SONY

ANALOG TAPE RECORDER

APR-5001
APR-5002
APR-5003V
Series

OPERATION AND MAINTENANCE MANUAL

1st Edition (Revised 1)

APR-5001 Serial No.10001 and Higher

APR-5002 Serial No.20001 and Higher

APR-5003V Serial No.10001 and Higher

APR-5001/5002/5003V
3-711-352-02

Sony Corporation

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SECTION 10
REPLACEABLE PARTS

OVERVIEW

This section contains all of the exploded views, and parts list related to the APR-5001/5002/5003V series recorder.

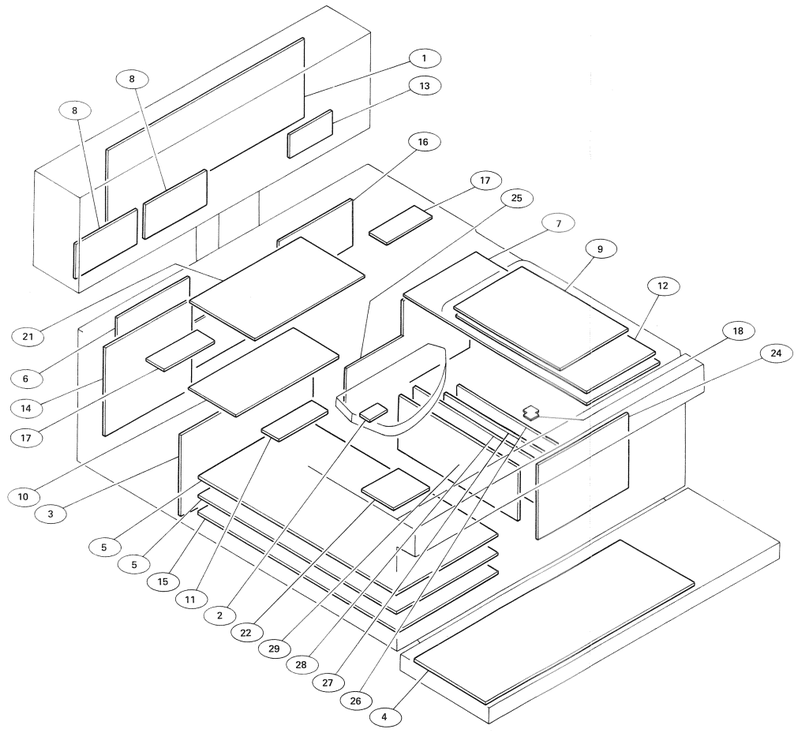
PARTS INFORMATION

1. Safety Related Component Warning Components identified by shading marked with ⚠ on the exploded views and spare parts list are critical to safe operation. Replace these components with Sony parts whose parts numbers appear as shown in this manual or in service bulletins and service manual supplements published by Sony.
2. Replacement parts supplied from Sony Parts Center will sometimes have different shape and outside view from the parts which are actually in use. This is due to "accommodating improved parts and/or engineering changes" or "standardization of genuine parts."
   - These spare parts lists indicate the part numbers of "standardized genuine parts".
   - Refer to Sony service bulletins and service manual supplements regarding engineering parts changes in our engineering department.
3. The parts of SONY Parts No. marked with "S" in the SP column of the exploded views and electrical spare parts list are normally stocked for replacement purposes. The parts marked with "O" in the SP column are not normally required for routine service work. Orders for parts marked with "O" will be processed, but allow for additional delivery time.
4. Items with no part number and/or no description are not stocked because they are seldom required for routine service or are a part of another assembly.

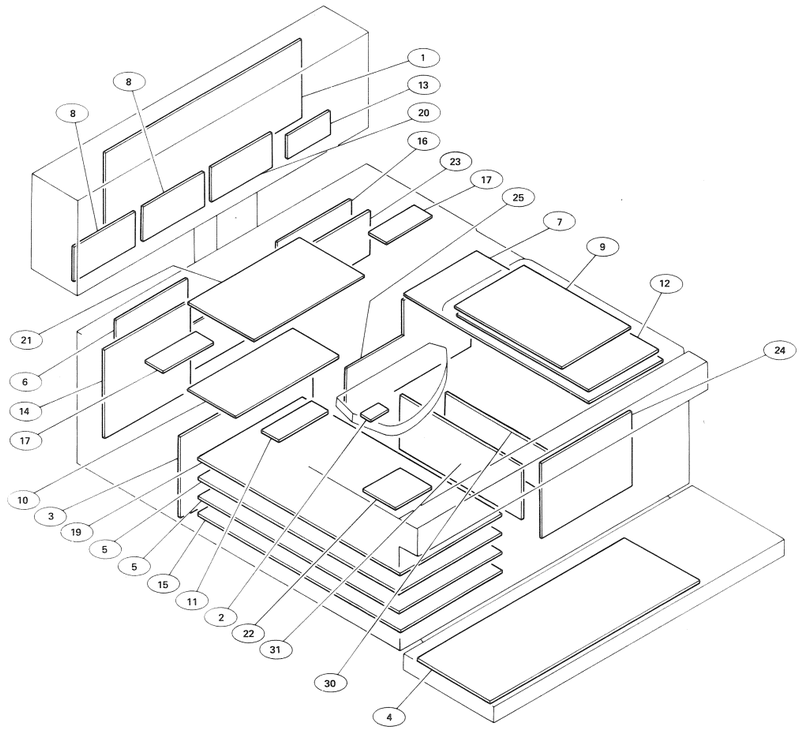
10-1. EXPLODED VIEWS AND PARTS LIST

BOARD LAYOUT

S/N; APR-5002 20001 TO 20700



S/N; APR-5002 20701 AND HIGHER
S/N; APR-5003V 10001 AND HIGHER



MAIN UNIT

(1) ACM board
(2) AHB board
(3) ADM board
(4) ALN board
(5) CNL board
(6) CNX board
(7) CPU board
(8) CTM board
(9) DSP board
(10) FEX board
(11) HES board
(12) KBD board
(13) MSB board
(14) LNT board
(15) MST board
(16) RMD board
(17) RTS board
(18) SBR board
(19) TCC board (For APR-5003V)
(20) TCM board (For APR-5003V)
(21) TIB board
(22) TTS board
(23) VVT board (For APR-5003V)

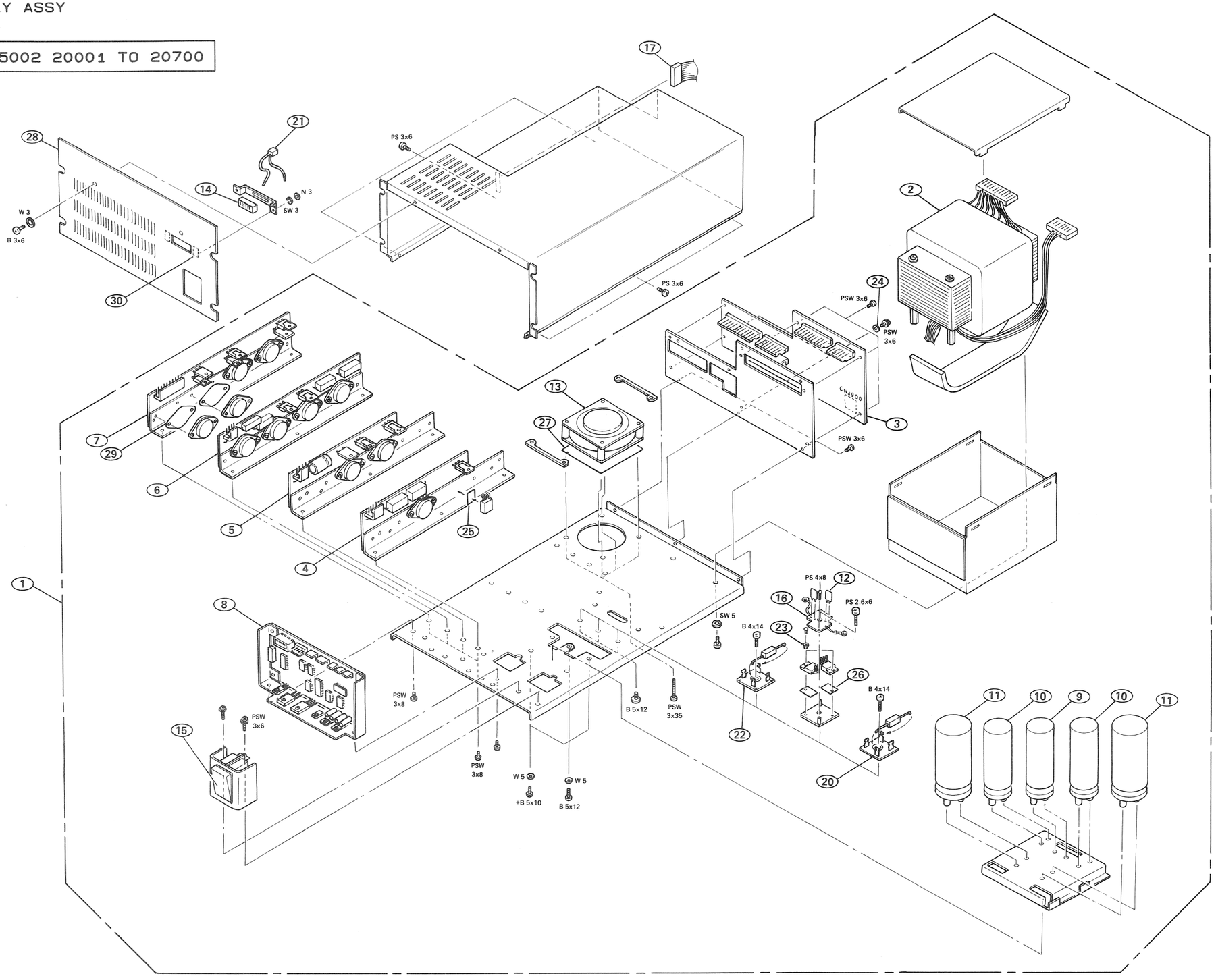
POWER SUPPLY

(24) CSL board
(25) PDB board
(26) RGA board
(27) RGB board
(28) RGC board
(29) RGD board
(30) RG-1 board
(31) RG-2 board

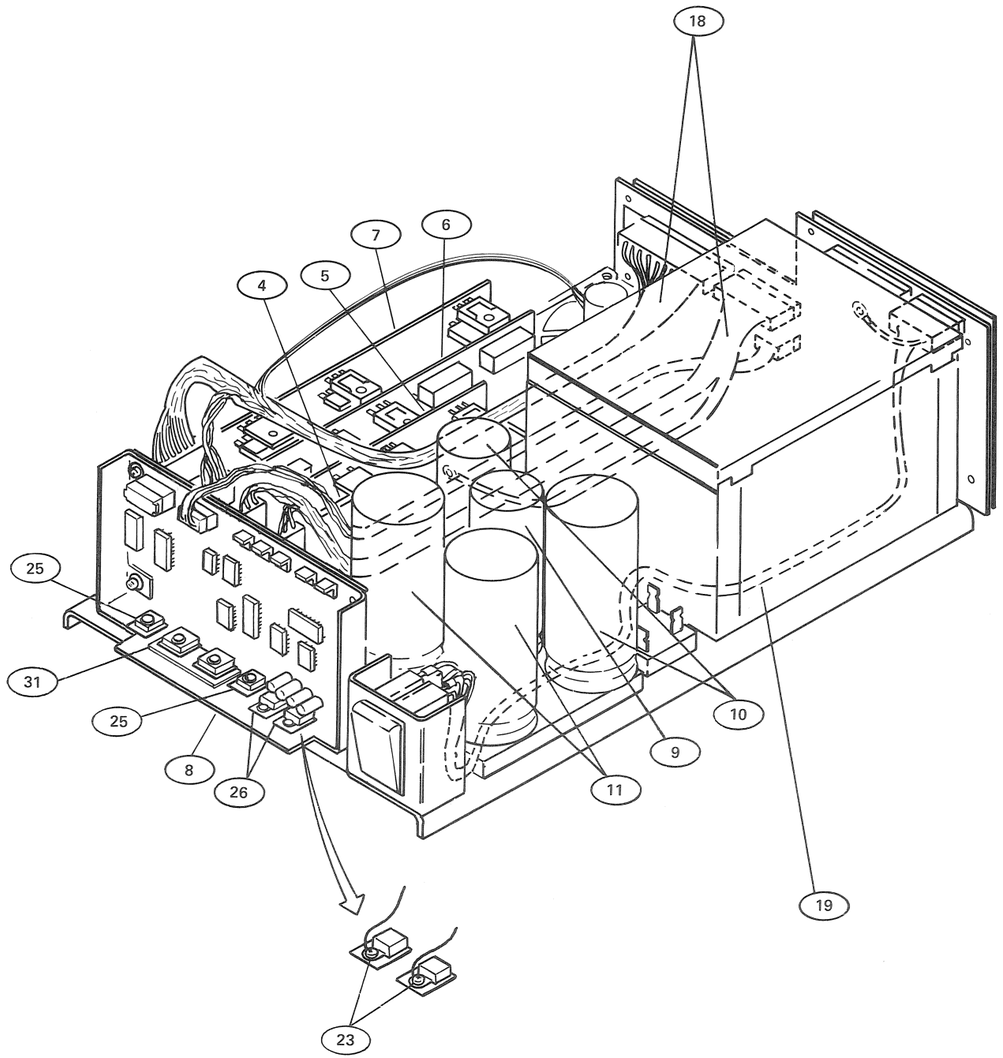
NOTE: For detail information, refer to "10-2" Electrical Parts List.

POWER SUPPLY ASSY

S/N; APR-5002 20001 TO 20700



POWER SUPPLY ASSY



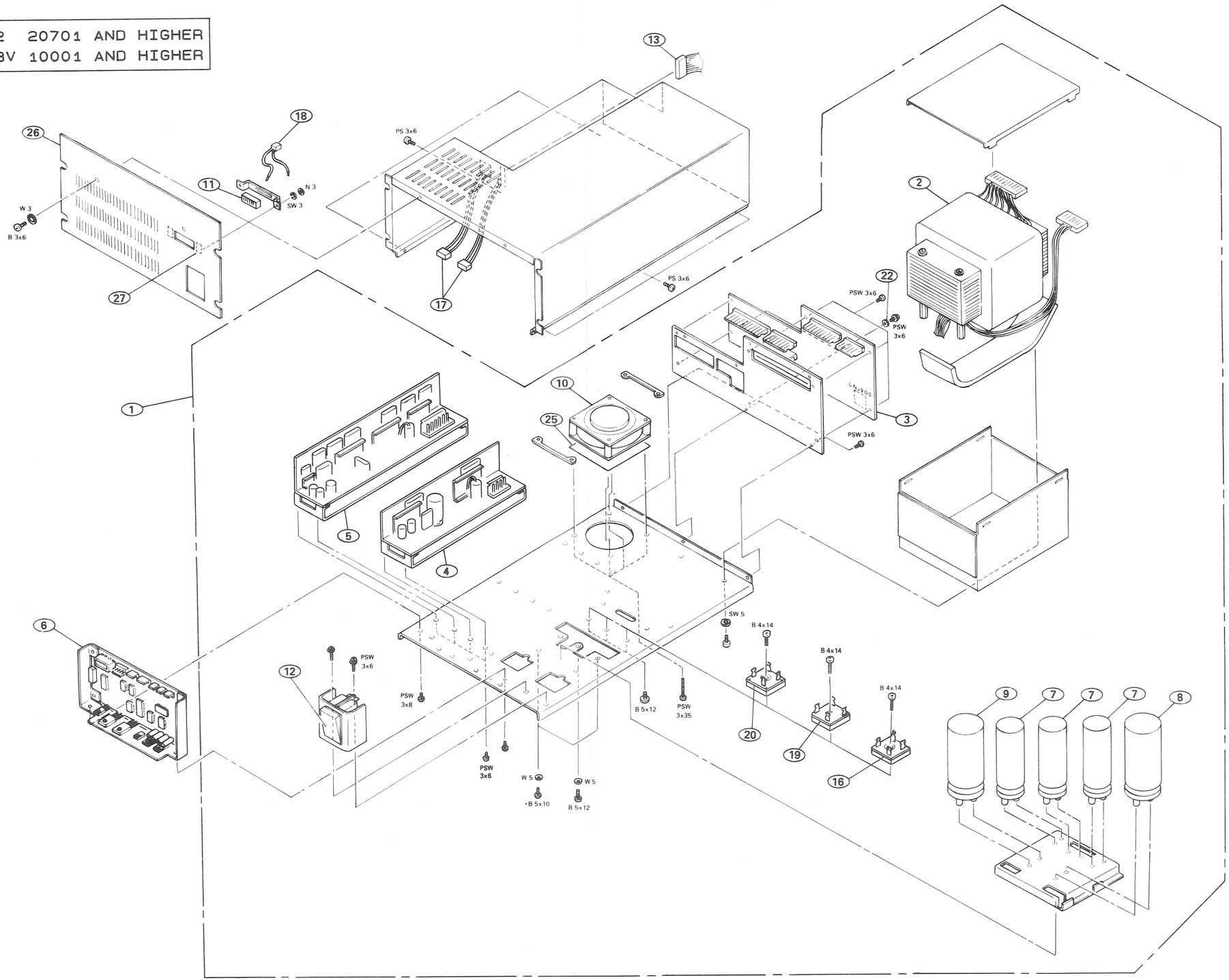
POWER SUPPLY ASSY

(APR-5002: Serial No. 20001 to 20700)

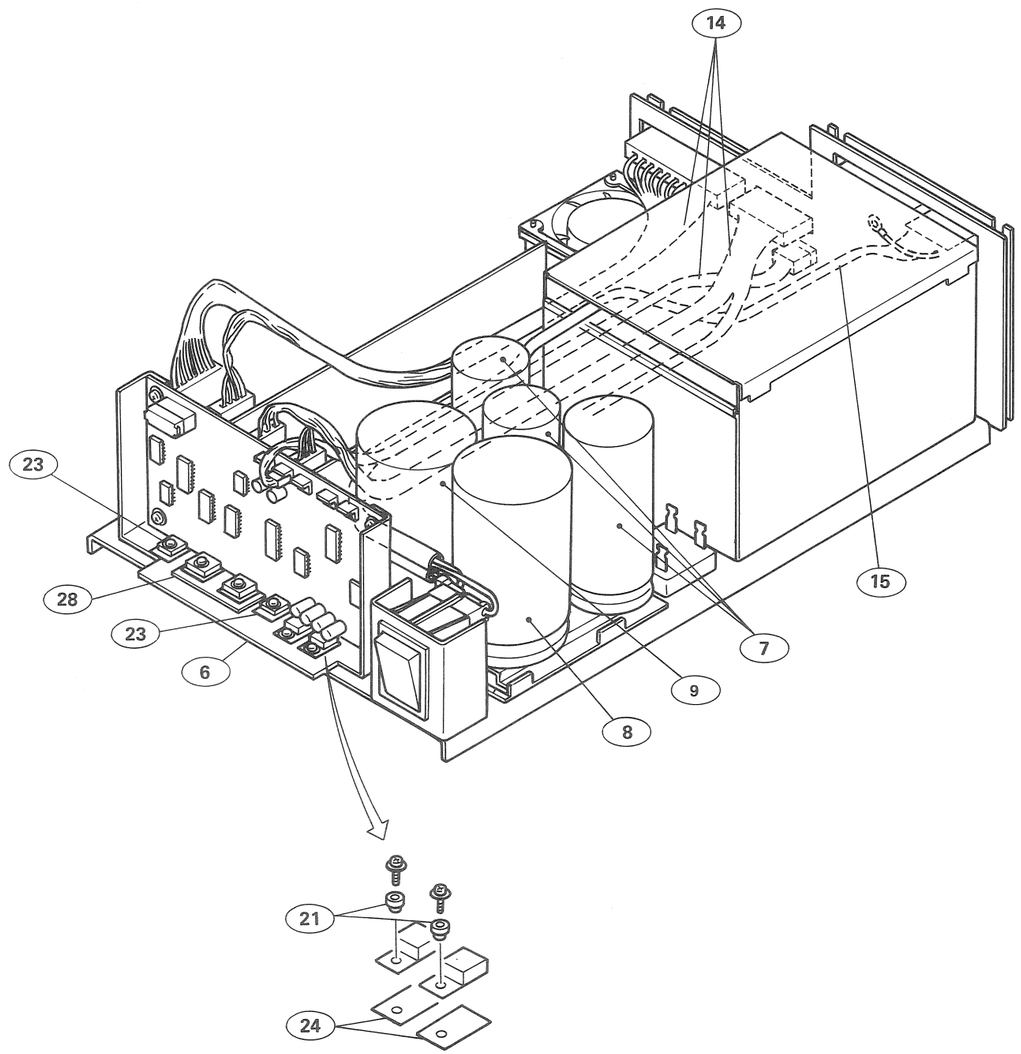
Ref. No.	SP	SONY Parts No.	Description
1	O	A-7810-201-A	POWER SUPPLY ASSY
2	O	⚠A-7810-278-A	TRANSFORMER ASSY, POWER
3	O	A-7850-341-A	MOUNTED PCB, PDB
4	O	A-7850-342-A	MOUNTED PCB, RGA
5	O	A-7850-343-A	MOUNTED PCB, RGB
6	O	A-7850-344-A	MOUNTED PCB, RGC
7	O	A-7850-345-A	MOUNTED PCB, RGD
8	O	A-7850-346-A	COMPLETE PCB ,CSL
9	O	1-125-453-10	CAP, ELECT 22000MF
10	O	1-125-454-10	CAP, ELECT 10000MF
11	S	1-125-455-10	CAP, ELECT 22000MF
12	O	1-535-419-00	TAB, FASTEN
13	S	1-541-409-11	FAN MOTOR
14	O	1-548-100-31	TIMER (S)
15	S	⚠1-554-066-00	SWITCH, SEESAW (AC POWER)
16	O	1-620-303-11	PC BOARD, SBR
17	O	1-937-528-11	HARNESS (POWER SUPPLY SUB)
18	O	1-937-540-12	HARNESS (POWER SUB)
19	O	⚠1-937-541-12	HARNESS (POWER SWITCH)
20	O	1-937-543-12	HARNESS (BRIDGE 1)
21	O	1-937-545-11	HARNESS (LIFE METER)
22	O	1-937-922-11	HARNESS (BRIDGE 3)
23	S	2-832-007-03	BUSHING, (K) INSULATING
24	S	3-564-542-01	WASHER, FIBER
25	S	3-566-928-01	SHEET, INSULATING
26	S	3-703-207-11	INSULATOR, TO-220
27	O	3-711-080-01	ISOLATOR, FAN
28	O	3-711-181-01	FRONT PANEL
29	S	4-848-640-11	PLATE, INSULATING, TO-3
30	S	4-849-592-00	CUSHION
31	O	4-857-833-00	INSULATOR, 03P

POWER SUPPLY ASSY

S/N; APR-5002 20701 AND HIGHER
S/N; APR-5003V 10001 AND HIGHER



POWER SUPPLY ASSY

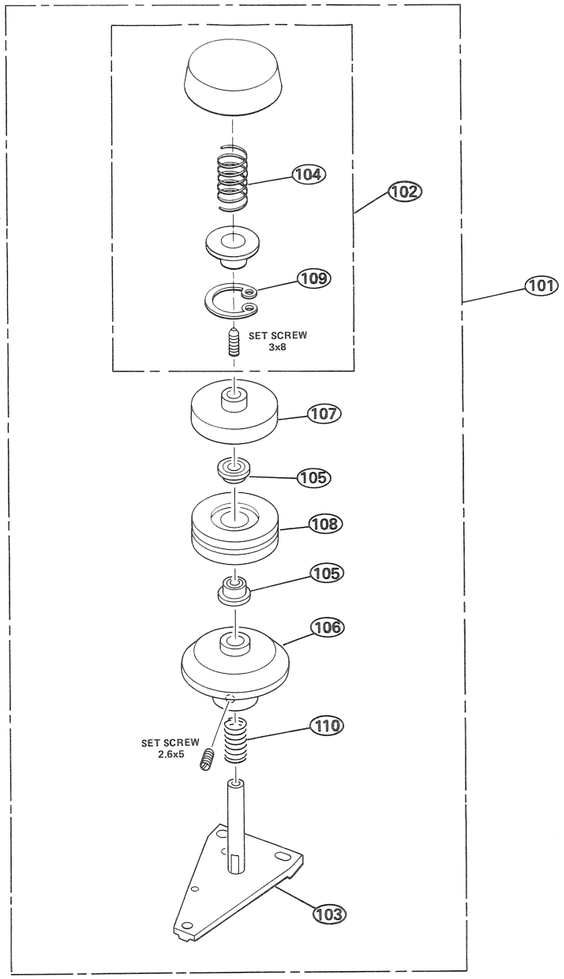


POWER SUPPLY ASSY

(APR-5002: Serial No. 20701 and higher
APR-5003V: Serial No. 10001 and higher)

Ref. No.	SP	SONY Parts No.	Description
1	O	A-7810-201-B	POWER SUPPLY ASSY
2	O	⚠A-7810-278-B	TRANSFORMER ASSY, POWER
3	O	A-7850-341-A	MOUNTED PCB, PDB
4	O	A-7850-517-A	MOUNTED PCB, RG-1
5	O	A-7850-518-A	MOUNTED PCB, RG-2
6	O	A-7850-346-A	COMPLETE PCB, CSL
7	S	1-125-454-11	CAP, ELECT 10000MF
8	S	1-125-455-11	CAP, ELECT 22000MF
9	S	1-125-484-11	CAP, ELECT 39000MF
10	S	1-541-409-21	FAN MOTOR $62.91
11	O	1-548-100-31	TIMER (S)
12	S	⚠1-554-066-00	SWITCH, SEESAW (AC POWER)
13	O	1-937-528-11	HARNESS (POWER SUPPLY SUB)
14	O	1-937-540-12	HARNESS (POWER SUB)
15	O	⚠1-937-541-12	HARNESS (POWER SWITCH)
16	O	1-937-543-12	HARNESS (BRIDGE 1)
17	O	1-937-544-12	HARNESS (CSL-CHASSIS)
18	O	1-937-545-11	HARNESS (METER)
19	O	1-937-921-12	HARNESS (BRIDGE 2)
20	O	1-937-922-11	HARNESS (BRIDGE 3)
21	S	2-832-007-00	BUSHING, (K) INSULATING
22	S	3-564-542-00	WASHER, FIBER
23	S	3-566-928-00	SHEET, INSULATING
24	S	3-703-207-11	INSULATOR, TO-220
25	O	3-711-080-01	ISOLATOR, FAN
26	O	3-711-181-01	FRONT PANEL
27	S	4-849-592-00	CUSHION
28	S	4-857-833-00	INSULATOR, 03P

"S" ROLLER ASSY

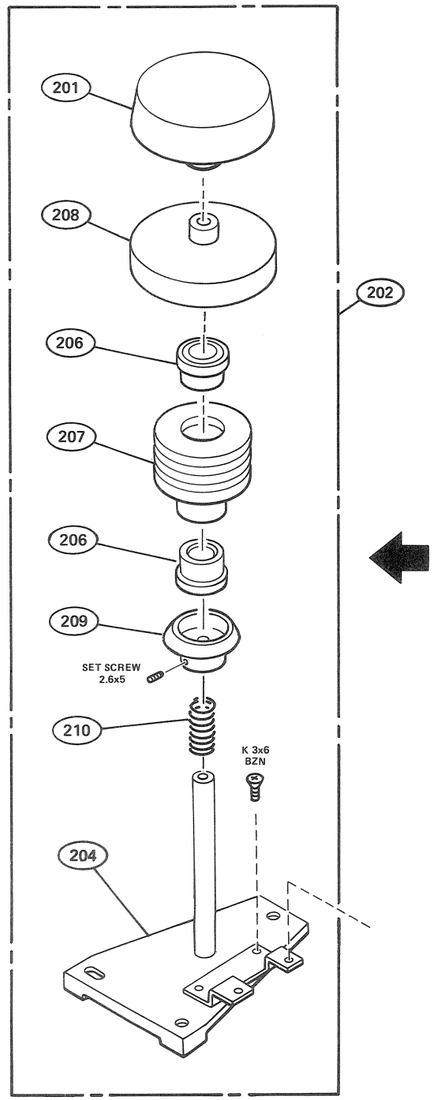


"S" ROLLER ASSY

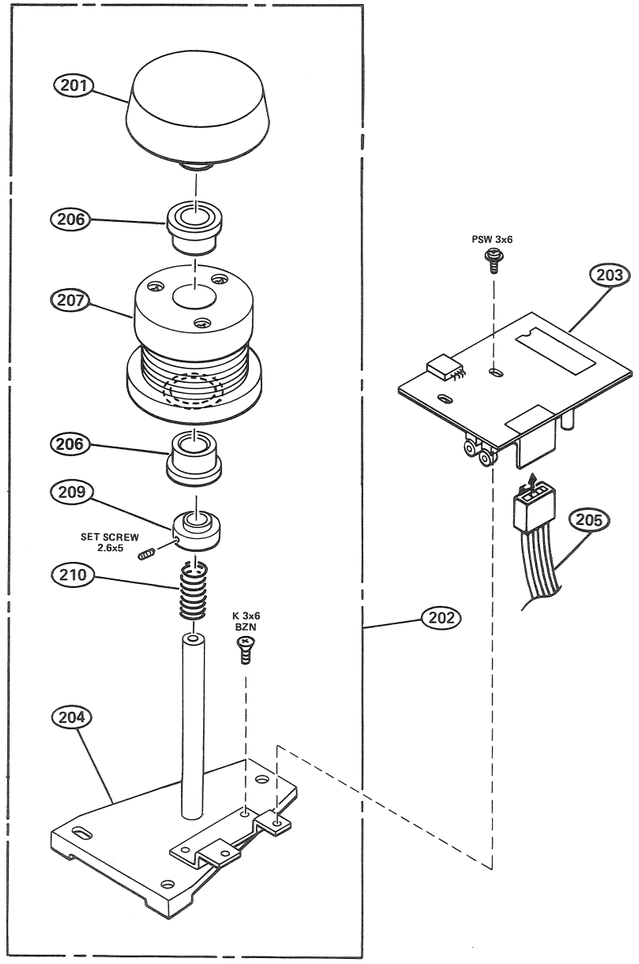
Ref. No.	SP	SONY Parts No.	Description
101	O	A-7810-209-A	S-ROLLER ASSY
102	O	A-7810-210-A	ROLLER CAP ASSY
103	O	X-3711-021-1	ASSY, BASE "S" ROLLER
104	S	3-531-738-00	SPRING, COMPRESSION
105	S	3-651-607-00	BEARING (FLANGE) BALL
106	O	3-711-285-01	BOTTOM FLANGE "S" ROLLER
107	O	3-711-286-01	1/4" "S" FLANGE
108	O	3-711-287-01	"S" ROLLER
109	S	7-624-199-01	STOP RING 18, TYPE C
110	O	3-669-396-02	SPRING, COMPRESSION

TIMER ROLLER ASSY

Applicable Serial No.
APR-5002 No. 20201 and higher.
APR-5003V No. 10001 and higher.



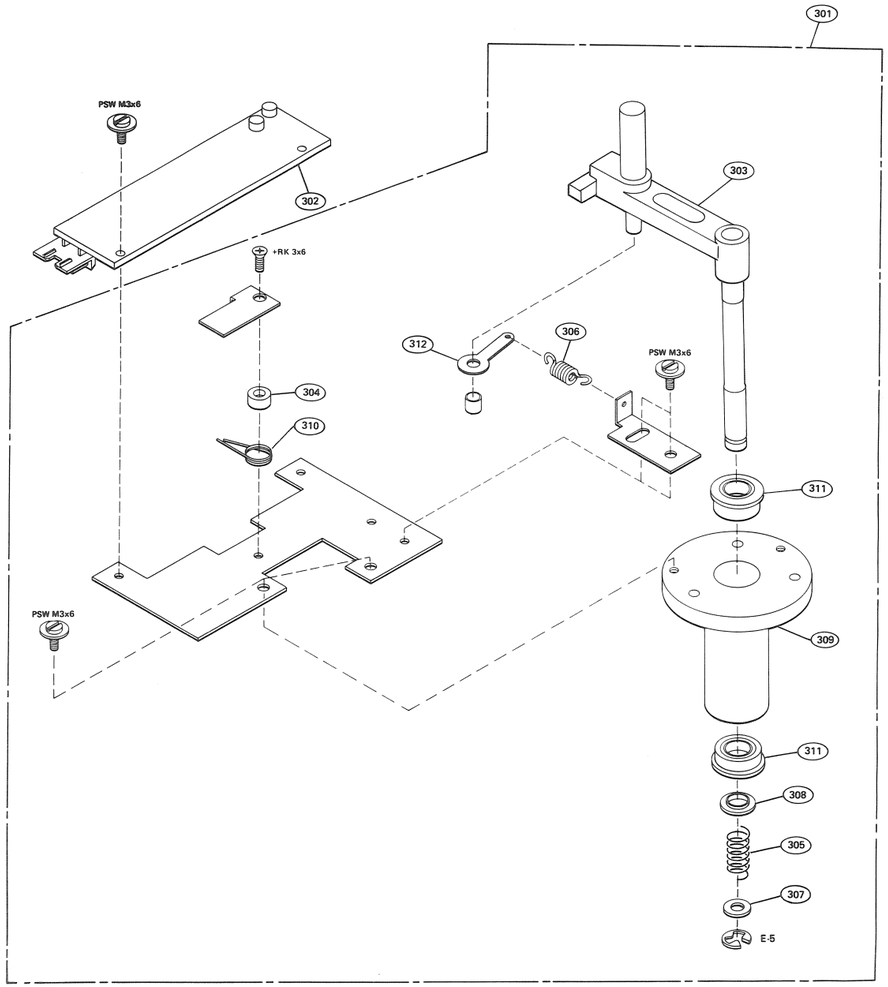
Applicable Serial No.
APR-5002 Up to No. 20200



TIMER ROLLER ASSEMBLY

201	O	A-7810-210-A	ROLLER CAP ASSY
202	O	A-7810-212-A	TIMER ROLLER SUB ASSY (APR-5002 Up to No. 20200) (APR-5003 Up to No. 20400)
	O	A-7810-279-A	TIMER ROLLER SUB ASSY (APR-5002 No. 20201 and higher) (APR-5003 No. 20401 and higher)
203	S	A-7850-381-A	TTS MOUNT
204	O	X-3711-022-1	ASSY, BASE TIMER ROLLER
205	O	1-937-527-11	HARNESS (TTS, HES-TIB SUB)
206	O	3-651-607-00	BEARING (FLANGE), BALL
207	O	X-3711-030-1	TIMER ROLLER SUB ASSY (APR-5002 Up to No. 20200) (APR-5003 Up to No. 20400)
	O	X-3711-028-1	ROLLER HUB ASSY (APR-5002 No. 20201 and higher) (APR-5003 No. 20401 and higher)
208	O	3-711-286-01	1/4" "S" FLANGE
209	O	3-711-169-01	COLLAR, ROLLER (APR-5002 Up to No. 20200) (APR-5003 Up to No. 20400)
	O	3-711-337-01	BOTTOM FLANGE-TIMER ROLLER (APR-5002 No. 20201 and higher) (APR-5003 No. 20401 and higher)
210	O	3-669-396-02	SPRING, COMPRESSION

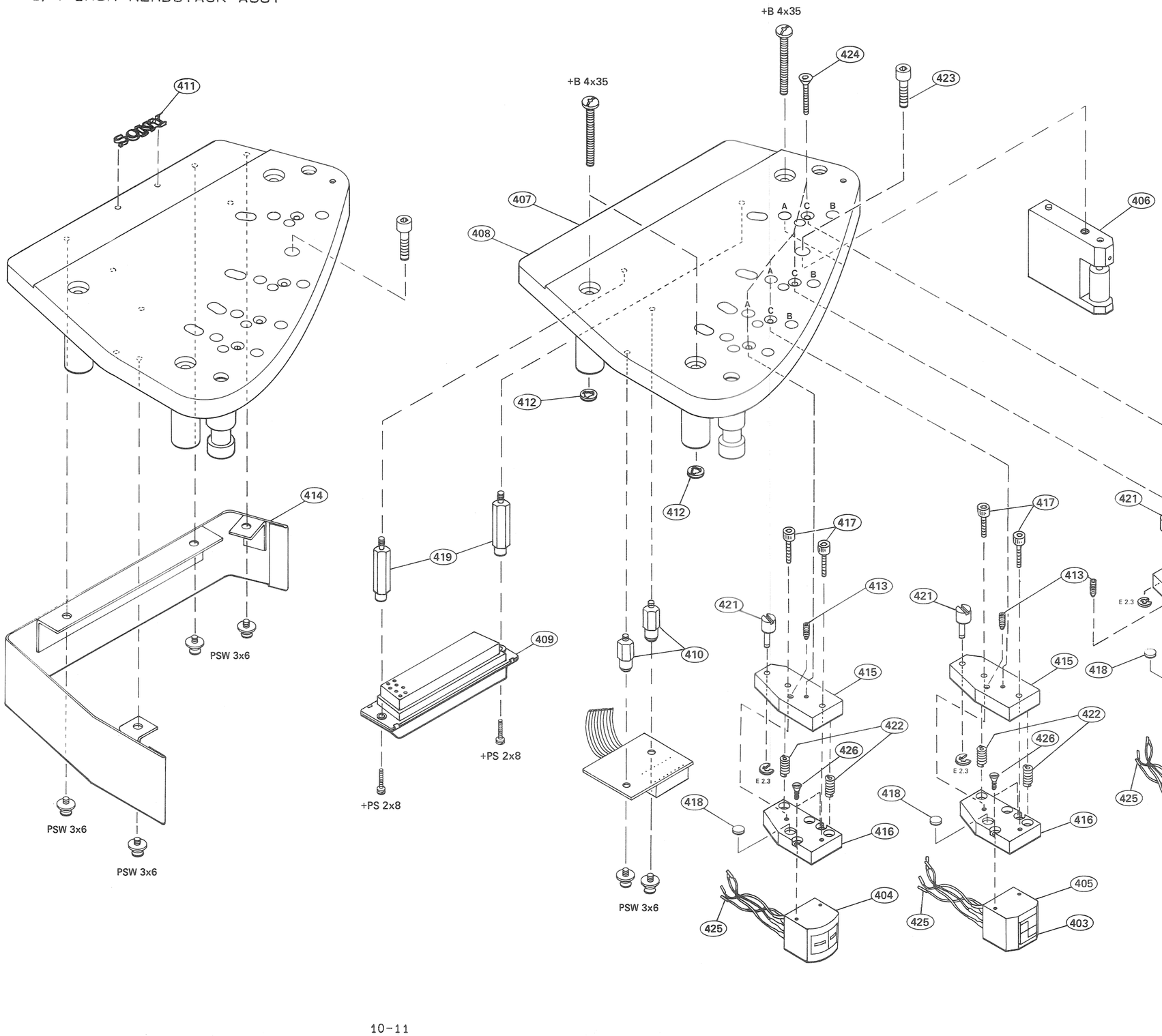
FLUTTER ARM ASSY



FLUTTER ARM ASSY

301	O	A-7810-216-A	FLUTTER ARM SUB ASSY
302	S	A-7850-351-A	HES MOUNT
303	O	X-3711-004-1	TENSION ARM ASSY
304	S	3-143-065-00	SPACER
305	S	3-571-836-11	SPRING, COMPRESSION
306	S	3-642-491-00	SPRING, TENSION
307	S	3-701-444-21	WASHER, 6
308	S	3-711-027-01	SPACER (DIA 6)
309	O	3-711-053-01	HUB-TENSION REG
310	S	3-711-146-01	SPRING, TORSION
311	S	3-651-607-00	BEARING, FLANGE BALL
312	S	7-623-510-01	LUG, 4

1/4-INCH HEADSTACK ASSY



1/4-INCH HEADSTACK ASSY

Ref. No.	SP	SONY Parts No.	Description
	O	* A-7810-230-A	HEAD STACK ASSY (For APR-5003V only) (This assembly includes the following parts.)
401	S	T-9410-181-1	1/4" 2TRK (NAB) REC HEAD
402	S	1-543-447-11	1/4" 2TRK (NAB) REP 80MH
403	S	T-9412-410-1	ERASE HEAD (For APR-5002A)
404	S	1-543-450-11	HEAD, 1/4", TC ERASE/TC RP (For APR-5003A)
405	S	1-543-449-11	HEAD, 1/4", 2TRK, ERASE, TC FORMAT (For APR-5003V)
406	S	T-9481-639-1	ASSY, SCRAPE FILTER, 1/4"
407	O	X-3711-014-1	BASE PLATE (1/4) ASSY (For APR-5002A)
408	O	X-3711-020-1	BASE PLATE TC ASSY (For APR-5003V)
409	O	1-937-559-12	HARNESS (HEAD STACK) 78P
410	O	2-264-136-00	SUPPORT, SWITCH, PUSH BUTTON
411	O	3-672-268-00	EMBLEM, SONY
412	O	3-673-968-00	STOPPER, SCREW
413	S	3-701-512-01	SET SCREW, DOUBLE POINT,(M4x8)
414	O	3-711-112-02	SIDE COVER (1/4")
415	O	3-711-113-01	PLATE. HEAD CAM
416	O	3-711-114-01	PLATE. HEAD MOUNTING
417	O	3-711-131-11	SCREW, M2.6x13 ALLEN CAP
418	O	3-711-183-01	DISC PRESSURE HD. BLOCK ASSY
419	O	3-711-191-01	STAND OFF CONNECTOR (S)
420	O	3-711-227-01	PLATE, HEAD MOUNTING (2)
421	O	3-711-246-01	CAM, WRAP ADJ. HEAD MTG BLOCK
422	S	3-711-280-01	COMPRESSION SPRING
423	S	T-9453-548-1	SCREW, 8-32x1/2 ALLEN CAP
424	S	4-911-928-11	BOLT M3x12
425	S	T-9412-251-1	CONTACT, CONNECTOR
426	S	T-9453-424-1	SCREW, 3-48x3/16FL HD
427	S	3-701-507-00	SET SCREW M3x5

