ sec to the color data writing address when writing to the line buffer memory is made. The color data write-in address is set after the amount of delay is determined by means of software. The color data write-in timing is transmitted to the line buffer memory for B/W, and from that timing read-out of B/W is also made.

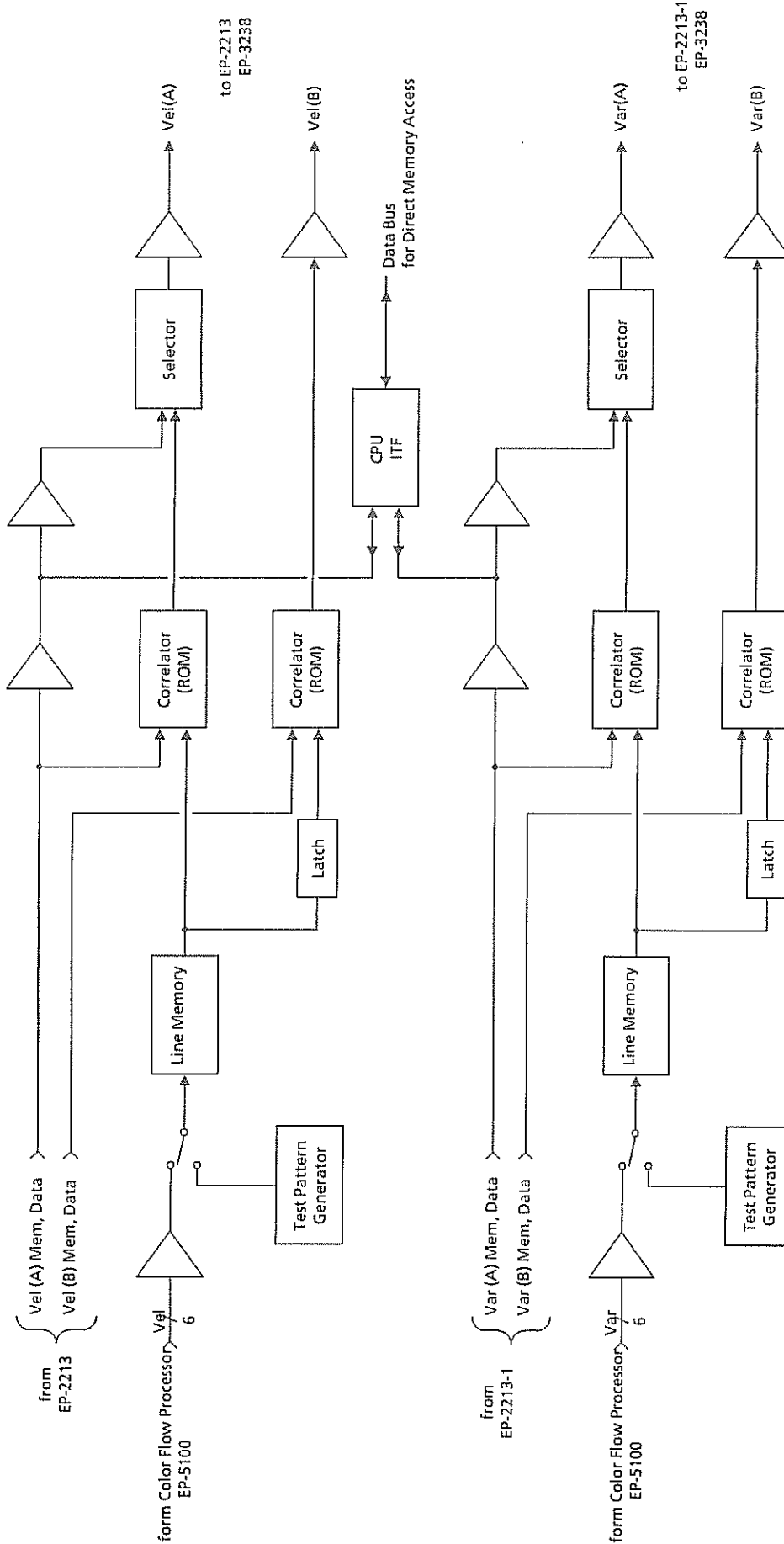
3) LINE BUFFER

This line buffer for color signal (velocity and variance) has the function similar to the line buffer for US video signal (B/W).

Color data is temporarily stored in the line buffer memory. When the data is read out from the line buffer with the cycle of Main memory, it is divided into two parts for the upper stage and lower stage, respectively, corresponded with 2×8 pixels in the Main memory. The line memory read-out data is correlated with the main memory read-out data (one- frame preceding data of the same address) to execute the so called frame correlation. Frame correlation is made at four ROMs in total; two of four ROMs are for two circuits (corresponding to the upper stage pixels and the lower stage pixels, respectively) for velocity data and the remainders are for two circuits for variance data.

4) INTERFACE FOR ACCESS TO MEMORY FROM CPU

There is a gate circuit which allows direct transfer to and from the CPU of the velocity and variance data after frame correlation before the data reaches the output buffer. Through this gate circuit, the CPU is able to read out data from the main memory when data is transferred to the CPU. When data is transferred from the CPU, the data is sent through the output buffer to the main memory and written in it.



Aloka	TITLE 名称 COLOR LINE BUFFER	MODEL 型号 EP-3115	1 / 1
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16-25 EP-3114 COLOR POST PROCESS

1. General

This PCB consists of the color-signal smoothing circuit, the WHT CUT level setting circuit, the color bar selection circuit the RGB conversion circuit, and Frame interpolation circuit.

2. Operation

1) COLOR SMOOTHING CIRCUIT

Data from the velocity-and-variance MEMORY enters the color smoothing circuit, where hole filling of 11 pixel maximum is made. First, the pipe-line register stores the data at both sides of the hole and detects number of holes and pixels to create parameters.

Here, in the velocity hole filling circuit, detection of aliasing and creation of differential data from the right-end data and left-end data are made first. That differential data is weighted by a parameter-dependent value and is added to the right-end data to generate the smoothing data.

On the other hand, in the variance hole filling circuit, like that of B/W, the parameter-weighted left-end data and right-end data are obtained from the hold filling ROM. And those data are summed up to output smoothing data.

2) FRAME INTERPOLATION CIRCUIT

The velocity and variance data after smoothing is processed by interpolation in the frame interpolation circuit to the maximum of 15 TV frames.

Parameter is created from the number of interpolation frames which is set by means of software on the basis of the interpolation frame number and frame rate. The differential data derived from the 1US frame delay data and the latest US data is weighted by parameter and is added to the latest ultrasound frame data to output interpolation data.

3) WHT-CUT LEVEL SETTING CIRCUIT

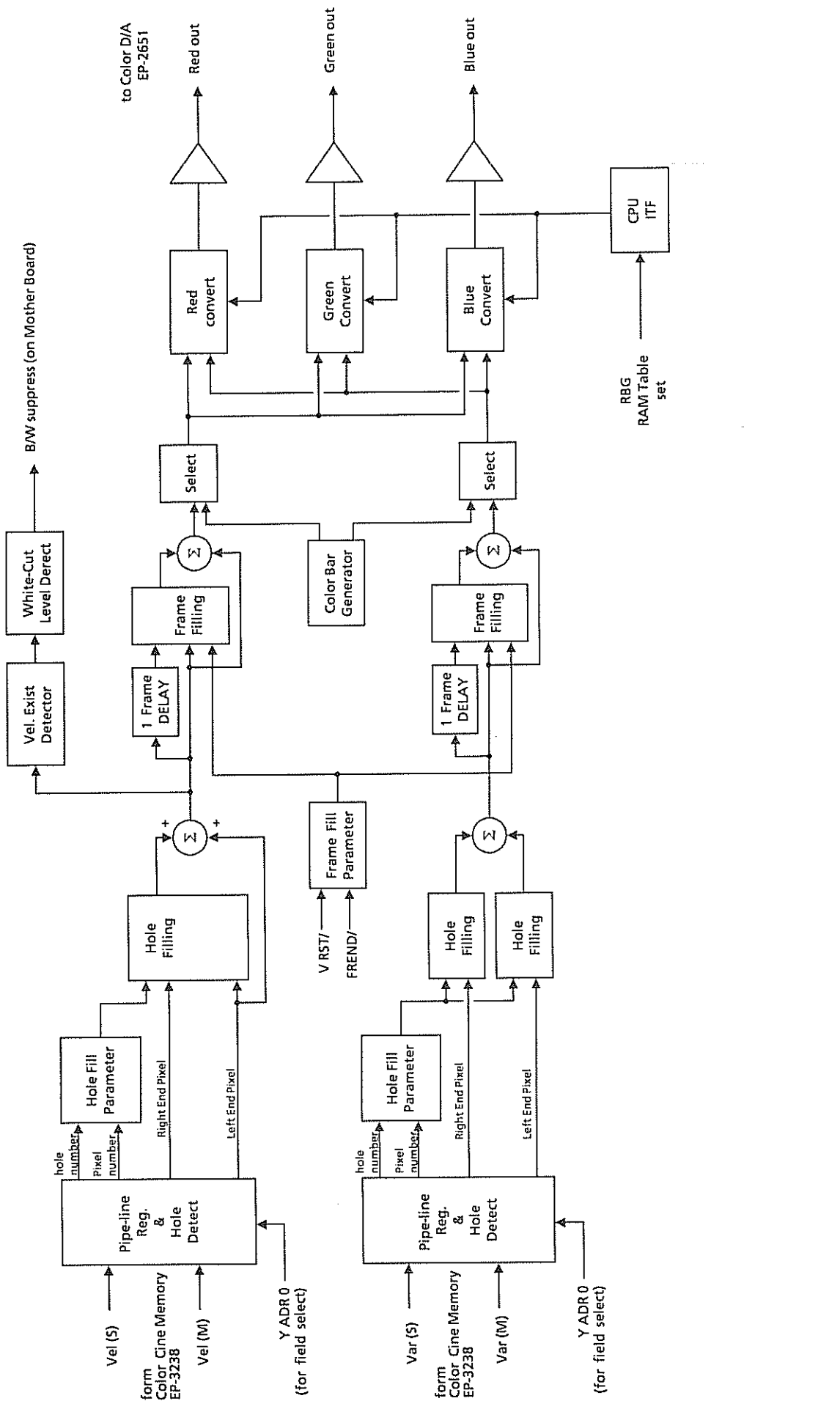
When a velocity exists and an echo level on the same pixel does not exceed a fixed value, the WHT-CUT function suppressed B/W(black and white) display to make the color display clear. The value of threshold for an echo level which suppressed B/W is set by the means of software. In this circuit, B/W suppression control signal is obtained from the comparator which detects the existence of the velocity signal and compares the echo level with the set value of threshold.