NOTE: * For APR-5002, the following options are available on request.
APR-HB5001 (Monaural)
APR-HB5002 (2-channel)
APR-HB5002D (DIN)
APR-HB5002H (Half inch 2-channel)

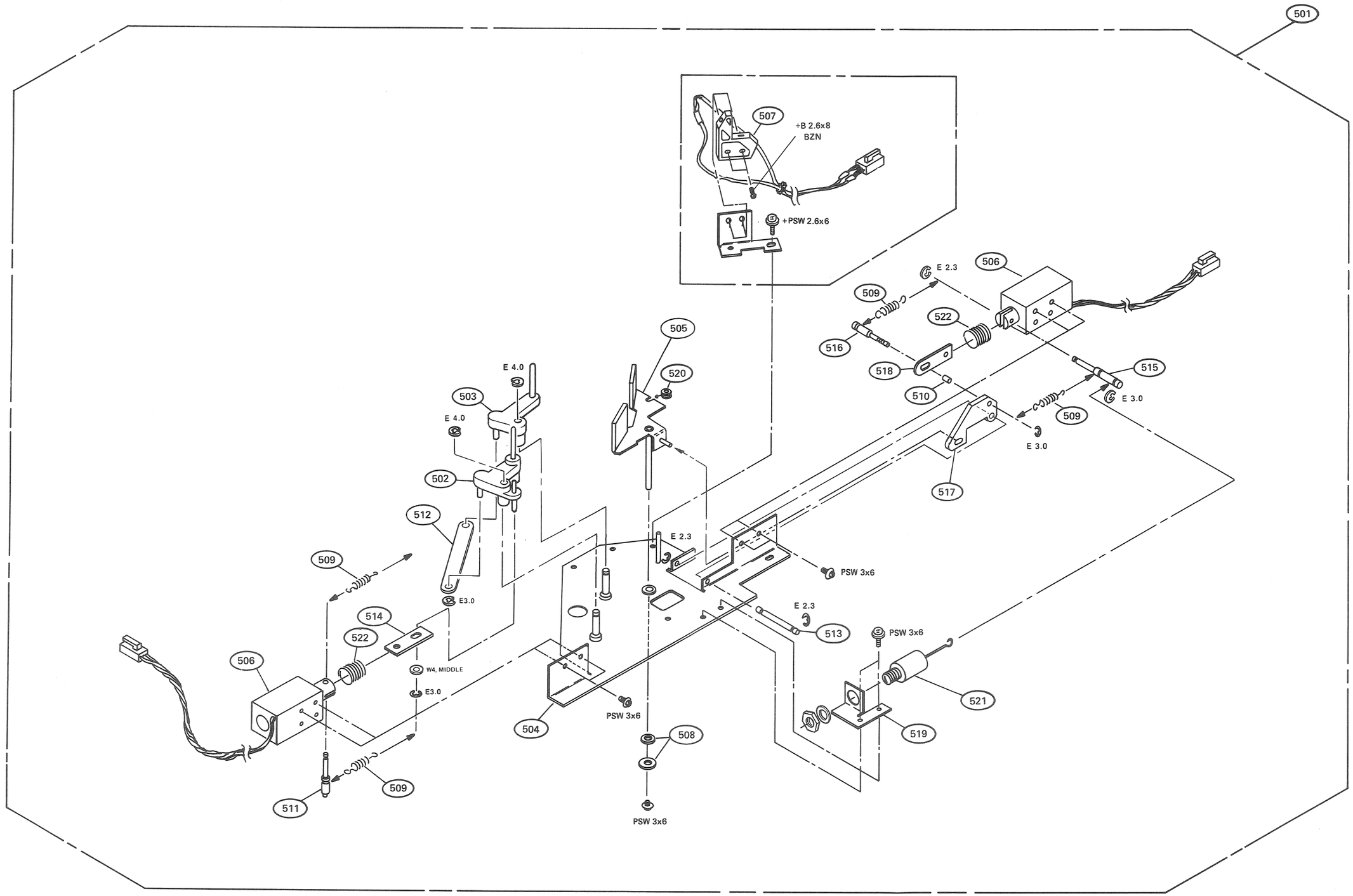
LIFTER & SHIELD ASSY

(APR-5002: Serial No. 20001 to 20700)

Ref. No.	SP	SONY Parts No.	Description
501	O	A-7810-217-A	LIFTER & SHIELD ASSY
502	O	X-3711-009-1	PLATE (A) ASSY, LIF
503	O	X-3711-010-1	PLATE (B) ASSY, LIF
504	O	X-3711-011-1	BASE PLATE LIF & SHD ASSY
505	O	X-3711-012-3	SHIELD PLATE ASSY
506	S	1-454-426-41	SOLENOID, PLUNGER
507	O	1-937-558-11	HARNESS (EOT-KBD)
508	S	3-509-043-11	FELT
509	O	3-564-108-00	SPRING, TENSION
510	S	3-659-365-00	SPACER (4x3)
511	O	3-711-115-01	PIN, SOLENOID
512	O	3-711-116-01	PLATE D, LIFTER
513	O	3-711-120-01	SHAFT ARM
514	O	3-711-167-01	PLATE C, LIFTER
515	O	3-711-220-01	SHAFT, SOLENOID SHIELD
516	O	3-711-221-01	SHAFT, TRANSMISSION SHIELD
517	O	3-711-224-01	ARM SHIELD
518	O	3-711-225-01	LIMITER PLATE SHIELD
519	O	3-711-226-01	BRACKET, AIRPOT SHIELD
520	O	3-711-229-01	BUSHING, SHIELD ASSY
521	O	3-711-282-01	ADJUSTABLE AIR DASHPOT
522	S	4-836-109-00	SPRING, COMPRESSION

LIFTER & SHIELD ASSY

S/N; APR-5002 20001 TO 20700



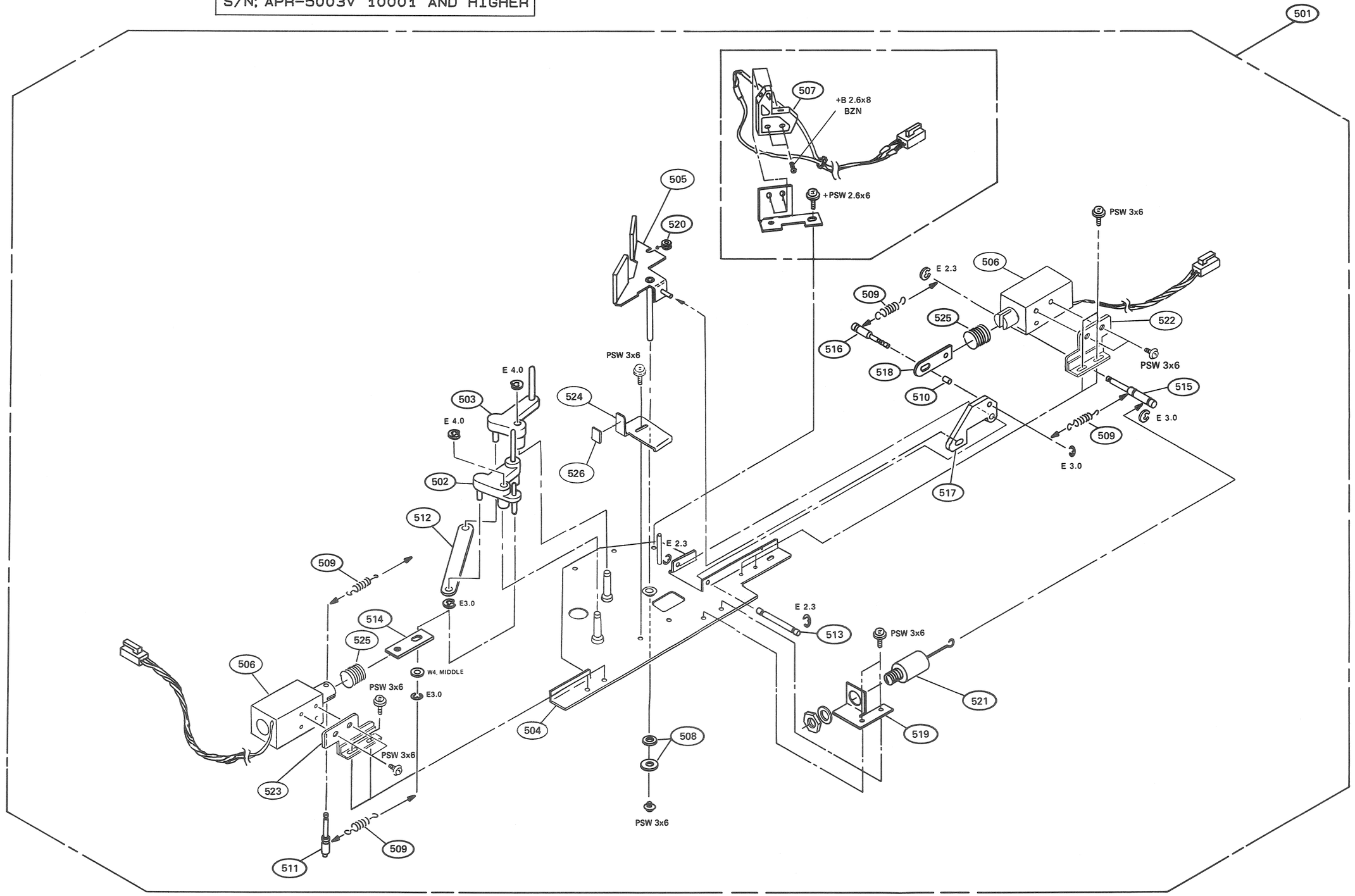
LIFTER & SHIELD ASSY

(APR-5002: Serial No. 20701 and higher
APR-5003V: Serial No. 10001 and higher)

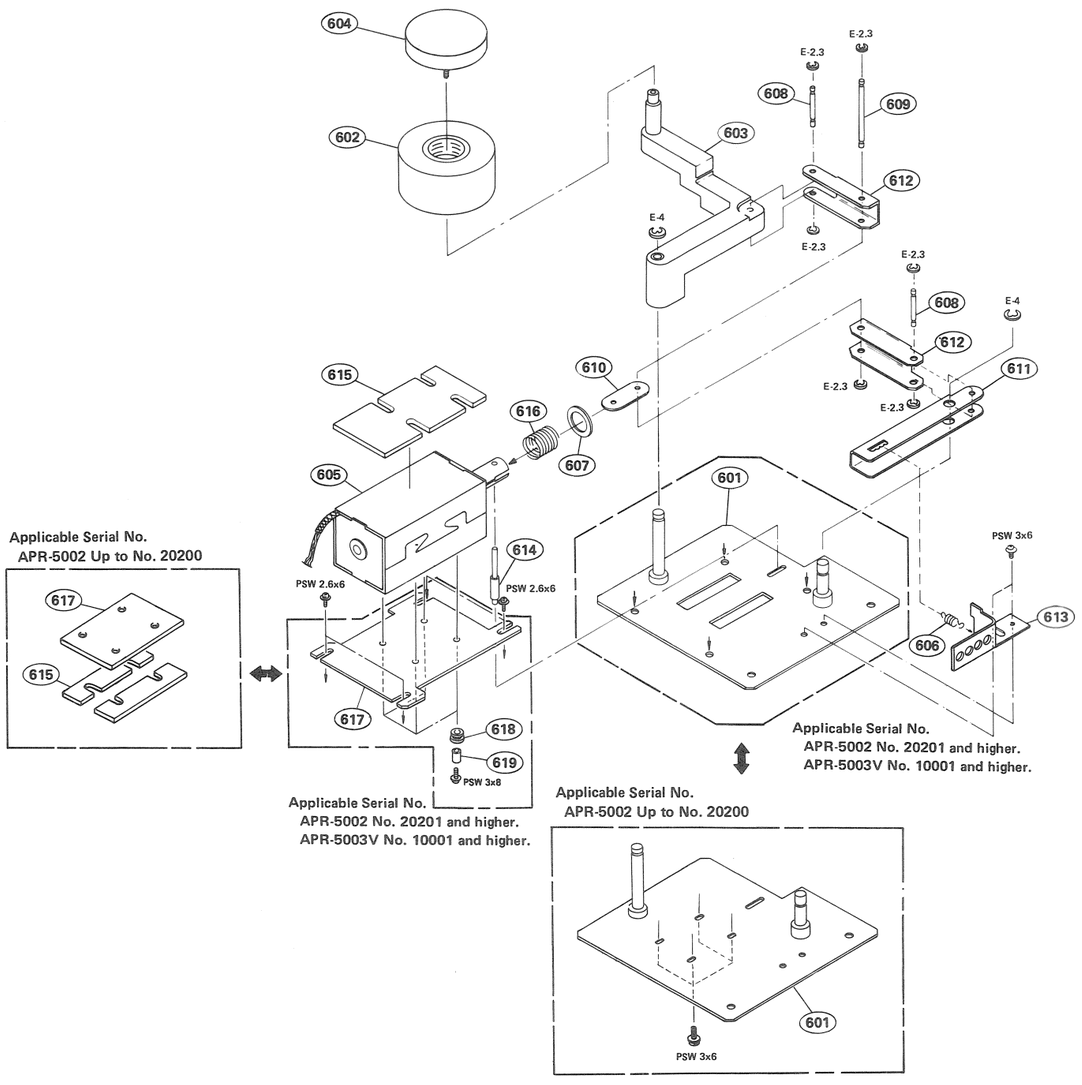
Ref. No.	SP	SONY Parts No.	Description
501	O	A-7810-217-C	LIFTER & SHIELD ASSY
502	O	X-3711-009-1	PLATE (A) ASSY, LIF
503	O	X-3711-010-1	PLATE (B) ASSY, LIF
504	O	X-3711-011-1	BASE PLATE LIF & SHD ASSY
505	O	X-3711-012-3	SHIELD PLATE ASSY
506	S	1-454-426-41	SOLENOID, PLUNGER
507	O	1-937-558-11	HARNESS (EOT-KBD)
508	S	9-911-860-XX	FELT
509	O	3-564-108-00	SPRING, TENSION
510	S	3-659-365-00	SPACER (4x3)
511	O	3-711-115-01	PIN, SOLENOID
512	O	3-711-116-03	PLATE D LIFTER
513	O	3-711-120-01	SHAFT ARM
514	O	3-711-167-01	PLATE C LIFTER
515	O	3-711-220-01	SHAFT, SOLENOID SHIELD
516	O	3-711-221-01	SHAFT, TRANSMISSION SHIELD
517	O	3-711-224-01	ARM SHIELD
518	O	3-711-225-01	LIMITER PLATE SHIELD
519	O	3-711-226-01	BRACKET, AIRPOT SHIELD
520	O	3-711-229-01	BUSHING, SHIELD ASSY
521	O	3-711-282-01	ADJUSTABLE AIR DASHPOT
522	O	3-711-346-01	BRACKET, SOLENOID "A"
523	O	3-711-347-01	BRACKET, SOLENOID "B"
524	O	3-711-348-01	STOPPER PLATE
525	S	4-836-109-00	SPRING, COMPRESSION
526	S	9-911-839-XX	CUSHION, RUBBER

LIFTER & SHIELD ASSY

S/N; APR-5002 20701 AND HIGHER
S/N; APR-5003V 10001 AND HIGHER



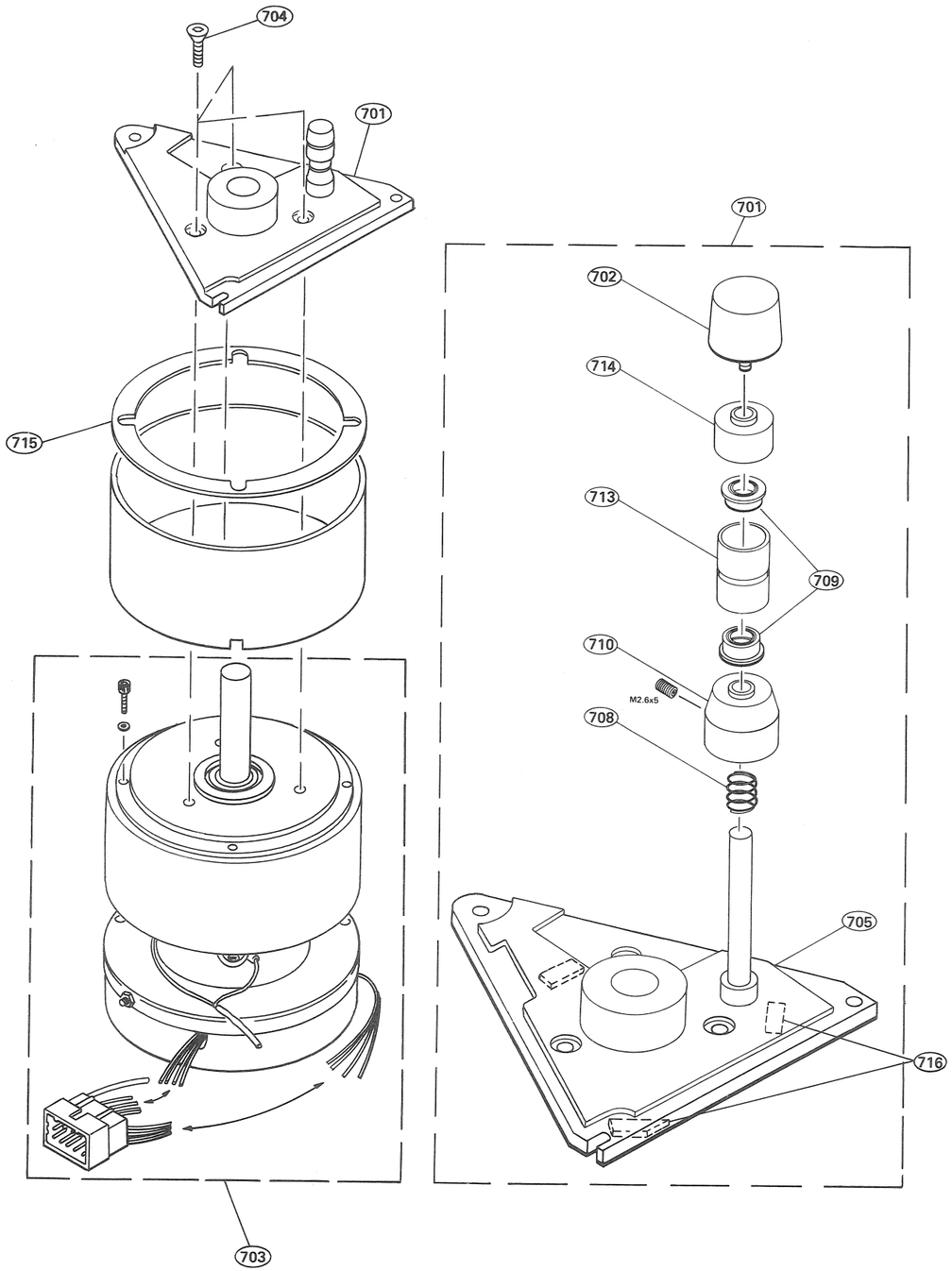
PINCH ROLLER ASSY



PINCH ROLLER ASSY

Ref. No.	SP	SONY Parts No.	Description
601	O	X-3711-005-2	PINCH BASE PLATE ASSY (APR-5002 Up to No. 20200)
	O	X-3711-005-3	PINCH BASE PLATE ASSY (APR-5002 No. 20201 and higher / APR-5003V No. 10001 and higher)
602	S	X-3711-016-2	ASSY, P/R PUCK
603	O	X-3711-019-1	PINCH LEVER ASSY, ANAL
604	O	X-3711-024-1	CAP, P/R ASSY AN
605	S	1-454-427-11	SOLENOID, PLUNGER
606	S	3-711-328-01	SPRING, TENSION
607	S	3-701-447-21	POLYWASHER, 10 ID
608	S	3-711-004-01	PIN A, P/R
609	S	3-711-005-01	PIN B, P/R
610	O	3-711-006-01	PLATE A, P/R
611	O	3-711-007-01	PLATE B, P/R
612	O	3-711-008-01	PLATE C, P/R
613	O	3-711-009-02	PINCH STOPPER PLATE
614	O	3-711-024-01	PLUNGER GUIDE PIN-P/R
615	O	3-711-205-02	ISOLATOR, RUBBER
616	S	3-711-212-02	SPRING, COMPRESSION
617	O	3-711-311-01	PLUNGER, PLATE (APR-5002 Up to No. 20200)
	O	3-711-327-01	PINCH, PLATE (APR-5002 No. 20201 and higher / APR-5003V No. 10001 and higher)
618	S	3-489-112-00	CUSHION, RUBBER
619	O	3-657-842-01	SPACER, 3x4

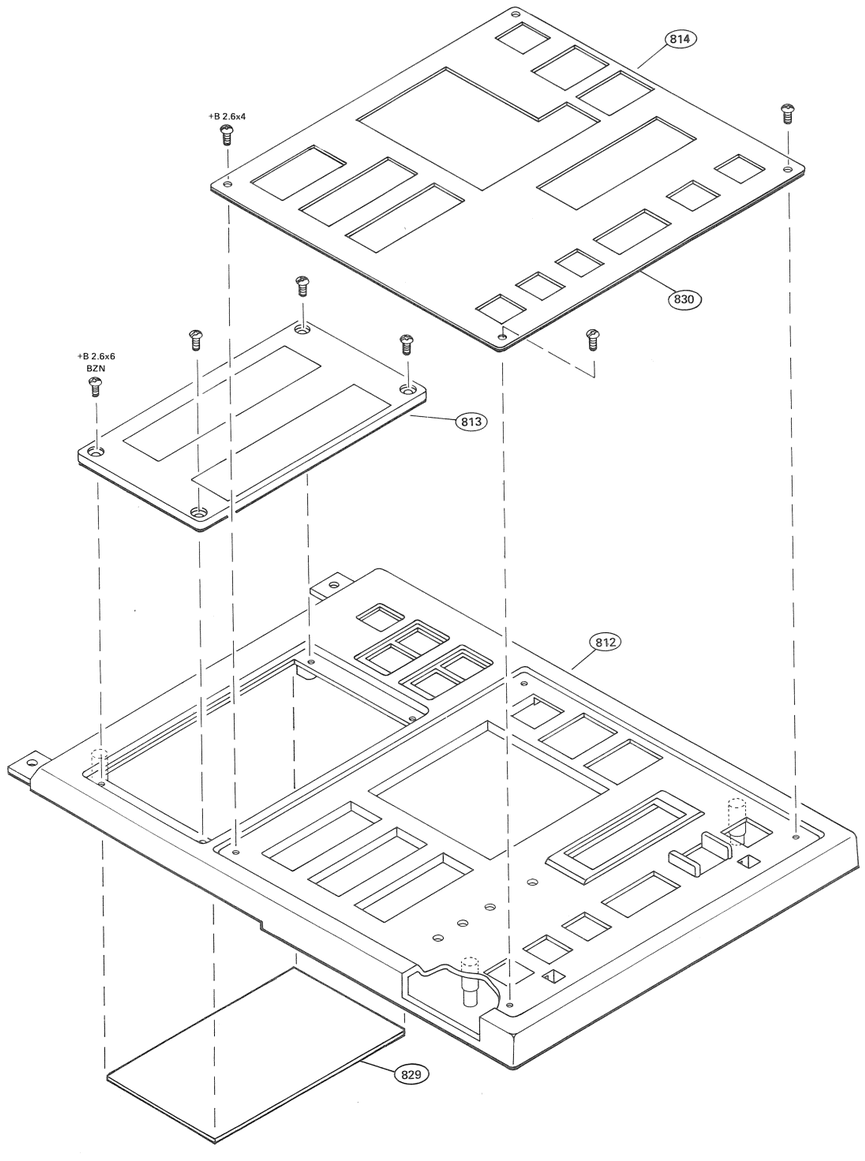
CAPSTAN MOTOR ASSY

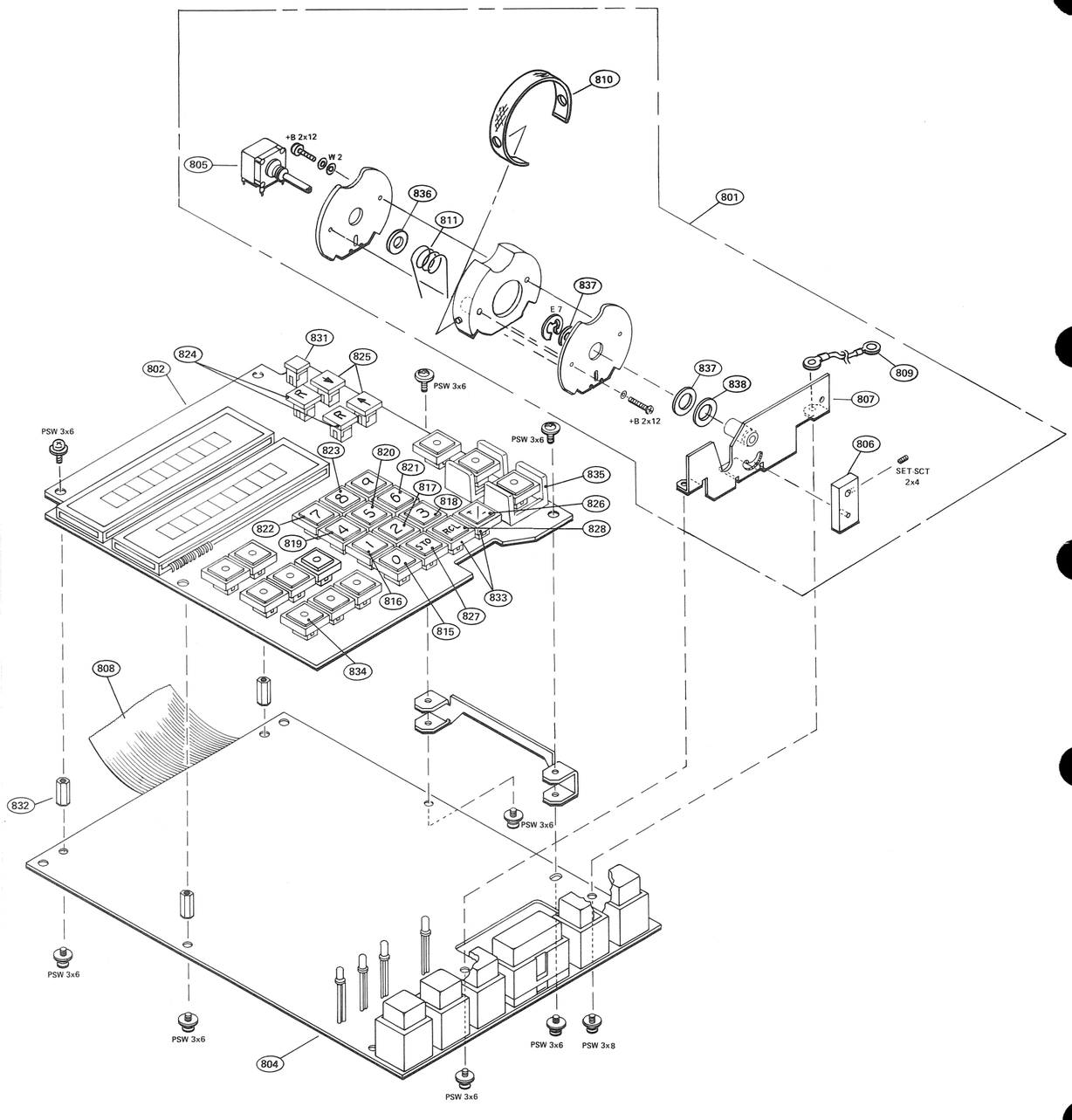


CAPSTAN MOTOR ASSY

701	O	A-7810-219-A	T GUIDE ASSY
702	O	A-7810-220-A	CAP T GUIDE ASSY
703	S	A-7810-265-A	CAPSTAN MOTOR TACH ASSY
704	S	T-9451-528-1	FLAT HEAD 10-32x1/2
705	O	X-3711-023-1	ASSY, CAPSTAN PLATE
708	O	3-663-116-00	SPRING, COMPRESSION
709	S	3-656-932-00	BEARING (FLANGE), BALL
710	O	3-711-081-01	BOTTOM FLANGE,"T" GUIDE
713	O	3-711-277-01	"T" ROLLER
714	O	3-711-278-01	1/4" "T" FLANGE
715	O	3-711-324-01	CAPSTAN SHIELD, UPPER
716	S	4-849-592-00	CUSHION

FUNCTION BLOCK ASSY





FUNCTION BLOCK ASSY

Ref. No.	SP	SONY Parts No.	Description
801	O	A-7810-223-A	MVC ASSY
802	O	A-7850-352-A	COMPLETE PCB, DSP (For APR-5002A)
	O	A-7850-353-A	COMPLETE PCB, DSP (For APR-5003A)
804	O	A-7850-357-A	MOUNTED PCB, KBD (For APR-5003V)
	O	A-7850-465-A	MOUNTED PCB, KBD (For APR-5002A)
*805	S	T-9411-043-1	PANEL POT (APR-5002 Up to No. 20615)
	S	1-237-681-11	RES, VAR 1K (APR-5002 No. 20616 and higher / APR-5003V No. 10001 and higher)
806	O	X-3711-006-1	ROD ASSY
807	O	X-3711-007-1	BASE PLATE ASSY/MVC
808	O	1-937-563-11	HARNESS (CPU-KBD)
809	O	1-937-562-11	HARNESS (ANTI-STATIC)
810	O	3-711-039-01	RUBBER, KNOB
*811	S	3-711-040-01	SPRING TORSION (APR-5002 Up to No. 20615)
	S	3-711-040-02	SPRING TORSION (APR-5002 No. 20616 and higher / APR-5003V No. 10001 and higher)
812	O	3-711-042-01	FUNCTION COVER
813	O	3-711-056-01	LENS DISPLAY
814	O	3-711-125-01	COVER COSMETIC TC (For APR-5003V)
815	O	3-711-147-01	KEY CAP (ZERO)
816	O	3-711-148-01	KEY CAP (ONE)
817	O	3-711-149-01	KEY CAP (TWO)
818	O	3-711-150-01	KEY CAP (THREE)
819	O	3-711-151-01	KEY CAP (FOUR)
820	O	3-711-152-01	KEY CAP (FIVE)
821	O	3-711-153-01	KEY CAP (SIX)
822	O	3-711-154-01	KEY CAP (SEVEN)
823	O	3-711-155-01	KEY CAP (EIGHT)
824	O	3-711-156-01	KEY CAP (R)
825	O	3-711-157-01	KEY CAP (ARROW)
826	O	3-711-158-01	KEY CAP (PLUS/MINUS)
827	O	3-711-159-01	KEY CAP (STO)
828	O	3-711-160-01	KEY CAP (RCL)
829	O	3-711-171-01	FILTER, POLARIZING
830	O	3-711-233-01	COVER COSMETIC APR (For APR-5002A)
831	O	3-711-301-01	KEY TOP (WINDOW)
832	O	4-360-293-00	SPACER, BOSS
833	S	4-903-740-01	FRAME, FITTING (SQUARE 10)
834	O	4-903-741-21	KEY TOP (SQUARE 10)
835	O	4-903-747-01	GUARD, SWITCH
836	S	7-623-928-11	WASHER 8, NYLON
837	S	3-701-446-11	WASHER 8, T=0.25
838	S	3-701-446-21	WASHER 8, T=0.5

NOTE: The above parts marked * must be replaced with each other.

"T" MOTOR AND BRAKE ASSY

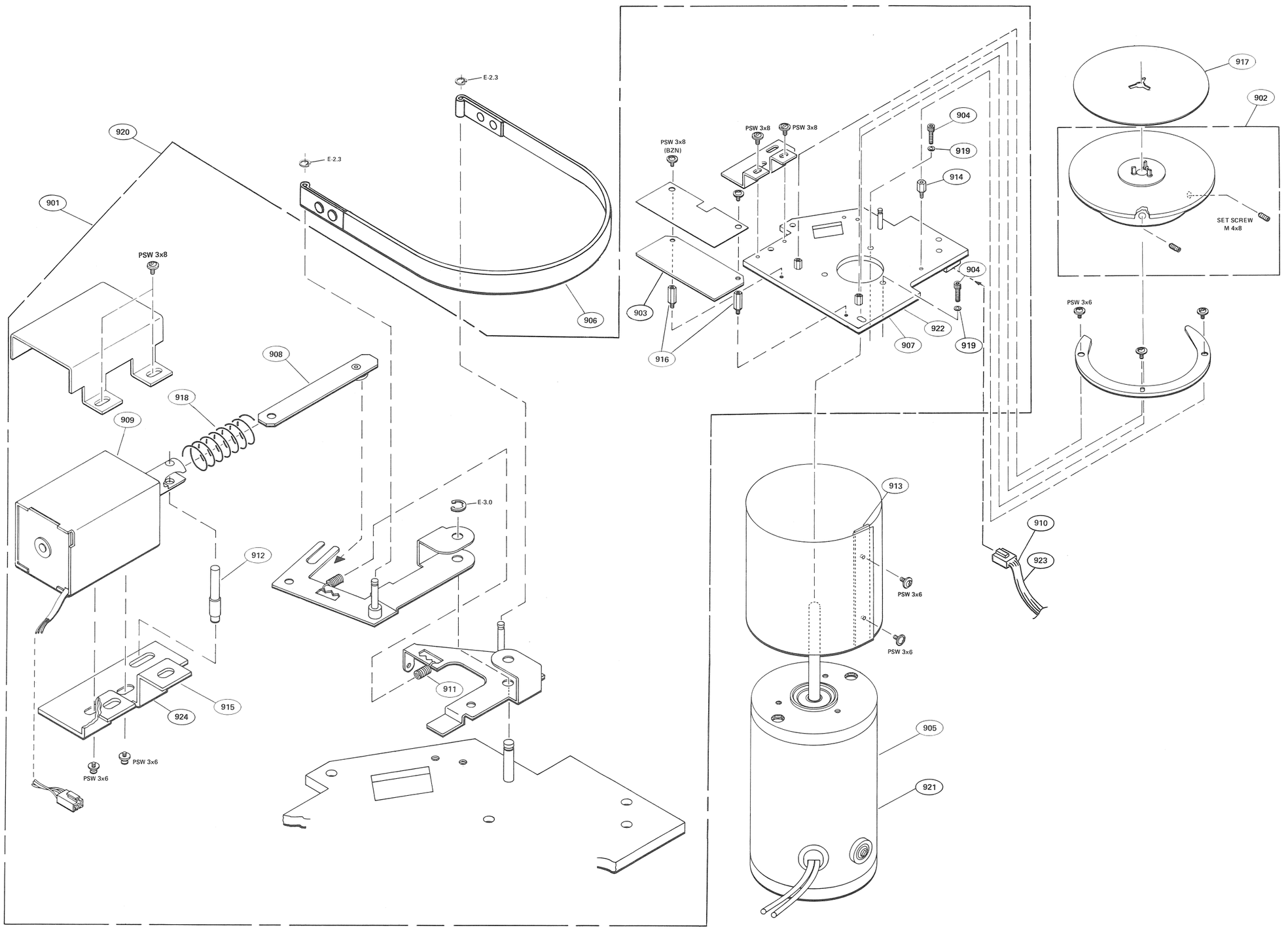
Ref. No.	SP	SONY Parts No.	Description
901	O	A-7810-204-A	T-REEL BRAKE ASSY
902	O	A-7810-205-A	HUB ASSY
903	O	A-7850-349-A	MOUNTED PCB, RTS-1
904	S	T-9452-179-1	SCREW, 6-32x3/8 SKT CAP
905	S	T-9481-731-1	T-REEL MOTOR ASSY
906	S	X-3673-601-0	BAND ASSY, BRAKE
907	O	X-3711-002-1	ASSY, PLATE MTG-T REEL
908	O	X-3711-003-2	ASSY, CONNECTOR PLATE
909	S	1-454-426-41	SOLENOID PLUNGER
910	O	1-937-532-11	HARNESS (RTS-TIB(R))
911	S	3-426-140-01	SPRING, TENSION
912	O	3-673-810-00	PIN, SOLENOID
913	O	3-711-016-02	NUT PLATE SHIELD
914	O	3-711-018-01	STAND OFF BRAKE BND GUIDE
915	O	3-711-022-02	BRACKET, BRAKE SOLENOID (T)
916	O	3-711-058-01	STAND OFF, RTS
917	S	3-711-185-01	REEL SHIM
918	S	4-836-109-00	SPRING, COMPRESSION
919	S	T-9451-550-1	SPRING WASHER 8

"S" MOTOR AND BRAKE ASSY

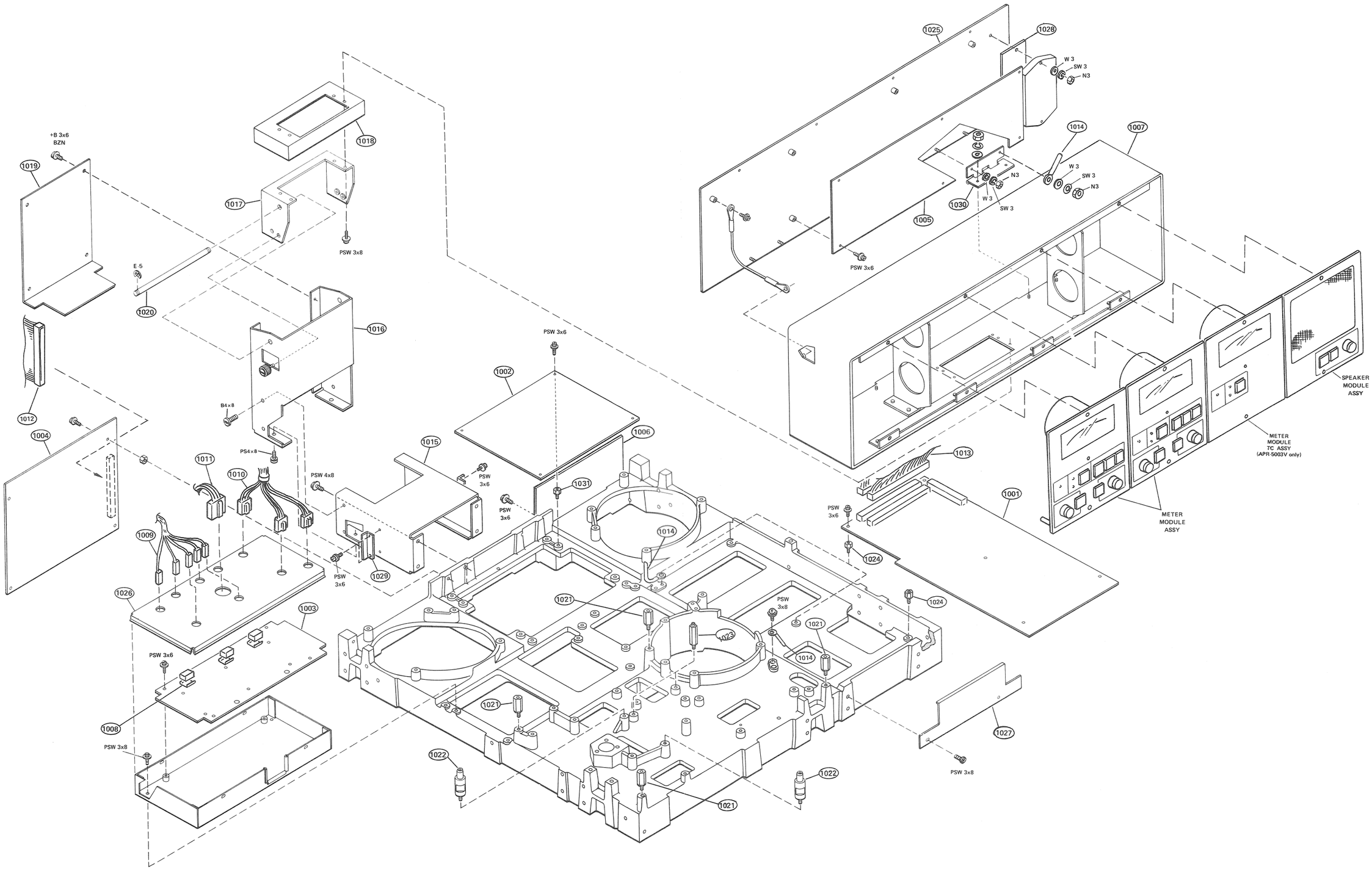
Ref. No.	SP	SONY Parts No.	Description
920	O	A-7810-207-A	S-REEL BRAKE ASSY
921	S	T-9481-730-1	S-REEL MOTOR ASSY
*922	O	X-3711-008-1	ASSY, PLATE MTG-S REEL
923	O	1-937-539-11	HARNESS (RTS-TIB (L))
924	O	3-711-021-02	BRACKET, BRAKE SOLENOID(S)

* The shape of the S reel plate is a mirror image of that of the T reel plate which is illustrated in the exploded view.