4) COLOR BAR SELECTION CIRCUIT

Smoothing is made for the two stages, upper and lower, of data in parallel with each other. Thereafter, either the upper or lower stage of data is selected for each field of TV display, and then changeover to output of the color-bar generator is made in time with color-bar display. The color-bar generator outputs data which causes linear variations of velocity and variance by countup of countdown of HD clock for velocity and 12 MHz clock for variance. Actual color bar is obtained by conversion of these signals into RGB.

5) RGB CONVERSION CIRCUIT (POST PROCESS FOR RGB)

This circuit is formed by the RAM which converts color data (velocity and variance) into RGB signals. Color correction data of RGB is previously transferred from the MPU to this RAM, so that the RAM outputs the RGB signals corresponding to the velocity and variance data which are input as address information to the RAM. Each RGB 8-bit signal is then sent to the COLOR D/A PCB where the RGB signal is converted into an analog signal.



Aloka	TITLE 名称 COLOR POST PROCESS	MODEL 型号 EP-3114	1 / 1
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16-26 EP-2213 COLOR MEMORY VEL / COLOR MEMORY VAR

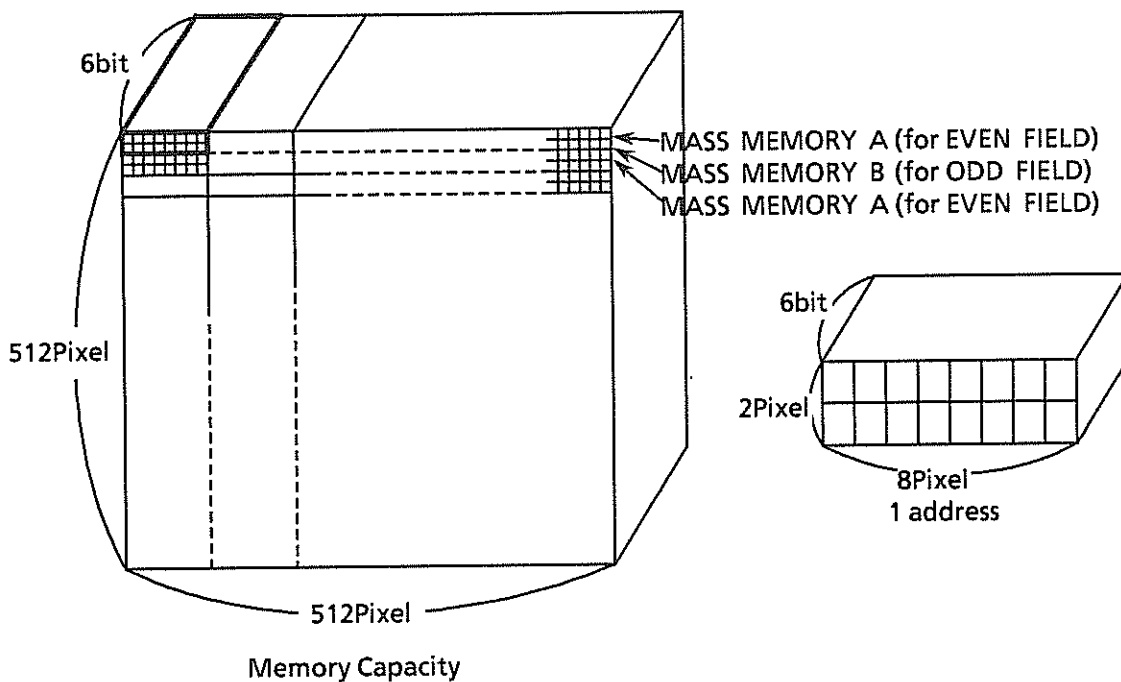
1. General

Two PCBs -- one for velocity (V) data and the other for Variance (δ) data -- are used. Each memory has the capacity large enough to store the whole area of ultrasound tomography image (512 pixels \times 512 pixels \times 6 bits). Velocity data is 6bit, however Variance data is 4 bit. Therefore on EP-2213*-1, for Variance, unnecessary D-RAMs are not mounted.

2. Operation

The mass memory consists of 32 chips of D-RAM ICs. The half of them (16 chips) have charge of 4 bits (0-3) and the remainder (16 chips) have charge of 2 bits (4 and 5) among 16 bits for gray-scale stages. (The remainder having charge of 2 bits is not in use.)

The arrangement of the memory is shown in the below figure. Eight chips are arranged in the horizontal-scanning direction and two chips are in the vertical direction, so that total 16 pixels are included in one address.



Therefore, the whole tomography image is composed of 64 addresses in the horizontal direction and 256 addresses in the vertical direction.

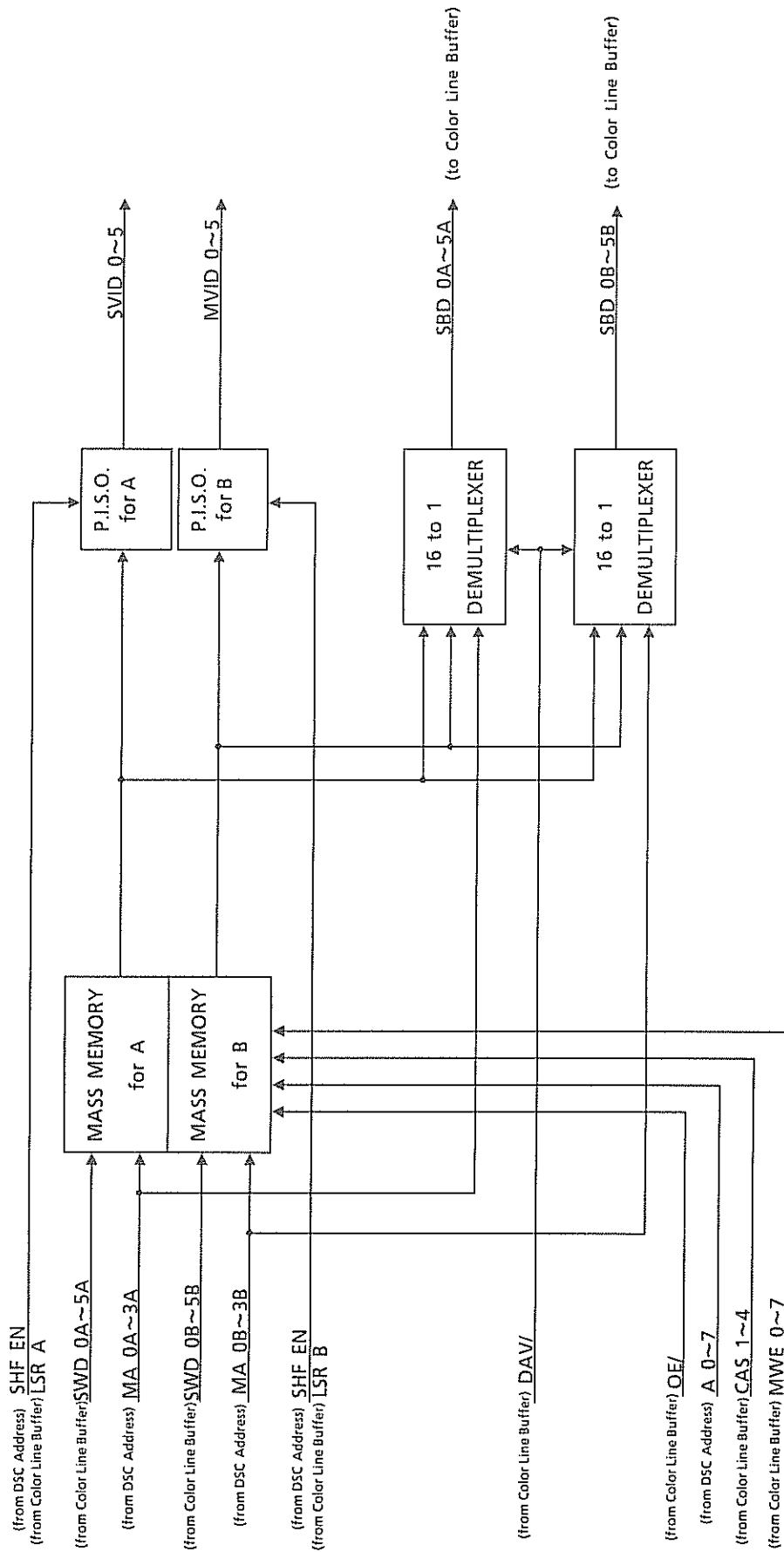
1) Writing in to memory (READ MODIFY WRITE)

To perform frame correlation, the mass memory operates in the RMW (Read Modify Write) cycle. To increase writing speed, access to two pixels in the same address is made simultaneously and writing of those two pixels is also made simultaneously.

2) Reading out from memory (PARALLEL READ)

To display data on the TV monitor, 16-pixel data (one pixel on each RAM chip) are read out from 16 RAM chips simultaneously for one address use.

The READ MODIFY WRITE cycle and the PARALLEL READ cycle are repeated alternately.