REEL MOTOR AND BRAKE ASSY



MECHA CHASSIS ASSY



MECHA CHASSIS ASSY

Ref. No.	SP	SONY Parts No.	Description
1001	O	A-7850-358-A	COMPLETE PCB, CPU (For APR-5002A)
	O	A-7850-736-A	COMPLETE PCB, CPU (For APR-5003V)
1002	O	A-7850-362-A	COMPLETE PCB, TIB
1003	O	A-7850-364-A	COMPLETE PCB, FEX
1004	O	A-7850-366-A	COMPLETE PCB, LNT
1005	O	A-7850-370-A	COMPLETE PCB, ACM
1006	O	T-9482-436-1 (A-7850-626-A)	COMPLETE PCB, VVT (For APR-5003V)
1007	O	X-3711-013-2	ENCLOSURE ASSY
1008	O	X-3711-026-1	ASSY SHIELD TRANSFORMER
1009	O	1-937-530-11	HARNESS (BIAS/ER/REC SUB)
1010	O	1-937-531-11	HARNESS (SYNC SUB)
1011	O	1-937-533-11	HARNESS (RELAY CONTROL)
1012	O	1-937-535-11	HARNESS (CPU-LNT)
1013	O	1-937-536-11	HARNESS (CPU-TIB)
1014	O	3-703-150-11	CLAMP
1015	O	3-711-043-02	SUPPORT, NECK
1016	O	3-711-044-02	NECK, MONITOR HOUSING
1017	O	3-711-045-01	YOKE, WELDMENT
1018	O	3-711-046-03	SKIRT, MONITOR HOUSING
1019	O	3-711-047-01	COVER, REAR
1020	O	3-711-048-01	SHAFT
1021	O	3-711-050-01	STANDOFF, COVER TOP
1022	O	3-711-106-01	STANDOFF HEAD BLOCK
1023	O	3-711-107-01	STANDOFF CONNECTOR
1024	O	3-711-128-02	STANDOFF 5MM
1025	O	3-711-135-02	PANEL, REAR
1026	O	3-711-161-03	COVER, SHIELD, FEX
1027	O	3-711-202-01 (APR-5002: Serial No. 20001 to 20700 only)	BRACKET, FUNC
1028	O	3-711-241-01	INSULATOR, AMPLIFIER
1029	O	3-711-253-01	COVER, NECK SUPPORT
1030	O	3-711-283-12	HINGE (B-1100 SERIES)
1031	O	3-880-616-00	BOSS

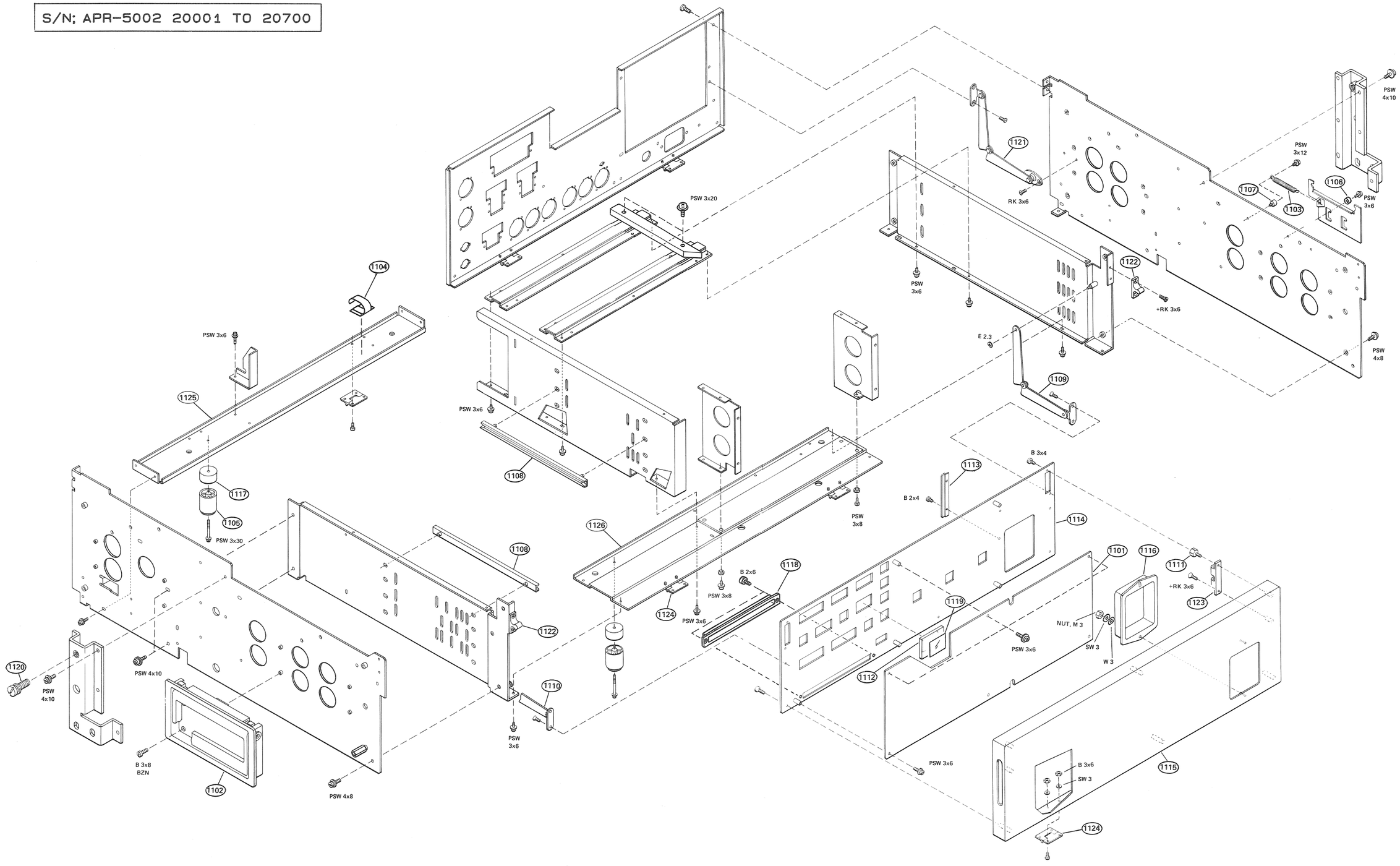
AMP CASE AND ALIGNMENT CTL PANEL ASSY

(APR-5002: Serial No. 20001 to 20700)

Ref. No.	SP	SONY Parts No.	Description
1101	O	A-7850-336-A	MOUNTED PCB, ALN
1102	S	X-3642-018-3	HANDLE ASSY
1103	S	3-426-136-01	SPRING, TENSION
1104	O	3-621-212-31	CLAMP, DKN
1105	S	3-642-656-01	FOOT
1106	O	3-654-058-11	SPACER (3x2)
1107	O	3-657-842-11	SPACER (3x7)
1108	O	3-673-676-21	RAIL, PC BOARD GUIDE
1109	O	3-711-093-01	STAY (LEFT)
1110	O	3-711-095-01	STAY (RIGHT)
1111	O	3-711-100-02	STANDOFF
1112	O	3-711-101-01	COVER, DISPLAY
1113	O	3-711-102-01	RETAINER, CARD
1114	O	3-711-103-01	PANEL, TOP
1115	O	3-711-104-01	COVER, FRONT
1116	O	3-711-105-01	FRAME, POWER SWITCH
1117	O	3-711-186-01	SPACER FOOT
1118	O	3-711-198-01	COVER, CONNECTOR
1119	O	3-711-199-01	FILTER, POLARIZING
1120	O	3-711-203-01	PIN-BASE SUPPORT
1121	O	3-711-271-11	STAY (LEFT)
1122	O	3-711-272-01	LATCH BALL
1123	O	3-711-272-11	LATCH, BALL
1124	O	3-711-283-02	HINGE (B-1100 SERIES)
1125	O	3-711-110-01	SUPPORT, BOTTOM REAR
1126	O	3-711-079-02	SUPPORT, BOTTOM FRONT

AMP CASE AND ALIGNMENT CTL PANEL ASSY

S/N; APR-5002 20001 TO 20700



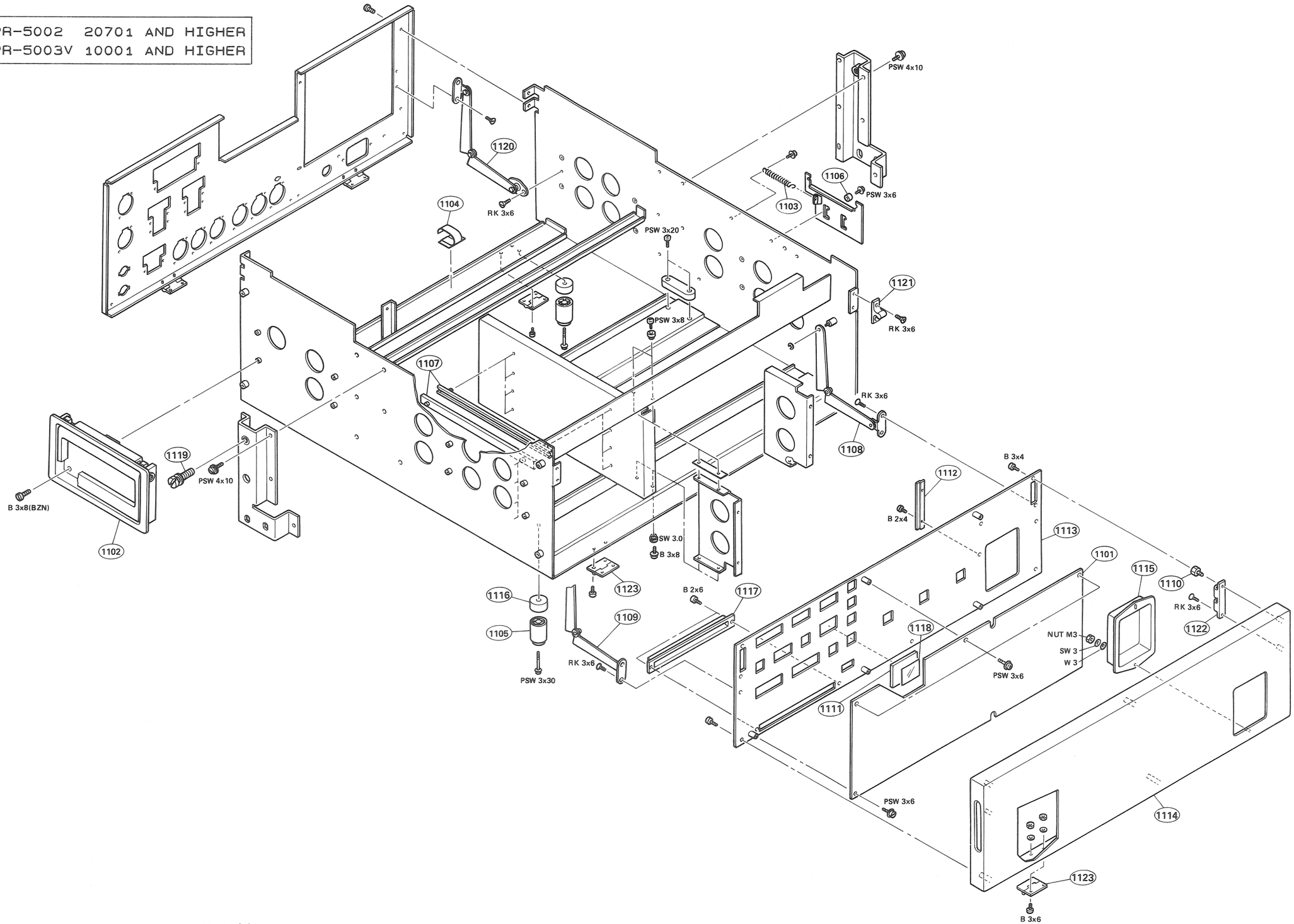
AMP CASE AND ALIGNMENT CTL PANEL ASSY

(APR-5002: Serial No. 20701 and higher
APR-5003V: Serial No. 10001 and higher)

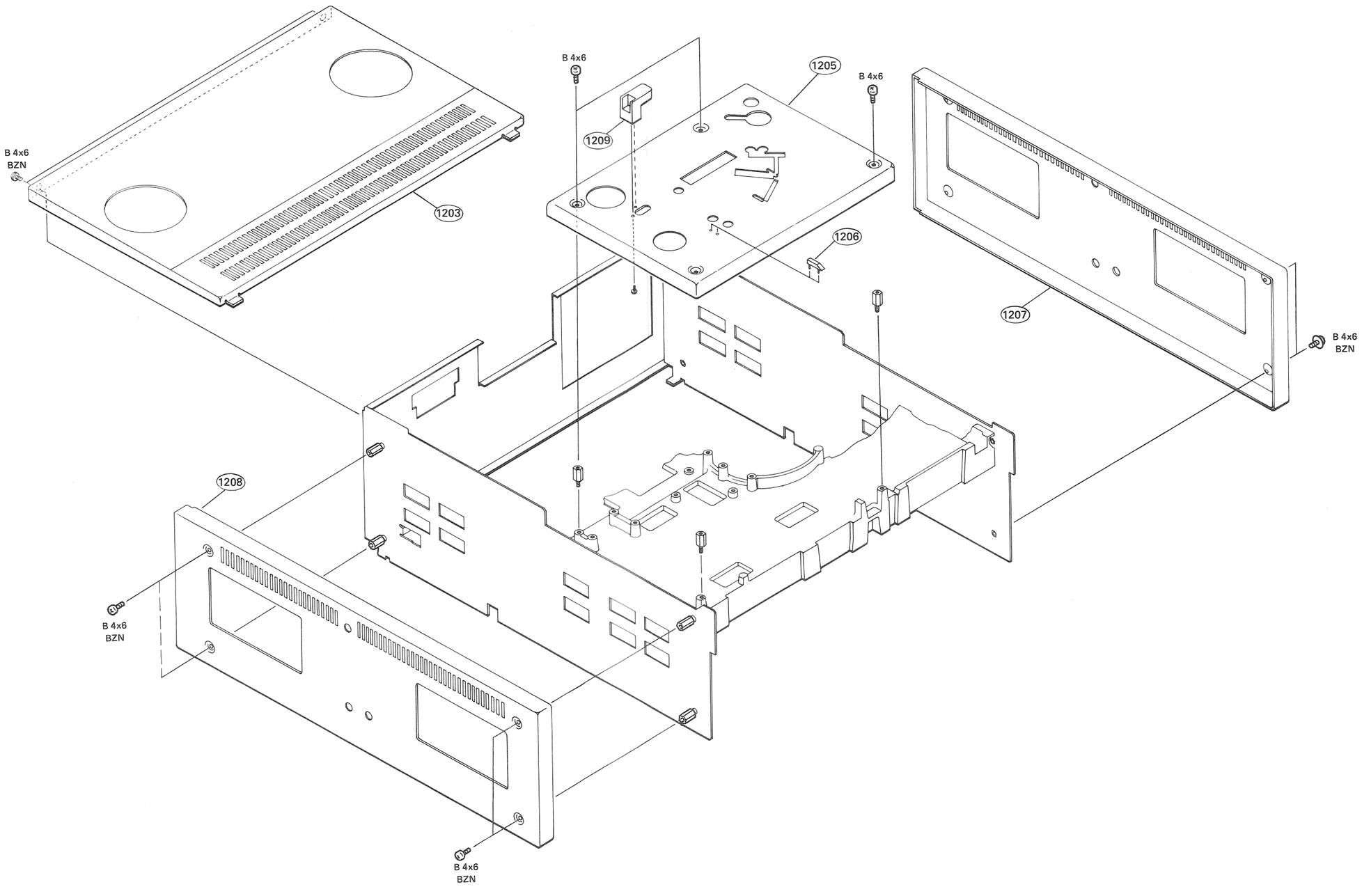
Ref. No.	SP	SONY Parts No.	Description
1101	O	A-7850-336-A	MOUNTED PCB, ALN
1102	S	X-3642-018-0	HANDLE ASSY
1103	S	3-426-136-01	SPRING, TENSION
1104	O	3-621-212-31	CLAMP, DKN
1105	S	3-642-656-01	FOOT
1106	O	3-654-058-11	SPACER (3x2)
1107	O	3-673-676-21	RAIL, PC BOARD GUIDE
1108	O	3-711-093-01	STAY (LEFT)
1109	O	3-711-095-01	STAY (RIGHT)
1110	S	3-711-100-02	STANDOFF
1111	O	3-711-101-01	COVER, DISPLAY
1112	O	3-711-102-01	RETAINER, CARD
1113	O	3-711-103-01	PANEL, TOP
1114	O	3-711-104-01	COVER, FRONT
1115	O	3-711-105-01	FRAME, POWER SWITCH
1116	O	3-711-186-02	SPACER FOOT
1117	O	3-711-198-01	COVER, CONNECTOR
1118	O	3-711-199-01	FILTER, POLARIZING
1119	O	3-711-203-01	PIN-BASE SUPPORT
1120	O	3-711-271-11	STAY (LEFT)
1121	O	3-711-272-01	LATCH BALL
1122	O	3-711-272-11	LATCH, BALL
1123	O	3-711-283-02	HINGE (B-1100 SERIES)

AMP CASE AND ALIGNMENT CTL PANEL ASSY

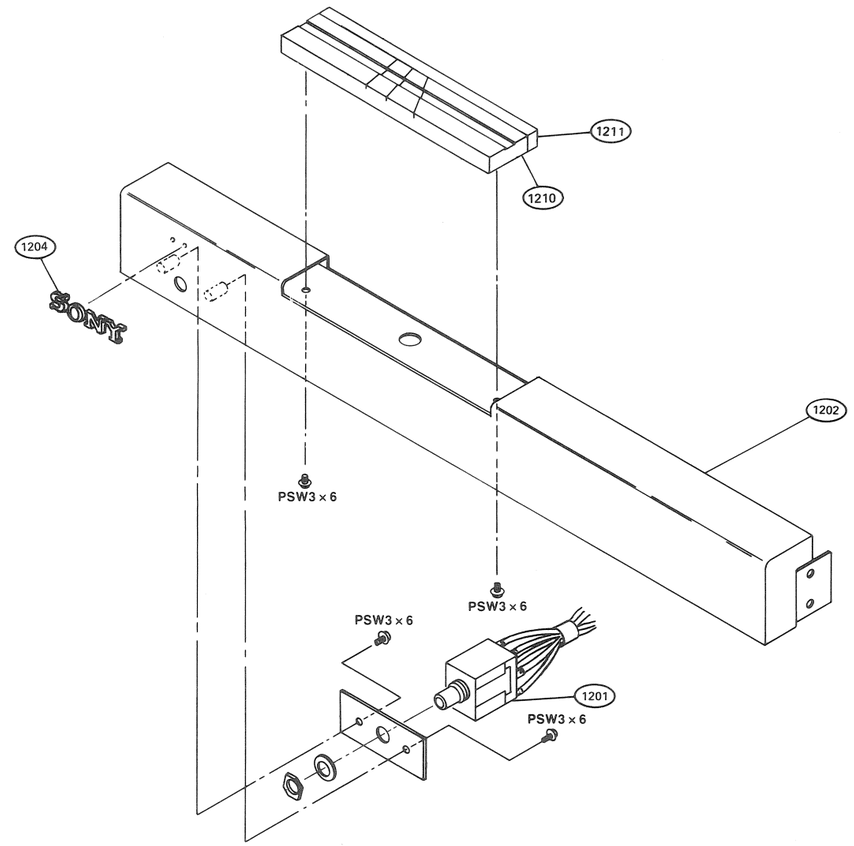
S/N; APR-5002 20701 AND HIGHER
S/N; APR-5003V 10001 AND HIGHER



COSMETIC COVER BLOCK



FRONT ARM ASSY

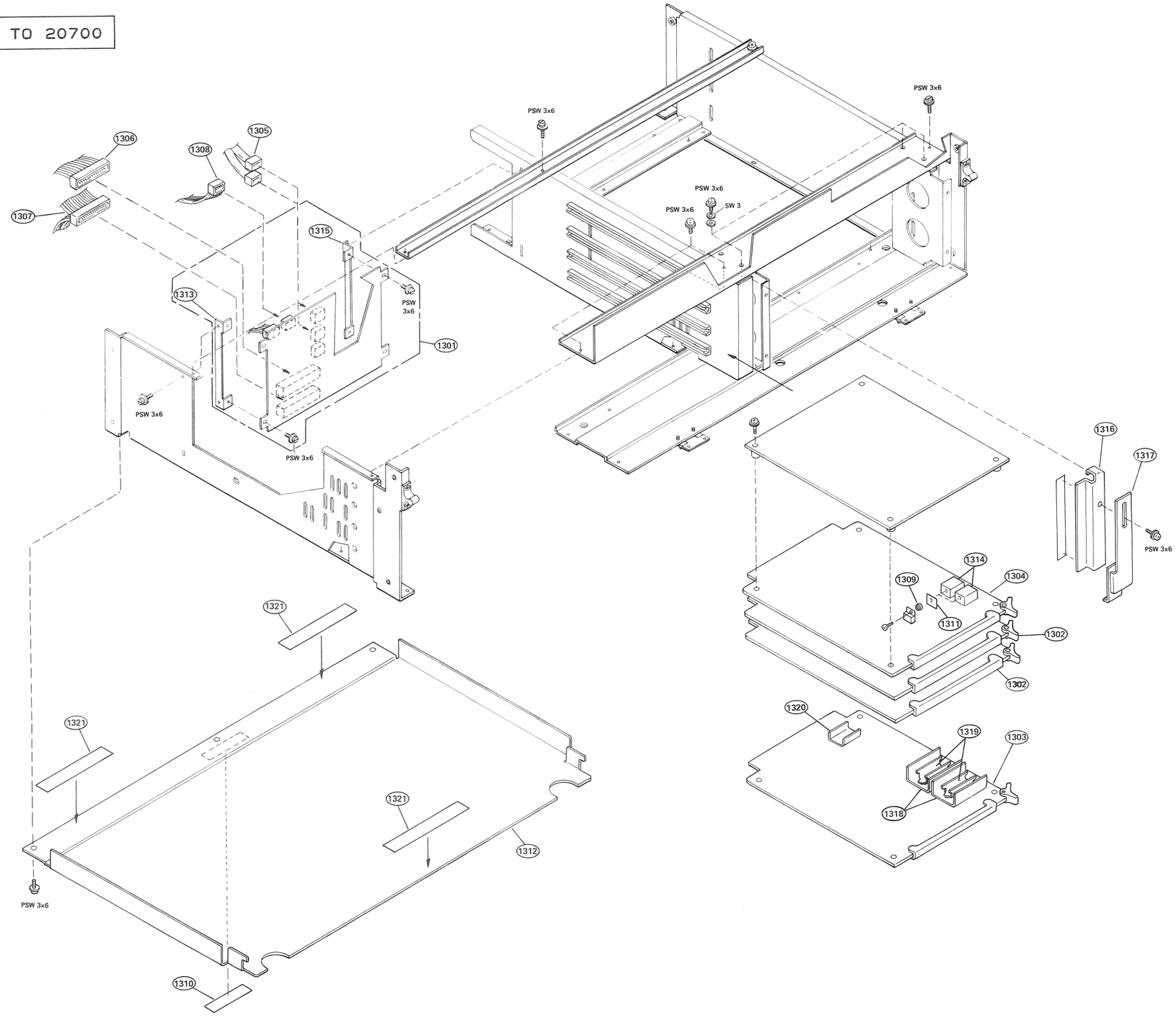


COSMETIC COVER BLOCK AND FRONT ARM ASSY

Ref. No.	SP	SONY Parts No.	Description
1201	S	T-9413-284-1	HEADPHONE JACK 3FP
1202	O	X-3711-015-1	FRONT ARM, ASSY
1203	S	X-3711-025-1	COVER, TOP REAR (A) ASSY
1204	O	3-672-268-00	EMBLEM, SONY
1205	O	3-711-129-02	COVER, TOP FRONT
1206	O	3-711-145-01	TAPE, STOPPER
1207	O	3-711-262-02	COVER, COSMETIC R.H
1208	O	3-711-263-02	COVER, COSMETIC L.H
1209	O	3-711-273-01	GUARD, TENSION ARM
1210	S	T-9451-971-2	SPLICE BLOCK ANALOG
1211	O	3-711-190-01	STOP PLATE SPLICE BLOCK

AMP CASE AND CHASSIS ASSY

S/N: APR-5002 20001 TO 20700



AMP CASE AND CHASSIS ASSY

(APR-5002: Serial No. 20001 to 20700)

Ref. No.	SP	SONY Parts No.	Description
1301	O	A-7810-195-A	COMPLETE PCB, ADM
1302	O	A-7850-373-A	COMPLETE PCB, CNL
1303	O	A-7850-376-A	COMPLETE PCB, MST
1304	O	A-7850-378-A	COMPLETE PCB, TCC (For APR-5003A)
1305	O	1-937-529-11	HARNESS (I/O UNCAL SUB)
1306	O	1-937-534-11	HARNESS (PROCESSER INTRFC)
1307	O	1-937-537-11	HARNESS (LOGIC INTER CONNECT)
1308	O	1-937-538-11	HARNESS (METER & CH STATUS)
1309	O	2-832-007-03	BUSHING, (K) INSULATING
1310	S	3-703-079-31	LABEL, CAUTION (BACK)
1311	O	3-703-207-11	INSULATOR, TO-220
1312	O	3-711-082-02	BOTTOM COVER APR
1313	O	3-711-099-02	MOUNTING BRACKET M.B.
1314	O	3-711-196-02	HEAT SINK, TR
1315	O	3-711-201-01	BRACKET (R) MTB
1316	O	3-711-314-01	HOLDER, CARD BD (A)
1317	O	3-711-315-01	HOLDER, CARD BD (B)
1318	O	3-711-319-01	HEAT SINK (A), MST
1319	O	3-711-320-01	HEAT SINK (B), MST
1320	O	3-711-326-01	HEAT SINK (C), MST
1321	S	3-837-974-00	CUSHION (B)

AMP CASE AND CHASSIS ASSY

(APR-5002: Serial No. 20701 and higher
APR-5003V: Serial No. 10001 and higher)

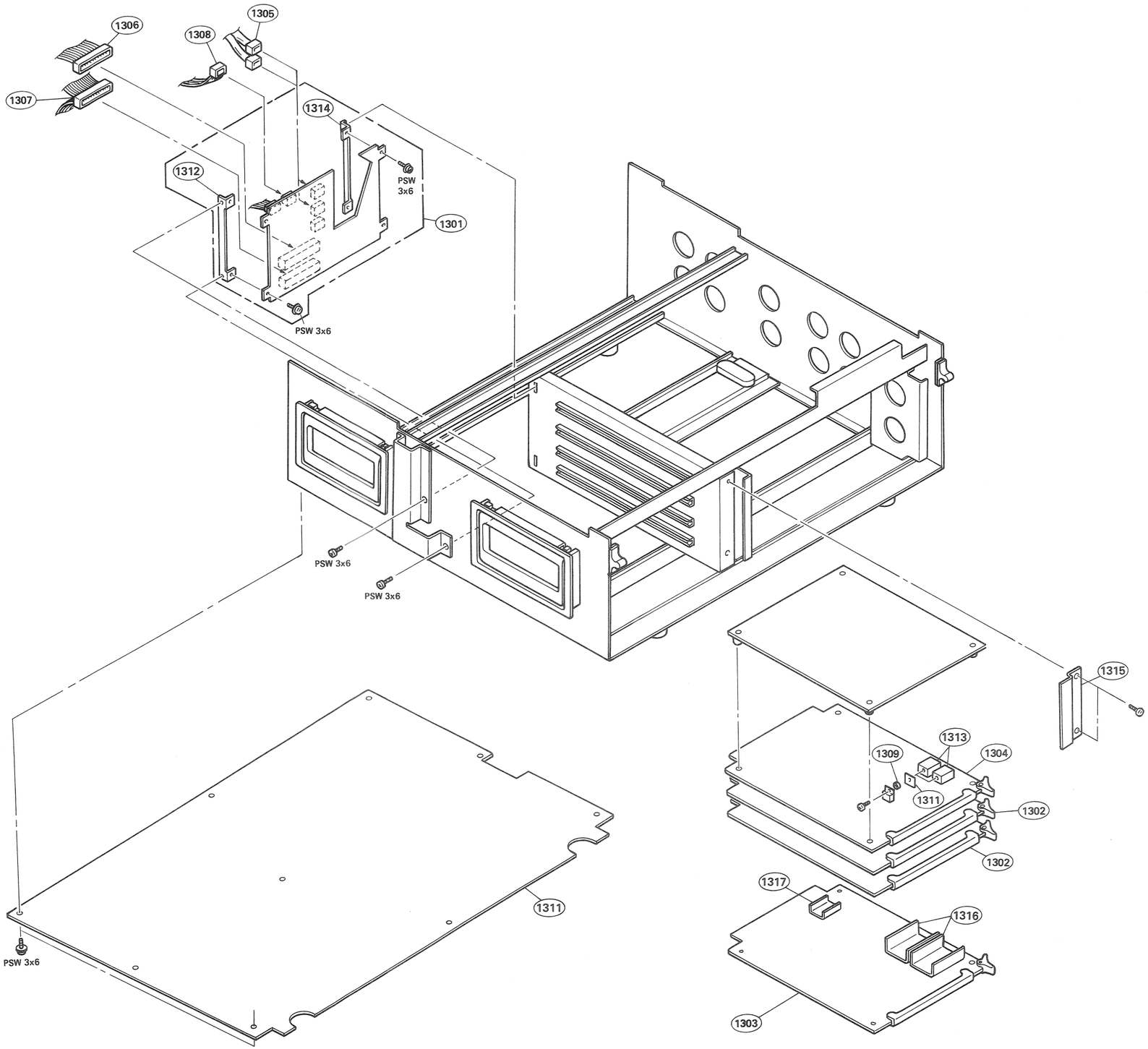
Ref. No.	SP	SONY Parts No.	Description
1301	O	A-7810-195-A	COMPLETE PCB, ADM
1302	O	A-7850-373-A	COMPLETE PCB, CNL
1303	O	A-7850-376-A	COMPLETE PCB, MST
1304	O	A-7850-378-A	COMPLETE PCB, TCC (For APR-5003A)
1305	O	1-937-529-11	HARNESS (I/O UNCAL SUB)
1306	O	1-937-534-11	HARNESS (PROCESSER INTRFC)
1307	O	1-937-537-11	HARNESS (LOGIC INTER CONNECT)
1308	O	1-937-538-11	HARNESS (METER & CH STATUS)
1309	S	2-832-007-00	BUSHING, (K) INSULATING
1310	S	3-703-207-11	INSULATOR, TO-220
1311	O	3-711-082-02	BOTTOM COVER APR
1312	O	3-711-099-02	MOUNTING BRACKET M.B.
1313	O	3-711-196-02	HEAT SINK, TR
1314	O	3-711-201-01	BRACKET (R) MTB
1315	O	3-711-344-01	HOLDER, CARD BD
1316	O	3-711-319-03	HEAT SINK (A), MST
1317	O	3-711-326-01	HEAT SINK (C), MST

METER MODULE ASSY (MONITOR HOUSING ASSY)

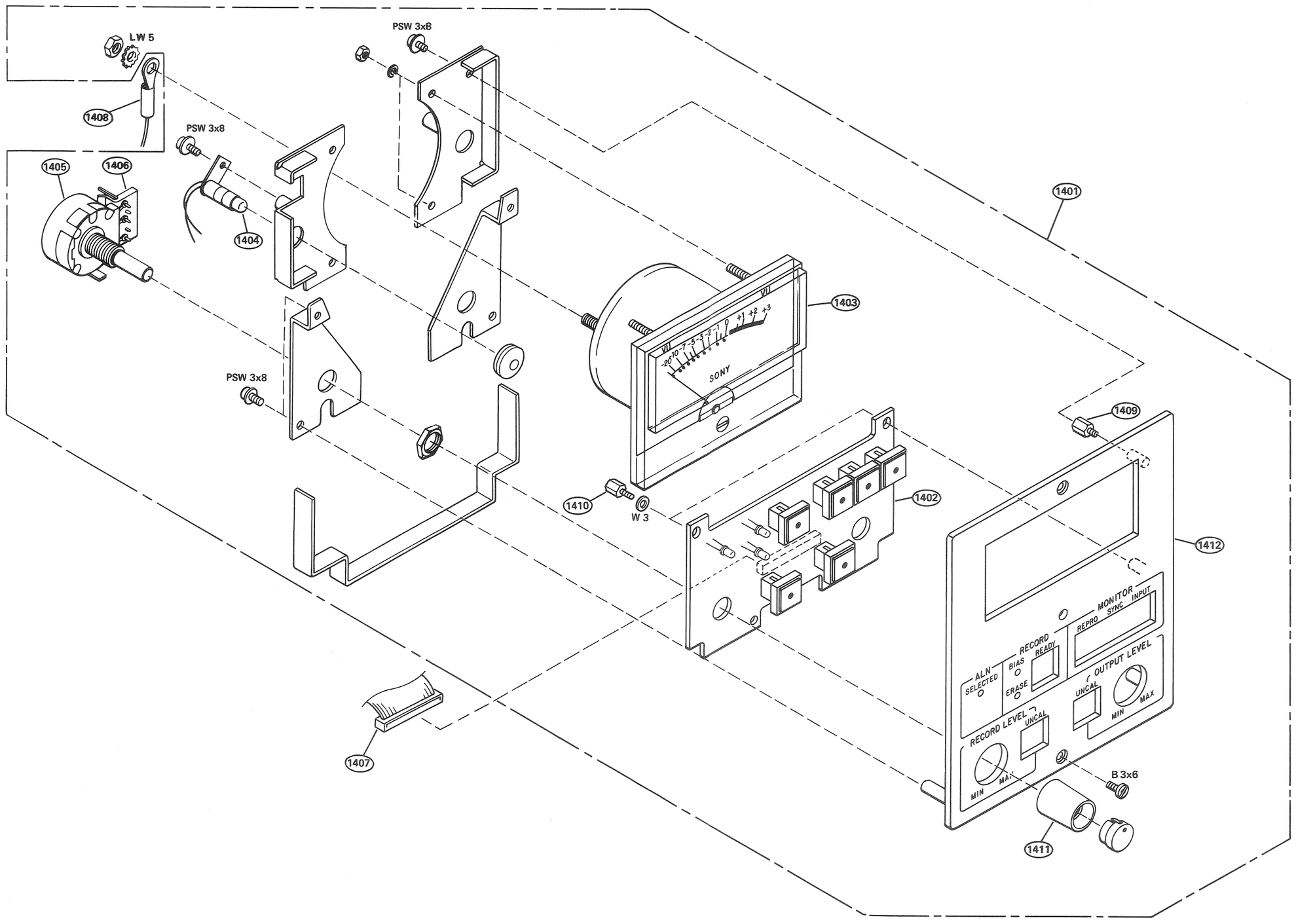
Ref. No.	SP	SONY Parts No.	Description
1401	O	A-7810-224-A	METER MODULE ASSY
1402	O	A-7850-368-A	MOUNTED PCB, CTM
1403	S	T-9412-212-1	METER, VU WS-220
1404	S	T-9412-216-1	LAMP ML7352
1405	S	1-237-945-11	RES, VAR, CARBON, 5K, AUDIO
1406	O	1-564-792-11	WAFER ASSY 5P
1407	O	1-937-553-11	HARNESS (METER CONTROL)
1408	O	1-937-554-12	HARNESS (METER INPUT)
1409	O	2-280-622-11	SUPPORT (M3), HEXAGON
1410	O	3-157-917-00	SUPPORT (B) PC BOARD
1411	O	3-711-014-21	KNOB
1412	O	3-711-139-01	PANEL, METER

AMP CASE AND CHASSIS ASSY

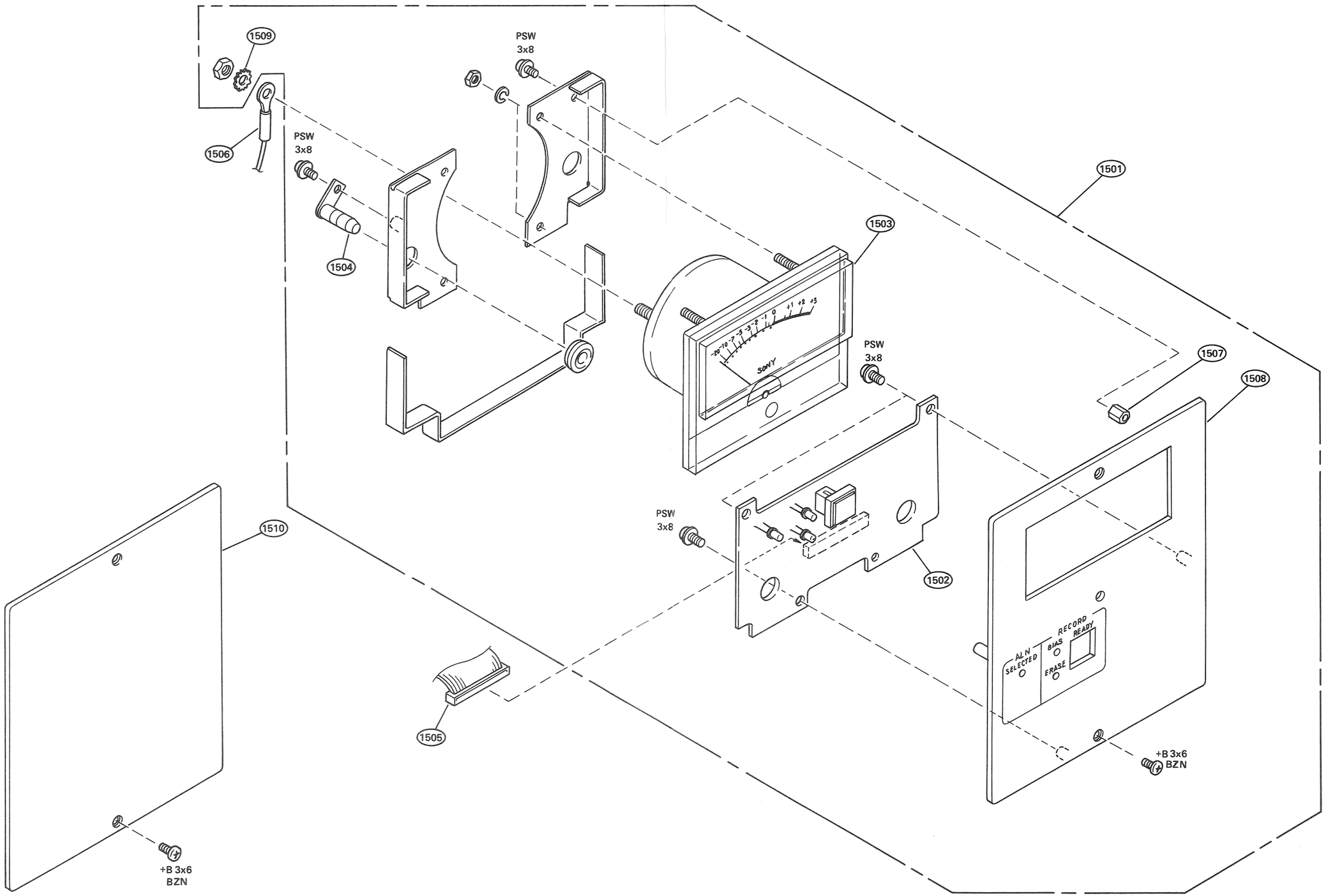
S/N; APR-5002 20701 AND HIGHER
S/N; APR-5003V 10001 AND HIGHER



METER MODULE ASSY



METER MODULE TC ASSY (APR-5003A)