EP-2213* : for Velocity
 EP-2213*-1 : for Variance



TITLE 名称
 COLOR MEMORY VEL
 COLOR MEMORY VAR

MODEL 形名
 EP-2213
 EP-2213 -1

16-27 EP-3238 COLOR CINE MEMORY

1. General

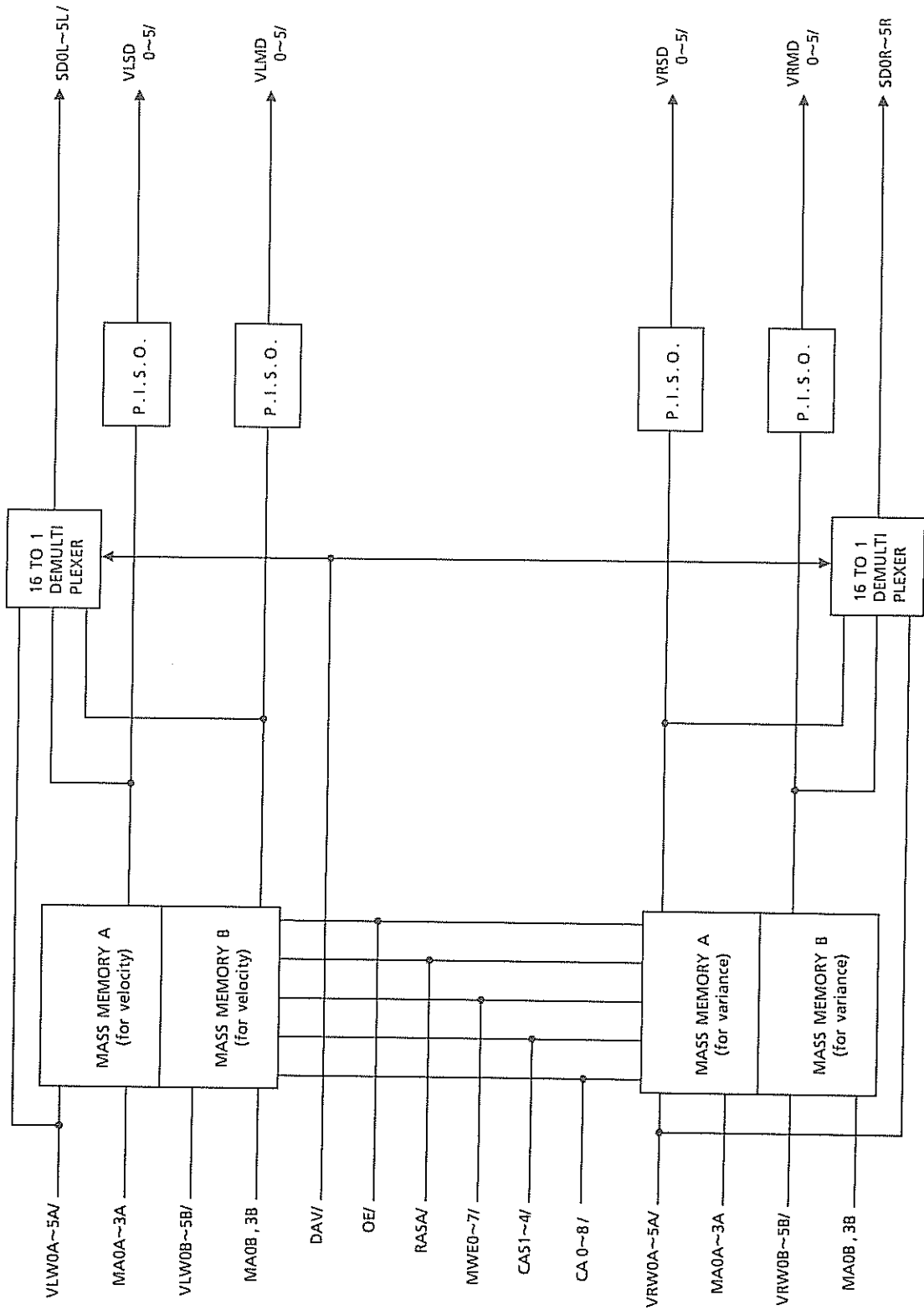
This PCB has Cine memory for both velocity and variance. The memory capacity is $512\text{pixels} \times 512\text{pixels} \times 6\text{bits} \times 16\text{planes}$ for velocity, and $512\text{pixels} \times 512\text{pixels} \times 4\text{bits} \times 16\text{planes}$ for variance. Writing of data, similar to that of Color memory, is made on the planes in order.

2. Operation

The Cine memory for velocity consists of 32 D-RAM ICs, a half of which, 16 ICs, being in charge of 4 bits of 6-bit data, while the other 16 ICs, of 2 bits. (The remainder, 2 bits, is not in use.)

And the Cine memory for variance consists of 16 D-RAM ICs. (The variance is 4-bit data)

The address formation of memories and the memory operation (writing and readout) are similar to those of EP-3237 (B/W CINE MEMORY).



Aloha	TITLE 名称 COLOR CINE MEMORY	MODEL 形名 EP-3238	1 / 1
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16-28 EP-3443 VIDEO ITF

1. General

This PCB consists of the video distributor, encoder and decoder. The encoder converts the RGB signal into the PAL or NTSC video signal, while the decoder converts the PAL or NTSC video signal into the RGB signal.

2. Principle of operation

1) VIDEO DISTRIBUTOR

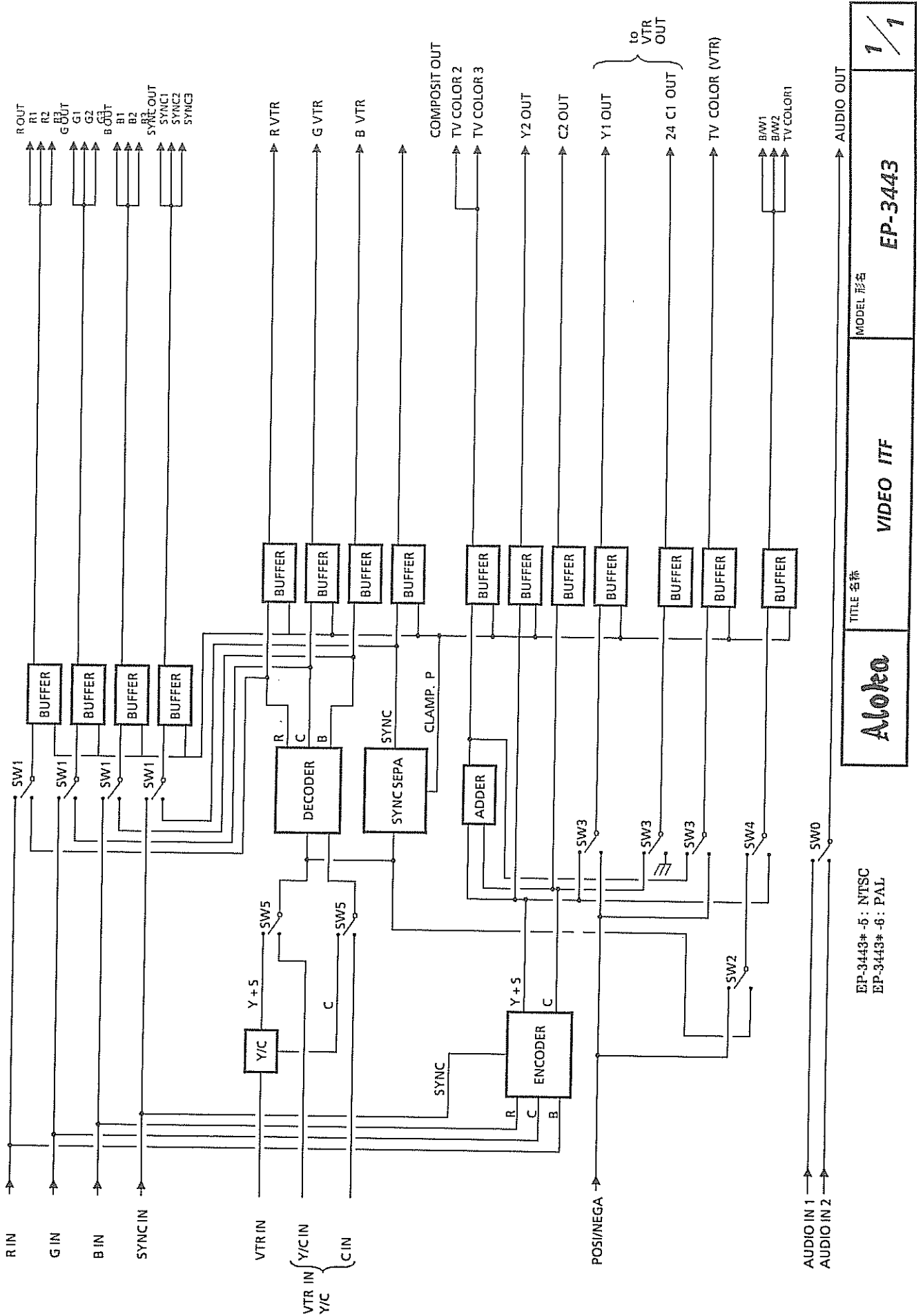
Consists of many relays and buffers and selects video signals to be distributed to the respective units.

2) ENCODER

Converts the RGB signal flowing in a circuit into the PAL or NTSC video signal necessary for the connected VCR.

3) DECODER

Converts the PAL or NTSC video signal which the VCR outputs into the RGB signal necessary for the connected VCR.



16-29 EP-3260 DOP TXRX

1. Signal list

Input signals

- Tx+/Tx- : Probe transmission signal (Differential type)
- Rx+/Rx- : Probe receiving signal (Differential type)
- Xcos : Transmission original signal
- XMIT : Signal for determining the burst length of transmission pulse wave
- COS/SIN : Reference signal which inputs to the mixer
- CWRELAY : Signal for controlling the PW/CW changeover relay
- VTXIN : Control signal for setting the transmission voltage
- TEST : Signal for turning on/off the test signal generator
- TESTTYPE : Signal for selecting the type of test signal
- MATCH : Signal for determining the width of range gate
- DSAMPLE : Signal for sampling the output of integrator
- RESET : Signal for resetting the integrator
- SD4 : Serial control data

Output signals

- Tx+/Tx- : Probe transmission signal (Differential type)
- Rx+/Rx- : Probe receiving signal (Differential type)
- HPA, HPB : Doppler shift echo after passing through the Walsh transform filter

State setting signal (Serial control data)

- FSEL (4 bits) : Selects the tank circuit.
- MACHI GAIN (4 bits) : Determines the time constant of integrator.(PW operation mode)
Determines the value of voltage gain (CW operation mode)
- HPFREQ (8 bits) : Determines the cutoff frequency of the high pass filter.

2. Flow of signals

In this equipment, transmission and receiving are possible in both the PW and CW operation modes. In the case of CW operation mode, one of two probes is used for transmission only and the other for receiving only. In the PW operation mode, each probe is used for both transmission and receiving at the same time.

The received echo signal is subjected to a band limitation while it passes through a band pass filter. Since four kinds of filters are mounted, frequency usable for doppler measurement depends on what filter is selected. Selection of one of four filters is made by serial control data "FSLE."

After passing through a filter, the signal is divided by orthogonal transform detection into two lines. In the case of PW operation mode, a range gate is applied to a signal of the aimed part and the signal in the gate is held by integration. Here, the serial control data "MATCH GAIN" determines integration time constant. In the case of CW operation mode, no range gate is used and no integration is made. Here, the above-mentioned "MATCH GAIN" determines only the gain

The below Fig. shows a time chart for PW operation mode. The signal finally passes through the high pass filter (HPF) which eliminates signals from slow-movement parts in the human body such as blood vessels. The HPF is formed by the switched resistor filter (SRF) and control data HPFREQ specified cutoff frequency of the HPF.