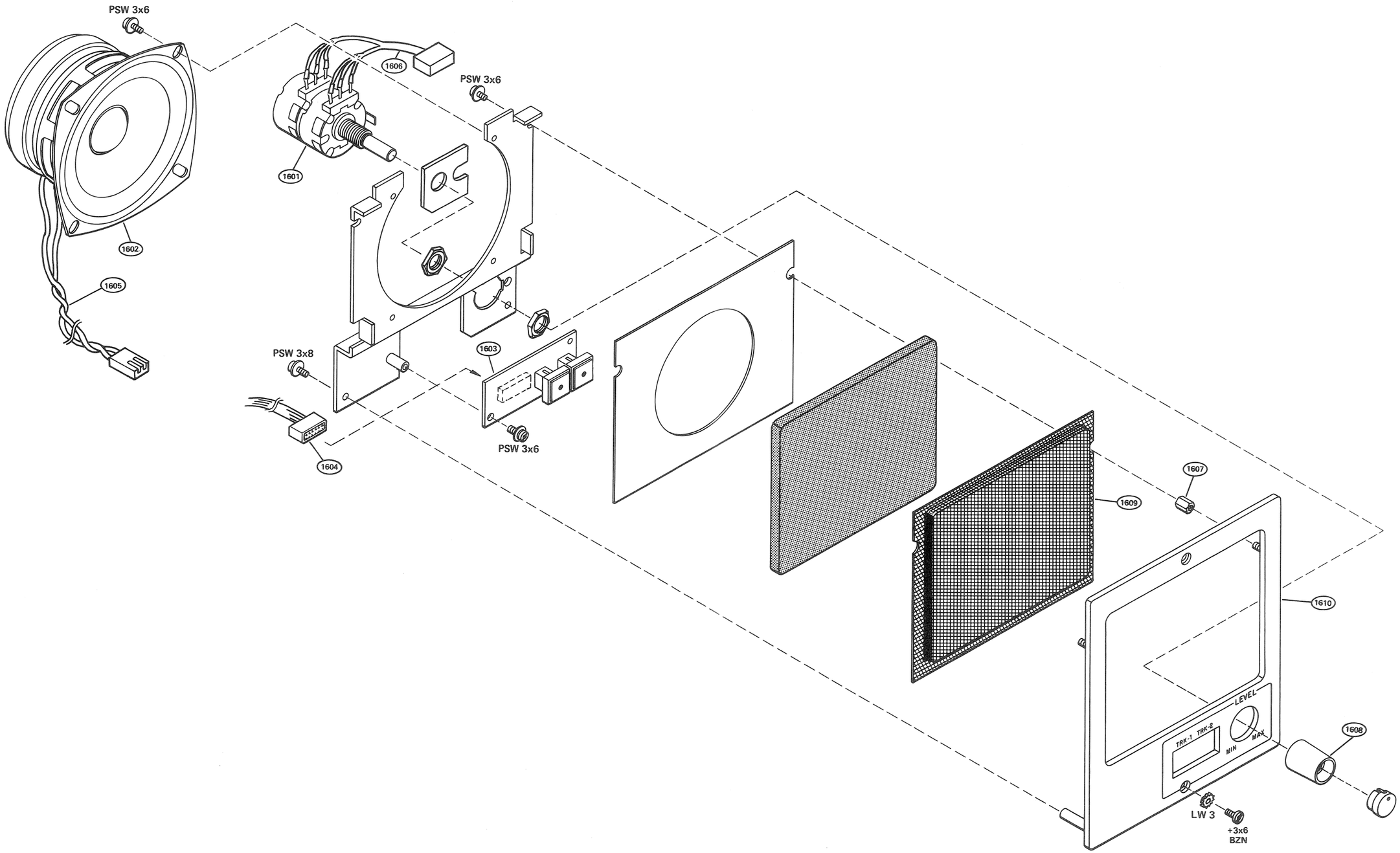
METER MODULE TC ASSY (MONITOR HOUSING ASSY)
(For APR-5003V)

Ref. No.	SP	SONY Parts No.	Description
1501	O	A-7810-226-A	METER MODULE TC ASSY
1502	O	A-7850-372-A	MOUNTED PCB, TCM
1503	S	T-9412-212-1	METER, VU WS-220
1504	S	T-9412-216-1	LAMP ML 7352
1505	O	1-937-553-11	HARNESS (METER CONTROL)
1506	O	1-937-554-12	HARNESS (METER INPUT)
1507	O	2-280-622-11	SUPPORT (M3), HEXAGON
1508	O	3-711-141-01	PANEL, METER, TC
1509	S	7-623-424-07	LW5, TYPE B
1510	O	3-711-136-01	PANEL, BLANK (For APR-5002A)

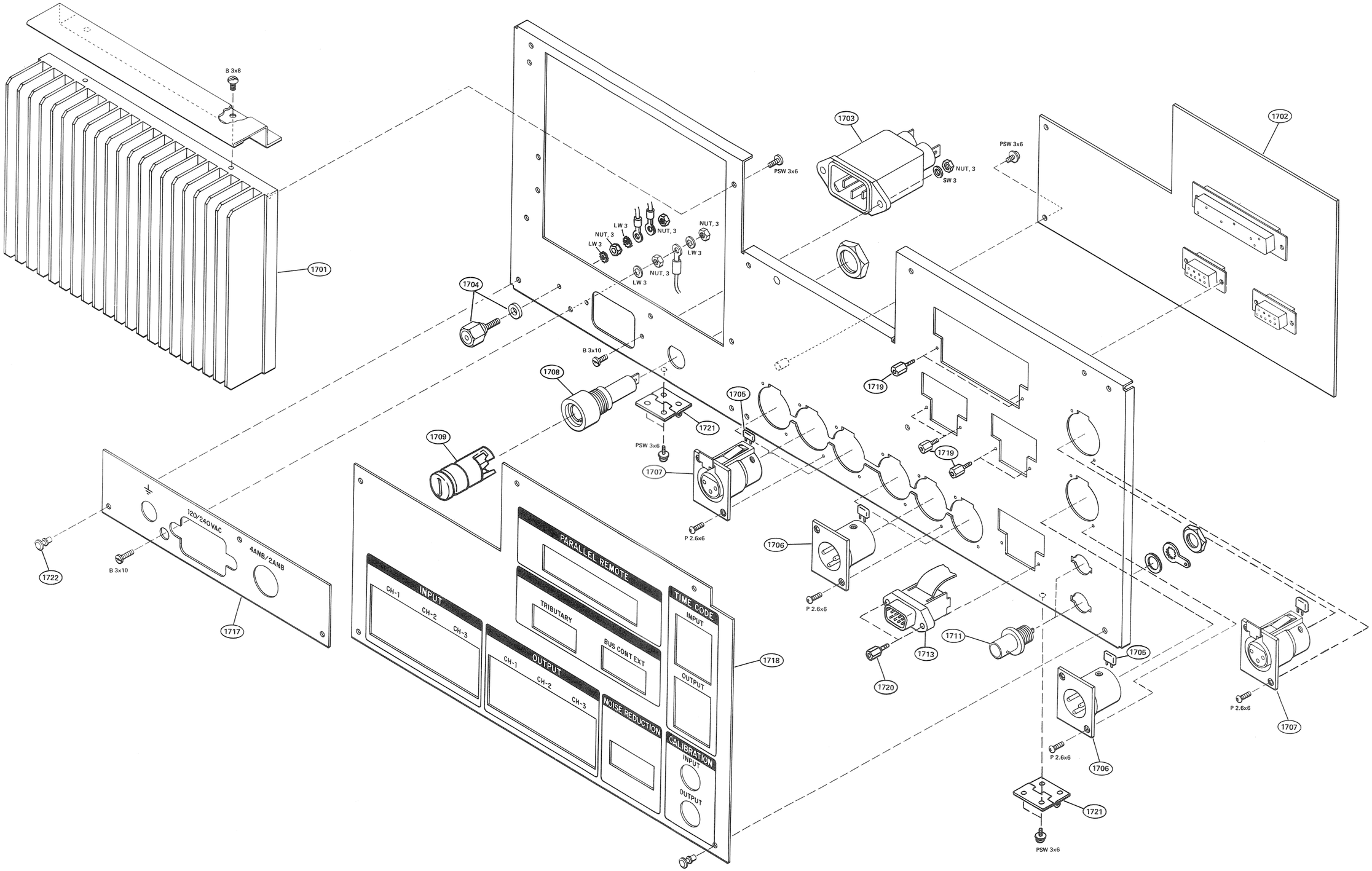
SPEAKER MODULE ASSY (MONITOR HOUSING ASSY)

Ref. No.	SP	SONY Parts No.	Description
1601	S	1-237-946-11	RES, VAR, CARBON, 5K/5K, AUDIO
1602	S	1-503-291-00	SPEAKER
1603	O	1-619-159-11	PC BOARD, MSB
1604	O	1-937-552-11	HARNESS (MUTE SWITCHING)
1605	O	1-937-555-11	HARNESS (SPEAKER)
1606	O	1-937-556-11	HARNESS (MONITOR ATTEN)
1607	O	2-280-622-11	SUPPORT (M3), HEXAGON
1608	O	3-711-014-21	KNOB
1609	O	3-711-137-01	GRILLE, SPEAKER
1610	O	3-711-138-01	PANEL, SPEAKER

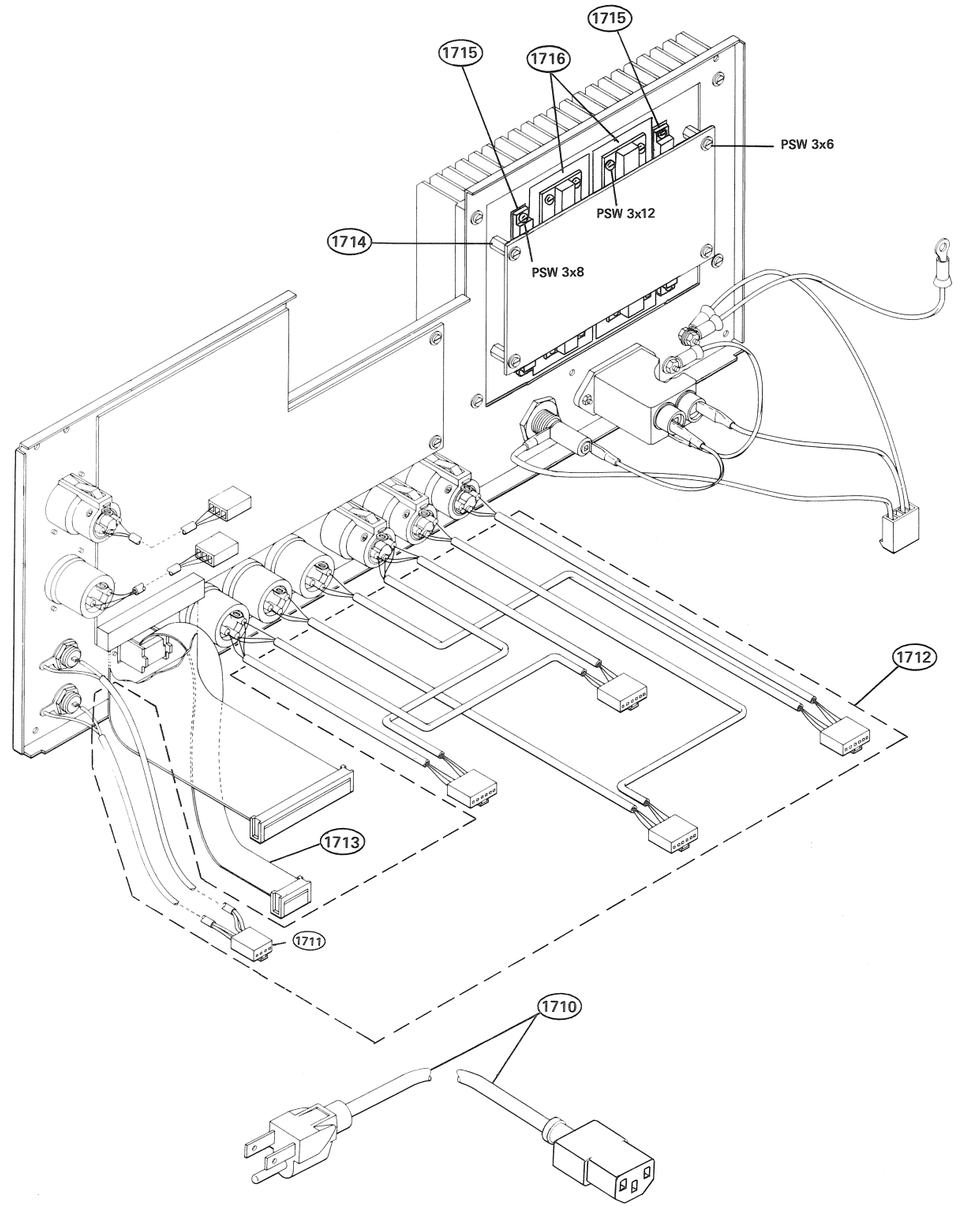
SPEAKER MODULE ASSY



REAR PANEL ASSY (For APR-5002)



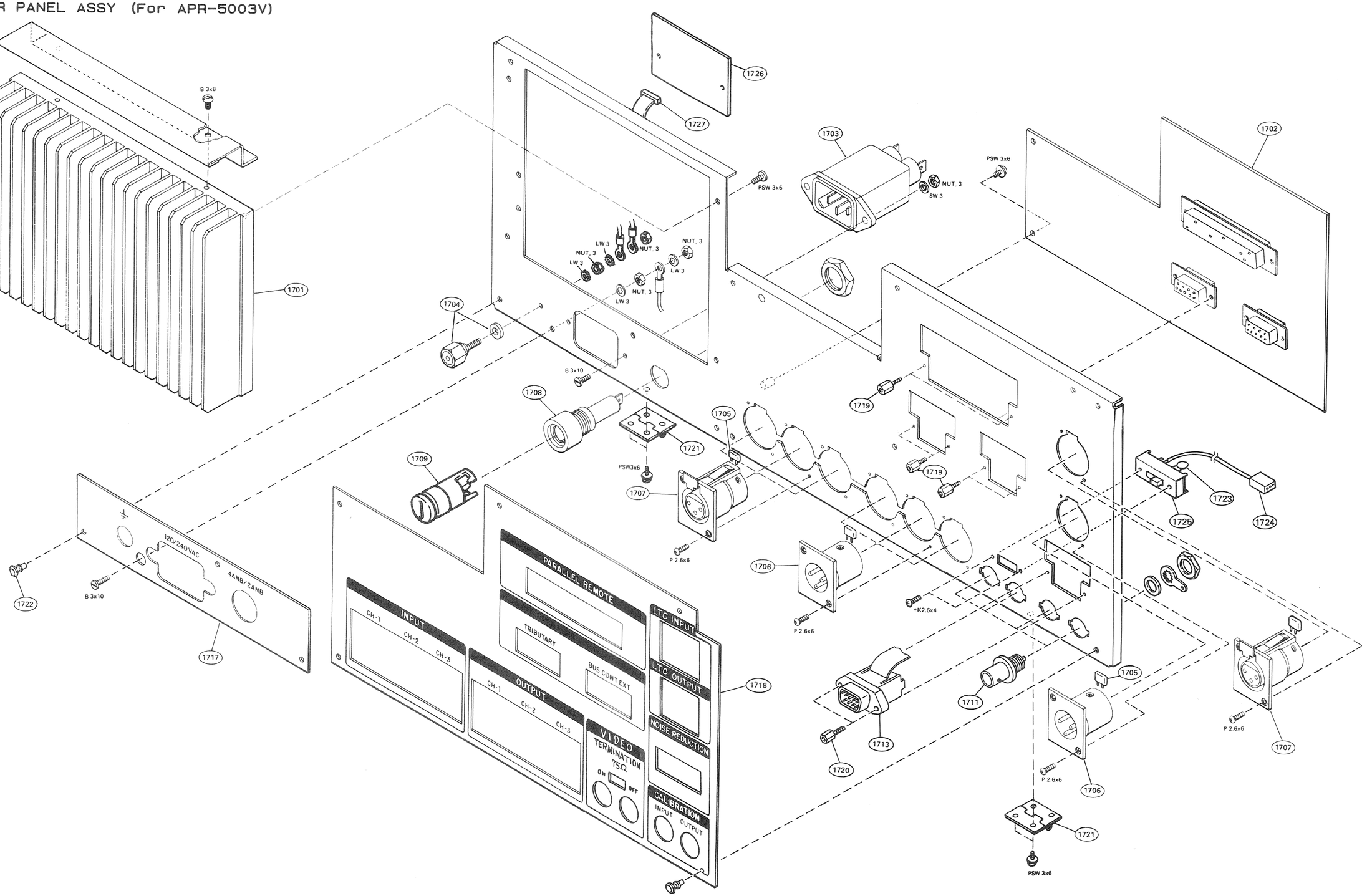
REAR PANEL ASSY (For APR-5002)



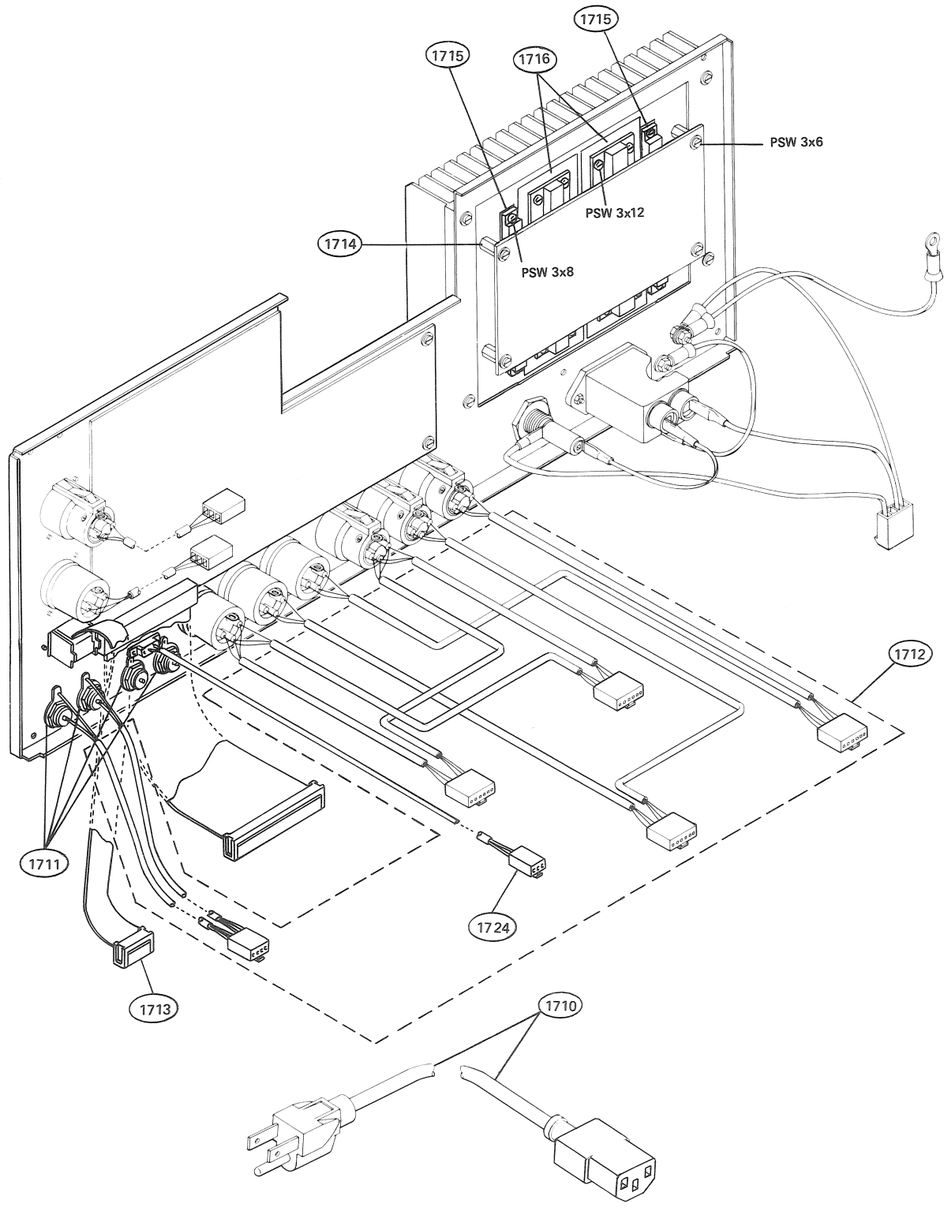
REAR PANEL ASSY

Ref. No.	SP	SONY Parts No.	Description
1701	O	A-7850-337-A	COMPLETE PCB, RMD
1702	O	A-7850-339-A	COMPLETE PCB, CNX
1703	S	⚠T-9412-524-1	AC INLET
1704	O	X-4801-204-0	TERMINAL ASSY
1705	S	1-161-051-00	CAP, CERAMIC 0.01MF 10% 50V
1706	S	1-509-176-51	CONNECTOR (RECEPTACLE) 3P
1707	S	1-509-184-51	CONNECTOR (RECEPTACLE) 3P
1708	S	⚠1-533-167-00	HOLDER, FUSE
1709	S	1-533-169-00	HOLDER, FUSE
1710	S	1-534-827-00	CORD, POWER
1711	S	1-561-781-21	CONNECTOR, BNC (RECEPTACLE)
1712	O	1-937-546-12	HARNESS (REAR PANEL SUB)
1713	O	1-937-547-11	HARNESS (NOISE REDUCTION)
1714	O	3-157-917-00	SUPPORT (B), PC BOARD
1715	O	3-577-229-00	INSULATOR, TO-126
1716	O	3-673-624-02	SHEET, INSULATING, TR
1717	O	3-711-097-02	PANEL, SILKSCREEN (A)
1718	O	3-711-098-01	PANEL, SILKSCREEN (B)
1719	O	3-711-228-01	STANDOFF, D SUB CONN
1720	O	3-711-228-11	STANDOFF, D SUB CONN
1721	O	3-711-283-02	HINGE
1722	S	4-812-134-11	RIVET NYLON, 3.5

REAR PANEL ASSY (For APR-5003V)



REAR PANEL ASSY (For APR-5003V)



REAR PANEL ASSY

Ref. No.	SP	SONY Parts No.	Description
1701	O	A-7850-337-A	COMPLETE PCB, RMD
1702	O	A-7850-339-B	COMPLETE PCB, CNX
1703	S	T-9412-524-1	CONNECTOR, POWER INPUT
1704	O	X-4801-204-0	ASSEMBLY, TERMINAL
1705	S	1-161-051-00	CAP., CERAMIC, 0.01UF/50V
1706	S	1-509-176-51	CONNECTOR, PLUG, 3-PIN, XLR-3-32-F77
1707	S	1-509-184-51	CONNECTOR, RECEPT., 3-PIN, XLR-3-31-F77
1708	S	⚠1-533-167-00	HOLDER, FUSE
1709	S	1-533-169-00	HOLDER, FUSE
1710	S	1-551-812-00	CORD, POWER
1711	S	1-561-781-21	CONNECTOR, RECEPTACLE, BNC
1712	O	1-937-546-12	HARNESS, REAR PANEL SUB-ASSEMBLY
1713	O	1-937-547-11	HARNESS, NOISE REDUCTION
1714	O	3-157-917-00	SUPPORT, PWA
1715	O	3-577-229-00	INSULATOR, TO-126
1716	O	3-673-624-02	SHEET, INSULATING, TR
1717	O	3-711-097-02	PANEL, SILK SCREEN
1718	O	3-711-351-01	PANEL, SILK SCREEN
1719	O	3-711-228-01	STANDOFF
1720	O	3-711-228-11	STANDOFF
1721	O	3-711-283-02	HINGE
1722	S	4-812-134-11	RIVET, NYLON, 3.5
1723	S	1-124-105-00	RESISTOR, 75 OHMS, 1/4W, 1%
1724	O	1-509-984-00	HOUSING, IL CONNECTOR, 3-PIN
	O	1-560-298-00	TERMINAL, SOLDERLESS
1725	S	1-516-783-XX	SWITCH, SLIDE
1726	O	A-7850-626-A (T-9482-436-1)	COMPLETE PCB, VVT
1727	O	T-9482-689-1	HARNESS, VVT to CNX

10-2 ELECTRICAL PARTS LIST

APR-5001/5002/5003V series circuit boards are arranged in alphabetical order.

Ref. No.	SP	SONY Parts No.	Description
ACM BOARD			
	O	A-7850-370-A	COMPLETE PCB,ACM (This assembly includes the following parts.)
C1	S	1-124-499-11	ELECT 1MF 20% 50V
C2	S	1-162-726-11	CERAMIC 470PF 5% 50V
C3	S	1-123-333-00	ELECT 100MF 20% 25V
C4	S	1-124-631-11	ELECT 47MF 20% 16V
C5	S	1-162-667-11	CERAMIC 10PF 5% 50V
C6	S	1-123-333-00	ELECT 100MF 20% 25V
C7	S	1-161-485-00	CERAMIC 0.1MF 50V
C8	S	1-123-333-00	ELECT 100MF 20% 25V
C9	S	1-123-333-00	ELECT 100MF 20% 25V
C10	S	1-162-667-11	CERAMIC 10PF 5% 50V
C11	S	1-124-631-11	ELECT 47MF 20% 16V
C12	S	1-123-333-00	ELECT 100MF 20% 25V
C13	S	1-162-726-11	CERAMIC 470PF 5% 50V
C14	S	1-161-485-00	CERAMIC 0.1MF 50V
C15	S	1-124-499-11	ELECT 1MF 20% 50V
C16	S	1-123-252-00	ELECT 0.33MF 20% 50V
C17	S	1-161-473-00	CERAMIC 0.01MF 10% 50V
C18	S	1-161-473-00	CERAMIC 0.01MF 10% 50V
C19	S	1-161-485-00	CERAMIC 0.1MF 50V
C20	S	1-161-485-00	CERAMIC 0.1MF 50V
C21	S	1-161-485-00	CERAMIC 0.1MF 50V
C22	S	1-123-333-00	ELECT 100MF 20% 25V
CNJ206	O	1-564-734-21	CONNECTOR,FLAT CABLE 50P
CNJ209	O	1-564-695-21	CONNECTOR,FLAT CABLE 16P
CNJ221	O	1-560-304-00	POST HEADER (IL CONNECTOR) 8P
CNJ222	O	1-560-305-00	POST HEADER (IL CONNECTOR) 10P
CNJ223	O	1-560-302-00	POST HEADER (IL CONNECTOR) 5P
CNJ224	O	1-560-299-00	POST HEADER (IL CONNECTOR) 2P
CNJ225	O	1-564-697-21	CONNECTOR,FLAT CABLE 26P
CNJ914	O	1-564-797-11	WAFER ASSY 10P
D1	S	8-719-911-19	1SS119
D2	S	8-719-911-19	1SS119
D3	S	8-719-911-19	1SS119
D4	S	8-719-911-19	1SS119
D5	S	8-719-911-19	1SS119

Ref. No.	SP	SONY Parts No.	Description
D6	S	8-719-911-19	1SS119
D7	S	8-719-911-19	1SS119
D8	S	8-719-911-19	1SS119
IC1	S	8-759-937-40	DG212CJ
IC2	S	8-759-340-13	HD14013BP
IC3	S	8-759-901-38	SN74LS138N
IC4	S	8-759-901-38	SN74LS138N
IC5	S	8-759-100-88	uPD8279C-5
IC6	S	8-759-202-74	TC74HC04P
IC7	S	8-759-202-21	TC74HC32P
IC8	S	8-759-000-25	MC14016BCP
IC9	S	8-759-000-25	MC14016BCP
IC10	S	8-749-900-42	STK-457
IC11	S	8-759-202-74	TC74HC04P
JW3	S	1-566-388-11	PIN, SHORT
L1	S	1-409-339-00	COIL,SN
R1	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R2	S	1-214-593-00	METAL FILM 33K 1% 1/8W
R3	S	1-214-545-00	METAL FILM 330 1% 1/8W
R4	S	1-214-588-00	METAL FILM 20K 1% 1/8W
R5	S	1-214-569-00	METAL FILM 3.3K 1% 1/8W
R6	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R7	S	1-214-573-00	METAL FILM 4.7K 1% 1/8W
R9	S	1-249-443-11	CARBON 0.47 5% 1/4W
R10	S	1-214-533-00	METAL FILM 100 1% 1/8W
R11	S	1-249-443-11	CARBON 0.47 5% 1/4W
R12	S	1-214-588-00	METAL FILM 20K 1% 1/8W
R13	S	1-214-545-00	METAL FILM 330 1% 1/8W
R14	S	1-214-569-00	METAL FILM 3.3K 1% 1/8W
R15	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R16	S	1-214-593-00	METAL FILM 33K 1% 1/8W
R17	S	1-214-573-00	METAL FILM 4.7K 1% 1/8W
R18	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R20	S	1-215-823-11	METAL FILM 51K 1% 1/8W
R21	S	1-214-573-00	METAL FILM 4.7K 1% 1/8W
R22	S	1-214-573-00	METAL FILM 4.7K 1% 1/8W
R23	S	1-217-678-11	WIREWOUND 10 10% 10W
R32	S	1-217-678-11	WIREWOUND 10 10% 10W
R33	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R34	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R35	S	1-214-581-00	METAL FILM 10K 1% 1/8W

Ref. No.	SP	SONY Parts No.	Description
R36	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R37	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R38	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R39	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R40	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R41	S	1-214-571-00	METAL FILM 3.9K 1% 1/8W
R42	S	1-214-571-00	METAL FILM 3.9K 1% 1/8W
R43	S	1-214-571-00	METAL FILM 3.9K 1% 1/8W
R44	S	1-214-571-00	METAL FILM 3.9K 1% 1/8W
R45	S	1-214-571-00	METAL FILM 3.9K 1% 1/8W
R46	S	1-214-571-00	METAL FILM 3.9K 1% 1/8W
R47	S	1-214-571-00	METAL FILM 3.9K 1% 1/8W
R48	S	1-214-571-00	METAL FILM 3.9K 1% 1/8W
R49	S	1-215-820-11	METAL FILM 39K 1% 1/8W
R50	S	1-215-820-11	METAL FILM 39K 1% 1/8W

ADM BOARD

	O	A-7810-195-A	COMPLETE PCB, ADM (This assembly includes the following parts.)
	O	3-555-872-21	SPACER
	O	3-711-099-02	MOUNTING BRACKET M.B
	O	3-711-201-01	BRACKET(R),MTB
	S	7-682-647-09	SCREW,PSW 3x6
CNJ200	O	1-564-699-21	CONNECTOR,RIBBON CABLE 34P
CNJ201	O	1-564-693-21	CONNECTOR,RIBBON CABLE 10P
CNJ202	O	1-560-301-00	POST HEADER 4P
CNJ203	O	1-560-303-00	POST HEADER 6P
CNJ205	O	1-564-734-21	CONNECTOR,RIBBON CABLE 50P
CNJ208	O	1-564-695-21	CONNECTOR,RIBBON CABLE 16P
CNJ212	O	1-560-303-00	POST HEADER 6P
CNJ213	O	1-560-303-00	POST HEADER 6P
CNJ214	O	1-560-300-00	POST HEADER 3P
CNJ215	O	1-560-303-00	POST HEADER 6P
CNJ915	O	1-560-260-00	CONNECTOR,WITH LOCK 9P

Ref. No.	SP	SONY Parts No.	Description
ALN BOARD			
	O	A-7850-336-A	MOUNTED PCB,ALN
			(This assembly includes the following parts.)
	S	4-903-740-01	FRAME, FITTING (SQUARE 10)
	S	4-903-741-01	KEY TOP (SQUARE 10)(WINDOW)
C1	S	1-161-485-00	CERAMIC 0.1MF 50V
C2	S	1-161-485-00	CERAMIC 0.1MF 50V
C3	S	1-161-485-00	CERAMIC 0.1MF 50V
C4	S	1-161-485-00	CERAMIC 0.1MF 50V
C5	S	1-161-485-00	CERAMIC 0.1MF 50V
C6	S	1-161-485-00	CERAMIC 0.1MF 50V
C7	S	1-161-485-00	CERAMIC 0.1MF 50V
C8	S	1-124-584-00	ELECT 100MF 20% 10V
CNJ207	O	1-506-958-11	PIN, CONNECTOR (PC BOARD) 50P
CNJ229	O	1-506-955-11	PIN, CONNECTOR (PC BOARD) 20P
D1	S	8-719-911-19	1SS119
D2	S	8-719-911-19	1SS119
D3	S	8-719-911-19	1SS119
D4	S	8-719-911-19	1SS119
D5	S	8-719-911-19	1SS119
D6	S	8-719-911-19	1SS119
D7	S	8-719-911-19	1SS119
D8	S	8-719-911-19	1SS119
D9	S	8-719-911-19	1SS119
D10	S	8-719-911-19	1SS119
D11	S	8-719-911-19	1SS119
D12	S	8-719-911-19	1SS119
D13	S	8-719-911-19	1SS119
D14	S	8-719-911-19	1SS119
D15	S	8-719-911-19	1SS119
D16	S	8-719-911-19	1SS119
D17	S	8-719-911-19	1SS119
D18	S	8-719-911-19	1SS119
D19	S	8-719-911-19	1SS119
D20	S	8-719-911-19	1SS119
D21	S	8-719-911-19	1SS119
D22	S	8-719-911-19	1SS119
D23	S	8-719-911-19	1SS119
D24	S	8-719-911-19	1SS119
D25	S	8-719-911-19	1SS119
D26	S	8-719-911-19	1SS119
D27	S	8-719-911-19	1SS119
D28	S	8-719-911-19	1SS119
D29	S	8-719-911-19	1SS119
D30	S	8-719-911-19	1SS119

Ref. No.	SP	SONY Parts No.	Description
D31	S	8-719-911-19	1SS119
D32	S	8-719-911-19	1SS119
DS1	S	8-719-802-12	TLR333
DS2	S	8-719-802-12	TLR333
IC1	S	8-759-100-88	uPD8279C-5
IC2	S	8-759-208-12	TC4016BPHB
IC3	S	8-759-208-12	TC4016BPHB
IC4	S	8-759-901-38	SN74LS138N
IC5	S	8-759-901-38	SN74LS138N
IC6	S	8-759-202-21	TC74HC32P
IC7	S	8-759-202-74	TC74HC04P
L1	S	1-409-339-00	COIL,SN
Q1	S	8-729-139-04	2N3904
Q2	S	8-729-139-04	2N3904
Q3	S	8-729-139-04	2N3904
Q4	S	8-729-139-04	2N3904
Q5	S	8-729-139-04	2N3904
Q6	S	8-729-139-04	2N3904
Q7	S	8-729-139-04	2N3904
Q8	S	8-729-139-04	2N3904
Q9	S	8-729-113-08	2N3906
Q10	S	8-729-113-08	2N3906
Q11	S	8-729-113-08	2N3906
Q12	S	8-729-113-08	2N3906
Q13	S	8-729-113-08	2N3906
Q14	S	8-729-113-08	2N3906
R1	S	1-214-533-00	METAL FILM 100 1% 1/8W
R2	S	1-214-533-00	METAL FILM 100 1% 1/8W
R3	S	1-214-533-00	METAL FILM 100 1% 1/8W
R4	S	1-214-533-00	METAL FILM 100 1% 1/8W
R5	S	1-214-533-00	METAL FILM 100 1% 1/8W
R6	S	1-214-533-00	METAL FILM 100 1% 1/8W
R7	S	1-214-533-00	METAL FILM 100 1% 1/8W
R8	S	1-214-533-00	METAL FILM 100 1% 1/8W
R11	S	1-215-428-00	METAL FILM 2K 1% 1/4W
R12	S	1-214-557-00	METAL FILM 1K 1% 1/8W
RN1	O	1-235-114-00	RES,ACCUMULATION
RN2	O	1-235-114-00	RES,ACCUMULATION
RN3	S	1-235-005-00	RESISTOR BLOCK 47K
S1	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)
S2	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)
S3	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)
S4	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)
S5	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)

Ref. No.	SP	SONY Parts No.	Description
S6	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)
S7	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)
S8	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)
S9	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)
S10	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)
S11	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)
S12	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)
S13	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)
S14	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)
S15	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)
S16	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)
S17	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)
S18	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)
S19	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)
S20	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)
S21	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)
S22	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)
S23	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)
S24	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)
S25	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)

Ref. No.	SP	SONY Parts No.	Description		
CNL BOARD		(1-619-158-11 to -14)			
	O	A-7850-373-A	COMPLETE PCB,CNL		
		(This assembly includes the following parts.)			
	S	1-417-157-11	BALUN		
	S	2-251-622-11	LEVER, PC BOARD		
	O	3-673-867-11	PLATE, INDICATION, PC BOARD		
	S	7-626-317-21	PIN, SPRING 2.5x8		
	S	7-628-254-20	SCREW, PS 2.6x8		
C1	S	1-123-333-00	ELECT	100MF	20% 25V
C2	S	1-123-333-00	ELECT	100MF	20% 25V
C3	S	1-123-333-00	ELECT	100MF	20% 25V
C4	S	1-123-333-00	ELECT	100MF	20% 25V
C5	S	1-123-333-00	ELECT	100MF	20% 25V
C6	S	1-162-724-11	CERAMIC	390PF	5% 50V
C8	S	1-162-716-11	CERAMIC	180PF	5% 50V
C9	S	1-162-716-11	CERAMIC	180PF	5% 50V
C10	S	1-162-668-11	CERAMIC	12PF	5% 50V
C11	S	1-124-631-11	ELECT	47MF	20% 16V
C18	S	1-161-473-00	CERAMIC	0.01MF	10% 50V
C19	S	1-162-873-11	CERAMIC	56PF	5% 50V
C20	S	1-130-777-00	POLYESTER	0.1MF	5% 100V
C21	S	1-162-720-11	CERAMIC	270PF	5% 50V
C22	S	1-162-716-11	CERAMIC	180PF	5% 50V
C23	S	1-162-724-11	CERAMIC	390PF	5% 50V
C24	S	1-162-730-11	CERAMIC	680PF	5% 50V
C25	S	1-162-736-11	CERAMIC	1500PF	10% 50V
C26	S	1-124-429-00	ELECT	0.68MF	20% 50V
C27	S	1-162-710-11	CERAMIC	100PF	5% 50V
C28	S	1-162-668-11	CERAMIC	12PF	5% 50V
C29	S	1-126-235-11	ELECT	100MF	20% 16V
C30	S	1-126-235-11	ELECT	100MF	20% 16V
C31	S	1-126-235-11	ELECT	100MF	20% 16V
C32	S	1-162-716-11	CERAMIC	180PF	5% 50V
C35	S	1-162-877-11	CERAMIC	82PF	5% 50V
C36	S	1-162-673-11	CERAMIC	33PF	5% 50V
C37	S	1-162-724-11	CERAMIC	390PF	5% 50V
C38	S	1-162-671-11	CERAMIC	22PF	5% 50V
C39	S	1-126-235-11	ELECT	100MF	20% 16V
C40	S	1-162-671-11	CERAMIC	22PF	5% 50V
C41	S	1-162-732-11	CERAMIC	820PF	5% 50V
C42	S	1-162-875-11	CERAMIC	68PF	5% 50V
C43	S	1-162-671-11	CERAMIC	22PF	5% 50V
C44	S	1-162-893-11	CERAMIC	2200PF	10% 50V

Ref. No.	SP	SONY Parts No.	Description		
C45	S	1-162-734-11	CERAMIC 0.001MF	10%	50V
C46	S	1-162-726-11	CERAMIC 470PF	5%	50V
C48	S	1-162-671-11	CERAMIC 22PF	5%	50V
C49	S	1-162-871-11	CERAMIC 47PF	5%	50V
C50	S	1-162-666-11	CERAMIC 0.027MF	10%	50V
C51	S	1-162-671-11	CERAMIC 22PF	5%	50V
C52	S	1-162-718-11	CERAMIC 220PF	5%	50V
C53	S	1-162-710-11	CERAMIC 100PF	5%	50V
C54	S	1-162-871-11	CERAMIC 47PF	5%	50V
C55	S	1-161-473-00	CERAMIC 0.01MF	10%	50V
C56	S	1-161-473-00	CERAMIC 0.01MF	10%	50V
C57	S	1-126-162-11	ELECT 3.3MF	20%	50V
C58	S	1-161-473-00	CERAMIC 0.01MF	10%	50V
C59	S	1-161-473-00	CERAMIC 0.01MF	10%	50V
C60	S	1-126-162-11	ELECT 3.3MF	20%	50V
C62	S	1-161-485-00	CERAMIC 0.1MF		50V
C63	S	1-123-357-00	ELECT 22MF	20%	35V
C64	S	1-123-357-00	ELECT 22MF	20%	35V
C65	S	1-123-357-00	ELECT 22MF	20%	35V
C66	S	1-123-357-00	ELECT 22MF	20%	35V
C67	S	1-124-499-11	ELECT 1MF	20%	50V
C68	S	1-124-499-11	ELECT 1MF	20%	50V
C69	S	1-162-714-11	CERAMIC 150PF	5%	50V
C70	S	1-162-670-11	CERAMIC 18PF	5%	50V
C71	S	1-162-800-11	CERAMIC 0.033MF	10%	50V
C72	S	1-162-800-11	CERAMIC 0.033MF	10%	50V
C73	S	1-161-473-00	CERAMIC 0.01MF	10%	50V
C74	S	1-161-473-00	CERAMIC 0.01MF	10%	50V
C75	S	1-123-357-00	ELECT 22MF	20%	35V
C76	S	1-123-357-00	ELECT 22MF	20%	35V
C80	S	1-161-485-00	CERAMIC 0.1MF		50V
C81	S	1-161-485-00	CERAMIC 0.1MF		50V
C82	S	1-123-357-00	ELECT 22MF	20%	35V
C83	S	1-123-357-00	ELECT 22MF	20%	35V
C90	S	1-123-357-00	ELECT 22MF	20%	35V
C91	S	1-123-357-00	ELECT 22MF	20%	35V
C92	S	1-123-357-00	ELECT 22MF	20%	35V
C93	S	1-123-357-00	ELECT 22MF	20%	35V
C94	S	1-123-357-00	ELECT 22MF	20%	35V
C95	S	1-123-357-00	ELECT 22MF	20%	35V
C96	S	1-162-839-11	CERAMIC 0.01MF	10%	16V
C97	S	1-123-357-00	ELECT 22MF	20%	35V
C98	S	1-123-357-00	ELECT 22MF	20%	35V
C105	S	1-162-839-11	CERAMIC 0.01MF	10%	16V
C106	S	1-123-357-00	ELECT 22MF	20%	35V

Ref. No.	SP	SONY Parts No.	Description			
C107	S	1-123-357-00	ELECT	22MF	20%	35V
C108	S	1-161-485-00	CERAMIC	0.1MF		50V
C109	S	1-162-893-11	CERAMIC	2200PF	10%	50V
C110	S	1-123-357-00	ELECT	22MF	20%	35V
C111	S	1-123-357-00	ELECT	22MF	20%	35V
C112	S	1-123-357-00	ELECT	22MF	20%	35V
C113	S	1-123-357-00	ELECT	22MF	20%	35V
C114	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C115	S	1-123-357-00	ELECT	22MF	20%	35V
C116	S	1-123-357-00	ELECT	22MF	20%	35V
C120	S	1-123-357-00	ELECT	22MF	20%	35V
C121	S	1-123-357-00	ELECT	22MF	20%	35V
C125	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C126	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C127	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C128	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C129	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C130	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C131	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C132	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C133	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C134	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C135	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C136	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C137	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C138	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C139	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C140	S	1-123-357-00	ELECT	22MF	20%	35V
C141	S	1-123-357-00	ELECT	22MF	20%	35V
C142	S	1-124-438-00	ELECT	1MF	20%	50V
C143	S	1-124-438-00	ELECT	1MF	20%	50V
C144	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C147	S	1-162-788-11	CERAMIC	3300PF	10%	50V
C148	S	1-162-732-11	CERAMIC	820PF	5%	50V
C149	S	1-162-667-11	CERAMIC	10PF	5%	50V
C150	S	1-162-670-11	CERAMIC	18PF	5%	50V
C151	S	1-162-663-11	CERAMIC	1200PF	10%	50V
C152	S	1-123-357-00	ELECT	22MF	20%	35V
C153	S	1-123-357-00	ELECT	22MF	20%	35V
C157	S	1-123-357-00	ELECT	22MF	20%	35V
C158	S	1-123-357-00	ELECT	22MF	20%	35V
C159	S	1-123-357-00	ELECT	22MF	20%	35V
C160	S	1-123-357-00	ELECT	22MF	20%	35V
C161	S	1-126-163-11	ELECT	4.7MF	20%	50V
C162	S	1-162-724-11	CERAMIC	390PF	5%	50V

Ref. No.	SP	SONY Parts No.	Description
C163	S	1-102-942-00	CERAMIC 5PF 10% 50V
C164	S	1-102-942-00	CERAMIC 5PF 10% 50V
C165	S	1-162-671-11	CERAMIC 22PF 5% 50V
C166	S	1-162-674-11	CERAMIC 39PF 5% 50V
C167	S	1-162-710-11	CERAMIC 100PF 5% 50V
C168	S	1-162-664-11	CERAMIC 1800PF 10% 50V
C169	S	1-123-357-00	ELECT 22MF 20% 35V
C170	S	1-123-357-00	ELECT 22MF 20% 35V
C171	S	1-124-438-00	ELECT 1MF 20% 50V
C172	S	1-161-473-00	CERAMIC 0.01MF 10% 50V
C173	S	1-123-357-00	ELECT 22MF 20% 35V
C174	S	1-123-357-00	ELECT 22MF 20% 35V
D1	S	8-719-911-19	1SS119
D2	S	8-719-911-19	1SS119
D3	S	8-719-911-19	1SS119
D4	S	8-719-911-19	1SS119
D5	S	8-719-911-19	1SS119
D6	S	8-719-911-19	1SS119
D7	S	8-719-911-19	1SS119
D8	S	8-719-911-19	1SS119
D9	S	8-719-911-19	1SS119
D10	S	8-719-911-19	1SS119
D11	S	8-719-200-90	11DF1
D12	S	8-719-200-90	11DF1
D13	S	8-719-911-19	1SS119
D14	S	8-719-911-19	1SS119
D15	S	8-719-200-90	11DF1
D16	S	8-719-200-90	11DF1
D17	S	8-719-911-19	1SS119
D18	S	8-719-911-19	1SS119
D19	S	8-719-911-19	1SS119
D20	S	8-719-911-19	1SS119
D21	S	T-9410-333-1	1N34
D22	S	8-719-911-19	1SS119
D23	S	8-719-911-19	1SS119
D24	S	8-719-911-19	1SS119
D25	S	8-719-109-85	RD5.1ES-B2
D26	S	8-719-911-19	1SS119
IC1	S	8-759-905-34	NE5534AN
IC2	S	8-759-905-34	NE5534AN
IC3	S	8-759-900-72	NE5532P
IC4	S	8-759-937-40	DG212CJ
IC5	S	8-759-937-20	AD7528AQ

Ref. No.	SP	SONY Parts No.	Description
IC6	S	8-741-135-20	BX1352
IC7	S	8-759-910-83	TL072ACP
IC8	S	8-759-910-83	TL072ACP
IC9	S	8-759-910-83	TL072ACP
IC10	S	8-759-905-34	NE5534AN
IC11	S	8-741-135-30	BX1353
IC12	S	8-759-937-40	DG212CJ
IC13	S	8-759-937-40	DG212CJ
IC14	S	8-759-937-40	DG212CJ
IC15	S	8-759-910-83	TL072ACP
IC16	S	8-759-937-40	DG212CJ
IC17	S	8-759-937-20	AD7528AQ
IC18	S	8-759-905-34	NE5534AN
IC19	S	8-759-937-40	DG212CJ
IC21	S	8-759-937-20	AD7528AQ
IC22	S	8-759-903-16	LM318P
IC23	S	8-759-937-40	DG212CJ
IC24	S	8-759-903-16	LM318P
IC25	S	8-759-903-16	LM318P
IC26	S	8-759-937-26	LM13600N
IC27	S	8-759-910-83	TL072ACP
IC28	S	8-759-202-55	TC74HC244P
IC29	S	8-759-203-48	TC74HC573P
IC30	S	8-759-203-48	TC74HC573P
IC31	S	8-759-203-48	TC74HC573P
IC32	S	8-759-202-14	TC74HC08P
IC33	S	8-759-202-21	TC74HC32P
IC34	S	8-759-202-21	TC74HC32P
IC35	S	8-759-202-12	TC74HC02P
IC36	S	8-759-245-16	TC4516BP
IC37	S	8-759-245-16	TC4516BP
IC38	S	8-759-340-13	HD14013BP
IC39	S	8-759-340-13	HD14013BP
IC40	S	8-759-140-69	uPD4069UBC
IC41	S	8-759-240-01	TC4001BP
IC42	S	8-759-140-81	uPD4081BC
IC43	S	8-719-945-28	PC619
IC44	S	8-719-901-03	PC525
IC46	S	8-759-981-00	TL081CP
IC47	S	8-759-202-21	TC74HC32P
IC48	S	8-759-907-01	TL071CP
K1	S	T-9413-260-1	RELAY,DPDT,5V
K2	S	T-9413-260-1	RELAY,DPDT,5V

Ref. No.	SP	SONY Parts No.	Description
L1	S	1-408-092-00	MICRO INDUCTOR 330MH 5%
L2	S	1-409-339-00	COIL,SN
L3	S	1-408-092-00	MICRO INDUCTOR 330MH 5%
Q1	S	T-9410-286-1	SP7000-0127-01
Q2	S	8-729-313-32	2SD1133
Q3	S	8-729-385-72	2SB857-C
Q4	S	8-729-313-32	2SD1133
Q5	S	8-729-385-72	2SB857-C
Q6	S	8-729-904-15	VN10KM
Q7	S	8-759-937-24	LM394H
Q8	S	T-9410-286-1	SP7000-0127-01
Q9	S	8-729-904-18	P1086
		(APR-5002: Up to No. 20300)	
R2	S	1-214-533-00	METAL FILM 100 1% 1/8W
R3	S	1-214-533-00	METAL FILM 100 1% 1/8W
R4	S	1-214-533-00	METAL FILM 100 1% 1/8W
R5	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R6	S	1-247-887-00	CARBON 220K 5% 1/4W
R11	S	1-214-745-00	METAL FILM 4.7K 1% 1/4W
R12	S	1-214-769-00	METAL FILM 47K 1% 1/4W
R23	S	1-214-765-00	METAL FILM 33K 1% 1/4W
R24	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R25	S	1-247-888-11	CARBON 240K 5% 1/4W
R26	S	1-214-549-00	METAL FILM 470 1% 1/8W
R27	S	1-214-533-00	METAL FILM 100 1% 1/8W
R28	S	1-247-887-00	CARBON 220K 5% 1/4W
R30	S	1-214-748-00	METAL FILM 6.2K 1% 1/4W
R31	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R32	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R33	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R34	S	1-214-575-00	METAL FILM 5.6K 1% 1/8W
R35	S	1-218-197-11	METAL FILM 2.43K 1% 1/8W
R36	S	1-214-757-00	METAL FILM 15K 1% 1/4W
R37	S	1-214-564-00	METAL FILM 2K 1% 1/8W
R38	S	1-214-564-00	METAL FILM 2K 1% 1/8W
R39	S	1-214-573-00	METAL FILM 4.7K 1% 1/8W
R42	S	1-214-533-00	METAL FILM 100 1% 1/8W
R43	S	1-249-441-11	CARBON 100K 5% 1/4W
R44	S	1-214-545-00	METAL FILM 330 1% 1/8W
R45	S	1-215-826-11	METAL FILM 68K 1% 1/8W
R46	S	1-215-826-11	METAL FILM 68K 1% 1/8W
R47	S	1-218-194-11	METAL FILM 1.62K 1% 1/8W
R48	S	1-218-200-11	METAL FILM 3.74K 1% 1/8W

Ref. No.	SP	SONY Parts No.	Description
R49	S	1-218-201-11	METAL FILM 4.12K 1% 1/8W
R50	S	1-218-221-11	METAL FILM 40.2K 1% 1/8W
R51	S	1-214-760-00	METAL FILM 20K 1% 1/4W
R52	S	1-214-760-00	METAL FILM 20K 1% 1/4W
R53	S	1-214-753-00	METAL FILM 10K 1% 1/4W
R54	S	1-218-213-11	METAL FILM 21K 1% 1/6W
R56	S	1-218-220-11	METAL FILM 39.2K 1% 1/6W
R57	S	1-214-760-00	METAL FILM 20K 1% 1/4W
R58	S	1-214-749-00	METAL FILM 6.8K 1% 1/4W
R59	S	1-214-549-00	METAL FILM 470 1% 1/8W
R60	S	1-214-760-00	METAL FILM 20K 1% 1/4W
R61	S	1-218-216-11	METAL FILM 28K 1% 1/8W
R62	S	1-214-736-00	METAL FILM 2K 1% 1/4W
R63	S	1-218-200-11	METAL FILM 3.74K 1% 1/8W
R64	S	1-218-194-11	METAL FILM 1.62K 1% 1/8W
R65	S	1-214-743-00	METAL FILM 3.9K 1% 1/4W
R66	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R67	S	1-247-888-11	CARBON 240K 5% 1/4W
R68	S	1-214-572-00	METAL FILM 4.3K 1% 1/8W
R69	S	1-214-772-00	METAL FILM 62K 1% 1/4W
R70	S	1-214-573-00	METAL FILM 4.7K 1% 1/8W
R71	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R73	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R74	S	1-247-888-11	CARBON 240K 5% 1/4W
R75	S	1-215-822-11	METAL FILM 47K 1% 1/8W
R76	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R77	S	1-214-772-00	METAL FILM 62K 1% 1/4W
R78	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R79	S	1-214-573-00	METAL FILM 4.7K 1% 1/8W
R80	S	1-247-893-11	CARBON 390K 5% 1/4W
R81	S	1-215-827-11	METAL FILM 75K 1% 1/8W
R82	S	1-214-739-00	METAL FILM 2.7K 1% 1/4W
R83	S	1-249-441-11	CARBON 100K 5% 1/4W
R84	S	1-214-533-00	METAL FILM 100 1% 1/8W
R85	S	1-247-889-00	CARBON 270K 5% 1/4W
R86	S	1-214-773-00	METAL FILM 68K 1% 1/4W
R87	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R88	S	1-214-753-00	METAL FILM 10K 1% 1/4W
R89	S	1-214-753-00	METAL FILM 10K 1% 1/4W
R90	S	1-214-746-00	METAL FILM 5.1K 1% 1/4W
R91	S	1-214-753-00	METAL FILM 10K 1% 1/4W
R92	S	1-214-746-00	METAL FILM 5.1K 1% 1/4W
R93	S	1-214-753-00	METAL FILM 10K 1% 1/4W
R94	S	1-214-746-00	METAL FILM 5.1K 1% 1/4W
R95	S	1-214-746-00	METAL FILM 5.1K 1% 1/4W

Ref. No.	SP	SONY Parts No.	Description
R96	S	1-214-578-00	METAL FILM 7.5K 1% 1/8W
R97	S	1-214-578-00	METAL FILM 7.5K 1% 1/8W
R98	S	1-214-753-00	METAL FILM 10K 1% 1/4W
R99	S	1-214-753-00	METAL FILM 10K 1% 1/4W
R100	S	1-214-746-00	METAL FILM 5.1K 1% 1/4W
R101	S	1-214-753-00	METAL FILM 10K 1% 1/4W
R102	S	1-214-746-00	METAL FILM 5.1K 1% 1/4W
R103	S	1-214-753-00	METAL FILM 10K 1% 1/4W
R104	S	1-214-746-00	METAL FILM 5.1K 1% 1/4W
R105	S	1-214-746-00	METAL FILM 5.1K 1% 1/4W
R106	S	1-214-578-00	METAL FILM 7.5K 1% 1/8W
R107	S	1-214-578-00	METAL FILM 7.5K 1% 1/8W
R108	S	1-214-563-00	METAL FILM 1.8K 1% 1/8W
R109	S	1-214-567-00	METAL FILM 2.7K 1% 1/8W
R110	S	1-214-563-00	METAL FILM 1.8K 1% 1/8W
R111	S	1-214-567-00	METAL FILM 2.7K 1% 1/8W
R112	S	1-214-719-00	METAL FILM 390 1% 1/4W
R113	S	1-214-584-00	METAL FILM 13K 1% 1/8W
R114	S	1-214-719-00	METAL FILM 390 1% 1/4W
R115	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R116	S	1-214-719-00	METAL FILM 390 1% 1/4W
R117	S	1-214-584-00	METAL FILM 13K 1% 1/8W
R118	S	1-214-719-00	METAL FILM 390 1% 1/4W
R119	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R120	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R121	S	1-214-565-00	METAL FILM 2.2K 1% 1/8W
R122	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R123	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R124	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R125	S	1-214-565-00	METAL FILM 2.2K 1% 1/8W
R126	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R127	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R128	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R129	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R130	S	1-214-533-00	METAL FILM 100 1% 1/8W
R131	S	1-215-822-11	METAL FILM 47K 1% 1/8W
R132	S	1-214-533-00	METAL FILM 100 1% 1/8W
R133	S	1-218-203-11	METAL FILM 5.9K 1% 1/8W
R134	S	1-214-573-00	METAL FILM 4.7K 1% 1/8W
R135	S	1-214-593-00	METAL FILM 33K 1% 1/8W
R136	S	1-214-577-00	METAL FILM 6.8K 1% 1/8W
R137	S	1-214-573-00	METAL FILM 4.7K 1% 1/8W
R138	S	1-214-573-00	METAL FILM 4.7K 1% 1/8W
R139	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R140	S	1-215-822-11	METAL FILM 47K 1% 1/8W

Ref. No.	SP	SONY Parts No.	Description
R141	S	1-214-573-00	METAL FILM 4.7K 1% 1/8W
R142	S	1-249-482-11	CARBON 4.7 5% 1/2W
R143	S	1-249-482-11	CARBON 4.7 5% 1/2W
R144	S	1-206-456-00	CARBON 5.1 5% 1/2W
R145	S	1-206-456-00	CARBON 5.1 5% 1/2W
R146	S	1-215-822-11	METAL FILM 47K 1% 1/8W
R147	S	1-215-822-11	METAL FILM 47K 1% 1/8W
R148	S	1-215-822-11	METAL FILM 47K 1% 1/8W
R149	S	1-215-822-11	METAL FILM 47K 1% 1/8W
R150	S	1-214-585-00	METAL FILM 15K 1% 1/8W
R151	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R152	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R153	S	1-214-587-00	METAL FILM 18K 1% 1/8W
R154	S	1-214-738-00	METAL FILM 2.4K 1% 1/4W
R156	S	1-214-545-00	METAL FILM 330 1% 1/8W
R157, R158	S	1-214-757-00	METAL FILM 15K PAIR
R159, R160	S	1-216-786-11	METAL FILM 180 PAIR
R161	S	1-214-743-00	METAL FILM 3.9K 1% 1/4W
R162, R163	S	1-216-787-11	METAL FILM 5.1K PAIR
R164, R165	S	1-216-787-11	METAL FILM 5.1K PAIR
R166	S	1-214-589-00	METAL FILM 22K 1% 1/8W
R169	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R170	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R171	S	1-247-888-11	METAL FILM 240K 5% 1/4W
R172	S	1-214-738-00	METAL FILM 2.4K 1% 1/4W
R173	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R174	S	1-214-553-00	METAL FILM 680 1% 1/8W
R175	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R176	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R177	S	1-214-573-00	METAL FILM 4.7K 1% 1/8W
R178	S	1-218-213-11	METAL FILM 21K 1% 1/8W
R179	S	1-218-228-11	METAL FILM 140K 1% 1/8W
R180	S	1-214-564-11	METAL FILM 2K 1% 1/8W
R181	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R182	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R183	S	1-215-830-11	METAL FILM 100K 1% 1/8W
R184	S	1-215-830-11	METAL FILM 100K 1% 1/8W
RV1	S	1-237-521-21	ADJ,METAL FILM 100K
RV2	S	1-237-514-21	ADJ,METAL FILM 500
RV3	S	1-237-518-21	ADJ,METAL FILM 10K
RV4	S	1-230-838-11	ADJ,METAL FILM 200
RV5	S	1-230-838-11	ADJ,METAL FILM 200

Ref. No.	SP	SONY Parts No.	Description			
CNL BOARD (1-619-158-15)						
	O	A-7850-373-A	COMPLETE PCB,CNL			
		(This assembly includes the following parts.)				
	S	1-417-157-11	BALUN			
	S	2-251-622-11	LEVER, PC BOARD			
	O	3-673-867-11	PLATE, INDICATION, PC BOARD			
	S	7-626-317-21	PIN, SPRING 2.5x8			
	S	7-628-254-20	SCREW, PS 2.6x8			
C1	S	1-123-333-00	ELECT	100MF	20%	25V
C2	S	1-123-333-00	ELECT	100MF	20%	25V
C3	S	1-123-333-00	ELECT	100MF	20%	25V
C4	S	1-123-333-00	ELECT	100MF	20%	25V
C5	S	1-123-333-00	ELECT	100MF	20%	25V
C6	S	1-162-724-11	CERAMIC	390PF	5%	50V
C8	S	1-162-716-11	CERAMIC	180PF	5%	50V
C9	S	1-162-716-11	CERAMIC	180PF	5%	50V
C10	S	1-162-668-11	CERAMIC	12PF	5%	50V
C11	S	1-124-631-11	ELECT	47MF	20%	16V
C12	S	1-162-710-11	CERAMIC	100PF	5%	50V
C15	S	1-162-710-11	CERAMIC	100PF	5%	50V
C18	S	1-161-473-00	CERAMIC	0.01MF	10%	50V
C19	S	1-162-873-11	CERAMIC	56PF	5%	50V
C20	S	1-130-777-00	POLYESTER	0.1MF	5%	100V
C21	S	1-162-720-11	CERAMIC	270PF	5%	50V
C22	S	1-162-716-11	CERAMIC	180PF	5%	50V
C23	S	1-162-724-11	CERAMIC	390PF	5%	50V
C24	S	1-162-730-11	CERAMIC	680PF	5%	50V
C25	S	1-162-736-11	CERAMIC	1500PF	10%	50V
C26	S	1-124-429-00	ELECT	0.68MF	20%	50V
C27	S	1-162-710-11	CERAMIC	100PF	5%	50V
C28	S	1-162-668-11	CERAMIC	12PF	5%	50V
C29	S	1-126-235-11	ELECT	100MF	20%	16V
C30	S	1-126-235-11	ELECT	100MF	20%	16V
C31	S	1-126-235-11	ELECT	100MF	20%	16V
C32	S	1-162-716-11	CERAMIC	180PF	5%	50V
C35	S	1-162-877-11	CERAMIC	82PF	5%	50V
C36	S	1-162-673-11	CERAMIC	33PF	5%	50V
C37	S	1-162-724-11	CERAMIC	390PF	5%	50V
C38	S	1-162-671-11	CERAMIC	22PF	5%	50V
C39	S	1-126-235-11	ELECT	100MF	20%	16V
C40	S	1-162-671-11	CERAMIC	22PF	5%	50V
C41	S	1-162-732-11	CERAMIC	820PF	5%	50V
C42	S	1-162-875-11	CERAMIC	68PF	5%	50V

Ref. No.	SP	SONY Parts No.	Description		
C43	S	1-162-671-11	CERAMIC 22PF	5%	50V
C44	S	1-162-893-11	CERAMIC 2200PF	10%	50V
C45	S	1-162-734-11	CERAMIC 0.001MF	10%	50V
C46	S	1-162-726-11	CERAMIC 470PF	5%	50V
C48	S	1-162-671-11	CERAMIC 22PF	5%	50V
C49	S	1-162-871-11	CERAMIC 47PF	5%	50V
C50	S	1-162-666-11	CERAMIC 0.027MF	10%	50V
C51	S	1-162-671-11	CERAMIC 22PF	5%	50V
C52	S	1-162-718-11	CERAMIC 220PF	5%	50V
C53	S	1-162-710-11	CERAMIC 100PF	5%	50V
C54	S	1-162-871-11	CERAMIC 47PF	5%	50V
C55	S	1-161-473-00	CERAMIC 0.01MF	10%	50V
C56	S	1-161-473-00	CERAMIC 0.01MF	10%	50V
C57	S	1-126-162-11	ELECT 3.3MF	20%	50V
C58	S	1-161-473-00	CERAMIC 0.01MF	10%	50V
C59	S	1-161-473-00	CERAMIC 0.01MF	10%	50V
C60	S	1-126-162-11	ELECT 3.3MF	20%	50V
C62	S	1-161-485-00	CERAMIC 0.1MF		50V
C63	S	1-123-357-00	ELECT 22MF	20%	35V
C64	S	1-123-357-00	ELECT 22MF	20%	35V
C65	S	1-123-357-00	ELECT 22MF	20%	35V
C66	S	1-123-357-00	ELECT 22MF	20%	35V
C67	S	1-124-499-11	ELECT 1MF	20%	50V
C68	S	1-124-499-11	ELECT 1MF	20%	50V
C69	S	1-162-714-11	CERAMIC 150PF	5%	50V
C70	S	1-162-670-11	CERAMIC 18PF	5%	50V
C71	S	1-162-800-11	CERAMIC 0.033MF	10%	50V
C72	S	1-162-800-11	CERAMIC 0.033MF	10%	50V
C73	S	1-161-473-00	CERAMIC 0.01MF	10%	50V
C74	S	1-161-473-00	CERAMIC 0.01MF	10%	50V
C75	S	1-123-357-00	ELECT 22MF	20%	35V
C76	S	1-123-357-00	ELECT 22MF	20%	35V
C80	S	1-161-485-00	CERAMIC 0.1MF		50V
C81	S	1-161-485-00	CERAMIC 0.1MF		50V
C82	S	1-123-357-00	ELECT 22MF	20%	35V
C83	S	1-123-357-00	ELECT 22MF	20%	35V
C90	S	1-123-357-00	ELECT 22MF	20%	35V
C91	S	1-123-357-00	ELECT 22MF	20%	35V
C92	S	1-123-357-00	ELECT 22MF	20%	35V
C93	S	1-123-357-00	ELECT 22MF	20%	35V
C94	S	1-123-357-00	ELECT 22MF	20%	35V
C95	S	1-123-357-00	ELECT 22MF	20%	35V
C96	S	1-162-839-11	CERAMIC 0.01MF	10%	16V
C97	S	1-123-357-00	ELECT 22MF	20%	35V
C98	S	1-123-357-00	ELECT 22MF	20%	35V

Ref. No.	SP	SONY Parts No.	Description
C105	S	1-162-839-11	CERAMIC 0.01MF 10% 16V
C106	S	1-123-357-00	ELECT 22MF 20% 35V
C107	S	1-123-357-00	ELECT 22MF 20% 35V
C108	S	1-161-485-00	CERAMIC 0.1MF 50V
C109	S	1-162-893-11	CERAMIC 2200PF 10% 50V
C110	S	1-123-357-00	ELECT 22MF 20% 35V
C111	S	1-123-357-00	ELECT 22MF 20% 35V
C112	S	1-123-357-00	ELECT 22MF 20% 35V
C113	S	1-123-357-00	ELECT 22MF 20% 35V
C114	S	1-162-839-11	CERAMIC 0.01MF 10% 16V
C115	S	1-123-357-00	ELECT 22MF 20% 35V
C116	S	1-123-357-00	ELECT 22MF 20% 35V
C120	S	1-123-357-00	ELECT 22MF 20% 35V
C121	S	1-123-357-00	ELECT 22MF 20% 35V
C125	S	1-162-839-11	CERAMIC 0.01MF 10% 16V
C126	S	1-162-839-11	CERAMIC 0.01MF 10% 16V
C127	S	1-162-839-11	CERAMIC 0.01MF 10% 16V
C128	S	1-162-839-11	CERAMIC 0.01MF 10% 16V
C129	S	1-162-839-11	CERAMIC 0.01MF 10% 16V
C130	S	1-162-839-11	CERAMIC 0.01MF 10% 16V
C131	S	1-162-839-11	CERAMIC 0.01MF 10% 16V
C132	S	1-162-839-11	CERAMIC 0.01MF 10% 16V
C133	S	1-162-839-11	CERAMIC 0.01MF 10% 16V
C134	S	1-162-839-11	CERAMIC 0.01MF 10% 16V
C135	S	1-162-839-11	CERAMIC 0.01MF 10% 16V
C136	S	1-162-839-11	CERAMIC 0.01MF 10% 16V
C137	S	1-162-839-11	CERAMIC 0.01MF 10% 16V
C138	S	1-162-839-11	CERAMIC 0.01MF 10% 16V
C139	S	1-162-839-11	CERAMIC 0.01MF 10% 16V
C140	S	1-123-357-00	ELECT 22MF 20% 35V
C141	S	1-123-357-00	ELECT 22MF 20% 35V
C142	S	1-124-438-00	ELECT 1MF 20% 50V
C143	S	1-124-438-00	ELECT 1MF 20% 50V
C144	S	1-162-839-11	CERAMIC 0.01MF 10% 16V
C147	S	1-162-788-11	CERAMIC 3300PF 10% 50V
C148	S	1-162-732-11	CERAMIC 820PF 5% 50V
C149	S	1-162-667-11	CERAMIC 10PF 5% 50V
C150	S	1-162-670-11	CERAMIC 18PF 5% 50V
C151	S	1-162-663-11	CERAMIC 1200PF 10% 50V
C152	S	1-123-357-00	ELECT 22MF 20% 35V
C153	S	1-123-357-00	ELECT 22MF 20% 35V
C157	S	1-123-357-00	ELECT 22MF 20% 35V
C158	S	1-123-357-00	ELECT 22MF 20% 35V
C159	S	1-123-357-00	ELECT 22MF 20% 35V
C160	S	1-123-357-00	ELECT 22MF 20% 35V

Ref. No.	SP	SONY Parts No.	Description
C161	S	1-126-163-11	ELECT 4.7MF 20% 50V
C162	S	1-162-724-11	CERAMIC 390PF 5% 50V
C163	S	1-102-942-00	CERAMIC 5PF 10% 50V
C164	S	1-102-942-00	CERAMIC 5PF 10% 50V
C165	S	1-162-671-11	CERAMIC 22PF 5% 50V
C166	S	1-162-674-11	CERAMIC 39PF 5% 50V
C167	S	1-162-710-11	CERAMIC 100PF 5% 50V
C168	S	1-162-664-11	CERAMIC 1800PF 10% 50V
C169	S	1-123-357-00	ELECT 22MF 20% 35V
C170	S	1-123-357-00	ELECT 22MF 20% 35V
C171	S	1-124-438-00	ELECT 1MF 20% 50V
C172	S	1-161-473-00	CERAMIC 0.01MF 10% 50V
C173	S	1-123-357-00	ELECT 22MF 20% 35V
C174	S	1-123-357-00	ELECT 22MF 20% 35V
D1	S	8-719-911-19	1SS119
D2	S	8-719-911-19	1SS119
D3	S	8-719-911-19	1SS119
D4	S	8-719-911-19	1SS119
D5	S	8-719-911-19	1SS119
D6	S	8-719-911-19	1SS119
D7	S	8-719-911-19	1SS119
D8	S	8-719-911-19	1SS119
D9	S	8-719-911-19	1SS119
D10	S	8-719-911-19	1SS119
D11	S	8-719-200-90	11DF1
D12	S	8-719-200-90	11DF1
D13	S	8-719-911-19	1SS119
D14	S	8-719-911-19	1SS119
D15	S	8-719-200-90	11DF1
D16	S	8-719-200-90	11DF1
D17	S	8-719-911-19	1SS119
D18	S	8-719-911-19	1SS119
D19	S	8-719-911-19	1SS119
D20	S	8-719-911-19	1SS119
D21	S	T-9410-333-1	1N34
D22	S	8-719-911-19	1SS119
D23	S	8-719-911-19	1SS119
D24	S	8-719-911-19	1SS119
D25	S	8-719-109-85	RD5.1ES-B2
D26	S	8-719-911-19	1SS119
IC1	S	8-759-905-34	NE5534AN
IC2	S	8-759-905-34	NE5534AN
IC3	S	8-759-900-72	NE5532P
IC4	S	8-759-937-40	DG212CJ
IC5	S	8-759-937-20	AD7528AQ

Ref. No.	SP	SONY Parts No.	Description
IC6	S	8-741-135-20	BX1352
IC7	S	8-759-910-83	TL072ACP
IC8	S	8-759-910-83	TL072ACP
IC9	S	8-759-910-83	TL072ACP
IC10	S	8-759-905-34	NE5534AN
IC11	S	8-741-135-30	BX1353
IC12	S	8-759-937-40	DG212CJ
IC13	S	8-759-937-40	DG212CJ
IC14	S	8-759-937-40	DG212CJ
IC15	S	8-759-910-83	TL072ACP
IC16	S	8-759-937-40	DG212CJ
IC17	S	8-759-937-20	AD7528AQ
IC18	S	8-759-905-34	NE5534AN
IC19	S	8-759-937-40	DG212CJ
IC21	S	8-759-937-20	AD7528AQ
IC22	S	8-759-903-16	LM318P
IC23	S	8-759-937-40	DG212CJ
IC24	S	8-759-903-16	LM318P
IC25	S	8-759-903-16	LM318P
IC26	S	8-759-937-26	LM13600N
IC27	S	8-759-910-83	TL072ACP
IC28	S	8-759-202-55	TC74HC244P
IC29	S	8-759-203-48	TC74HC573P
IC30	S	8-759-203-48	TC74HC573P
IC31	S	8-759-203-48	TC74HC573P
IC32	S	8-759-202-14	TC74HC08P
IC33	S	8-759-202-21	TC74HC32P
IC34	S	8-759-202-21	TC74HC32P
IC35	S	8-759-202-12	TC74HC02P
IC36	S	8-759-245-16	TC4516BP
IC37	S	8-759-245-16	TC4516BP
IC38	S	8-759-340-13	HD14013BP
IC39	S	8-759-340-13	HD14013BP
IC40	S	8-759-140-69	uPD4069UBC
IC41	S	8-759-240-01	TC4001BP
IC42	S	8-759-140-81	uPD4081BC
IC43	S	8-719-945-28	PC619
IC44	S	8-719-901-03	PC525
IC46	S	8-759-981-00	TL081CP
IC47	S	8-759-202-21	TC74HC32P
IC48	S	8-759-907-01	TL071CP
JW4	S	1-566-388-11	PIN,SHORT
JW5	S	1-566-388-11	PIN,SHORT
K1	S	1-515-716-11	RELAY,DPDT,5V
K2	S	1-515-716-11	RELAY,DPDT,5V

Ref. No.	SP	SONY Parts No.	Description
L1	S	1-408-092-00	MICRO INDUCTOR 330MH 5%
L2	S	1-409-339-00	COIL,SN
L3	S	1-408-092-00	MICRO INDUCTOR 330MH 5%
Q1	S	T-9410-286-1	SP7000-0127-01
Q2	S	8-729-313-32	2SD1133
Q3	S	8-729-385-72	2SB857-C
Q4	S	8-729-313-32	2SD1133
Q5	S	8-729-385-72	2SB857-C
Q6	S	8-729-904-15	VN10KM
Q7	S	8-759-937-24	LM394H
Q8	S	T-9410-286-1	SP7000-0127-01
R2	S	1-214-550-00	METAL FILM 510 1% 1/8W
R3	S	1-214-533-00	METAL FILM 100 1% 1/8W
R4	S	1-214-533-00	METAL FILM 100 1% 1/8W
R5	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R6	S	1-247-887-00	CARBON 220K 5% 1/4W
R11	S	1-214-745-00	METAL FILM 4.7K 1% 1/4W
R12	S	1-214-769-00	METAL FILM 47K 1% 1/4W
R13	S	1-215-825-11	METAL FILM 62K 1% 1/8W
R14	S	1-215-825-11	METAL FILM 62K 1% 1/8W
R23	S	1-214-765-00	METAL FILM 33K 1% 1/4W
R24	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R25	S	1-247-888-11	CARBON 240K 5% 1/4W
R26	S	1-214-549-00	METAL FILM 470 1% 1/8W
R27	S	1-214-533-00	METAL FILM 100 1% 1/8W
R28	S	1-247-887-00	CARBON 220K 5% 1/4W
R30	S	1-214-748-00	METAL FILM 6.2K 1% 1/4W
R31	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R32	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R33	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R34	S	1-214-575-00	METAL FILM 5.6K 1% 1/8W
R35	S	1-218-197-11	METAL FILM 2.43K 1% 1/8W
R36	S	1-214-757-00	METAL FILM 15K 1% 1/4W
R37	S	1-214-564-00	METAL FILM 2K 1% 1/8W
R38	S	1-214-564-00	METAL FILM 2K 1% 1/8W
R39	S	1-214-573-00	METAL FILM 4.7K 1% 1/8W
R42	S	1-214-533-00	METAL FILM 100 1% 1/8W
R43	S	1-249-441-11	CARBON 100K 5% 1/4W
R44	S	1-214-545-00	METAL FILM 330 1% 1/8W
R45	S	1-215-826-11	METAL FILM 68K 1% 1/8W
R46	S	1-215-826-11	METAL FILM 68K 1% 1/8W
R47	S	1-218-194-11	METAL FILM 1.62K 1% 1/8W
R48	S	1-218-200-11	METAL FILM 3.74K 1% 1/8W
R49	S	1-218-201-11	METAL FILM 4.12K 1% 1/8W
R50	S	1-218-221-11	METAL FILM 40.2K 1% 1/8W
R51	S	1-214-760-00	METAL FILM 20K 1% 1/4W

Ref. No.	SP	SONY Parts No.	Description
R52	S	1-214-760-00	METAL FILM 20K 1% 1/4W
R53	S	1-214-753-00	METAL FILM 10K 1% 1/4W
R54	S	1-218-213-11	METAL FILM 21K 1% 1/6W
R56	S	1-218-220-11	METAL FILM 39.2K 1% 1/6W
R57	S	1-214-760-00	METAL FILM 20K 1% 1/4W
R58	S	1-214-749-00	METAL FILM 6.8K 1% 1/4W
R59	S	1-214-549-00	METAL FILM 470 1% 1/8W
R60	S	1-214-760-00	METAL FILM 20K 1% 1/4W
R61	S	1-218-216-11	METAL FILM 28K 1% 1/8W
R62	S	1-214-736-00	METAL FILM 2K 1% 1/4W
R63	S	1-218-200-11	METAL FILM 3.74K 1% 1/8W
R64	S	1-218-194-11	METAL FILM 1.62K 1% 1/8W
R65	S	1-214-743-00	METAL FILM 3.9K 1% 1/4W
R66	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R67	S	1-247-888-11	CARBON 240K 5% 1/4W
R68	S	1-214-572-00	METAL FILM 4.3K 1% 1/8W
R69	S	1-214-772-00	METAL FILM 62K 1% 1/4W
R70	S	1-214-573-00	METAL FILM 4.7K 1% 1/8W
R71	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R73	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R74	S	1-247-888-11	CARBON 240K 5% 1/4W
R75	S	1-215-822-11	METAL FILM 47K 1% 1/8W
R76	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R77	S	1-214-772-00	METAL FILM 62K 1% 1/4W
R78	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R79	S	1-214-573-00	METAL FILM 4.7K 1% 1/8W
R80	S	1-247-893-11	CARBON 390K 5% 1/4W
R81	S	1-215-827-11	METAL FILM 75K 1% 1/8W
R82	S	1-214-739-00	METAL FILM 2.7K 1% 1/4W
R83	S	1-249-441-11	CARBON 100K 5% 1/4W
R84	S	1-214-533-00	METAL FILM 100 1% 1/8W
R85	S	1-247-889-00	CARBON 270K 5% 1/4W
R86	S	1-214-773-00	METAL FILM 68K 1% 1/4W
R87	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R88	S	1-214-753-00	METAL FILM 10K 1% 1/4W
R89	S	1-214-753-00	METAL FILM 10K 1% 1/4W
R90	S	1-214-746-00	METAL FILM 5.1K 1% 1/4W
R91	S	1-214-753-00	METAL FILM 10K 1% 1/4W
R92	S	1-214-746-00	METAL FILM 5.1K 1% 1/4W
R93	S	1-214-753-00	METAL FILM 10K 1% 1/4W
R94	S	1-214-746-00	METAL FILM 5.1K 1% 1/4W
R95	S	1-214-746-00	METAL FILM 5.1K 1% 1/4W
R96	S	1-214-578-00	METAL FILM 7.5K 1% 1/8W
R97	S	1-214-578-00	METAL FILM 7.5K 1% 1/8W
R98	S	1-214-753-00	METAL FILM 10K 1% 1/4W