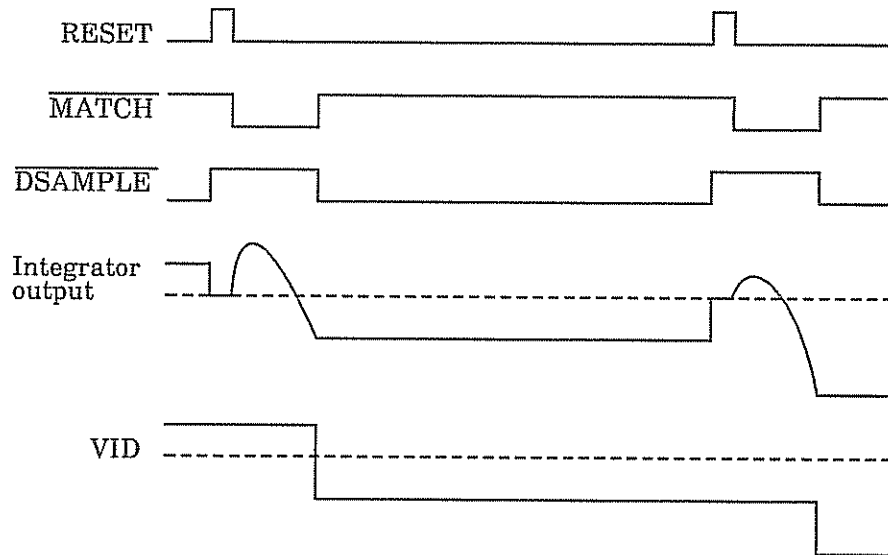
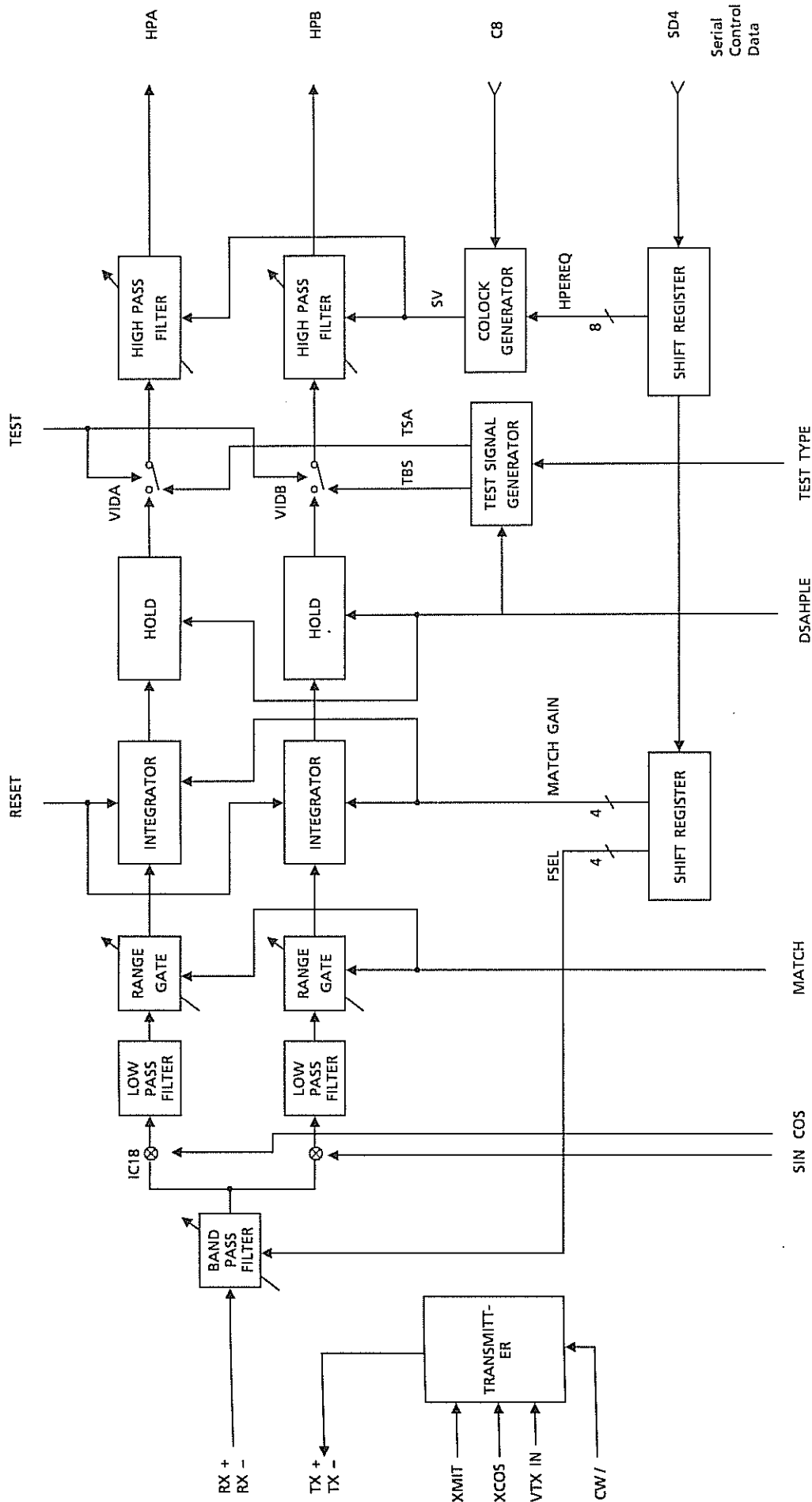


Fig. Range gate and Sample and Hold



TITLE 名称 Aloha	MODEL 型号 EP-3260	1 / 1
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16-30 EP-2810 DOP CONTROLLER

1. General

This PCB consists of the MPU and its peripheral circuit, and various timing generating circuits

2. Operation

1. MPU AND ITS PERIPHERAL CIRCUIT

1-1 MPU

The MPU performs various kinds of operation and control.

1-2 RANDOM ACCESS MEMORY

The read/write memory for temporary storage of operational data.

1-3 READ ONLY MEMORY

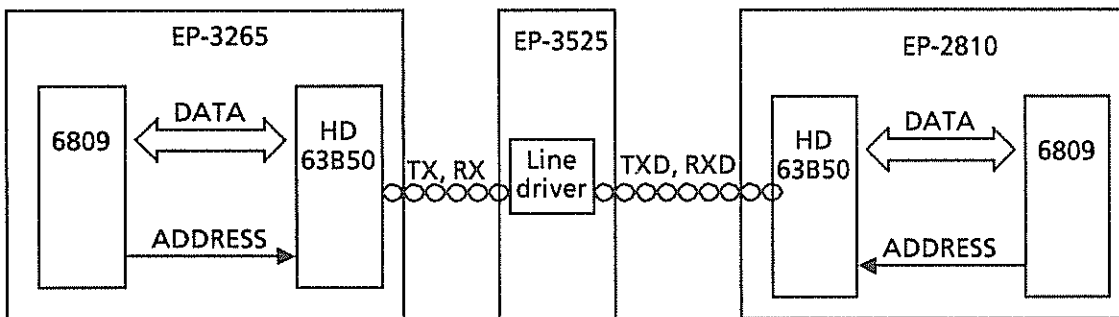
The memory for storing the control program which controls the CPU.

1-4 ASYNCHRONOUS COMMUNICATION INTERFACE ADAPTER (ACIA)

This adapter is use for communication with the host. The transfer method is of the serial link type.

1-5 VERSATILE INTERFACE ADAPTER (VIA)

Gives the communication clock to the ACIA and outputs the serial control data necessary for controlling the circuit in the unit (DM-5).



Communication with host

2. VARIOUS TIMING GENERATING CIRCUITS

Those circuits are roughly classified as the (CW) transmission voltage control circuit, the (CW) transmission signal generating circuit, the system clock generating circuit, and the doppler-signal image processing control signal generating circuit.

2-1 TRANSMISSION VOLTAGE CONTROL CIRCUIT

Serial data from the MPU is converted by the shift register into 8-bit parallel data, which is converted by the D/A converter into analog data which is sent to the Tx & Rx PCB.

2-2 Quadrature detector and Transmission signal generating circuit

Signals of 40 MHz (for 5 MHz) and 56 MHz (for 3.5 MHz and 7 MHz) from the host are divided into N by the frequency divider to output a frequency suited to the probe. Two lines of signals different 90 °C in phase from each other are used for Quadrature detector.

2-3 SYSTEM CLOCK GENERATING CIRCUIT

Signals of 40 MHz and 56 MHz are frequency divided into N to form the clock waveform of 8 MHz. This signal serves as the basic clock of the system.

2-4 Doppler-signal image processing control signal generating circuit

This circuit generates the following control signals:

Clock which determines cutoff frequency of

LPF in FILTER PCB (EP-3259) →LPCLK

Signal for sampling the output of

integrator in Tx & Rx PCB (EP-3260) →DSAMPLE

Signal for resetting the integrator in Tx & Rx PCB (EP-3260) →RST

Signal which determines the width of

range gate in Tx & Rx PCB (EP-3260) →MATCH

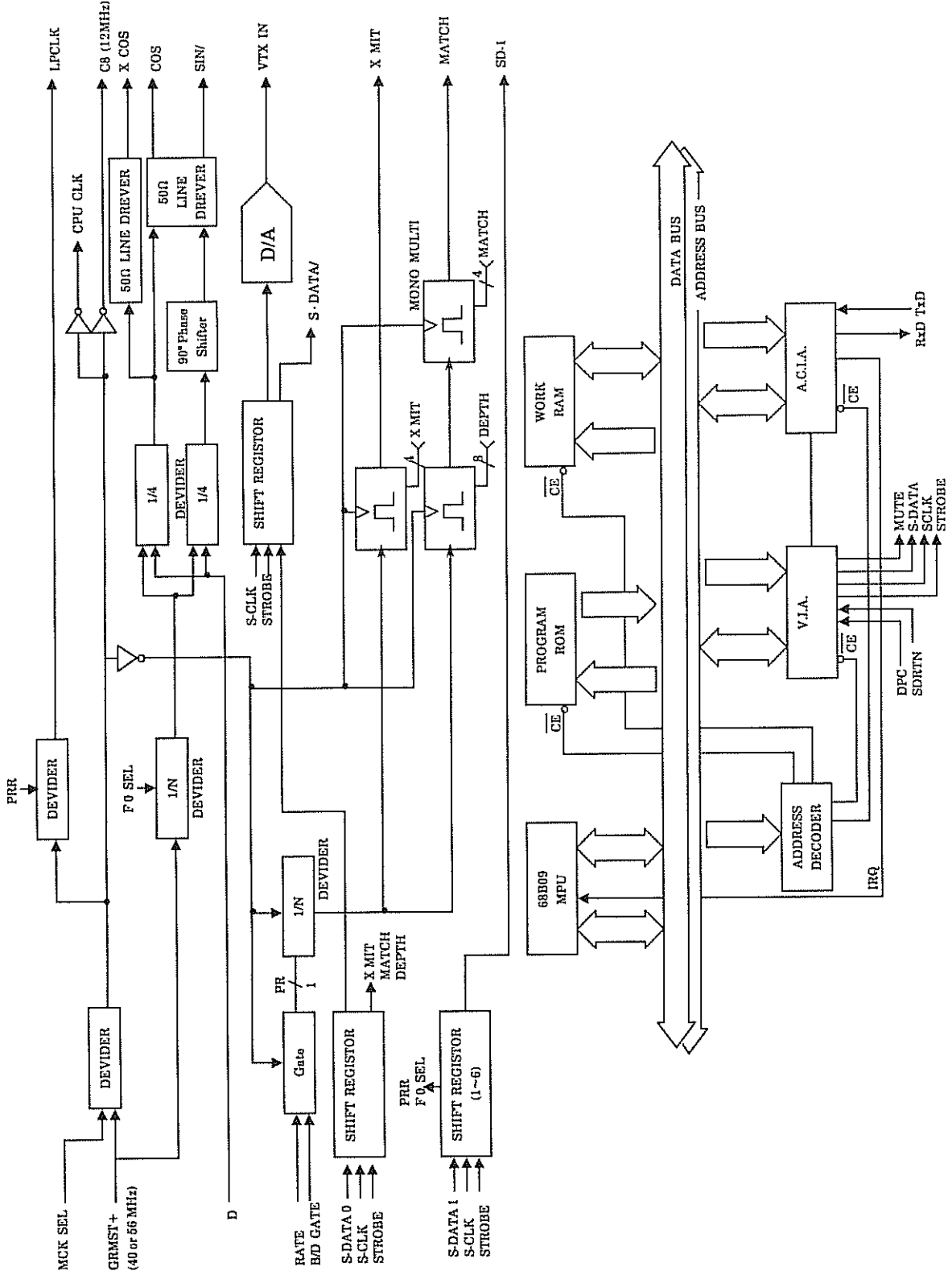
Gate signal which determines pulse width of