Ref. No.	SP	SONY Parts No.	Description		
R99	S	1-214-753-00	METAL FILM	10K	1% 1/4W
R100	S	1-214-746-00	METAL FILM	5.1K	1% 1/4W
R101	S	1-214-753-00	METAL FILM	10K	1% 1/4W
R102	S	1-214-746-00	METAL FILM	5.1K	1% 1/4W
R103	S	1-214-753-00	METAL FILM	10K	1% 1/4W
R104	S	1-214-746-00	METAL FILM	5.1K	1% 1/4W
R105	S	1-214-746-00	METAL FILM	5.1K	1% 1/4W
R106	S	1-214-578-00	METAL FILM	7.5K	1% 1/8W
R107	S	1-214-578-00	METAL FILM	7.5K	1% 1/8W
R108	S	1-214-563-00	METAL FILM	1.8K	1% 1/8W
R109	S	1-214-567-00	METAL FILM	2.7K	1% 1/8W
R110	S	1-214-563-00	METAL FILM	1.8K	1% 1/8W
R111	S	1-214-567-00	METAL FILM	2.7K	1% 1/8W
R112	S	1-214-719-00	METAL FILM	390	1% 1/4W
R113	S	1-214-584-00	METAL FILM	13K	1% 1/8W
R114	S	1-214-719-00	METAL FILM	390	1% 1/4W
R115	S	1-214-581-00	METAL FILM	10K	1% 1/8W
R116	S	1-214-719-00	METAL FILM	390	1% 1/4W
R117	S	1-214-584-00	METAL FILM	13K	1% 1/8W
R118	S	1-214-719-00	METAL FILM	390	1% 1/4W
R119	S	1-214-581-00	METAL FILM	10K	1% 1/8W
R120	S	1-214-581-00	METAL FILM	10K	1% 1/8W
R121	S	1-214-565-00	METAL FILM	2.2K	1% 1/8W
R122	S	1-214-581-00	METAL FILM	10K	1% 1/8W
R123	S	1-214-574-00	METAL FILM	5.1K	1% 1/8W
R124	S	1-214-581-00	METAL FILM	10K	1% 1/8W
R125	S	1-214-565-00	METAL FILM	2.2K	1% 1/8W
R126	S	1-214-581-00	METAL FILM	10K	1% 1/8W
R127	S	1-214-574-00	METAL FILM	5.1K	1% 1/8W
R128	S	1-214-581-00	METAL FILM	10K	1% 1/8W
R129	S	1-214-574-00	METAL FILM	5.1K	1% 1/8W
R130	S	1-214-533-00	METAL FILM	100	1% 1/8W
R131	S	1-215-822-11	METAL FILM	47K	1% 1/8W
R132	S	1-214-533-00	METAL FILM	100	1% 1/8W
R133	S	1-218-203-11	METAL FILM	5.9K	1% 1/8W
R134	S	1-214-573-00	METAL FILM	4.7K	1% 1/8W
R135	S	1-214-593-00	METAL FILM	33K	1% 1/8W
R136	S	1-214-577-00	METAL FILM	6.8K	1% 1/8W
R137	S	1-214-573-00	METAL FILM	4.7K	1% 1/8W
R138	S	1-214-573-00	METAL FILM	4.7K	1% 1/8W
R139	S	1-214-574-00	METAL FILM	5.1K	1% 1/8W
R140	S	1-215-822-11	METAL FILM	47K	1% 1/8W
R141	S	1-214-573-00	METAL FILM	4.7K	1% 1/8W
R142	S	1-249-482-11	CARBON	4.7	5% 1/2W
R143	S	1-249-482-11	CARBON	4.7	5% 1/2W

Ref. No.	SP	SONY Parts No.	Description
R144	S	1-206-456-00	CARBON 5.1 5% 1/2W
R145	S	1-206-456-00	CARBON 5.1 5% 1/2W
R146	S	1-215-822-11	METAL FILM 47K 1% 1/8W
R147	S	1-215-822-11	METAL FILM 47K 1% 1/8W
R148	S	1-215-822-11	METAL FILM 47K 1% 1/8W
R149	S	1-215-822-11	METAL FILM 47K 1% 1/8W
R150	S	1-214-585-00	METAL FILM 15K 1% 1/8W
R151	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R152	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R153	S	1-214-587-00	METAL FILM 18K 1% 1/8W
R154	S	1-214-738-00	METAL FILM 2.4K 1% 1/4W
R156	S	1-214-545-00	METAL FILM 330 1% 1/8W
R157, R158	S	1-214-757-00	METAL FILM 15K PAIR
R159, R160	S	1-216-786-11	METAL FILM 180 PAIR
R161	S	1-214-743-00	METAL FILM 3.9K 1% 1/4W
R162, R163	S	1-216-787-11	METAL FILM 5.1K PAIR
R164, R165	S	1-216-787-11	METAL FILM 5.1K PAIR
R166	S	1-214-589-00	METAL FILM 22K 1% 1/8W
R169	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R170	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R171	S	1-247-888-11	METAL FILM 240K 5% 1/4W
R172	S	1-214-738-00	METAL FILM 2.4K 1% 1/4W
R173	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R174	S	1-214-553-00	METAL FILM 680 1% 1/8W
R175	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R176	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R177	S	1-214-573-00	METAL FILM 4.7K 1% 1/8W
R178	S	1-218-213-11	METAL FILM 21K 1% 1/8W
R179	S	1-218-228-11	METAL FILM 140K 1% 1/8W
R180	S	1-214-564-11	METAL FILM 2K 1% 1/8W
R181	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R182	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R183	S	1-215-830-11	METAL FILM 100K 1% 1/8W
R184	S	1-215-830-11	METAL FILM 100K 1% 1/8W
RV1	S	1-237-521-21	ADJ,METAL FILM 100K
RV2	S	1-237-514-21	ADJ,METAL FILM 500
RV3	S	1-237-518-21	ADJ,METAL FILM 10K
RV4	S	1-230-838-11	ADJ,METAL FILM 200
RV5	S	1-230-838-11	ADJ,METAL FILM 200

Ref. No.	SP	SONY Parts No.	Description
CNX BOARD		(1-619-162-11)	
	O	A-7850-339-A	COMPLETE PCB,CNX
			(This assembly includes the following parts.)
	S	1-561-832-00	SOCKET,SHORT
	O	1-937-551-12	HARNESS (CNX-LNT)
C1	S	1-124-584-00	ELECT 100MF 20% 10V
C2	S	1-126-096-11	ELECT 10MF 20% 25V
C3	S	1-126-096-11	ELECT 10MF 20% 25V
C4	S	1-161-485-00	CERAMIC 0.1MF 50V
C5	S	1-162-734-11	CERAMIC 0.001MF 10% 50V
C6	S	1-162-734-11	CERAMIC 0.001MF 10% 50V
C7	S	1-161-485-00	CERAMIC 0.1MF 50V
C8	S	1-161-485-00	CERAMIC 0.1MF 50V
C9	S	1-161-485-00	CERAMIC 0.1MF 50V
C10	S	1-161-485-00	CERAMIC 0.1MF 50V
C11	S	1-161-485-00	CERAMIC 0.1MF 50V
C12	S	1-161-485-00	CERAMIC 0.1MF 50V
C13	S	1-161-485-00	CERAMIC 0.1MF 50V
C14	S	1-161-485-00	CERAMIC 0.1MF 50V
C15	S	1-161-485-00	CERAMIC 0.1MF 50V
C16	S	1-161-485-00	CERAMIC 0.1MF 50V
C17	S	1-162-665-11	CERAMIC 5600PF 10% 50V
C18	S	1-162-734-11	CERAMIC 0.001MF 10% 50V
C19	S	1-162-734-11	CERAMIC 0.001MF 10% 50V
C20	S	1-124-282-00	ELECT 22MF 20% 16V
C21	S	1-124-282-00	ELECT 22MF 20% 16V
C22	S	1-161-485-00	CERAMIC 0.1MF 50V
C23	S	1-161-485-00	CERAMIC 0.1MF 50V
C24	S	1-162-665-11	CERAMIC 5600PF 10% 50V
C25	S	1-162-665-11	CERAMIC 5600PF 10% 50V
C26	S	1-161-485-00	CERAMIC 0.1MF 50V
C27	S	1-161-485-00	CERAMIC 0.1MF 50V
C28	S	1-161-485-00	CERAMIC 0.1MF 50V
C29	S	1-161-485-00	CERAMIC 0.1MF 50V
C30	S	1-161-485-00	CERAMIC 0.1MF 50V
C31	S	1-161-485-00	CERAMIC 0.1MF 50V
C32	S	1-161-485-00	CERAMIC 0.1MF 50V
C33	S	1-161-485-00	CERAMIC 0.1MF 50V
C34	S	1-161-485-00	CERAMIC 0.1MF 50V
C35	S	1-161-485-00	CERAMIC 0.1MF 50V

Ref. No.	SP	SONY Parts No.	Description
C36	S	1-161-485-00	CERAMIC 0.1MF 50V
C37	S	1-161-485-00	CERAMIC 0.1MF 50V
C38	S	1-161-485-00	CERAMIC 0.1MF 50V
C39	S	1-161-485-00	CERAMIC 0.1MF 50V
C40	S	1-161-485-00	CERAMIC 0.1MF 50V
C41	S	1-161-485-00	CERAMIC 0.1MF 50V
C42	S	1-161-485-00	CERAMIC 0.1MF 50V
C43	S	1-161-485-00	CERAMIC 0.1MF 50V
C44	S	1-161-485-00	CERAMIC 0.1MF 50V
C45	S	1-161-485-00	CERAMIC 0.1MF 50V
C46	S	1-161-485-00	CERAMIC 0.1MF 50V
CNJ451	O	1-506-903-11	CONNECTOR 16P
CNJ453	O	1-560-303-00	POST HEADER (IL CONNECTOR) 6P
CNJ454	O	1-560-300-00	POST HEADER (IL CONNECTOR) 3P
CNJ455	O	1-560-300-00	POST HEADER (IL CONNECTOR) 3P
CNJ800	S	1-563-893-21	CONNECTOR SOCKET 50P
CNJ801	S	1-563-890-21	CONNECTOR SOCKET 9P
CNJ802	S	1-563-890-21	CONNECTOR SOCKET 9P
D1	S	8-719-911-19	1SS119
D2	S	8-719-911-19	1SS119
D4	S	8-719-940-03	1N4004
D5	S	8-719-911-19	1SS119
D6	S	8-719-911-19	1SS119
D7	S	8-719-911-19	1SS119
D8	S	8-719-911-19	1SS119
D9	S	8-719-911-19	1SS119
D10	S	8-719-911-19	1SS119
D11	S	8-719-911-19	1SS119
D12	S	8-719-911-19	1SS119
D13	S	8-719-911-19	1SS119
D14	S	8-719-911-19	1SS119
D15	S	8-719-911-19	1SS119
D16	S	8-719-911-19	1SS119
D17	S	8-719-911-19	1SS119
D18	S	8-719-911-19	1SS119
D19	S	8-719-911-19	1SS119
D20	S	8-719-911-19	1SS119
D21	S	8-719-911-19	1SS119
D22	S	8-719-911-19	1SS119
D23	S	8-719-911-19	1SS119
D24	S	8-719-911-19	1SS119
D25	S	8-719-911-19	1SS119
D26	S	8-719-911-19	1SS119

Ref. No.	SP	SONY Parts No.	Description
D27	S	8-719-911-19	1SS119
D28	S	8-719-911-19	1SS119
D29	S	8-719-911-19	1SS119
D30	S	8-719-911-19	1SS119
D31	S	8-719-911-19	1SS119
D32	S	8-719-911-19	1SS119
D33	S	8-719-911-19	1SS119
D34	S	8-719-911-19	1SS119
D35	S	8-719-109-85	RD5.1ES-B2
D36	S	8-719-109-85	RD5.1ES-B2
D37	S	8-719-109-85	RD5.1ES-B2
D38	S	8-719-109-85	RD5.1ES-B2
D39	S	8-719-109-85	RD5.1ES-B2
D40	S	8-719-109-85	RD5.1ES-B2
D41	S	8-719-109-85	RD5.1ES-B2
D42	S	8-719-109-85	RD5.1ES-B2
D43	S	8-719-109-85	RD5.1ES-B2
D44	S	8-719-109-85	RD5.1ES-B2
D45	S	8-719-109-85	RD5.1ES-B2
D46	S	8-719-109-85	RD5.1ES-B2
D47	S	8-719-109-85	RD5.1ES-B2
D48	S	8-719-109-85	RD5.1ES-B2
D49	S	8-719-109-85	RD5.1ES-B2
D50	S	8-719-109-85	RD5.1ES-B2
F1	S	T-9410-119-1	PICO FUSE 1A 125V
F2	S	T-9410-119-1	PICO FUSE 1A 125V
IC1	S	8-759-202-56	TC74HC245P
IC2	S	8-759-202-16	TC74HC11P
IC3	S	8-759-100-88	uPD8279C-5
IC4	S	8-759-202-26	TC74HC138P
IC5	S	8-759-903-73	SN74LS373N
IC6	S	8-759-903-73	SN74LS373N
IC7	S	8-719-939-12	HCPL-2531
IC8	S	8-759-202-24	TC74HC86P
IC9	S	8-759-910-83	TL072ACP
IC10	S	8-759-990-04	TL074CN
IC11	S	8-759-909-33	LM311P
IC12	S	8-759-909-33	LM311P
IC13	S	8-759-990-04	TL074CN
IC14	S	T-9412-418-1	DLO-3
IC15	S	8-759-926-32	AM26LS32PC

Ref. No.	SP	SONY Parts No.	Description
IC16	S	8-759-926-31	AM26LS31PC
IC17	S	8-759-900-04	SN74LS04N
IC18	S	8-759-202-74	TC74HC04P
IC19	S	8-759-202-74	TC74HC04P
IC20	S	8-719-901-98	PC713
IC21	S	8-719-901-98	PC713
IC22	S	8-719-901-98	PC713
IC23	S	8-719-901-98	PC713
IC24	S	8-719-901-98	PC713
IC25	S	8-719-901-98	PC713
IC26	S	8-719-901-98	PC713
IC27	S	8-719-901-98	PC713
IC28	S	8-719-901-98	PC713
IC29	S	8-719-901-98	PC713
IC30	S	8-719-901-98	PC713
IC31	S	8-719-901-98	PC713
IC32	S	8-719-901-98	PC713
IC33	S	8-719-901-98	PC713
JU1	S	1-566-388-11	PIN,SHORT
JU2	S	1-566-388-11	PIN,SHORT
JU3	S	1-566-388-11	PIN,SHORT
JU4	S	1-566-388-11	PIN,SHORT
JU5	S	1-566-388-11	PIN,SHORT
JU6	S	1-566-388-11	PIN,SHORT
JU7	S	1-566-388-11	PIN,SHORT
K1	S	1-515-670-11	RELAY,P.C. MOUNT
K2	S	1-515-670-11	RELAY,P.C. MOUNT
K3	S	1-515-670-11	RELAY,P.C. MOUNT
K4	S	1-515-670-11	RELAY,P.C. MOUNT
Q1	S	8-729-139-04	2N3904
Q2	S	8-729-139-04	2N3904
Q3	S	T-9410-287-1	SP7000-0127-02
Q4	S	8-729-904-15	VN10KM
Q5	S	8-729-904-15	VN10KM
R1	S	1-249-429-11	CARBON 10K 5% 1/4W
R2	S	1-249-417-11	CARBON 1K 5% 1/4W
R3	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R4	S	1-249-413-11	CARBON 470 5% 1/4W
R5	S	1-249-413-11	CARBON 470 5% 1/4W
R6	S	1-249-441-11	CARBON 100K 5% 1/4W
R7	S	1-249-429-11	CARBON 10K 5% 1/4W
R8	S	1-247-903-00	CARBON 1M 5% 1/4W
R9	S	1-247-903-00	CARBON 1M 5% 1/4W
R10	S	1-247-903-00	CARBON 1M 5% 1/4W

Ref. No.	SP	SONY Parts No.	Description
R11	S	1-249-441-11	CARBON 100K 5% 1/4W
R12	S	1-249-441-11	CARBON 100K 5% 1/4W
R13	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R14	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R15	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R16	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R17	S	1-249-405-11	CARBON 100 5% 1/4W
R18	S	1-249-429-11	CARBON 10K 5% 1/4W
R19	S	1-249-429-11	CARBON 10K 5% 1/4W
R20	S	1-247-903-00	CARBON 1M 5% 1/4W
R21	S	1-249-429-11	CARBON 10K 5% 1/4W
R22	S	1-249-429-11	CARBON 10K 5% 1/4W
R23	S	1-249-405-11	CARBON 100 5% 1/4W
R24	S	1-249-405-11	CARBON 100 5% 1/4W
R25	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R26	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R27	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R28	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R29	S	1-249-441-11	CARBON 100K 5% 1/4W
R30	S	1-249-441-11	CARBON 100K 5% 1/4W
R31	S	1-249-441-11	CARBON 100K 5% 1/4W
R32	S	1-249-441-11	CARBON 100K 5% 1/4W
R33	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R34	S	1-249-441-11	CARBON 100K 5% 1/4W
R35	S	1-249-441-11	CARBON 100K 5% 1/4W
R36	S	1-249-417-11	CARBON 1K 5% 1/4W
R37	S	1-249-417-11	CARBON 1K 5% 1/4W
R38	S	1-249-441-11	CARBON 100K 5% 1/4W
R39	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R40	S	1-249-441-11	CARBON 100K 5% 1/4W
R41	S	1-249-441-11	CARBON 100K 5% 1/4W
R42	S	1-249-441-11	CARBON 100K 5% 1/4W
R43	S	1-249-441-11	CARBON 100K 5% 1/4W
R44	S	1-249-441-11	CARBON 100K 5% 1/4W
R45	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R46	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R47	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R48	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R49	S	1-249-406-11	CARBON 120 5% 1/4W
R50	S	1-249-429-11	CARBON 10K 5% 1/4W
R51	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R52	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R53	S	1-247-701-11	CARBON 120 5% 1/4W
R54	S	1-247-701-11	CARBON 120 5% 1/4W
R55	S	1-249-429-11	CARBON 10K 5% 1/4W

Ref. No.	SP	SONY Parts No.	Description
R56	S	1-249-429-11	CARBON 10K 5% 1/4W
R57	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R58	S	1-249-406-11	CARBON 120 5% 1/4W
R59	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R60	S	1-249-406-11	CARBON 120 5% 1/4W
R61	S	1-249-413-11	CARBON 470 5% 1/4W
R62	S	1-249-413-11	CARBON 470 5% 1/4W
R63	S	1-249-413-11	CARBON 470 5% 1/4W
R64	S	1-249-413-11	CARBON 470 5% 1/4W
R65	S	1-249-413-11	CARBON 470 5% 1/4W
R66	S	1-249-413-11	CARBON 470 5% 1/4W
R67	S	1-249-413-11	CARBON 470 5% 1/4W
R68	S	1-249-441-11	CARBON 100K 5% 1/4W
R69	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R70	S	1-249-413-11	CARBON 470 5% 1/4W
R71	S	1-249-413-11	CARBON 470 5% 1/4W
R72	S	1-249-413-11	CARBON 470 5% 1/4W
R73	S	1-249-413-11	CARBON 470 5% 1/4W
R74	S	1-249-413-11	CARBON 470 5% 1/4W
R75	S	1-249-413-11	CARBON 470 5% 1/4W
R76	S	1-249-413-11	CARBON 470 5% 1/4W
R77	S	1-249-393-11	CARBON 10 5% 1/4W
R78	S	1-249-393-11	CARBON 10 5% 1/4W
R79	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R80	S	1-249-425-11	CARBON 4.7K 5% 1/4W
R81	S	1-249-425-11	CARBON 4.7K 5% 1/4W
R82	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R83	S	1-249-426-11	CARBON 5.6K 5% 1/4W
RN2	S	1-231-409-00	RESISTOR BLOCK,5.6K
RN3	S	1-231-527-11	RESISTOR BLOCK,5.6Kx4
RN4	S	1-231-409-00	RESISTOR BLOCK,5.6K
RV1	S	1-237-514-21	ADJ,METAL FILM 500
RV2	S	1-237-518-21	ADJ,METAL FILM 10K
RV3	S	1-237-520-21	ADJ,METAL FILM 50K

Ref. No.	SP	SONY Parts No.	Description
CNX BOARD		(1-619-162-12)	
	O	A-7850-339-B	COMPLETE PCB,CNX
			(This assembly includes the following parts.)
	S	1-561-832-00	SOCKET,SHORT
C1	S	1-124-584-00	ELECT 100MF 20% 10V
C2	S	1-126-096-11	ELECT 10MF 20% 25V
C3	S	1-126-096-11	ELECT 10MF 20% 25V
C4	S	1-161-485-00	CERAMIC 0.1MF 50V
C5	S	1-162-734-11	CERAMIC 0.001MF 10% 50V
C6	S	1-162-734-11	CERAMIC 0.001MF 10% 50V
C7	S	1-161-485-00	CERAMIC 0.1MF 50V
C8	S	1-161-485-00	CERAMIC 0.1MF 50V
C9	S	1-161-485-00	CERAMIC 0.1MF 50V
C10	S	1-161-485-00	CERAMIC 0.1MF 50V
C11	S	1-161-485-00	CERAMIC 0.1MF 50V
C12	S	1-161-485-00	CERAMIC 0.1MF 50V
C13	S	1-161-485-00	CERAMIC 0.1MF 50V
C14	S	1-161-485-00	CERAMIC 0.1MF 50V
C15	S	1-161-485-00	CERAMIC 0.1MF 50V
C16	S	1-161-485-00	CERAMIC 0.1MF 50V
C17	S	1-162-665-11	CERAMIC 5600PF 10% 50V
C18	S	1-162-734-11	CERAMIC 0.001MF 10% 50V
C19	S	1-162-734-11	CERAMIC 0.001MF 10% 50V
C20	S	1-124-282-00	ELECT 22MF 20% 16V
C21	S	1-124-282-00	ELECT 22MF 20% 16V
C22	S	1-161-485-00	CERAMIC 0.1MF 50V
C23	S	1-161-485-00	CERAMIC 0.1MF 50V
C24	S	1-162-665-11	CERAMIC 5600PF 10% 50V
C25	S	1-162-665-11	CERAMIC 5600PF 10% 50V
C26	S	1-161-485-00	CERAMIC 0.1MF 50V
C27	S	1-161-485-00	CERAMIC 0.1MF 50V
C28	S	1-161-485-00	CERAMIC 0.1MF 50V
C29	S	1-161-485-00	CERAMIC 0.1MF 50V
C30	S	1-161-485-00	CERAMIC 0.1MF 50V
C31	S	1-161-485-00	CERAMIC 0.1MF 50V
C32	S	1-161-485-00	CERAMIC 0.1MF 50V
C33	S	1-161-485-00	CERAMIC 0.1MF 50V
C34	S	1-161-485-00	CERAMIC 0.1MF 50V
C35	S	1-161-485-00	CERAMIC 0.1MF 50V

Ref. No.	SP	SONY Parts No.	Description
C36	S	1-161-485-00	CERAMIC 0.1MF 50V
C37	S	1-161-485-00	CERAMIC 0.1MF 50V
C38	S	1-161-485-00	CERAMIC 0.1MF 50V
C39	S	1-161-485-00	CERAMIC 0.1MF 50V
C40	S	1-161-485-00	CERAMIC 0.1MF 50V
C41	S	1-161-485-00	CERAMIC 0.1MF 50V
C42	S	1-161-485-00	CERAMIC 0.1MF 50V
C43	S	1-161-485-00	CERAMIC 0.1MF 50V
C44	S	1-161-485-00	CERAMIC 0.1MF 50V
C45	S	1-161-485-00	CERAMIC 0.1MF 50V
C46	S	1-161-485-00	CERAMIC 0.1MF 50V
C47	S	1-161-485-00	CERAMIC 0.1MF 50V
C48	S	1-126-096-11	ELECT 10MF 20% 25V
CNJ450	O	1-937-551-12	HARNESS (CNX-LNT)
CNJ451	O	1-506-903-11	CONNECTOR 16P
CNJ453	O	1-560-303-00	POST HEADER (IL CONNECTOR) 6P
CNJ454	O	1-560-300-00	POST HEADER (IL CONNECTOR) 3P
CNJ455	O	1-560-300-00	POST HEADER (IL CONNECTOR) 3P
CNJ456	O	1-564-693-21	CONNECTOR, RIBBON CABLE 10P
CNJ800	S	1-563-894-21	CONNECTOR SOCKET 50P
CNJ801	S	1-563-890-21	CONNECTOR SOCKET 9P
CNJ802	S	1-563-890-21	CONNECTOR SOCKET 9P
D1	S	8-719-911-19	1SS119
D2	S	8-719-911-19	1SS119
D4	S	8-719-940-03	1N4004
D5	S	8-719-911-19	1SS119
D6	S	8-719-911-19	1SS119
D7	S	8-719-911-19	1SS119
D8	S	8-719-911-19	1SS119
D9	S	8-719-911-19	1SS119
D10	S	8-719-911-19	1SS119
D11	S	8-719-911-19	1SS119
D12	S	8-719-911-19	1SS119
D13	S	8-719-911-19	1SS119
D14	S	8-719-911-19	1SS119
D15	S	8-719-911-19	1SS119
D16	S	8-719-911-19	1SS119
D17	S	8-719-911-19	1SS119
D18	S	8-719-911-19	1SS119
D19	S	8-719-911-19	1SS119
D20	S	8-719-911-19	1SS119
D21	S	8-719-911-19	1SS119
D22	S	8-719-911-19	1SS119
D23	S	8-719-911-19	1SS119
D24	S	8-719-911-19	1SS119
D25	S	8-719-911-19	1SS119
D26	S	8-719-911-19	1SS119

Ref. No.	SP	SONY Parts No.	Description
D27	S	8-719-911-19	1SS119
D28	S	8-719-911-19	1SS119
D29	S	8-719-911-19	1SS119
D30	S	8-719-911-19	1SS119
D31	S	8-719-911-19	1SS119
D32	S	8-719-911-19	1SS119
D33	S	8-719-911-19	1SS119
D34	S	8-719-911-19	1SS119
D35	S	8-719-109-85	RD5.1ES-B2
D36	S	8-719-109-85	RD5.1ES-B2
D37	S	8-719-109-85	RD5.1ES-B2
D38	S	8-719-109-85	RD5.1ES-B2
D39	S	8-719-109-85	RD5.1ES-B2
D40	S	8-719-109-85	RD5.1ES-B2
D41	S	8-719-109-85	RD5.1ES-B2
D42	S	8-719-109-85	RD5.1ES-B2
D43	S	8-719-109-85	RD5.1ES-B2
D44	S	8-719-109-85	RD5.1ES-B2
D45	S	8-719-109-85	RD5.1ES-B2
D46	S	8-719-109-85	RD5.1ES-B2
D47	S	8-719-109-85	RD5.1ES-B2
D48	S	8-719-109-85	RD5.1ES-B2
D49	S	8-719-109-85	RD5.1ES-B2
D50	S	8-719-109-85	RD5.1ES-B2
IC1	S	8-759-202-56	TC74HC245P
IC2	S	8-759-202-16	TC74HC11P
IC3	S	8-759-100-88	uPD8279C-5
IC4	S	8-759-202-26	TC74HC138P
IC5	S	8-759-903-73	SN74LS373N
IC6	S	8-759-903-73	SN74LS373N
IC7	S	8-719-939-12	HCPL-2531
IC8	S	8-759-202-24	TC74HC86P
IC9	S	8-759-910-83	TL072ACP
IC10	S	8-759-990-04	TL074CN
IC11	S	8-759-909-33	LM311P
IC12	S	8-759-909-33	LM311P
IC13	S	8-759-990-04	TL074CN
IC14	S	T-9412-418-1	DLO-3
IC15	S	8-759-926-32	AM26LS32PC

Ref. No.	SP	SONY Parts No.	Description
IC16	S	8-759-926-31	AM26LS31PC
IC17	S	8-759-900-04	SN74LS04N
IC18	S	8-759-202-74	TC74HC04P
IC19	S	8-759-202-74	TC74HC04P
IC20	S	8-719-901-98	PC713
IC21	S	8-719-901-98	PC713
IC22	S	8-719-901-98	PC713
IC23	S	8-719-901-98	PC713
IC24	S	8-719-901-98	PC713
IC25	S	8-719-901-98	PC713
IC26	S	8-719-901-98	PC713
IC27	S	8-719-901-98	PC713
IC28	S	8-719-901-98	PC713
IC29	S	8-719-901-98	PC713
IC30	S	8-719-901-98	PC713
IC31	S	8-719-901-98	PC713
IC32	S	8-719-901-98	PC713
IC33	S	8-719-901-98	PC713
IC34	S	8-759-171-05	uPC7805H
JU1	S	1-566-388-11	PIN,SHORT
JU2	S	1-566-388-11	PIN,SHORT
JU3	S	1-566-388-11	PIN,SHORT
JU4	S	1-566-388-11	PIN,SHORT
JU7	S	1-566-388-11	PIN,SHORT
JU8	S	1-566-388-11	PIN,SHORT
K1	S	1-515-670-11	RELAY,P.C. MOUNT
K2	S	1-515-670-11	RELAY,P.C. MOUNT
K3	S	1-515-670-11	RELAY,P.C. MOUNT
K4	S	1-515-670-11	RELAY,P.C. MOUNT
Q1	S	8-729-139-04	2N3904
Q2	S	8-729-139-04	2N3904
Q3	S	T-9410-287-1	SP7000-0127-02
Q4	S	8-729-904-15	VN10KM
Q5	S	8-729-904-15	VN10KM
R1	S	1-249-429-11	CARBON 10K 5% 1/4W
R2	S	1-249-417-11	CARBON 1K 5% 1/4W
R3	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R4	S	1-249-413-11	CARBON 470 5% 1/4W
R5	S	1-249-413-11	CARBON 470 5% 1/4W
R6	S	1-249-441-11	CARBON 100K 5% 1/4W
R7	S	1-249-429-11	CARBON 10K 5% 1/4W
R8	S	1-247-903-00	CARBON 1M 5% 1/4W
R9	S	1-247-903-00	CARBON 1M 5% 1/4W
R10	S	1-247-903-00	CARBON 1M 5% 1/4W

Ref. No.	SP	SONY Parts No.	Description
R11	S	1-249-441-11	CARBON 100K 5% 1/4W
R12	S	1-249-441-11	CARBON 100K 5% 1/4W
R13	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R14	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R15	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R16	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R17	S	1-249-405-11	CARBON 100 5% 1/4W
R18	S	1-249-429-11	CARBON 10K 5% 1/4W
R19	S	1-249-429-11	CARBON 10K 5% 1/4W
R20	S	1-247-903-00	CARBON 1M 5% 1/4W
R21	S	1-249-429-11	CARBON 10K 5% 1/4W
R22	S	1-249-429-11	CARBON 10K 5% 1/4W
R23	S	1-249-405-11	CARBON 100 5% 1/4W
R24	S	1-249-405-11	CARBON 100 5% 1/4W
R25	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R26	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R27	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R28	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R29	S	1-249-441-11	CARBON 100K 5% 1/4W
R30	S	1-249-441-11	CARBON 100K 5% 1/4W
R31	S	1-249-441-11	CARBON 100K 5% 1/4W
R32	S	1-249-441-11	CARBON 100K 5% 1/4W
R33	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R34	S	1-249-441-11	CARBON 100K 5% 1/4W
R35	S	1-249-441-11	CARBON 100K 5% 1/4W
R36	S	1-249-417-11	CARBON 1K 5% 1/4W
R37	S	1-249-417-11	CARBON 1K 5% 1/4W
R38	S	1-249-441-11	CARBON 100K 5% 1/4W
R39	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R40	S	1-249-441-11	CARBON 100K 5% 1/4W
R41	S	1-249-441-11	CARBON 100K 5% 1/4W
R42	S	1-249-441-11	CARBON 100K 5% 1/4W
R43	S	1-249-441-11	CARBON 100K 5% 1/4W
R44	S	1-249-441-11	CARBON 100K 5% 1/4W
R45	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R46	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R47	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R48	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R49	S	1-249-406-11	CARBON 120 5% 1/4W
R50	S	1-249-429-11	CARBON 10K 5% 1/4W
R51	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R52	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R53	S	1-247-701-11	CARBON 120 5% 1/4W
R54	S	1-247-701-11	CARBON 120 5% 1/4W
R55	S	1-249-429-11	CARBON 10K 5% 1/4W

Ref. No.	SP	SONY Parts No.	Description
R56	S	1-249-429-11	CARBON 10K 5% 1/4W
R57	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R58	S	1-249-406-11	CARBON 120 5% 1/4W
R59	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R60	S	1-249-406-11	CARBON 120 5% 1/4W
R61	S	1-249-413-11	CARBON 470 5% 1/4W
R62	S	1-249-413-11	CARBON 470 5% 1/4W
R63	S	1-249-413-11	CARBON 470 5% 1/4W
R64	S	1-249-413-11	CARBON 470 5% 1/4W
R65	S	1-249-413-11	CARBON 470 5% 1/4W
R66	S	1-249-413-11	CARBON 470 5% 1/4W
R67	S	1-249-413-11	CARBON 470 5% 1/4W
R68	S	1-249-441-11	CARBON 100K 5% 1/4W
R69	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R70	S	1-249-413-11	CARBON 470 5% 1/4W
R71	S	1-249-413-11	CARBON 470 5% 1/4W
R72	S	1-249-413-11	CARBON 470 5% 1/4W
R73	S	1-249-413-11	CARBON 470 5% 1/4W
R74	S	1-249-413-11	CARBON 470 5% 1/4W
R75	S	1-249-413-11	CARBON 470 5% 1/4W
R76	S	1-249-413-11	CARBON 470 5% 1/4W
R77	S	1-249-393-11	CARBON 10 5% 1/4W
R78	S	1-249-393-11	CARBON 10 5% 1/4W
R79	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R80	S	1-249-425-11	CARBON 4.7K 5% 1/4W
R81	S	1-249-425-11	CARBON 4.7K 5% 1/4W
R82	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R83	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R84	S	1-247-728-11	CARBON 12 5% 1/2W
RN2	S	1-231-409-00	RESISTOR BLOCK,5.6K
RN3	S	1-231-527-11	RESISTOR BLOCK,5.6Kx4
RN4	S	1-231-409-00	RESISTOR BLOCK,5.6K
RV1	S	1-237-514-21	ADJ,METAL FILM 500
RV2	S	1-237-518-21	ADJ,METAL FILM 10K
RV3	S	1-237-520-21	ADJ,METAL FILM 50K

Ref. No.	SP	SONY Parts No.	Description
CPU BOARD		(1-619-161-11)	
	O	A-7850-358-A	COMPLETE PCB,CPU (For APR-5002A) (This assembly includes the following parts.)
	S	1-561-832-00	SOCKET,SHORT
B1	O	T-9413-327-1	LITHIUM BATTERY
C1	S	1-124-584-00	ELECT 100MF 20% 10V
C2	S	1-123-357-00	ELECT 22MF 20% 35V
C3	S	1-123-357-00	ELECT 22MF 20% 35V
C4	S	1-124-902-00	ELECT 0.47MF 20% 50V
C5	S	1-130-471-00	PE TEREPHTHALATE 0.001MF 5% 50V
C6	S	1-162-667-11	CERAMIC 10PF 5% 50V
C7	S	1-162-667-11	CERAMIC 10PF 5% 50V
C8	S	1-130-471-00	PE TEREPHTHALATE 0.001MF 5% 50V
C9	S	1-161-896-11	CERAMIC 0.22MF 50V
C10	S	1-130-471-00	PE TEREPHTHALATE 0.001MF 5% 50V
C11	S	1-130-471-00	PE TEREPHTHALATE 0.001MF 5% 50V
C12	S	1-161-485-00	CERAMIC 0.1MF 50V
C13	S	1-161-485-00	CERAMIC 0.1MF 50V
C14	S	1-130-471-00	PE TEREPHTHALATE 0.001MF 5% 50V
C15	S	1-130-471-00	PE TEREPHTHALATE 0.001MF 5% 50V
C16	S	1-161-485-00	CERAMIC 0.1MF 50V
C17	S	1-161-485-00	CERAMIC 0.1MF 50V
C18	S	1-161-485-00	CERAMIC 0.1MF 50V
C19	S	1-161-485-00	CERAMIC 0.1MF 50V
C20	S	1-161-485-00	CERAMIC 0.1MF 50V
C21	S	1-161-485-00	CERAMIC 0.1MF 50V
C22	S	1-161-485-00	CERAMIC 0.1MF 50V
C23	S	1-161-485-00	CERAMIC 0.1MF 50V
C24	S	1-161-485-00	CERAMIC 0.1MF 50V
C25	S	1-161-485-00	CERAMIC 0.1MF 50V
C26	S	1-161-485-00	CERAMIC 0.1MF 50V
C27	S	1-161-485-00	CERAMIC 0.1MF 50V
C28	S	1-161-485-00	CERAMIC 0.1MF 50V
C29	S	1-161-485-00	CERAMIC 0.1MF 50V
C30	S	1-161-485-00	CERAMIC 0.1MF 50V

Ref. No.	SP	SONY Parts No.	Description
C31	S	1-161-485-00	CERAMIC 0.1MF 50V
C32	S	1-161-485-00	CERAMIC 0.1MF 50V
C33	S	1-161-485-00	CERAMIC 0.1MF 50V
C34	S	1-161-485-00	CERAMIC 0.1MF 50V
C35	S	1-161-485-00	CERAMIC 0.1MF 50V
C36	S	1-161-485-00	CERAMIC 0.1MF 50V
C37	S	1-161-485-00	CERAMIC 0.1MF 50V
C38	S	1-161-485-00	CERAMIC 0.1MF 50V
C39	S	1-161-485-00	CERAMIC 0.1MF 50V
C40	S	1-161-485-00	CERAMIC 0.1MF 50V
C41	S	1-162-871-11	CERAMIC 47PF 5% 50V
C42	S	1-162-871-11	CERAMIC 47PF 5% 50V
C43	S	1-130-471-00	PE TEREPHTHALATE 0.001MF 5% 50V
C44	S	1-130-471-00	PE TEREPHTHALATE 0.001MF 5% 50V
C45	S	1-161-485-00	CERAMIC 0.1MF 50V
C46	S	1-161-485-00	CERAMIC 0.1MF 50V
C47	S	1-130-471-00	PE TEREPHTHALATE 0.001MF 5% 50V
C48	S	1-130-471-00	PE TEREPHTHALATE 0.001MF 5% 50V
C49	S	1-162-714-11	CERAMIC 150PF 5% 50V
C50	S	1-162-871-11	CERAMIC 47PF 5% 50V
C51	S	1-162-871-11	CERAMIC 47PF 5% 50V
C52	S	1-162-667-11	CERAMIC 10PF 5% 50V
C53	S	1-161-485-00	CERAMIC 0.1MF 50V
C54	S	1-161-485-00	CERAMIC 0.1MF 50V
CNJ420	O	1-564-699-21	CONNECTOR,RIBBON CABLE 34P
CNJ421	O	1-506-904-11	CONNECTOR,FLAT CABLE 40P
CNJ422	O	1-506-904-11	CONNECTOR,FLAT CABLE 40P
CNJ950	O	1-560-305-00	POST HEADER (IL CONNECTOR) 10P
D1	S	8-719-911-19	1SS119
D2	S	8-719-911-19	1SS119
D3	S	8-719-912-20	1SS120
D4	S	8-719-912-20	1SS120
D5	S	8-719-911-19	1SS119
D6	S	8-719-911-19	1SS119
D7	S	8-719-911-19	1SS119
IC1	S	8-759-937-43	Z8002APS
IC2	S	8-759-202-74	TC74HC04P
IC3	S	8-759-202-11	TC74HC00P
IC4	S	8-759-202-21	TC74HC32P
IC5	S	8-759-202-18	TC74HC20P

Ref. No.	SP	SONY Parts No.	Description		
IC6	S	8-759-995-14	AM9513DC		
IC7	S	8-759-995-14	AM9513DC		
IC8	S	8-759-202-15	TC74HC10P		
IC9	S	8-759-203-48	TC74HC573P		
IC10	S	8-759-203-48	TC74HC573P		
IC11	S	8-759-202-26	TC74HC138P		
IC12	S	8-759-202-32	TC74HC163P		
IC13	S	T-9413-954-2	P2.01.04.4 ODD	Programmed SET P2.01.04.4 T-9413-953-2	APR-5001 (Up to S/N 20521) APR-5002 (Up to S/N 20615)
IC14	S	T-9413-955-2	P2.01.04.4 EVEN		
IC13	S	T-9413-957-3	P4.01.01.1 ODD	Programmed SET P4.01.01.1 T-9413-956-3	APR-5001 (S/N 20522 and higher) APR-5002 (S/N 20616 and higher)
IC14	S	T-9413-958-3	P4.01.01.1 EVEN		
IC15	S	8-759-202-26	TC74HC138P		
IC16	S	8-759-300-63	HM6264LP-15		
IC17	S	8-759-300-63	HM6264LP-15		
IC18	S	8-759-202-74	TC74HC04P		
IC19	S	8-759-000-XX	MC74HC74N		
IC20	S	8-759-001-42	MC74HC174N		
IC22	S	8-759-202-86	TC74HC123P		
IC23	S	8-759-001-00	MC74HC132N		
IC24	S	8-759-937-46	Z8030APS		
IC25	S	8-759-937-44	Z8036APS		
IC26	S	8-759-900-26	SN74LS26N		
IC27	S	8-759-202-11	TC74HC00P		
IC28	S	8-759-000-XX	MC74HC74N		
IC29	S	8-759-000-XX	MC74HC74N		
IC30	S	8-759-001-42	MC74HC174N		
IC31	S	8-759-203-01	TC74HC175P		
IC32	S	8-759-202-24	TC74HC86P		
IC33	S	8-759-937-49	RC4152NB		
IC34	S	8-759-937-49	RC4152NB		
IC36	S	8-759-937-49	RC4152NB		
IC37	S	8-759-937-49	RC4152NB		
IC38	S	8-759-202-56	TC74HC245P		
IC39	S	8-759-202-56	TC74HC245P		
IC40	S	8-759-202-56	TC74HC245P		
IC41	S	8-759-202-55	TC74HC244P		
IC42	S	8-759-202-55	TC74HC244P		

Ref. No.	SP	SONY Parts No.	Description
IC43	S	8-759-202-55	TC74HC244P
IC44	S	8-759-937-40	DG212CJ
IC45	S	8-759-202-17	TC74HC14P
IC46	S	8-759-937-49	RC4152NB
IC47	S	8-759-937-49	RC4152NB
IC48	S	8-759-937-49	RC4152NB
IC50	S	8-719-901-03	PC525
JU1	S	1-560-733-00	PIN,SHORT
JU2	S	1-560-733-00	PIN,SHORT
JU3	S	1-560-733-00	PIN,SHORT
JU4	S	1-560-733-00	PIN,SHORT
JU5	S	1-560-733-00	PIN,SHORT
JU6	S	1-560-733-00	PIN,SHORT
JU7	S	1-560-733-00	PIN,SHORT
JU8	S	1-560-733-00	PIN,SHORT
JU9	S	1-560-733-00	PIN,SHORT
JU10	S	1-560-733-00	PIN,SHORT
JU11	S	1-560-733-00	PIN,SHORT
L1	S	1-421-329-00	COIL,CHOKE
Q1	S	8-729-113-08	2N3906
Q2	S	8-729-139-04	2N3904
Q3	S	8-729-139-04	2N3904
R1	S	1-249-393-11	CARBON 10 5% 1/4W
R2	S	1-249-393-11	CARBON 10 5% 1/4W
R3	S	1-249-417-11	CARBON 1K 5% 1/4W
R4	S	1-247-852-11	CARBON 7.5K 5% 1/4W
R5	S	1-247-903-00	CARBON 1M 5% 1/4W
R6	S	1-249-441-11	CARBON 100K 5% 1/4W
R7	S	1-247-849-00	CARBON 5.6K 5% 1/4W
R8	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R9	S	1-214-569-00	METAL FILM 3.3K 1% 1/8W
R10	S	1-214-552-00	METAL FILM 620 1% 1/8W
R11	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R12	S	1-247-854-11	CARBON 9.1K 5% 1/4W
R13	S	1-247-887-00	CARBON 220K 5% 1/4W
R14	S	1-249-417-11	CARBON 1K 5% 1/4W
R15	S	1-249-441-11	CARBON 100K 5% 1/4W
R16	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R17	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R18	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R19	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R20	S	1-249-426-11	CARBON 5.6K 5% 1/4W

Ref. No.	SP	SONY Parts No.	Description			
R21	S	1-249-426-11	CARBON	5.6K	5%	1/6W
R22	S	1-249-426-11	CARBON	5.6K	5%	1/6W
R23	S	1-249-426-11	CARBON	5.6K	5%	1/6W
R24	S	1-249-426-11	CARBON	5.6K	5%	1/6W
R25	S	1-249-437-11	CARBON	47K	5%	1/6W
R26	S	1-249-437-11	CARBON	47K	5%	1/6W
R27	S	1-249-439-11	CARBON	68K	5%	1/6W
R28	S	1-249-439-11	CARBON	68K	5%	1/6W
R29	S	1-249-437-11	CARBON	47K	5%	1/6W
R30	S	1-249-437-11	CARBON	47K	5%	1/6W
R31	S	1-247-903-00	CARBON	1M	5%	1/6W
R32	S	1-247-903-00	CARBON	1M	5%	1/6W
R33	S	1-247-883-00	CARBON	150K	5%	1/6W
R34	S	1-247-883-00	CARBON	150K	5%	1/6W
R35	S	1-249-426-11	CARBON	5.6K	5%	1/6W
R36	S	1-249-426-11	CARBON	5.6K	5%	1/6W
R37	S	1-214-565-00	METAL FILM	2.2K	1%	1/8W
R38	S	1-214-563-00	METAL FILM	1.8K	1%	1/8W
R39	S	1-249-426-11	CARBON	5.6K	5%	1/6W
R40	S	1-249-426-11	CARBON	5.6K	5%	1/6W
R41	S	1-249-426-11	CARBON	5.6K	5%	1/6W
R42	S	1-249-426-11	CARBON	5.6K	5%	1/6W
R43	S	1-249-426-11	CARBON	5.6K	5%	1/6W
R44	S	1-247-878-00	CARBON	91K	5%	1/6W
R45	S	1-247-878-00	CARBON	91K	5%	1/6W
R46	S	1-247-883-00	CARBON	150K	5%	1/6W
R47	S	1-247-883-00	CARBON	150K	5%	1/6W
R48	S	1-247-903-00	CARBON	1M	5%	1/6W
R49	S	1-247-903-00	CARBON	1M	5%	1/6W
R50	S	1-249-437-11	CARBON	47K	5%	1/6W
R51	S	1-249-437-11	CARBON	47K	5%	1/6W
R52	S	1-249-426-11	CARBON	5.6K	5%	1/6W
R53	S	1-249-426-11	CARBON	5.6K	5%	1/6W
R54	S	1-249-413-11	CARBON	470	5%	1/6W
R55	S	1-249-441-11	CARBON	100K	5%	1/6W
R57	S	1-247-804-11	CARBON	75		1/6W
R58	S	1-249-437-11	CARBON	47K	5%	1/6W
R59	S	1-249-437-11	CARBON	47K	5%	1/6W
R60	S	1-249-426-11	CARBON	5.6K	5%	1/6W
R61	S	1-249-426-11	CARBON	5.6K	5%	1/6W
R62	S	1-249-426-11	CARBON	5.6K	5%	1/6W
R63	S	1-249-426-11	CARBON	5.6K	5%	1/6W
R64	S	1-249-426-11	CARBON	5.6K	5%	1/6W
R65	S	1-249-426-11	CARBON	5.6K	5%	1/6W
R66	S	1-249-426-11	CARBON	5.6K	5%	1/6W

Ref. No.	SP	SONY Parts No.	Description
R67	S	1-214-567-00	METAL FILM 2.7K 1% 1/8W
R68	S	1-214-567-00	METAL FILM 2.7K 1% 1/8W
RN1	S	1-231-409-00	RESISTOR BLOCK 5.6K
RN2	S	1-231-409-00	RESISTOR BLOCK 5.6K
RN3	S	1-231-409-00	RESISTOR BLOCK 5.6K
RN4	S	1-231-409-00	RESISTOR BLOCK 5.6K
RN5	S	1-231-409-00	RESISTOR BLOCK 5.6K
RN6	S	1-231-409-00	RESISTOR BLOCK 5.6K
RV1	S	1-228-462-00	ADJ,CERMET 100K
RV2	S	1-228-462-00	ADJ,CERMET 100K
RV3	S	1-228-461-00	ADJ,CERMET 50K
RV4	S	1-228-461-00	ADJ,CERMET 50K
S1	S	1-554-750-11	SWITCH,KEY BOARD (WITH LED)
Y1	S	1-567-691-12	OSC 7.872MHz

Ref. No.	SP	SONY Parts No.	Description
CPU BOARD (1-619-161-12)			
	O	A-7850-358-A	COMPLETE PCB,CPU (For APR-5002A)
	O	A-7850-736-A	COMPLETE PCB,CPU (For APR-5003V)
		(These assemblies include the following parts.)	
	S	1-561-832-00	SOCKET,SHORT
B1	O	T-9413-327-1	LITHIUM BATTERY
C1	S	1-124-584-00	ELECT 100MF 20% 10V
C2	S	1-123-357-00	ELECT 22MF 20% 35V
C3	S	1-123-357-00	ELECT 22MF 20% 35V
C4	S	1-124-902-00	ELECT 0.47MF 20% 50V
C5	S	1-130-471-00	PE TEREPHTHALATE 0.001MF 5% 50V
C6	S	1-162-667-11	CERAMIC 10PF 5% 50V
C7	S	1-162-667-11	CERAMIC 10PF 5% 50V
C8	S	1-130-471-00	PE TEREPHTHALATE 0.001MF 5% 50V
C9	S	1-161-896-11	CERAMIC 0.22MF 50V
C10	S	1-130-471-00	PE TEREPHTHALATE 0.001MF 5% 50V
C11	S	1-130-471-00	PE TEREPHTHALATE 0.001MF 5% 50V
C12	S	1-161-485-00	CERAMIC 0.1MF 50V
C13	S	1-161-485-00	CERAMIC 0.1MF 50V
C14	S	1-130-471-00	PE TEREPHTHALATE 0.001MF 5% 50V
C15	S	1-130-471-00	PE TEREPHTHALATE 0.001MF 5% 50V
C16	S	1-161-485-00	CERAMIC 0.1MF 50V
C17	S	1-161-485-00	CERAMIC 0.1MF 50V
C18	S	1-161-485-00	CERAMIC 0.1MF 50V
C19	S	1-161-485-00	CERAMIC 0.1MF 50V
C20	S	1-161-485-00	CERAMIC 0.1MF 50V
C21	S	1-161-485-00	CERAMIC 0.1MF 50V
C22	S	1-161-485-00	CERAMIC 0.1MF 50V
C23	S	1-161-485-00	CERAMIC 0.1MF 50V
C24	S	1-161-485-00	CERAMIC 0.1MF 50V
C25	S	1-161-485-00	CERAMIC 0.1MF 50V
C26	S	1-161-485-00	CERAMIC 0.1MF 50V
C27	S	1-161-485-00	CERAMIC 0.1MF 50V
C28	S	1-161-485-00	CERAMIC 0.1MF 50V
C29	S	1-161-485-00	CERAMIC 0.1MF 50V
C30	S	1-161-485-00	CERAMIC 0.1MF 50V

Ref. No.	SP	SONY Parts No.	Description
C31	S	1-161-485-00	CERAMIC 0.1MF 50V
C32	S	1-161-485-00	CERAMIC 0.1MF 50V
C33	S	1-161-485-00	CERAMIC 0.1MF 50V
C34	S	1-161-485-00	CERAMIC 0.1MF 50V
C35	S	1-161-485-00	CERAMIC 0.1MF 50V
C36	S	1-161-485-00	CERAMIC 0.1MF 50V
C37	S	1-161-485-00	CERAMIC 0.1MF 50V
C38	S	1-161-485-00	CERAMIC 0.1MF 50V
C39	S	1-161-485-00	CERAMIC 0.1MF 50V
C40	S	1-161-485-00	CERAMIC 0.1MF 50V
C41	S	1-162-871-11	CERAMIC 47PF 5% 50V
C42	S	1-162-871-11	CERAMIC 47PF 5% 50V
C43	S	1-130-471-00	PE TEREPHTHALATE 0.001MF 5% 50V
C44	S	1-130-471-00	PE TEREPHTHALATE 0.001MF 5% 50V
C45	S	1-161-485-00	CERAMIC 0.1MF 50V
C46	S	1-161-485-00	CERAMIC 0.1MF 50V
C47	S	1-130-471-00	PE TEREPHTHALATE 0.001MF 5% 50V
C48	S	1-130-471-00	PE TEREPHTHALATE 0.001MF 5% 50V
C49	S	1-162-714-11	CERAMIC 150PF 5% 50V
C50	S	1-162-871-11	CERAMIC 47PF 5% 50V
C51	S	1-162-871-11	CERAMIC 47PF 5% 50V
C52	S	1-162-667-11	CERAMIC 10PF 5% 50V
C53	S	1-161-485-00	CERAMIC 0.1MF 50V
C54	S	1-161-485-00	CERAMIC 0.1MF 50V
CNJ420	O	1-564-699-21	CONNECTOR,RIBBON CABLE 34P
CNJ421	O	1-506-904-11	CONNECTOR,FLAT CABLE 40P
CNJ422	O	1-506-904-11	CONNECTOR,FLAT CABLE 40P
CNJ950	O	1-560-305-00	POST HEADER (IL CONNECTOR) 10P
D1	S	8-719-911-19	1SS119
D2	S	8-719-911-19	1SS119
D3	S	8-719-912-20	1SS120
D4	S	8-719-912-20	1SS120
D5	S	8-719-911-19	1SS119
D6	S	8-719-911-19	1SS119
D7	S	8-719-911-19	1SS119
IC1	S	8-759-937-43	Z8002APS
IC2	S	8-759-202-74	TC74HC04P
IC3	S	8-759-202-11	TC74HC00P
IC4	S	8-759-202-21	TC74HC32P
IC5	S	8-759-202-18	TC74HC20P

Ref. No.	SP	SONY Parts No.	Description
IC6	S	8-759-995-14	AM9513DC
IC7	S	8-759-995-14	AM9513DC
IC8	S	8-759-202-15	TC74HC10P
IC9	S	8-759-203-48	TC74HC573P
IC10	S	8-759-203-48	TC74HC573P
IC11	S	T-9414-200-1	IC PROM STATUS DEC
IC12	S	8-759-202-32	TC74HC163P
IC13	S	T-9413-957-3	P4.01.01.1 ODD
IC14	S	T-9413-958-3	P4.01.01.1 EVEN
IC15	S	8-759-202-26	TC74HC138P
IC16	S	8-759-301-62	HM6264P-12
IC17	S	8-759-301-62	HM6264P-12
IC18	S	8-759-202-74	TC74HC04P
IC19	S	8-759-000-XX	MC74HC74N
IC20	S	8-759-001-42	MC74HC174N
IC22	S	8-759-202-86	TC74HC123P
IC23	S	8-759-001-00	MC74HC132N
IC24	S	8-759-937-46	Z8030APS
IC25	S	8-759-937-44	Z8036APS
IC26	S	8-759-900-26	SN74LS26N
IC27	S	8-759-202-11	TC74HC00P
IC28	S	8-759-000-XX	MC74HC74N
IC29	S	8-759-000-XX	MC74HC74N
IC30	S	8-759-001-42	MC74HC174N
IC31	S	8-759-203-01	TC74HC175P
IC32	S	8-759-202-24	TC74HC86P
IC33	S	8-759-937-49	RC4152NB
IC34	S	8-759-937-49	RC4152NB
IC35	S	8-759-990-04	TL074CN (For APR-5003V)
IC36	S	8-759-937-49	RC4152NB
IC37	S	8-759-937-49	RC4152NB
IC38	S	8-759-202-56	TC74HC245P
IC39	S	8-759-202-56	TC74HC245P
IC40	S	8-759-202-56	TC74HC245P
IC41	S	8-759-202-55	TC74HC244P
IC42	S	8-759-202-55	TC74HC244P
IC43	S	8-759-202-55	TC74HC244P
IC44	S	8-759-937-40	DG212CJ
IC45	S	8-759-202-17	TC74HC14P
IC46	S	8-759-937-49	RC4152NB

Ref. No.	SP	SONY Parts No.	Description
IC47	S	8-759-937-49	RC4152NB
IC48	S	8-759-937-49	RC4152NB
IC49	S	8-759-937-49	RC4152NB (For APR-5003V)
IC50	S	8-719-901-03	PC525
JU1	S	1-560-733-00	PIN,SHORT
JU2	S	1-560-733-00	PIN,SHORT
JU3	S	1-560-733-00	PIN,SHORT
JU4	S	1-560-733-00	PIN,SHORT
JU5	S	1-560-733-00	PIN,SHORT
JU6	S	1-560-733-00	PIN,SHORT
JU7	S	1-560-733-00	PIN,SHORT
JU8	S	1-560-733-00	PIN,SHORT
JU9	S	1-560-733-00	PIN,SHORT
JU10	S	1-560-733-00	PIN,SHORT
JU11	S	1-560-733-00	PIN,SHORT
L1	S	1-421-329-00	COIL,CHOKE
Q1	S	8-729-113-08	2N3906
Q2	S	8-729-139-04	2N3904
Q3	S	8-729-139-04	2N3904
R1	S	1-249-393-11	CARBON 10 5% 1/4W
R2	S	1-249-393-11	CARBON 10 5% 1/4W
R3	S	1-249-417-11	CARBON 1K 5% 1/4W
R4	S	1-247-852-11	CARBON 7.5K 5% 1/4W
R5	S	1-247-903-00	CARBON 1M 5% 1/4W
R6	S	1-249-441-11	CARBON 100K 5% 1/4W
R8	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R9	S	1-214-569-00	METAL FILM 3.3K 1% 1/8W
R10	S	1-214-552-00	METAL FILM 620 1% 1/8W
R11	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R12	S	1-247-854-11	CARBON 9.1K 5% 1/4W
R13	S	1-247-887-00	CARBON 220K 5% 1/4W
R14	S	1-249-417-11	CARBON 1K 5% 1/4W
R15	S	1-249-441-11	CARBON 100K 5% 1/4W
R16	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R17	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R18	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R19	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R20	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R21	S	1-249-426-11	CARBON 5.6K 5% 1/6W

Ref. No.	SP	SONY Parts No.	Description
R22	S	1-249-426-11	CARBON 5.6K 5% 1/6W
R23	S	1-249-426-11	CARBON 5.6K 5% 1/6W
R24	S	1-249-426-11	CARBON 5.6K 5% 1/6W
R25	S	1-249-437-11	CARBON 47K 5% 1/6W
R26	S	1-249-437-11	CARBON 47K 5% 1/6W
R27	S	1-249-439-11	CARBON 68K 5% 1/6W
R28	S	1-249-439-11	CARBON 68K 5% 1/6W
R29	S	1-249-437-11	CARBON 47K 5% 1/6W
R30	S	1-249-437-11	CARBON 47K 5% 1/6W
R31	S	1-247-903-00	CARBON 1M 5% 1/6W
R32	S	1-247-903-00	CARBON 1M 5% 1/6W
R33	S	1-247-883-00	CARBON 150K 5% 1/6W
R34	S	1-247-883-00	CARBON 150K 5% 1/6W
R35	S	1-249-426-11	CARBON 5.6K 5% 1/6W
R36	S	1-249-426-11	CARBON 5.6K 5% 1/6W
R37	S	1-214-565-00	METAL FILM 2.2K 1% 1/8W
R38	S	1-214-563-00	METAL FILM 1.8K 1% 1/8W
R39	S	1-249-426-11	CARBON 5.6K 5% 1/6W
R40	S	1-249-426-11	CARBON 5.6K 5% 1/6W
R41	S	1-249-426-11	CARBON 5.6K 5% 1/6W
R42	S	1-249-426-11	CARBON 5.6K 5% 1/6W
R43	S	1-249-426-11	CARBON 5.6K 5% 1/6W
R44	S	1-247-878-00	CARBON 91K 5% 1/6W
R45	S	1-247-878-00	CARBON 91K 5% 1/6W
R46	S	1-247-883-00	CARBON 150K 5% 1/6W
R47	S	1-247-883-00	CARBON 150K 5% 1/6W
R48	S	1-247-903-00	CARBON 1M 5% 1/6W
R49	S	1-247-903-00	CARBON 1M 5% 1/6W
R50	S	1-249-437-11	CARBON 47K 5% 1/6W
R51	S	1-249-437-11	CARBON 47K 5% 1/6W
R52	S	1-249-426-11	CARBON 5.6K 5% 1/6W
R53	S	1-249-426-11	CARBON 5.6K 5% 1/6W
R54	S	1-249-413-11	CARBON 470 5% 1/6W
R55	S	1-249-441-11	CARBON 100K 5% 1/6W
R57	S	1-247-804-11	CARBON 75 1/6W
R58	S	1-249-437-11	CARBON 47K 5% 1/6W
R59	S	1-249-437-11	CARBON 47K 5% 1/6W
R60	S	1-249-426-11	CARBON 5.6K 5% 1/6W
R61	S	1-249-426-11	CARBON 5.6K 5% 1/6W
R62	S	1-249-426-11	CARBON 5.6K 5% 1/6W
R63	S	1-249-426-11	CARBON 5.6K 5% 1/6W
R64	S	1-249-426-11	CARBON 5.6K 5% 1/6W
R65	S	1-249-426-11	CARBON 5.6K 5% 1/6W
R66	S	1-249-426-11	CARBON 5.6K 5% 1/6W
R67	S	1-214-567-00	METAL FILM 2.7K 1% 1/8W
R68	S	1-214-567-00	METAL FILM 2.7K 1% 1/8W

Ref. No.	SP	SONY Parts No.	Description
RN1	S	1-231-409-00	RESISTOR BLOCK 5.6K
RN2	S	1-231-409-00	RESISTOR BLOCK 5.6K
RN3	S	1-231-409-00	RESISTOR BLOCK 5.6K
RN4	S	1-231-409-00	RESISTOR BLOCK 5.6K
RN5	S	1-231-409-00	RESISTOR BLOCK 5.6K
RN6	S	1-231-409-00	RESISTOR BLOCK 5.6K
RV1	S	1-228-462-00	ADJ,CERMET 100K
RV2	S	1-228-462-00	ADJ,CERMET 100K
RV3	S	1-228-461-00	ADJ,CERMET 50K
RV4	S	1-228-461-00	ADJ,CERMET 50K
S1	S	1-554-750-11	SWITCH,KEY BOARD (WITH LED)
Y1	S	1-567-691-12	OSC 7.872MHz

CSL BOARD

	O	A-7850-346-A	COMPLETE PCB, CSL (This assemby includes the following parts.)
	S	2-832-007-00	BUSHING(K), INSULATING
	S	3-566-928-00	SHEET, INSULATING
	S	3-703-207-11	INSULATOR, TO-220
	S	7-628-254-10	SCREW, PSW 2.6x6
	S	7-628-254-20	SCREW, PSW 2.6x8
	S	7-682-648-09	SCREW, PSW 3x8
	S	7-684-023-04	N3, TYPE 2
	S	7-688-003-11	W3, MIDDLE
C1	S	1-161-485-00	CERAMIC 0.1MF 50V
C2	S	1-162-710-11	CERAMIC 100PF 5% 50V
C3	S	1-161-485-00	CERAMIC 0.1MF 50V
C4	S	1-161-485-00	CERAMIC 0.1MF 50V
C5	S	1-161-485-00	CERAMIC 0.1MF 50V
C6	S	1-161-485-00	CERAMIC 0.1MF 50v
C7	S	1-162-710-11	CERAMIC 100PF 5% 50V
C8	S	1-161-485-00	CERAMIC 0.1MF 50V
C9	S	1-161-485-00	CERAMIC 0.1MF 50V
C10	S	1-161-485-00	CERAMIC 0.1MF 50V
C11	S	1-161-485-00	CERAMIC 0.1MF 50V
C12	S	1-161-485-00	CERAMIC 0.1MF 50V
C13	S	1-161-485-00	CERAMIC 0.1MF 50V
C14	S	1-162-734-11	CERAMIC 0.001MF 10% 50V
C15	S	1-162-734-11	CERAMIC 0.001MF 10% 50V

Ref. No.	SP	SONY Parts No.	Description
C16	S	1-130-777-00	POLYESTER FILM 0.1MF 5% 100V
C17	S	1-161-473-00	CERAMIC 0.01MF 10% 50V
C18	S	1-162-790-11	CERAMIC 0.0047MF 10% 50V
C19	S	1-130-777-00	POLYESTER FILM 0.1MF 5% 100V
C20	S	1-130-777-00	POLYESTER FILM 0.1MF 5% 100V
C21	S	1-162-734-11	CERAMIC 0.001MF 10% 50V
C22	S	1-161-485-00	CERAMIC 0.1MF 50V
C23	S	1-161-485-00	CERAMIC 0.1MF 50V
C24	S	1-161-485-00	CERAMIC 0.1MF 50V
C25	S	1-124-584-00	ELECT 100MF 20% 10V
C26	S	1-123-357-00	ELECT 22MF 20% 35V
C27	S	1-123-357-00	ELECT 22MF 20% 35V
C28	S	1-123-357-00	ELECT 22MF 20% 35V
C29	S	1-123-357-00	ELECT 22MF 20% 35V
C30	S	1-161-485-00	CERAMIC 0.1MF 50V
C31	S	1-161-485-00	CERAMIC 0.1MF 50V
C32	S	1-161-485-00	CERAMIC 0.1MF 50V
C33	S	1-161-485-00	CERAMIC 0.1MF 50V
C34	S	1-161-485-00	CERAMIC 0.1MF 50V
C35	S	1-161-485-00	CERAMIC 0.1MF 50V
C36	S	1-161-485-00	CERAMIC 0.1MF 50V
C37	S	1-161-485-00	CERAMIC 0.1MF 50V
C38	S	1-161-485-00	CERAMIC 0.1MF 50V
C39	S	1-161-485-00	CERAMIC 0.1MF 50V
C40	S	1-161-485-00	CERAMIC 0.1MF 50V
CNJ460	O	1-566-416-11	PIN, CONNECTOR (PC BOARD) 3P
CNJ461	O	1-560-301-00	POST HEADER (IL CONNECTOR) 4P
CNJ463	O	1-560-301-00	POST HEADER (IL CONNECTOR) 4P
CNJ464	O	1-560-300-00	POST HEADER (IL CONNECTOR) 3P
CNJ951	O	1-560-302-00	POST HEADER (IL CONNECTOR) 5P
D1	S	8-719-911-19	1SS119
D2	S	8-719-911-19	1SS119
D3	S	8-719-911-19	1SS119
D4	S	8-719-911-19	1SS119
D5	S	8-719-911-19	1SS119
D6	S	8-719-911-19	1SS119
D7	S	8-719-911-19	1SS119
D8	S	8-719-110-72	RD30ES-B2
D9	S	8-719-109-85	RD5.1ES-B2
D10	S	8-719-911-19	1SS119
DS1	S	8-719-404-06	LN28RP
F1	S	1-532-782-11	FUSE, MICRO 4A (SECONDARY)

Ref. No.	SP	SONY Parts No.	Description
IC1	S	8-759-990-04	TL074CN
IC2	S	8-759-907-01	TL071CP
IC3	S	8-759-909-33	LM311P
IC4	S	8-759-001-00	MC74HC132N
IC5	S	8-719-939-12	HCPL-2531
IC6	S	8-759-937-30	MM74C932N
IC7	S	8-759-990-04	TL074CN
IC8	S	8-759-907-01	TL071CP
IC9	S	8-759-910-83	TL072ACP
IC10	S	8-759-001-00	MC74HC132N
IC11	S	8-759-937-40	DG212CJ
IC12	S	8-759-604-34	M5F7815
IC13	S	8-759-604-52	M5F7915
IC14	S	8-759-982-44	RC79LO5A
L1	S	1-421-329-00	COIL,CHOKE
Q1	S	8-729-139-04	2N3904
Q2	S	8-729-139-04	2N3904
Q3	S	8-729-306-92	2SD669A
Q4	S	8-729-383-73	2SC2837
Q5	S	8-729-304-92	2SB649A
Q6	S	8-729-383-73	2SC2837
R1	S	1-249-417-11	CARBON 1K 5% 1/4W
R2	S	1-249-429-11	CARBON 10K 5% 1/4W
R3	S	1-249-441-11	CARBON 100K 5% 1/4W
R4	S	1-249-417-11	CARBON 1K 5% 1/4W
R5	S	1-249-438-11	CARBON 56K 5% 1/4W
R6	S	1-247-903-00	CARBON 1M 5% 1/4W
R7	S	1-249-429-11	CARBON 10K 5% 1/4W
R8	S	1-247-700-11	CARBON 100 5% 1/4W
R9	S	1-249-417-11	CARBON 1K 5% 1/4W
R10	S	1-249-429-11	CARBON 10K 5% 1/4W
R11	S	1-249-441-11	CARBON 100K 5% 1/4W
R12	S	1-249-417-11	CARBON 1K 5% 1/4W
R13	S	1-249-438-11	CARBON 56K 5% 1/4W
R14	S	1-247-903-00	CARBON 1M 5% 1/4W
R15	S	1-249-429-11	CARBON 10K 5% 1/4W
R16	S	1-247-700-11	CARBON 100 5% 1/4W
R17	S	1-249-429-11	CARBON 10K 5% 1/4W
R18	S	1-247-838-00	CARBON 2K 5% 1/4W
R19	S	1-247-838-00	CARBON 2K 5% 1/4W
R20	S	1-249-425-11	CARBON 4.7K 5% 1/4W
R21	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R22	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R23	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R24	S	1-247-903-00	CARBON 1M 5% 1/4W
R25	S	1-249-417-11	CARBON 1K 5% 1/4W

Ref. No.	SP	SONY Parts No.	Description
R26	S	1-249-441-11	CARBON 100K 5% 1/4W
R27	S	1-249-417-11	CARBON 1K 5% 1/4W
R28	S	1-249-431-11	CARBON 15K 5% 1/4W
R29	S	1-249-431-11	CARBON 15K 5% 1/4W
R32	S	1-249-408-11	CARBON 180 5% 1/4W
R33	S	1-249-425-11	CARBON 4.7K 5% 1/4W
R34	S	1-249-441-11	CARBON 100K 5% 1/4W
R35	S	1-215-822-11	METAL FILM 47K 1% 1/8W
R36	S	1-214-591-00	METAL FILM 27K 1% 1/8W
R37	S	1-214-587-00	METAL FILM 18K 1% 1/8W
R38	S	1-215-822-11	METAL FILM 47K 1% 1/8W
R39	S	1-214-578-00	METAL FILM 7.5K 1% 1/8W
R40	S	1-214-579-00	METAL FILM 8.2K 1% 1/8W
R41	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R42	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R43	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R44	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R45	S	1-214-588-00	METAL FILM 20K 1% 1/8W
R46	S	1-214-588-00	METAL FILM 20K 1% 1/8W
R47	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R49	S	1-249-417-11	CARBON 1K 5% 1/4W
R50	S	1-247-713-11	CARBON 1K 5% 1/4W
R51	S	1-247-713-11	CARBON 1K 5% 1/4W
R52	S	1-247-713-11	CARBON 1K 5% 1/4W
R53	S	1-247-713-11	CARBON 1K 5% 1/4W
R54	S	1-207-612-00	RES,WIRE 0.1 10% 3W
R55	S	1-249-429-11	CARBON 10K 5% 1/4W
R56	S	1-249-417-11	CARBON 1K 5% 1/4W
R57	S	1-247-889-00	CARBON 270K 5% 1/4W
R58	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R59	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R60	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R61	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R63	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R65	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R66	S	1-249-434-11	CARBON 27K 5% 1/4W
R67	S	1-249-441-11	CARBON 100K 5% 1/4W
R68	S	1-249-417-11	CARBON 1K 5% 1/4W
RV1	S	1-237-520-21	ADJ,METAL FILM 50K
RV2	S	1-237-520-21	ADJ,METAL FILM 50K

Ref. No.	SP	SONY Parts No.	Description
CTM BOARD			
	O	A-7850-368-A	MOUNTED PCB,CTM
			(This assembly includes the following parts.)
	O	1-937-553-11	HARNESS (METER CONTROL)
	O	1-937-554-12	HARNESS (METER INPUT)
	S	4-903-740-01	FRAME, FITTING (SQUARE 10)
	S	4-903-741-01	KEY TOP (SQUARE 10) (WINDOW)
	O	T-9412-217-1	SOCKET,LAMP 25-212
C1	S	1-161-473-00	CERAMIC 0.01MF 10% 50V
C2	S	1-161-473-00	CERAMIC 0.01MF 10% 50V
C3	S	1-161-473-00	CERAMIC 0.01MF 10% 50V
C4	S	1-161-473-00	CERAMIC 0.01MF 10% 50V
C5	S	1-161-473-00	CERAMIC 0.01MF 10% 50V
C6	S	1-161-473-00	CERAMIC 0.01MF 10% 50V
C7	S	1-161-473-00	CERAMIC 0.01MF 10% 50V
D1	S	8-719-911-19	1SS119
D2	S	8-719-911-19	1SS119
D3	S	8-719-911-19	1SS119
D4	S	8-719-911-19	1SS119
D5	S	8-719-911-19	1SS119
D6	S	8-719-911-19	1SS119
D7	S	8-719-911-19	1SS119
D8	S	8-719-911-19	1SS119
D9	S	8-719-911-19	1SS119
D10	S	8-719-911-19	1SS119
D11	S	8-719-911-19	1SS119
D12	S	8-719-911-19	1SS119
D13	S	8-719-911-19	1SS119
D14	S	8-719-404-08	LN48YP
D15	S	8-719-404-06	LN28RP
D16	S	8-719-404-06	LN28RP
IC1	S	8-759-202-14	TC74HC08P
IC2	S	8-759-202-14	TC74HC08P
Q1	S	8-729-113-08	2N3906
Q2	S	8-729-113-08	2N3906
Q3	S	8-729-904-15	VN10KM
Q4	S	8-729-904-15	VN10KM
Q5	S	8-729-904-15	VN10KM
Q6	S	8-729-904-15	VN10KM
Q7	S	8-729-904-15	VN10KM
Q8	S	8-729-904-15	VN10KM
Q9	S	8-729-904-15	VN10KM

Ref. No.	SP	SONY Parts No.	Description
R1	S	1-214-575-00	METAL FILM 5.6K 1% 1/8W
R2	S	1-214-575-00	METAL FILM 5.6K 1% 1/8W
R3	S	1-214-539-00	METAL FILM 180 1% 1/8W
R4	S	1-214-539-00	METAL FILM 180 1% 1/8W
R5	S	1-247-886-11	CARBON 200K 5% 1/4W
R6	S	1-247-886-11	CARBON 200K 5% 1/4W
R7	S	1-247-886-11	CARBON 200K 5% 1/4W
R8	S	1-247-886-11	CARBON 200K 5% 1/4W
R9	S	1-247-886-11	CARBON 200K 5% 1/4W
R10	S	1-247-886-11	CARBON 200K 5% 1/4W
R11	S	1-247-886-11	CARBON 200K 5% 1/4W
R12	S	1-214-531-00	METAL FILM 82 1% 1/8W
R13	S	1-214-531-00	METAL FILM 82 1% 1/8W
R14	S	1-214-531-00	METAL FILM 82 1% 1/8W
R15	S	1-214-531-00	METAL FILM 82 1% 1/8W
R16	S	1-214-531-00	METAL FILM 82 1% 1/8W
R17	S	1-214-531-00	METAL FILM 82 1% 1/8W
R18	S	1-214-531-00	METAL FILM 82 1% 1/8W
S1	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)
S2	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)
S3	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)
S4	S	1-554-750-21	SWITCH,KEY BOARD (WITH LED)
S5	S	1-554-750-21	SWITCH,KEY BOARD (WITH LED)
S6	S	1-554-750-21	SWITCH,KEY BOARD (WITH LED)

DSP BOARD

	O	A-7850-352-A	COMPLETE PCB,DSP (For APR-5002A)
	O	A-7850-353-A	COMPLETE PCB,DSP (For APR-5003V)
			(These assemblies include the following parts.)
C1	S	1-161-485-00	CERAMIC 0.1MF 50V
CNP1	O	T-9411-053-1	POST HEADER
CNP2	O	T-9411-053-1	POST HEADER
D4	S	8-719-911-19	1SS119
D5	S	8-719-911-19	1SS119
D6	S	8-719-911-19	1SS119
D7	S	8-719-911-19	1SS119
D12	S	8-719-911-19	1SS119

Ref. No.	SP	SONY Parts No.	Description
D13	S	8-719-911-19	1SS119
D14	S	8-719-911-19	1SS119
D16	S	8-719-911-19	1SS119
D17	S	8-719-911-19	1SS119
D18	S	8-719-911-19	1SS119
D20	S	8-719-911-19	1SS119
D21	S	8-719-911-19	1SS119
D22	S	8-719-911-19	1SS119
D24	S	8-719-911-19	1SS119
D25	S	8-719-911-19	1SS119
D26	S	8-719-911-19	1SS119
D27	S	8-719-911-19	1SS119
D28	S	8-719-911-19	1SS119
D29	S	8-719-911-19	1SS119
D30	S	8-719-911-19	1SS119
D32	S	8-719-911-19	1SS119
D33	S	8-719-911-19	1SS119
D34	S	8-719-911-19	1SS119
D35	S	8-719-911-19	1SS119
D36	S	8-719-911-19	1SS119
D37	S	8-719-911-19	1SS119
D38	S	8-719-911-19	1SS119
D39	S	8-719-911-19	1SS119
D40	S	8-719-911-19	1SS119
DS1	S	T-9411-139-1	FIP DISPLAY
DS2	S	T-9411-139-1	FIP DISPLAY
IC1	S	8-759-207-75	TD62781AP
IC2	S	8-759-207-75	TD62781AP
IC3	S	8-759-207-75	TD62781AP
IC4	S	8-759-207-75	TD62781AP
S4	S	1-554-761-12	SWITCH,KEY BOARD (WITH LED)
S5	S	1-554-761-12	SWITCH,KEY BOARD (WITH LED)
S6	S	1-554-761-12	SWITCH,KEY BOARD (WITH LED)
S7	S	1-554-761-12	SWITCH,KEY BOARD (WITH LED)
S12	S	1-554-761-12	SWITCH,KEY BOARD (WITH LED)
S13	S	1-554-761-12	SWITCH,KEY BOARD (WITH LED)
S14	S	1-554-761-12	SWITCH,KEY BOARD (WITH LED)
S16	S	1-554-750-11	SWITCH,KEY BOARD (WITH LED)
S17	S	1-554-750-11	SWITCH,KEY BOARD (WITH LED)
S18	S	1-554-750-11	SWITCH,KEY BOARD (WITH LED)
S20	S	1-554-761-12	SWITCH,KEY BOARD (WITH LED)
S21	S	1-554-761-12	SWITCH,KEY BOARD (WITH LED)
S22	S	1-554-761-12	SWITCH,KEY BOARD (WITH LED)
S24	S	1-554-750-11	SWITCH,KEY BOARD (WITH LED)
S25	S	1-554-750-11	SWITCH,KEY BOARD (WITH LED)

Ref. No.	SP	SONY Parts No.	Description
S26	S	1-554-750-11	SWITCH,KEY BOARD (WITH LED) (For APR-5003V)
S27	S	1-554-750-11	SWITCH,KEY BOARD (WITH LED) (For APR-5003V)
S28	S	1-554-761-12	SWITCH,KEY BOARD (WITH LED)
S29	S	1-554-761-12	SWITCH,KEY BOARD (WITH LED)
S30	S	1-554-761-12	SWITCH,KEY BOARD (WITH LED)
S32	S	1-554-750-11	SWITCH,KEY BOARD (WITH LED)
S33	S	1-554-750-11	SWITCH,KEY BOARD (WITH LED)
S34	S	1-554-750-11	SWITCH,KEY BOARD (WITH LED)
S35	S	1-554-750-11	SWITCH,KEY BOARD (WITH LED)
S36	S	1-554-761-12	SWITCH,KEY BOARD (WITH LED)
S37	S	1-554-761-12	SWITCH,KEY BOARD (WITH LED)
S38	S	1-554-761-12	SWITCH,KEY BOARD (WITH LED)
S39	S	1-554-761-12	SWITCH,KEY BOARD (WITH LED)
S40	S	1-554-750-11	SWITCH,KEY BOARD (WITH LED)

FEX BOARD

	O	A-7850-364-A	COMPLETE PCB,FEX (This assembly includes the following parts.)
C1	S	1-109-561-00	MICA 0.001MF 1% 100V
C2	S	1-109-633-00	DIP-MICA 470PF 1% 500V
C3	S	1-109-687-00	DIP-MICA 390PF 1% 500V
C4	S	1-162-664-11	CERAMIC 1800PF 10% 50V
C5	S	1-109-561-00	MICA 0.001MF 1% 100V
C6	S	1-109-633-00	DIP-MICA 470PF 1% 500V
C7	S	1-109-687-00	DIP-MICA 390PF 1% 500V
C8	S	1-162-664-11	CERAMIC 1800PF 10% 50V
C9	S	1-109-561-00	MICA 0.001MF 1% 100V
C10	S	1-109-633-00	DIP-MICA 470PF 1% 500V
C11	S	1-109-687-00	DIP-MICA 390PF 1% 500V
C12	S	1-162-664-11	CERAMIC 1800PF 10% 50V
C13	S	1-124-006-11	ELECT 10MF 20% 25V
C14	S	1-124-006-11	ELECT 10MF 20% 25V
C15	S	1-124-006-11	ELECT 10MF 20% 25V
CNJ204	O	1-560-303-00	POST HEADER (IL CONNECTOR) 6P
CNJ216	O	1-560-301-00	POST HEADER (IL CONNECTOR) 4P
CNJ217	O	1-560-299-00	POST HEADER (IL CONNECTOR) 2P
CNJ218	O	1-560-300-00	POST HEADER (IL CONNECTOR) 3P
CNJ219	O	1-560-300-00	POST HEADER (IL CONNECTOR) 3P
CNJ220	O	1-560-299-00	POST HEADER (IL CONNECTOR) 2P

Ref. No.	SP	SONY Parts No.	Description
D1	S	8-719-911-19	1SS119
D2	S	8-719-911-19	1SS119
D3	S	8-719-911-19	1SS119
K1	S	1-515-658-11	RELAY,DPDT 5V
K2	S	1-515-658-11	RELAY,DPDT 5V
K3	S	1-515-658-11	RELAY,DPDT 5V
L1	S	1-408-092-00	INDUCTOR,MICRO 330MH 5%
L2	S	1-408-092-00	INDUCTOR,MICRO 330MH 5%
L3	S	1-408-092-00	INDUCTOR,MICRO 330MH 5%
R1	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R2	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R3	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R4	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R5	S	1-214-561-00	METAL FILM 1.5K 1% 1/8W
R6	S	1-214-561-00	METAL FILM 1.5K 1% 1/8W
T1	S	T-9413-670-2	TRANSFORMER
T2	S	T-9480-936-1	BIAS TRANSFORMER
T3	S	T-9480-952-1	ERASE TRANSFORMER
T4	S	T-9413-670-2	TRANSFORMER
T5	S	T-9480-936-1	BIAS TRANSFORMER
T6	S	T-9480-952-1	ERASE TRANSFORMER
T7	S	T-9413-670-2	TRANSFORMER
T8	S	T-9480-936-1	BIAS TRANSFORMER
T9	S	T-9480-952-1	ERASE TRANSFORMER