transmission pulse signal →XMIT

Signal for controlling the PW/CW

selector relay in Tx & Rx PCB (EP-3260) →CW RELAY

To output those signals, serial data from the MPU are converted into parallel data by the shift register.



Aloha	TITLE 名称	DOP CONTROLLER	MODEL 名称	EP-2810	1 / 1
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16-31 EP-3259 DOP FILTER

This PCB has the following four functions :

- (1) Serves as the Low Pass Filter circuit to increase the S/N ratio of doppler signals.
- (2) Serves as the AA Filter (Anti-Allasing Filter) circuit which previously provides a limitation of band to prevent folding at the analysis part.
- (3) Serves as the AGC (Automatic Gain Control) circuit to expand the dynamic range of input to the analysis part.
- (4) Serves as the ring buffer memory to transfer data to be analyzed timely to the analysis part.

1. Signal list

Input signals

- HPA/HPB : Complex doppler signal passed through the High Pass Filter
- RPLYA/RPLYB : External input audio signal. The signal is input when only the analysis part is used
- LPCLK : Clock signal which controls the cutoff frequency of the Low Pass Filter
- SD3 : Serial data transferred from the CPU

Output signals

- MD0~7 : Output signal to the analysis part. A doppler signal to be analyzed and a level signal which determines the rejection level are transferred by time division.

Internal signals

- LPGAIN 0.1 : Signal for controlling the gain of a signal to be analyzed or for switching over to an external input signal
- LOWC1 : Signal for controlling the cutoff frequency of AA Filter.
It doubles the cutoff frequency of the filter in the case of base-line shift.
- AA CLK : Clock signal of the AA Filter
- AA FREQ : Preset value of the counter which determines sampling frequency of the analysis part
- SYN SAMPLE : Sampling signal for frequency analysis.
- MUX A/B : Switching signal which transfers crossed doppler signal to the AGC circuit by time division
- REJECT LEVEL : Signal which determines the rejection level of spectrum indication
- SPGAIN : Signal which determines the gain to a small signal
- SSAMPLE : Trigger signal for sampling for the frequency analysis part
- SC. OE : Signal for determining timing of AD conversion of doppler signal (SC) and signal for determining timing of data transfer to the ring buffer memory (OE)
- GAIN EN : Signal for setting AGC gain
- R/W : Timing signal for write/read of the ring buffer memory.

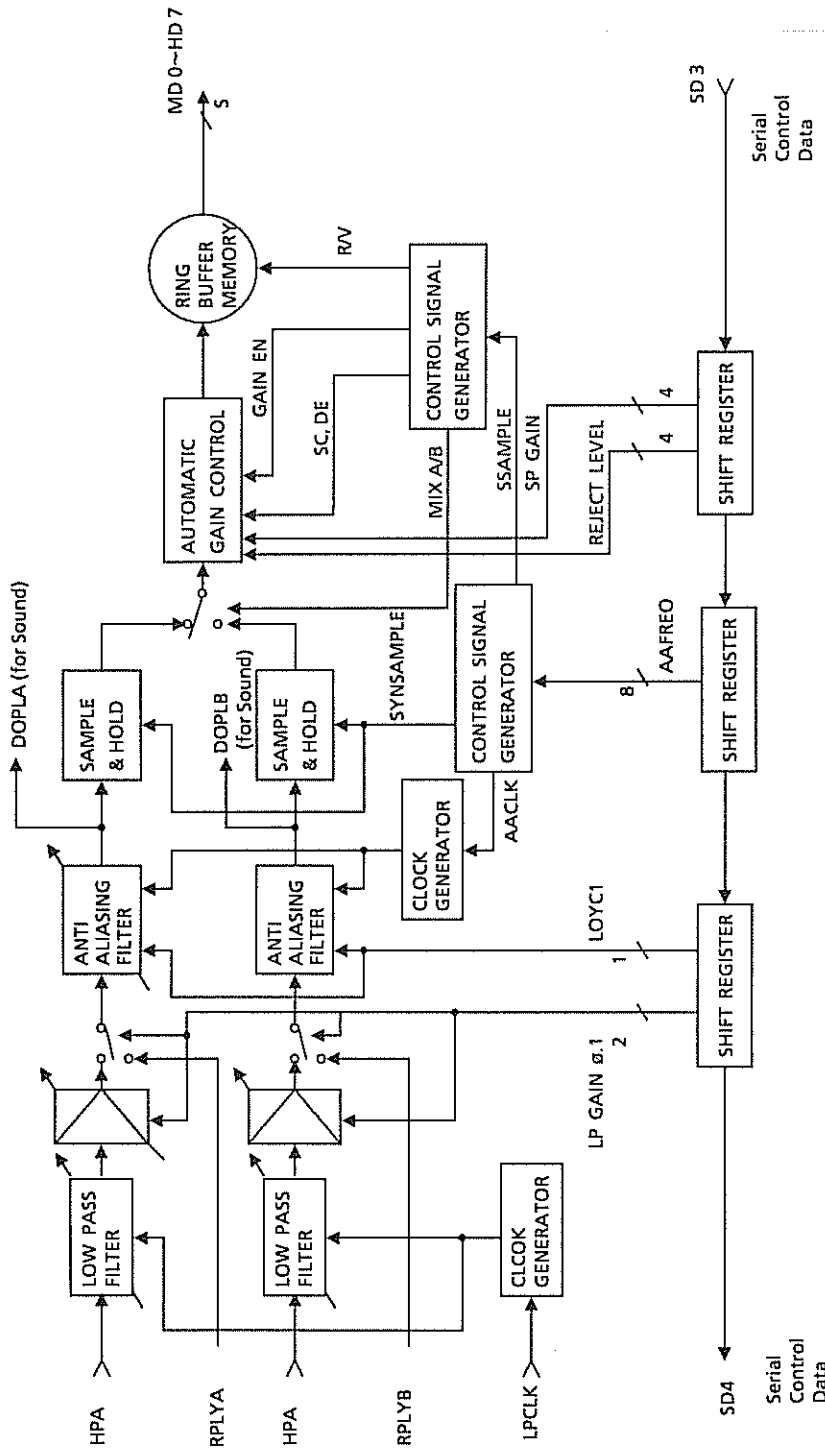
2. Flow of signals

The complex doppler signal (HPA/HPB) in which two signals are 90° different in phase from each other is first input into LPF. During PW operation, the LPE has the pass band width which is a half of transmission pulse repetition frequency PRF ($PRF/2$), and is able to remove the high-frequency component of the doppler signal, caused by the sample-hold circuit in the Tx-and-Rx PCB, and white noise of background. During CW operation, cutoff frequency of the LPF is fixed to 20 KHz.

Then, output signal from the LPF is connected through ATT to the external input signal changeover switch. The part succeeding to this switch is considered the substantial signal analysis part.

To prevent aliasing, which is caused by sampling of input signal, a previous band limitation must be applied to the input signal. The necessary band limitation is made by the AA Filter whose cutoff frequency is set to a half of the frequency of SSAMPLE signal.

After passing through the AA Filter, the signal to be analyzed is maintained at a constant sample-hold circuit output, divided into time-division signals, and then transferred to the AGC circuit.



Aloka	TITLE 名称	DOP FILTER	MODEL 型号	EP-3259	1 / 1
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16-32 EP-2812 DOP INTERFACE

1. Signal list

Input signals

SP VID 0/~6/	:	Spectrum data sent from the frequency analysis part.
TR PPM/	:	Analog trace signal sent from the frequency analysis part.
UNBLS	:	Unblanking signal for spectrum (Disabling output)
UNBLT	:	Unblanking signal for trace (Disabling output)
DOT CLK	:	Clock for reading out spectrum/trace data
48 MHz/	:	Master clock (48 MHz) disabling signal
SDI	:	Serial control data for condition setting
TxD/	:	Serial control data for condition setting
RPLY A	:	Doppler sound (from VTR) reproduction signal
RPLY B	:	Doppler sound (from VTR) reproduction signal

Output signals

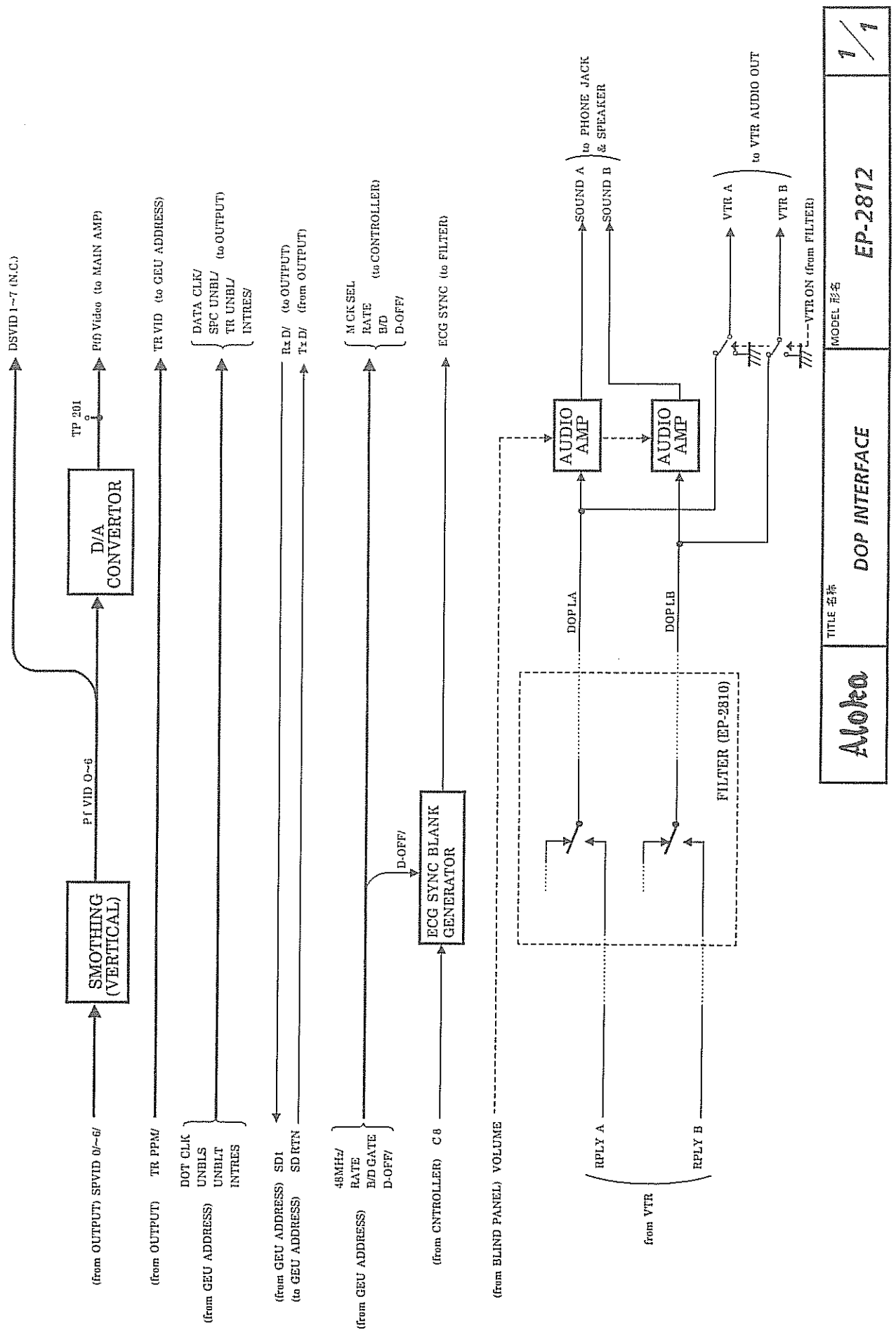
P(f) Video	:	Spectrum signal
TR VID	:	Analog trace signal (PPM)
SOUND A	:	Doppler signal
SOUND B	:	Doppler signal
SD RTN	:	Serial control data for condition setting
RxD/	:	Serial control data for condition setting

2. Flow of signals

128-point spectrum data (SPVID 0/~6/) from the frequency analysis part pass through the smoothing circuit in the vertical direction (frequency-axis direction) and, after converted into analog signal (P(f) Video), flow to the GEU unit.

The PPM signal for analog trace display use is also sent out from the frequency analysis part and it flows through this PCB to the CEU unit.

Doppler sound signals from the Filter PCB are output to the speaker and VTR.



Aloka	DOP INTERFACE	MODEL 形名 EP-2812	1 / 1
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16-33 FFT PCB

1. General

The frequency analyzer (NJK-196A) consists of the FFT PCB and OUTPUT PCB.

To increase the speed of processing, the frequency analyzer uses four DSPs (Digital signal Processors) for FFT operation (by two DSPs), power operation, and trace operation, respectively. Overall processing time is about 5 ms and the result is updated every about 2.3 ms by pipeline control. Furthermore, interpolation control can be made to increase apparent speed.

This FFT PCB performs FFT operation and power operation.

2. Operation

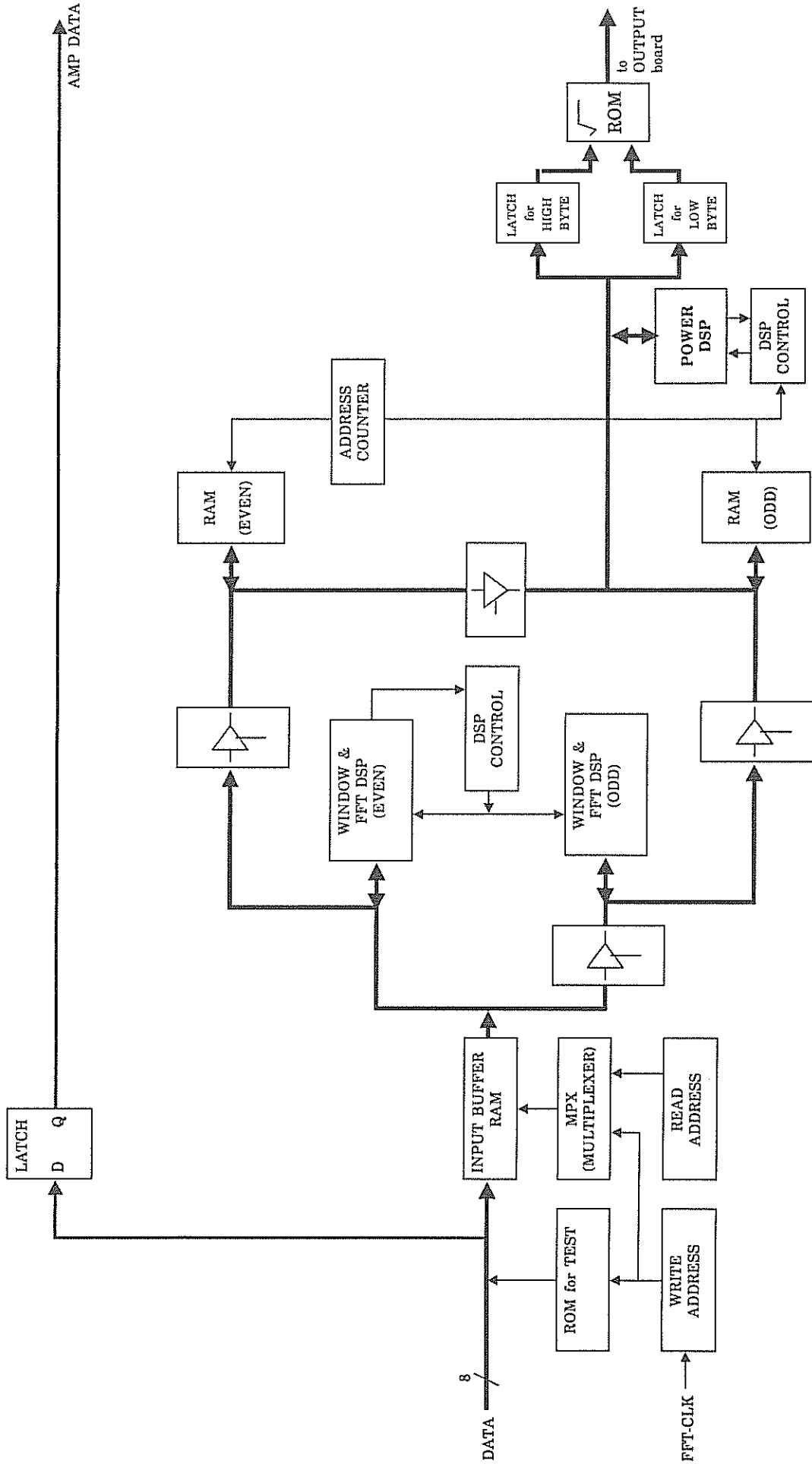
1) FFT OPERATION

The input buffer RAM stores the real-number data and imaginary-number data alternately each time of arrival of data. For each operational cycle, the DSP for FFT takes 128 data, from the buffer RAM data of 128 samples before to the data of up to date, in to the internal RAM. There are two DSPs for FFT; one stores even-number data and the other stores odd-number data. In each DSP, 6-stage FFT operation is made with application of Hanning window. After operation, the result is outputted to the RAMs (a RAM for even-number use and the other for odd-number use).

Then, the DSP sends an interrupt signal to the power operation DSP to inform it of the end of outputting data.

2) POWER OPERATION

The power operation DSP performs butterfly operation for the FFT final stage of 128-point complex data, alternately taking data from the even-number RAM and odd-number RAM. Then, the DSP calculates " $| \text{Real number} | + | \text{Imaginary number} |$ " and outputs the result. 16-bit data is compressed to 8-bit data through extraction of square root by the $\sqrt{\text{ROM}}$ and is transferred to the trace operation RAM. Although this DSP is called the POWER OPERATION DSP, it does not perform "power operation," but calculates the sum of absolute values as mentioned above.



1 / 1	MODEL 名称 FFT (NJK-196A)	TITLE 名称 FFT Calculator	Alolea
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16-34 OUTPUT PCB

1. General

The FREQUENCY ANALYZER (NJK-196A) consists of the FFT PCB and OUTPUT PCB.

To increase the speed of processing, the frequency analyzer uses four DSPs (Digital Signal Processors) for FFT operation (by two DSPs), power operation, and trace operation, respectively. Overall processing time is about 5 ms and the result is updated every about 2.3 ms by pipeline control. Furthermore, interpolation control can be made to increase apparent speed.

This OUTPUT PCB performs trace operation, interpolation, and moving average processing.

2. Operation

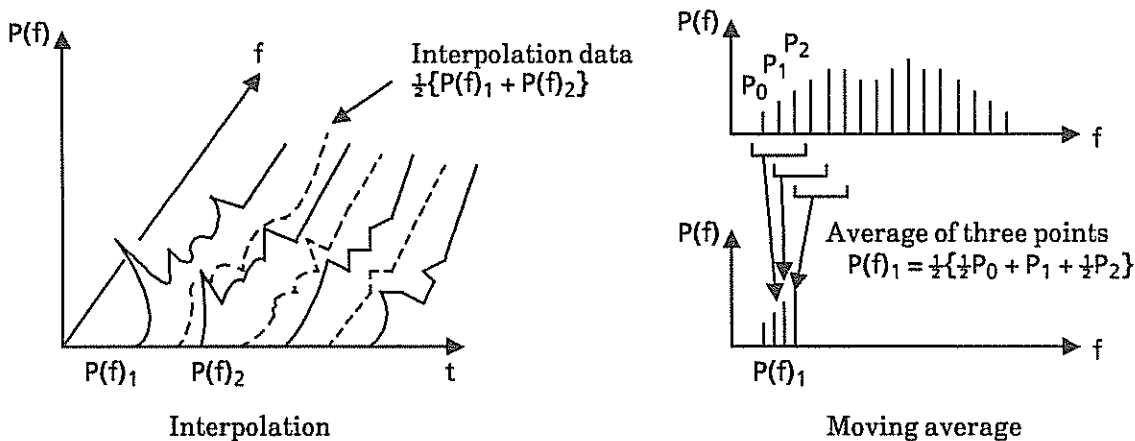
1) TRACE OPERATION

The trace DSP takes data in from the trace buffer RAM (1) and performs various TRACE operations. Because of limitation in capacity of the DSP internal RAM, taking data in and operation are made two times repeatedly. Accordingly, when the DSP takes data in from the buffer RAM (1), the data is transferred to the trace buffer RAM (2), too, to use the stored data for the second time of taking data in (and operation to be made at the same time).

The base line shift, rejection, integrating scale information, and heart-beat timing, which are necessary for trace operation, are taken in through the serial port of DSP.

2) INTERPOLATION AND MOVING AVERAGE PROCESSING

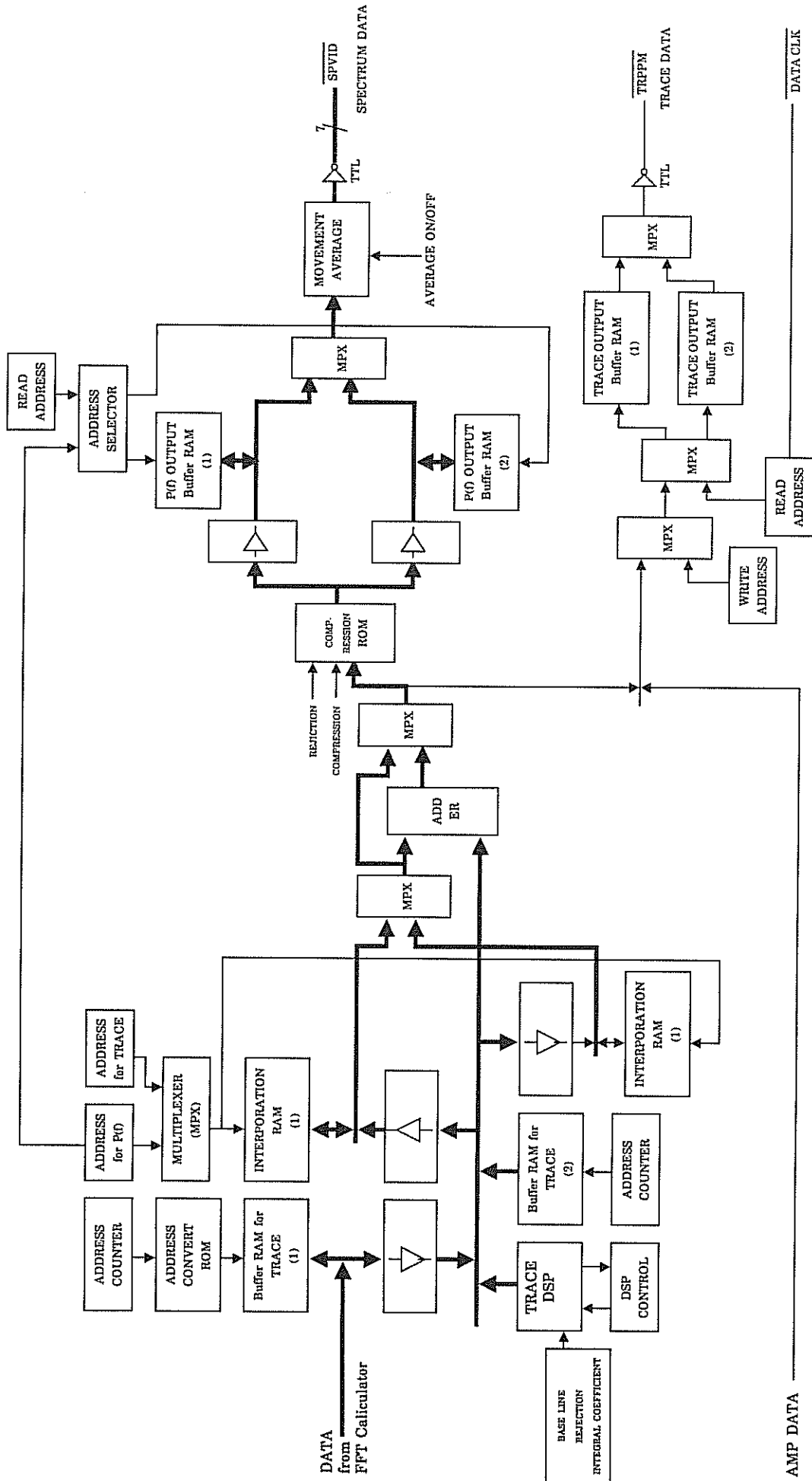
In interpolation, data are interposed between 128 frequency data which are updated every about 2.3 ms so that results come out about every 1.1 ms apparently. The moving average processing averages three consecutive data on the frequency axis to get the mean-value data. This process is applied to 128 data, moving on the frequency axis to take data in one after another.



Interpolation is made as follows: When data is transferred to the trace buffer RAM (2), the data is written to the interpolation RAM (1) or RAM (2) at the same time. In parallel with this operation, data is read out from the interpolation RAM (1) or RAM (2) which stores the preceding data and being not used for writing in of current data.

The data to which the preceding data is added is transferred to the $P(f)$ output buffer RAM. Before arrival of the next new data from the power operation unit, the OUTPUT PCB reads out data from the interpolation RAM to use it as the data not used for interpolation data. On receipt of the new data, the interpolation RAM (1) and RAM (2) alternate with each other in the read/write function and repeat the above-mentioned operation to output the next interpolation data. For trace data, interpolation of TRACE DSP output is made in the same manner.

Moving average processing on the frequency axis is made when spectrum data is transferred from the $P(f)$ output buffer RAM to the host unit. Output from each stage of three-stage shift register is added together.



Aloka	TITLE 名称 TRACE Calculator & Output Buffer	MODEL 形名 OUTPUT (NJK-196A)	1 / 1
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16-35 EP-3117 PHYSIO AMP

1. General

This board composed with ECG AMP and R-WAVE DETECTOR.

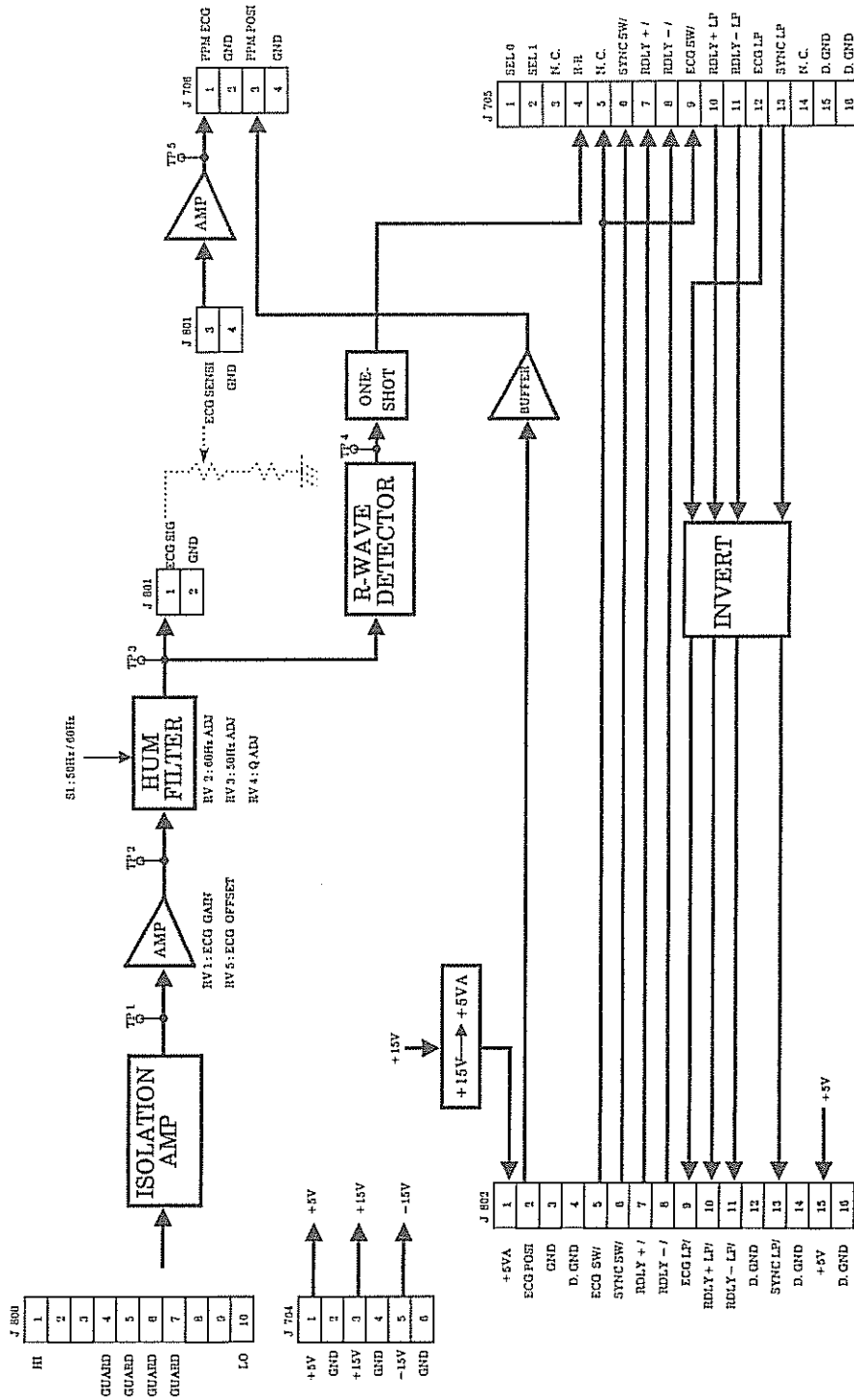
2. Operation

(1) ECG AMP

ECG signal is amplified by ISOLATION AMP, and pass through HUM FILTER.

(2) R-WAVE DETECTOR

This circuit detect R wave from ECG waveform.



Aloka	TITLE 名称 PHYSIO AMP	MODEL 名称 EP-3117	1 / 1
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16-36 EP-2841 ECG MEMORY

1. General

This PC converts the physiological signals into image signals and makes it possible to freeze the image, as like the supersound echo image, by writing those signals in the memory. With this PC, the physiological signals are displayed in the manner of overlay, like graphic display, in the B-mode, and displayed as PPM on the M image in the case of B/M, M-mode.

2. Operation

1) Overlay part

ECG signal from the physiological-signal amplifier passes through the amp-buffer and is converted by the A/D converter into 6-bit digital signal. The converted data is sent through the latch to the line memory which writes in the data.

The line memory, which is in sync with horizontal synchronization of TV, writes in data during the period of erasure of TV picture and reads out the data during the period of display. The readout address is counted up from the written address because of the necessity of scroll operation.

The readout data is the amplitude data of ECG signal which varies with time, though the overlay signal for display use needs the time data for each amplitude. So, the data read out from the memory is processed in the interpolation circuit for the purposes of necessary conversion and smoothed display. The processed data is controlled by display enable signal, etc. and is outputted to OVLY/ of the body through the open collector.

For the ECG SYNC MARK, ECGFM/ which the body sends out in sync with the R-R is written in the memory as bit 6 of the physiological signal data, and the data read out from the memory is latched by 12 MHz and sent to the output control part.

Memory bit 7 records information of erase. As for as this bit exists, the byte data including this bit is regarded as being erased and is not displayed.

2) PPM part

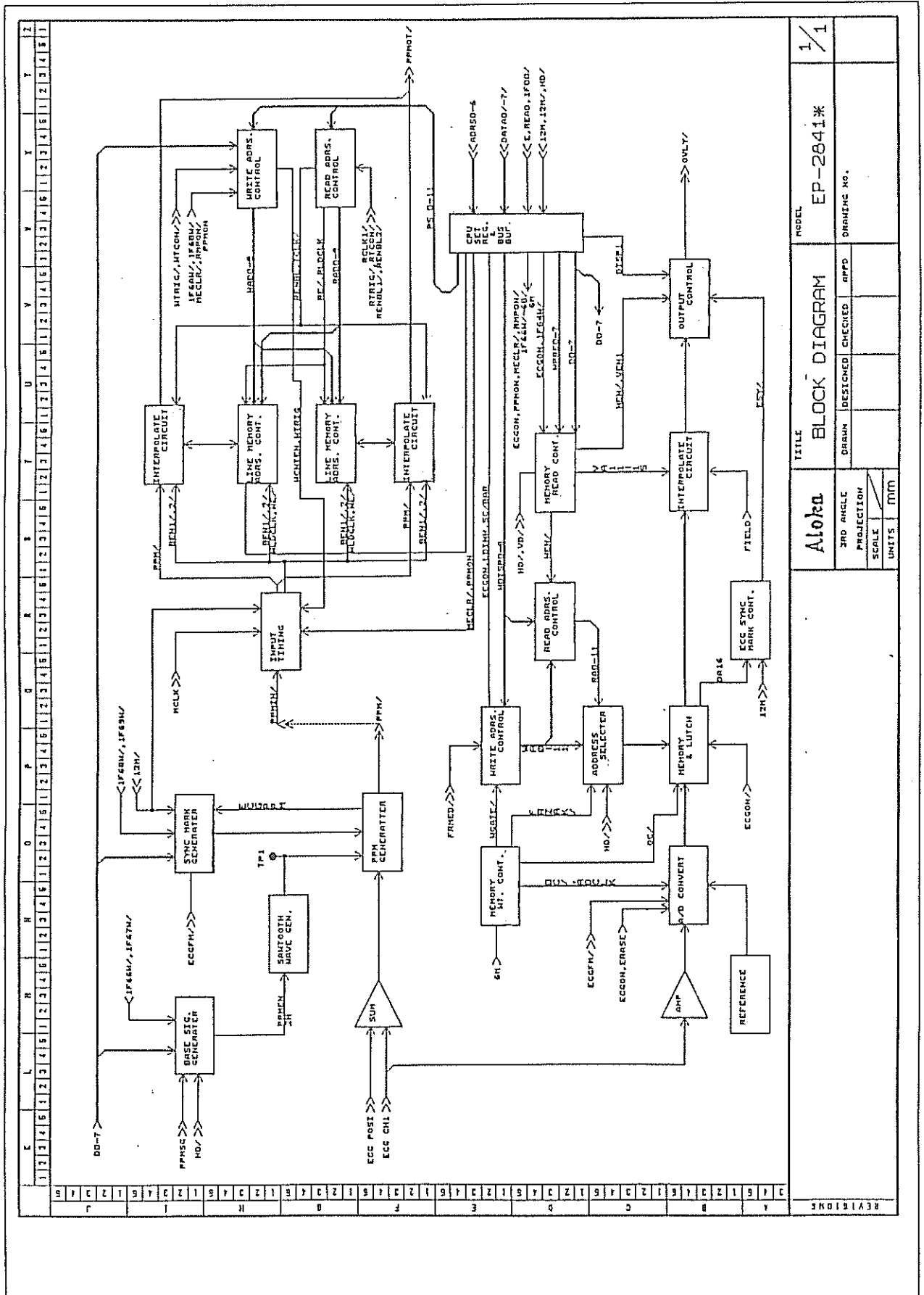
ECG signal from the physiological-signal amplifier is sent through the addition circuit, where the signal is added to the position signal is added to the position signal from the physiological unit, to the PPM modulator.

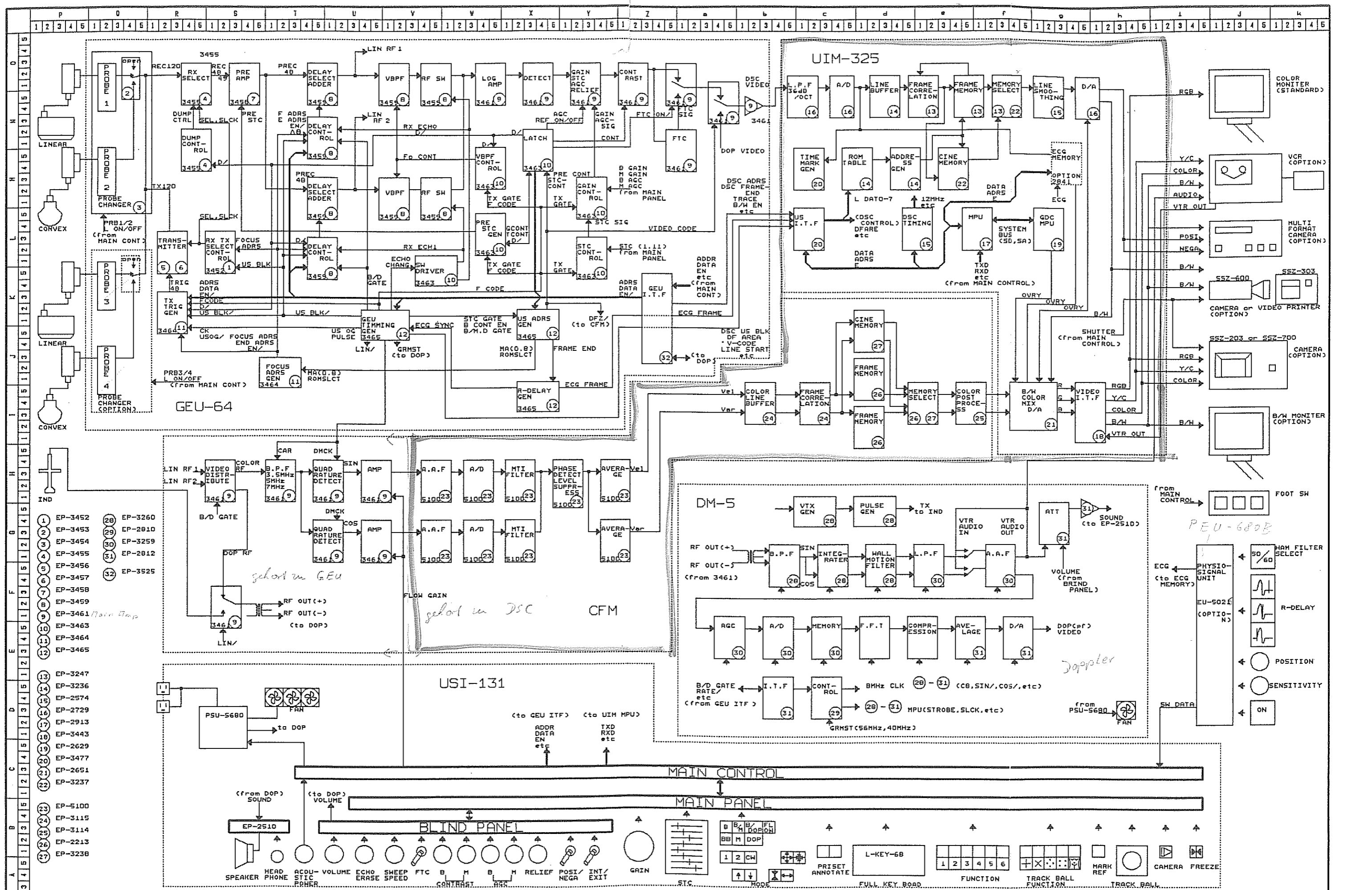
Saw tooth wave, the basic signal of PPM, is made from PPMSG sent out by the recorder interface if the optional interface is in use, or from HD/ if the optional interface is not in use. The ECG signal is PPM modulated by this saw tooth wave and is outputted as PPM/. The output signal is sent transitionally to the mother board and returns as PPMIN/ to this PC again.

Sending of PPM signal is timed with writing-in timing of the memory. Two memories and two interpolation circuits are used so that writing in to and reading out from the memory are made alternately (called the "pingpong" operation) for each line of M image.

The PPM signal timed at writing to the memory is sent to the interpolation circuit. Since writing to the memory is made more frequently than reading out of the memory, the interpolation circuit holds the written PPM signals until they are read out.

PPM signal read out from the memory is processed in the interpolation circuit so that it is distributed to two pixels and, then, is outputted to the mother board through the open collectors.





- 1 EP-3452
- 2 EP-3453
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- 15 EP-2574
- 16 EP-2729
- 17 EP-2913
- 18 EP-3443
- 19 EP-2629
- 20 EP-3477
- 21 EP-2651
- 22 EP-3237
- 23 EP-5100
- 24 EP-3115
- 25 EP-3114
- 26 EP-2213
- 27 EP-3238
- 28 EP-3260
- 29 EP-3259
- 30 EP-2812
- 31 EP-3525

REVISIONS		Aloka		TITLE				MODEL	
		SYSTEM BLOCK		SSD-680EX				1/1	
3RD ANGLE PROJECTION		DRAWN	DESIGNED	CHECKED	APPD	DRAWING NO.			
SCALE						MA300109			
UNITS		mm							