Ref. No.	SP	SONY Parts No.	Description
HES BOARD			
	O	A-7850-351-A	MOUNTED PCB,HES
			(This assembly includes the following parts.)
C1	S	1-161-485-00	CERAMIC 0.1MF 50V
C2	S	1-161-485-00	CERAMIC 0.1MF 50V
C3	S	1-161-485-00	CERAMIC 0.1MF 50V
C4	S	1-126-096-11	ELECT 10MF 20% 25V
C5	S	1-126-096-11	ELECT 10MF 20% 25V
C6	S	1-161-485-00	CERAMIC 0.1MF 50V
CNJ401	O	1-560-310-00	POST HEADER (IL CONNECTOR) 4P
D1	S	8-719-109-85	RD5.1ES-B2
IC1	S	T-9412-310-1	634SS2 HALL EFF SENSOR
IC2	S	8-759-910-83	TL072ACP
R1	S	1-249-429-11	CARBON 10K 5% 1/4W
R2	S	1-249-429-11	CARBON 10K 5% 1/4W
R3	S	1-249-441-11	CARBON 75K 5% 1/4W
R4	S	1-249-441-11	CARBON 75K 5% 1/4W
R5	S	1-249-429-11	CARBON 10K 5% 1/4W
R6	S	1-249-429-11	CARBON 10K 5% 1/4W
R7	S	1-249-429-11	CARBON 10K 5% 1/4W
R8	S	1-249-429-11	CARBON 10K 5% 1/4W
R9	S	1-249-429-11	CARBON 10K 5% 1/4W
R10	S	1-249-393-11	CARBON 10 5% 1/4W
R11	S	1-249-393-11	CARBON 10 5% 1/4W
R12	S	1-249-417-11	CARBON 1K 5% 1/4W
R13	S	1-249-429-11	CARBON 10K 5% 1/4W
R14	S	1-249-429-11	CARBON 10K 5% 1/4W
RV1	S	1-228-460-00	ADJ,CERMET 20K
RV2	S	1-228-460-00	ADJ,CERMET 20K

Ref. No.	SP	SONY Parts No.	Description
KBD BOARD			
	O	A-7850-357-A	MOUNTED PCB,KBD (For APR-5003V)
	O	A-7850-465-A	MOUNTED PCB,KBD (For APR-5002)
			(These assemblies include the following parts.)
	O	1-937-562-11	HARNESS (ANTI-STATIC)
C1	S	1-161-485-00	CERAMIC 0.1MF 50V
C2	S	1-124-242-00	ELECT 33MF 20% 25V
C3	S	1-124-242-00	ELECT 33MF 20% 25V
C4	S	1-124-242-00	ELECT 33MF 20% 25V
C5	S	1-124-584-00	ELECT 100MF 20% 10V
C6	S	1-161-485-00	CERAMIC 0.1MF 50V
C7	S	1-161-485-00	CERAMIC 0.1MF 50V
C8	S	1-161-485-00	CERAMIC 0.1MF 50V
C9	S	1-161-485-00	CERAMIC 0.1MF 50V
C10	S	1-161-485-00	CERAMIC 0.1MF 50V
C11	S	1-161-485-00	CERAMIC 0.1MF 50V
C12	S	1-161-485-00	CERAMIC 0.1MF 50V
C13	S	1-161-485-00	CERAMIC 0.1MF 50V
C14	S	1-161-485-00	CERAMIC 0.1MF 50V
C15	S	1-162-667-11	CERAMIC 10PF 5% 50V
C16	S	1-162-790-11	CERAMIC 0.0047MF 10% 50V
C17	S	1-161-485-00	CERAMIC 0.1MF 50V
C18	S	1-161-485-00	CERAMIC 0.1MF 50V
C19	S	1-161-485-00	CERAMIC 0.1MF 50V
C20	S	1-161-485-00	CERAMIC 0.1MF 50V
C21	S	1-161-485-00	CERAMIC 0.1MF 50V
C22	S	1-161-485-00	CERAMIC 0.1MF 50V
C24	S	1-161-485-00	CERAMIC 0.1MF 50V
C25	S	1-161-485-00	CERAMIC 0.1MF 50V
C26	S	1-161-485-00	CERAMIC 0.1MF 50V
C27	S	1-161-485-00	CERAMIC 0.1MF 50V
C31	S	1-126-096-11	ELECT 10MF 20% 25V
C32	S	1-161-485-00	CERAMIC 0.1MF 50V
C34	S	1-161-473-00	CERAMIC 0.01MF 10% 50V
C35	S	T-9413-408-1	0.001MF 100V NPO
C36	S	T-9413-408-1	0.001MF 100V NPO
C37	S	1-162-734-11	CERAMIC 0.001MF 10% 50V
C38	S	1-162-734-11	CERAMIC 0.001MF 10% 50V
C39	S	1-162-734-11	CERAMIC 0.001MF 10% 50V
C40	S	1-161-485-00	CERAMIC 0.1MF 50V

Ref. No.	SP	SONY Parts No.	Description
C41	S	1-161-485-00	CERAMIC 0.1MF 50V
C42	S	1-161-485-00	CERAMIC 0.1MF 50V
C43	S	1-161-485-00	CERAMIC 0.1MF 50V
C44	S	1-161-485-00	CERAMIC 0.1MF 50V
C45	S	1-161-485-00	CERAMIC 0.1MF 50V
C46	S	1-161-485-00	CERAMIC 0.1MF 50V
C47	S	1-161-485-00	CERAMIC 0.1MF 50V
C48	S	1-161-485-00	CERAMIC 0.1MF 50V
C49	S	1-161-485-00	CERAMIC 0.1MF 50V
CNJ430	O	T-9411-085-1	HEADER,STRAIGHT POST 34P
CNJ431	O	T-9411-085-1	HEADER,STRAIGHT POST 34P
CNJ432	O	1-937-563-11	HARNESS(CPU-KBD)
CNJ433	O	1-560-310-00	POST HEADER (IL CONNECTOR) 4P
D1	S	8-719-109-85	RD5.1ES-B2
D2	S	8-719-911-19	1SS119
D3	S	8-719-911-19	1SS119
D4	S	8-719-911-19	1SS119
D5	S	8-719-911-19	1SS119
D6	S	8-719-911-19	1SS119
D7	S	8-719-911-19	1SS119
D8	S	8-719-911-19	1SS119
D9	S	8-719-911-19	1SS119
D10	S	8-719-911-19	1SS119
D11	S	8-719-911-19	1SS119
D12	S	8-719-911-19	1SS119
D13	S	8-719-911-19	1SS119
D14	S	8-719-911-19	1SS119
D15	S	8-719-911-19	1SS119
D18	S	8-719-911-19	1SS119
D19	S	8-719-911-19	1SS119
D20	S	8-719-911-19	1SS119
D21	S	8-719-911-19	1SS119
D22	S	8-719-911-19	1SS119
D23	S	8-719-911-19	1SS119
D24	S	8-719-911-19	1SS119
D25	S	8-719-911-19	1SS119
D26	S	8-719-911-19	1SS119
D27	S	8-719-911-19	1SS119
D31	S	8-719-911-19	1SS119
DS1	S	8-719-902-19	DIODE GL-4NG2
DS2	S	8-719-902-19	DIODE GL-4NG2
DS3	S	8-719-902-19	DIODE GL-4NG2
DS4	S	8-719-902-19	DIODE GL-4NG2

Ref. No.	SP	SONY Parts No.	Description
IC1	S	8-759-202-56	TC74HC245P
IC2	S	8-759-937-38	ICM7218D
IC3	S	8-759-937-38	ICM7218D
IC4	S	8-759-202-74	TC74HC04P
IC5	S	8-759-202-74	TC74HC04P
IC6	S	8-759-202-74	TC74HC04P
IC7	S	8-759-202-11	TC74HC00P
IC8	S	8-759-909-33	LM311P
IC9	S	8-759-202-56	TC74HC245P
IC10	S	8-759-202-74	TC74HC04P
IC11	S	8-759-202-21	TC74HC32P
IC12	S	8-759-000-99	MC74HC74N
IC13	S	8-759-203-40	TC74HC393P
IC14	S	8-759-100-88	uPD8279C-5
IC15	S	8-759-202-26	TC74HC138P
IC16	S	8-759-202-26	TC74HC138P
IC17	S	8-759-202-17	TC74HC14P
IC18	S	8-759-202-14	TC74HC08P
IC19	S	8-759-202-14	TC74HC08P
IC20	S	8-759-990-04	TL074CN
IC22	S	8-759-910-83	TL072ACP
IC23	S	8-759-909-72	CX7912A (For APR-5003V only)
Q1	S	8-729-113-08	2N3906
Q2	S	8-729-113-08	2N3906
Q3	S	8-729-113-08	2N3906
Q4	S	8-729-113-08	2N3906
Q5	S	8-729-113-08	2N3906
Q6	S	8-729-113-08	2N3906
Q7	S	8-729-113-08	2N3906
Q8	S	8-729-113-08	2N3906
Q9	S	8-729-113-08	2N3906
Q10	S	8-729-139-04	2N3904
Q11	S	8-729-139-04	2N3904
Q12	S	8-729-139-04	2N3904
Q13	S	8-729-139-04	2N3904
Q14	S	8-729-139-04	2N3904
Q15	S	8-729-139-04	2N3904
Q16	S	8-729-139-04	2N3904
Q17	S	8-729-139-04	2N3904
Q18	S	8-729-139-04	2N3904
Q19	S	T-9410-287-1	SP7000-0127-02
Q20	S	T-9410-286-1	SP7000-0127-01

Ref. No.	SP	SONY Parts No.	Description
Q21	S	T-9410-286-1	SP7000-0127-01
Q22	S	T-9410-287-1	SP7000-0127-02
Q23	S	8-729-139-04	2N3904
Q24	S	8-729-904-15	VN10KM
Q25	S	8-729-139-04	2N3904
Q26	S	8-729-139-04	2N3904
Q27	S	8-729-904-15	VN10KM
Q28	S	8-729-904-15	VN10KM
Q29	S	8-729-904-15	VN10KM
Q30	S	8-729-904-15	VN10KM
Q31	S	8-729-904-15	VN10KM
R1	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R2	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R3	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R4	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R5	S	1-249-429-11	CARBON 10K 5% 1/4W
R6	S	1-249-429-11	CARBON 10K 5% 1/4W
R7	S	1-249-429-11	CARBON 10K 5% 1/4W
R8	S	1-249-429-11	CARBON 10K 5% 1/4W
R25	S	1-249-417-11	CARBON 1K 5% 1/4W
R26	S	1-249-417-11	CARBON 1K 5% 1/4W
R27	S	1-249-417-11	CARBON 1K 5% 1/4W
R28	S	1-249-417-11	CARBON 1K 5% 1/4W
R29	S	1-249-417-11	CARBON 1K 5% 1/4W
R30	S	1-249-417-11	CARBON 1K 5% 1/4W
R31	S	1-249-417-11	CARBON 1K 5% 1/4W
R32	S	1-249-417-11	CARBON 1K 5% 1/4W
R34	S	1-249-417-11	CARBON 1K 5% 1/4W
R35	S	1-249-417-11	CARBON 1K 5% 1/4W
R36	S	1-249-417-11	CARBON 1K 5% 1/4W
R37	S	1-249-417-11	CARBON 1K 5% 1/4W
R38	S	1-249-417-11	CARBON 1K 5% 1/4W
R39	S	1-249-417-11	CARBON 1K 5% 1/4W
R40	S	1-249-417-11	CARBON 1K 5% 1/4W
R42	S	1-249-407-11	CARBON 150 5% 1/4W
R43	S	1-249-407-11	CARBON 150 5% 1/4W
R44	S	1-249-407-11	CARBON 150 5% 1/4W
R45	S	1-249-407-11	CARBON 150 5% 1/4W
R46	S	1-249-407-11	CARBON 150 5% 1/4W
R47	S	1-249-407-11	CARBON 150 5% 1/4W
R48	S	1-249-407-11	CARBON 150 5% 1/4W

Ref. No.	SP	SONY Parts No.	Description
R60	S	1-249-429-11	CARBON 10K 5% 1/4W
R61	S	1-249-441-11	CARBON 100K 5% 1/4W
R62	S	1-249-417-11	CARBON 1K 5% 1/4W
R63	S	1-249-429-11	CARBON 10K 5% 1/4W
R64	S	1-249-429-11	CARBON 10K 5% 1/4W
R65	S	1-249-429-11	CARBON 10K 5% 1/4W
R66	S	T-9411-045-1	LEAD CARBON FILM 1/4W 5%
R67	S	1-249-429-11	CARBON 10K 5% 1/4W
R68	S	1-249-441-11	CARBON 100K 5% 1/4W
R69	S	1-249-429-11	CARBON 10K 5% 1/4W
R70	S	1-249-399-11	CARBON 33 5% 1/4W
R71	S	1-249-399-11	CARBON 33 5% 1/4W
R72	S	1-249-399-11	CARBON 33 5% 1/4W
R73	S	1-247-804-11	CARBON 75 5% 1/4W
R74	S	1-249-399-11	CARBON 33 5% 1/4W
R75	S	1-247-122-00	CARBON 430 5% 1/4W
R76	S	1-247-122-00	CARBON 430 5% 1/4W
R78	S	1-249-433-11	CARBON 22K 5% 1/4W
R79	S	1-247-876-11	CARBON 75K 5% 1/4W
R80	S	1-247-876-11	CARBON 75K 5% 1/4W
R81	S	1-247-876-11	CARBON 75K 5% 1/4W
R82	S	1-249-429-11	CARBON 10K 5% 1/4W
R83	S	1-249-435-11	CARBON 33K 5% 1/4W
R84	S	1-249-421-11	CARBON 2.2K 5% 1/4W
R85	S	1-249-441-11	CARBON 100K 5% 1/4W
R86	S	1-249-429-11	CARBON 10K 5% 1/4W
R87	S	1-247-903-00	CARBON 1M 5% 1/4W
R88	S	1-249-417-11	CARBON 1K 5% 1/4W
R89	S	1-249-429-11	CARBON 10K 5% 1/4W
R90	S	1-249-429-11	CARBON 10K 5% 1/4W
R91	S	1-247-903-00	CARBON 1M 5% 1/4W
R92	S	1-249-417-11	CARBON 1K 5% 1/4W
R93	S	1-249-429-11	CARBON 10K 5% 1/4W
R94	S	1-249-417-11	CARBON 1K 5% 1/4W
R95	S	1-247-832-11	CARBON 1.1K 5% 1/4W
R96	S	1-249-455-11	CARBON 4.7 5% 1/4W
R97	S	1-249-417-11	CARBON 1K 5% 1/4W
R98	S	1-249-417-11	CARBON 1K 5% 1/4W
R99	S	1-249-417-11	CARBON 1K 5% 1/4W
R100	S	1-249-417-11	CARBON 1K 5% 1/4W

Ref. No.	SP	SONY Parts No.	Description
R101	S	1-249-429-11	CARBON 10K 5% 1/4W
R102	S	1-249-429-11	CARBON 10K 5% 1/4W
R103	S	1-249-429-11	CARBON 10K 5% 1/4W
R104	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R105	S	1-247-895-00	CARBON 470K 5% 1/4W
R106	S	1-247-895-00	CARBON 470K 5% 1/4W
R107	S	1-247-895-00	CARBON 470K 5% 1/4W
R108	S	1-247-895-00	CARBON 470K 5% 1/4W
R109	S	1-247-895-00	CARBON 470K 5% 1/4W
R110	S	1-247-895-00	CARBON 470K 5% 1/4W
R111	S	1-249-399-11	CARBON 33 5% 1/4W
R112	S	1-249-399-11	CARBON 33 5% 1/4W
R113	S	1-249-399-11	CARBON 33 5% 1/4W
R114	S	1-247-804-11	CARBON 75 1/4W
R115	S	1-249-399-11	CARBON 33 5% 1/4W
R116	S	1-247-710-11	CARBON 560 5% 1/4W
R117	S	1-249-429-11	CARBON 10K 5% 1/4W
RN1	S	1-231-409-00	RESISTOR BLOCK 5.6K
RN2	S	1-231-409-00	RESISTOR BLOCK 5.6K
RN3	S	1-231-399-00	RESISTOR BLOCK 330
RV2	S	1-237-500-21	ADJ,METAL FILM 1K
RV3	S	1-237-500-21	ADJ,METAL FILM 1K
RV4	S	1-237-500-21	ADJ,METAL FILM 1K
S1	S	1-554-039-51	SWITCH,PUSH
S2	S	1-554-039-41	SWITCH,PUSH(FF & REW)
S3	S	1-554-039-21	SWITCH,PUSH(PLAY)
S4	S	1-554-045-22	SWITCH,PUSH(STOP)
S5	S	1-554-040-21	SWITCH,PUSH(REC)
S6	S	1-554-039-11	SWITCH,PUSH

Ref. No.	SP	SONY Parts No.	Description
LNT BOARD			
	O	A-7850-366-A	COMPLETE PCB,LNT
			(This assembly includes the following parts.)
	S	1-561-832-00	SOCKET,SHORT
C1	S	1-161-485-00	CERAMIC 0.1MF 50V
C2	S	1-161-485-00	CERAMIC 0.1MF 50V
C3	S	1-124-589-11	ELECT 47MF 20% 10V
C5	S	1-161-485-00	CERAMIC 0.1MF 50V
C6	S	1-161-485-00	CERAMIC 0.1MF 50V
C7	S	1-161-485-00	CERAMIC 0.1MF 50V
C8	S	1-161-485-00	CERAMIC 0.1MF 50V
C9	S	1-161-485-00	CERAMIC 0.1MF 50V
C10	S	1-123-357-00	ELECT 22MF 20% 35V
C11	S	1-161-485-00	CERAMIC 0.1MF 50V
C12	S	1-161-485-00	CERAMIC 0.1MF 50V
C13	S	1-161-485-00	CERAMIC 0.1MF 50V
C14	S	1-161-485-00	CERAMIC 0.1MF 50V
C15	S	1-161-485-00	CERAMIC 0.1MF 50V
CNJ440	O	1-564-700-21	CONNECTOR,RIBBON CABLE 40P
CNJ441	O	1-564-700-21	CONNECTOR,RIBBON CABLE 40P
CNJ952	O	1-560-303-00	POST HEADER (IL CONNECTOR) 6P
D1	S	8-719-911-19	1SS119
IC1	S	8-759-000-XX	MC74HC74N
IC2	S	8-759-202-55	TC74HC244P
IC3	S	8-759-203-35	TC74HC373P
IC4	S	8-759-202-74	TC74HC04P
IC5	S	8-759-202-26	TC74HC138P
IC6	S	8-752-321-00	CXK5816PN-12L
IC7	S	8-759-202-55	TC74HC244P
IC8	S	8-759-202-26	TC74HC138P
IC9	S	8-759-202-26	TC74HC138P
IC10	S	8-759-202-55	TC74HC244P
IC11	S	8-759-903-77	SN74LS377N
IC12	S	8-759-202-26	TC74HC138P
IC13	S	8-759-773-36	27128-LNT13V2.0
IC14	S	8-759-202-14	TC74HC08P
IC15	S	8-759-202-30	TC74HC161P

Ref. No.	SP	SONY Parts No.	Description
IC16	S	8-759-202-30	TC74HC161P
IC17	S	8-759-202-30	TC74HC161P
IC18	S	8-759-202-56	TC74HC245P
IC19	S	8-759-901-89	SN74LS189AN
IC20	S	8-759-901-89	SN74LS189AN
IC21	S	8-759-180-85	uPD8085AC
IC22	S	8-759-202-56	TC74HC245P
IC23	S	8-759-901-89	SN74LS189AN
IC24	S	8-759-901-89	SN74LS189AN
IC25	S	8-759-938-45	Z8530PC
IC26	S	8-759-202-21	TC74HC32P
IC27	S	8-759-202-74	TC74HC04P
IC28	S	8-759-202-21	TC74HC32P
IC29	S	8-759-202-14	TC74HC08P
IC30	S	8-759-202-11	MC74HC00N
IC31	S	8-759-202-21	TC74HC32P
IC32	S	8-759-202-11	MC74HC00N
JW1	S	1-566-388-11	PIN,SHORT
JW2	S	1-566-388-11	PIN,SHORT
JW3	S	1-566-388-11	PIN,SHORT
JW4	S	1-566-388-11	PIN,SHORT
L1	S	1-421-329-00	COIL,CHOKE
R1	S	1-249-429-11	CARBON 10K 5% 1/4W
R2	S	1-249-441-11	CARBON 100K 5% 1/4W
R3	S	1-249-441-11	CARBON 100K 5% 1/4W
R4	S	1-249-417-11	CARBON 1K 5% 1/4W
R5	S	1-249-429-11	CARBON 10K 5% 1/4W
R6	S	1-249-429-11	CARBON 10K 5% 1/4W
R7	S	1-249-429-11	CARBON 10K 5% 1/4W
R8	S	1-249-405-11	CARBON 100 5% 1/4W
R9	S	1-249-405-11	CARBON 100 5% 1/4W
RN1	S	1-231-410-00	RESISTOR BLOCK,10K
RN2	S	1-231-410-00	RESISTOR BLOCK,10K
RN3	S	1-231-410-00	RESISTOR BLOCK,10K
RN4	S	1-231-410-00	RESISTOR BLOCK,10K
RN5	S	1-231-410-00	RESISTOR BLOCK,10K
RN6	S	1-231-410-00	RESISTOR BLOCK,10K
RN7	S	1-231-410-00	RESISTOR BLOCK,10K
S1	S	1-516-925-21	SWITCH,DIP
Y1	S	1-527-847-00	OSC 6.144MHz

Ref. No.	SP	SONY Parts No.	Description
MSB BOARD			
	O	1-619-159-11	PC BOARD,MSB
	S	4-903-740-01	FRAME, FITTING (SQUARE 10)
	S	4-903-741-01	KEY TOP (SQUARE 10)(WINDOW)
CNJ232	O	1-560-302-00	POST HEADER (IL CONNECTOR) 5P
R1	S	1-249-405-11	CARBON 100 5% 1/4W
R2	S	1-249-405-11	CARBON 100 5% 1/4W
S1	S	1-554-750-21	SWITCH,KEY BOARD (WITH LED)
S2	S	1-554-750-21	SWITCH,KEY BOARD (WITH LED)
MST BOARD			
	O	A-7850-376-A	COMPLETE PCB,MST
		(This assembly includes the following parts.)	
	S	2-251-622-11	LEVER, PC BOARD
	O	3-673-867-11	PLATE, INDICATION, PC BOARD
	S	3-703-207-11	INSULATOR, TO-220
	O	3-711-001-02	LABEL, AUDIO MASTER CARD
	O	3-711-319-03	HEAT SINK (A), MST
	S	7-623-955-01	WASHER, PC BOARD
	S	7-626-317-21	PIN, SPRING 2.5x8
	S	7-682-650-09	SCREW, PSW3x12
	S	7-684-023-04	N3, TYPE2
C1	S	1-123-333-00	ELECT 100MF 20% 25V
C2	S	1-123-333-00	ELECT 100MF 20% 25V
C3	S	1-123-333-00	ELECT 100MF 20% 25V
C4	S	1-124-438-00	ELECT 1MF 20% 50V
C5	S	1-124-438-00	ELECT 1MF 20% 50V
C6	S	1-124-438-00	ELECT 1MF 20% 50V
C7	S	1-124-438-00	ELECT 1MF 20% 50V
C8	S	1-124-438-00	ELECT 1MF 20% 50V
C9	S	1-124-438-00	ELECT 1MF 20% 50V
C10	S	1-162-671-11	CERAMIC 22PF 5% 50V
C12	S	1-124-274-00	ELECT 4.7MF 20% 50V
C13	S	1-161-485-00	CERAMIC 0.1MF 50V
C14	S	1-161-485-00	CERAMIC 0.1MF 50V
C15	S	1-162-726-11	CERAMIC 470PF 5% 50V
C16	S	1-162-718-11	CERAMIC 220PF 5% 50V

Ref. No.	SP	SONY Parts No.	Description		
C17	S	1-161-485-00	CERAMIC 0.1MF		50V
C18	S	1-161-485-00	CERAMIC 0.1MF		50V
C19	S	1-162-724-11	CERAMIC 390PF	5%	50V
C20	S	1-162-873-11	CERAMIC 56PF	5%	50V
C21	S	1-161-473-00	CERAMIC 0.01MF	10%	50V
C22	S	1-161-473-00	CERAMIC 0.01MF	10%	50V
C23	S	1-123-357-00	ELECT 22MF	20%	35V
C24	S	1-123-357-00	ELECT 22MF	20%	35V
C25	S	1-123-357-00	ELECT 22MF	20%	35V
C26	S	1-123-357-00	ELECT 22MF	20%	35V
C27	S	1-123-357-00	ELECT 22MF	20%	35V
C28	S	1-123-357-00	ELECT 22MF	20%	35V
C29	S	1-123-357-00	ELECT 22MF	20%	35V
C30	S	1-123-357-00	ELECT 22MF	20%	35V
C31	S	1-123-357-00	ELECT 22MF	20%	35V
C32	S	1-123-357-00	ELECT 22MF	20%	35V
C33	S	1-123-357-00	ELECT 22MF	20%	35V
C34	S	1-123-357-00	ELECT 22MF	20%	35V
C35	S	1-123-357-00	ELECT 22MF	20%	35V
C36	S	1-123-357-00	ELECT 22MF	20%	35V
C37	S	1-123-357-00	ELECT 22MF	20%	35V
C38	S	1-123-357-00	ELECT 22MF	20%	35V
C39	S	1-161-485-00	CERAMIC 0.1MF		50V
C40	S	1-161-485-00	CERAMIC 0.1MF		50V
C41	S	1-161-485-00	CERAMIC 0.1MF		50V
C42	S	1-161-485-00	CERAMIC 0.1MF		50V
C43	S	1-161-485-00	CERAMIC 0.1MF		50V
C44	S	1-161-485-00	CERAMIC 0.1MF		50V
C45	S	1-161-485-00	CERAMIC 0.1MF		50V
C49	S	1-161-485-00	CERAMIC 0.1MF		50V
C50	S	1-161-485-00	CERAMIC 0.1MF		50V
C51	S	1-161-485-00	CERAMIC 0.1MF		50V
C52	S	1-161-485-00	CERAMIC 0.1MF		50V
C53	S	1-161-485-00	CERAMIC 0.1MF		50V
C54	S	1-161-485-00	CERAMIC 0.1MF		50V
C55	S	1-161-485-00	CERAMIC 0.1MF		50V
C56	S	1-161-485-00	CERAMIC 0.1MF		50V
C57	S	1-161-485-00	CERAMIC 0.1MF		50V
C58	S	1-161-485-00	CERAMIC 0.1MF		50V
C59	S	1-161-485-00	CERAMIC 0.1MF		50V
C60	S	1-161-485-00	CERAMIC 0.1MF		50V
C61	S	1-161-485-00	CERAMIC 0.1MF		50V
C62	S	1-161-485-00	CERAMIC 0.1MF		50V
C66	S	1-162-672-11	CERAMIC 27PF	5%	50V
C67	S	1-162-674-11	CERAMIC 39PF	5%	50V

Ref. No.	SP	SONY Parts No.	Description
C68	S	1-162-671-11	CERAMIC 22PF 5% 50V
C69	S	1-162-671-11	CERAMIC 22PF 5% 50V
C70	S	1-162-671-11	CERAMIC 22PF 5% 50V
C71	S	1-162-671-11	CERAMIC 22PF 5% 50V
C72	S	1-162-671-11	CERAMIC 22PF 5% 50V
C73	S	1-162-671-11	CERAMIC 22PF 5% 50V
C74	S	1-162-714-11	CERAMIC 150PF 5% 50V
C75	S	1-162-664-11	CERAMIC 1800PF 10% 50V
C76	S	1-162-664-11	CERAMIC 1800PF 10% 50V
C77	S	1-162-664-11	CERAMIC 1800PF 10% 50V
C78	S	1-123-357-00	ELECT 22MF 20% 35V
CNI22	O	1-526-658-21	SOCKET,IC (DP) 24P
CNI23	O	1-526-658-21	SOCKET,IC (DP) 24P
CNI24	O	1-526-658-21	SOCKET,IC (DP) 24P
D1	S	8-719-911-19	1SS119
D2	S	8-719-911-19	1SS119
D3	S	8-719-911-19	1SS119
D4	S	8-719-911-19	1SS119
D5	S	8-719-939-39	GL-5HD8
IC1	S	8-759-910-83	TL072ACP
IC2	S	8-759-907-01	TL071CP
IC3	S	8-759-340-13	HD14013BP
IC4	S	8-759-340-13	HD14013BP
IC5	S	8-719-939-39	GL-5HD8
IC6	S	8-759-200-56	TC4526BP
IC7	S	8-759-903-17	LM318N
IC8	S	8-759-903-17	LM318N
IC9	S	8-759-903-17	LM318N
IC10	S	8-759-903-17	LM318N
IC11	S	8-759-903-17	LM318N
IC12	S	8-759-903-17	LM318N
IC13	S	8-759-202-21	TC74HC32P
IC14	S	8-759-240-01	TC4001BP
IC15	S	8-759-340-13	HD14013BP
IC16	S	8-759-045-57	MC14557BCP
IC17	S	8-759-045-57	MC14557BCP
IC18	S	8-759-200-56	TC4526BP
IC19	S	8-759-200-56	TC4526BP
IC20	S	8-759-903-37	LM337T
IC21	S	8-759-003-17	LM317T
IC22	S	T-9413-995-1	TBP28L86 MST V2.0
IC23	S	T-9413-995-1	TBP28L86 MST V2.0
IC24	S	T-9413-995-1	TBP28L86 MST V2.0
IC25	S	8-759-202-12	TC74HC02P

Ref. No.	SP	SONY Parts No.	Description
IC26	S	8-759-202-21	TC74HC32P
IC27	S	8-759-202-55	TC74HC244P
IC28	S	8-759-203-48	TC74HC573P
IC29	S	8-759-203-48	TC74HC573P
IC30	S	8-759-203-48	TC74HC573P
JW1	S	1-566-388-11	PIN, SHORT
JW2	S	1-566-388-11	PIN, SHORT
JW3	S	1-566-388-11	PIN, SHORT
JW4	S	1-566-388-11	PIN, SHORT
JW5	S	1-566-388-11	PIN, SHORT
JW6	S	1-566-388-11	PIN, SHORT
L1	S	1-409-339-00	COIL,SN
L2	S	T-9412-204-1	INDUCTOR 5MH
L3	S	1-408-092-00	INDUCTOR,MICRO 33MH 5%
Q1	S	8-729-139-04	2N3904
Q2	S	T-9410-035-1	MJE105
R1	S	1-247-903-00	CARBON 1M 5% 1/4W
R2	S	1-247-903-00	CARBON 1M 5% 1/4W
R3	S	1-247-903-00	CARBON 1M 5% 1/4W
R4	S	1-214-533-00	METAL FILM 100 1% 1/8W
R7	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R8	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R9	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R10	S	1-214-541-00	METAL FILM 220 1% 1/8W
R11	S	1-214-541-00	METAL FILM 220 1% 1/8W
R12	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R13	S	1-215-830-11	METAL FILM 100K 1% 1/8W
R14	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R15	S	1-214-578-00	METAL FILM 7.5K 1% 1/8W
R16	S	1-214-591-00	METAL FILM 27K 1% 1/8W
R17	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R18	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R19	S	1-214-541-00	METAL FILM 220 1% 1/8W
R20	S	1-214-541-00	METAL FILM 220 1% 1/8W
R21	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R22	S	1-215-830-11	METAL FILM 100K 1% 1/8W
R23	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R24	S	1-214-563-00	METAL FILM 1.8K 1% 1/8W
R25	S	1-247-862-11	CARBON 20K 5% 1/4W
R26	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R27	S	1-214-549-00	METAL FILM 470 1% 1/8W
R28	S	1-214-549-00	METAL FILM 470 1% 1/8W
R29	S	1-214-573-00	METAL FILM 4.7K 1% 1/8W
R30	S	1-214-573-00	METAL FILM 4.7K 1% 1/8W
R31	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R32	S	1-247-688-11	CARBON 10 5% 1/4W

Ref. No.	SP	SONY Parts No.	Description			
R33	S	1-247-688-11	CARBON	10	5%	1/4W
R34	S	1-247-688-11	CARBON	10	5%	1/4W
R35	S	1-247-688-11	CARBON	10	5%	1/4W
R36	S	1-247-688-11	CARBON	10	5%	1/4W
R37	S	1-247-688-11	CARBON	10	5%	1/4W
R38	S	1-247-688-11	CARBON	10	5%	1/4W
R39	S	1-247-688-11	CARBON	10	5%	1/4W
R40	S	1-247-688-11	CARBON	10	5%	1/4W
R41	S	1-247-688-11	CARBON	10	5%	1/4W
R42	S	1-247-688-11	CARBON	10	5%	1/4W
R43	S	1-247-688-11	CARBON	10	5%	1/4W
R44	S	1-247-688-11	CARBON	10	5%	1/4W
R45	S	1-247-688-11	CARBON	10	5%	1/4W
R46	S	1-247-688-11	CARBON	10	5%	1/4W
R47	S	1-247-688-11	CARBON	10	5%	1/4W
R48	S	1-215-822-11	METAL FILM	47K	1%	1/8W
R49	S	1-215-822-11	METAL FILM	47K	1%	1/8W
R50	S	1-215-822-11	METAL FILM	47K	1%	1/8W
R51	S	1-215-822-11	METAL FILM	47K	1%	1/8W
R52	S	1-215-822-11	METAL FILM	47K	1%	1/8W
R53	S	1-215-822-11	METAL FILM	47K	1%	1/8W
R54	S	1-215-822-11	METAL FILM	47K	1%	1/8W
R55	S	1-215-822-11	METAL FILM	47K	1%	1/8W
R56	S	1-215-822-11	METAL FILM	47K	1%	1/8W
R57	S	1-215-822-11	METAL FILM	47K	1%	1/8W
R58	S	1-215-822-11	METAL FILM	47K	1%	1/8W
R59	S	1-215-822-11	METAL FILM	47K	1%	1/8W
R60	S	1-215-822-11	METAL FILM	47K	1%	1/8W
R61	S	1-215-822-11	METAL FILM	47K	1%	1/8W
R62	S	1-215-822-11	METAL FILM	47K	1%	1/8W
R63	S	1-215-822-11	METAL FILM	47K	1%	1/8W
R64	S	1-215-822-11	METAL FILM	47K	1%	1/8W
R65	S	1-247-741-11	CARBON	150	5%	1/2W
R66	S	1-214-581-00	METAL FILM	10K	1%	1/8W
R67	S	1-214-581-00	METAL FILM	10K	1%	1/8W
R70	S	1-214-567-00	METAL FILM	2.7K	1%	1/8W
R71	S	1-214-567-00	METAL FILM	2.7K	1%	1/8W
R72	S	1-214-567-00	METAL FILM	2.7K	1%	1/8W
R73	S	1-214-567-00	METAL FILM	2.7K	1%	1/8W
R74	S	1-214-573-00	METAL FILM	4.7K	1%	1/8W
R75	S	1-214-533-00	METAL FILM	100	1%	1/8W
R76	S	1-214-533-00	METAL FILM	100	1%	1/8W
R77	S	1-215-830-11	METAL FILM	100K	1%	1/8W
R78	S	1-214-581-00	METAL FILM	10K	1%	1/8W
R79	S	1-247-225-00	CARBON	240	5%	1/2W
R80	S	1-247-225-00	CARBON	240	5%	1/2W

Ref. No.	SP	SONY Parts No.	Description
RN1	S	1-235-005-00	RESISTOR BLOCK 47K
RN2	S	1-235-005-00	RESISTOR BLOCK 47K
RN3	S	1-235-005-00	RESISTOR BLOCK 47K
RN4	S	1-235-005-00	RESISTOR BLOCK 47K
RV1	S	1-237-332-11	ADJ,CERMET 2K
RV2	S	1-228-932-00	ADJ,CERMET 10K
RV3	S	1-237-517-21	ADJ, METAL FILM 5K
RV4	S	1-237-517-21	ADJ, METAL FILM 5K

PDB BOARD

	O	A-7850-341-A	MOUNTED PCB,PDB (This assembly includes the following parts.)
	S	9-911-863-XX	SPACER
C1	S	1-123-334-00	ELECT 220MF 20% 25V
C2	S	1-123-334-00	ELECT 220MF 20% 25V
CNJ900	O	1-560-815-00	CONNECTOR WITH LOCK 4P
CNJ901	O	1-560-259-00	CONNECTOR WITH LOCK 6P
CNJ902-1	O	1-564-794-11	WAFER ASSY 7P
CNJ902-2	O	1-560-259-00	CONNECTOR WITH LOCK 6P
CNJ903	O	1-560-260-00	CONNECTOR WITH LOCK 9P
CNJ904	O	1-560-304-00	POST HEADER (IL CONNECTOR) 8P
CNJ905	O	1-560-305-00	POST HEADER (IL CONNECTOR) 10P
CNJ906	O	1-560-303-00	POST HEADER (IL CONNECTOR) 6P
CNJ907	O	1-560-302-00	POST HEADER (IL CONNECTOR) 5P
CNJ908	O	1-508-776-00	CONNECTOR WITH LOCK 10P
CNJ910	O	1-564-693-21	CONNECTOR,RIBBON CABLE 10P
CNJ911	O	1-560-260-00	CONNECTOR WITH LOCK 9P
CNJ912	O	1-564-797-11	WAFER ASSY 10P
CNJ916	O	1-564-797-11	WAFER ASSY 10P
D1	S	8-719-940-03	1N4004
D2	S	8-719-940-03	1N4004
IC1	S	8-759-909-33	LM311P
R1	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R2	S	1-214-568-00	METAL FILM 3.0K 1% 1/8W
R3	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R4	S	1-214-575-00	METAL FILM 5.6K 1% 1/8W
R5	S	1-215-824-11	METAL FILM 56K 1% 1/8W
R6	S	1-249-417-11	CARBON 1K 5% 1/4W
RV1	S	1-237-516-21	ADJ,METAL FILM 2K
SW1	S	T-9412-737-1	SW G-660-S
SW2	S	T-9412-738-1	SW GF-626

Ref. No.	SP	SONY Parts No.	Description		

RGA BOARD

(APR-5002: Serial No. 20001 to 20700)

	O	A-7850-342-A	MOUNTED PCB,RGA (This assembly includes the following parts.)		
C1	S	1-123-619-00	ELECT	4.7MF	20% 50V
C2	S	1-161-894-11	CERAMIC	0.1MF	50V
C3	S	1-124-002-11	ELECT	1MF	20% 50V
C4	S	1-123-356-00	ELECT	10MF	20% 25V
CNJ960	O	1-564-979-11	PIN,CONNECTOR (RIGHT ANGLE) 4P		
D1	S	8-719-904-55	GL-5HD5		
D2	S	8-719-911-19	1SS119		
D3	S	8-719-230-04	30D4		
D4	S	8-719-940-03	1N4004		
D5	S	8-719-940-03	1N4004		
D6	S	8-719-940-03	1N4004		
D7	S	8-719-100-38	RD6.2EB2		
F1	S	T-9413-675-1	FUSE 7A		
Q1	S	8-729-113-08	2N3906		
Q2	S	T-9413-258-1	MJ2955A		
Q3	S	8-759-925-54	LM2940CT-5.0		
Q4	S	T-9410-021-1	1T015		
R1	S	1-214-114-00	METAL FILM 180	1%	1/4W
R2	S	1-217-054-00	RES,WIRE 1	10%	5W
R3	S	T-9412-298-1	RES,PWR 0.22HM	10%	5W
R4	S	1-247-192-00	CARBON 10	5%	1/2W
R5	S	1-247-208-00	CARBON 47	5%	1/2W
R6	S	1-247-208-00	CARBON 47	5%	1/2W
R7	S	1-246-408-00	CARBON 2	5%	1/4W

Ref. No.	SP	SONY Parts No.	Description

RGB BOARD

(APR-5002: Serial No. 20001 to 20700)

	O	A-7850-343-A	MOUNTED PCB,RGB (This assembly includes the following parts.)
C1	S	1-123-337-00	ELECT 1000MF 20% 25V
C2	S	1-123-619-00	ELECT 4.7MF 20% 50V
C3	S	1-161-894-11	CERAMIC 0.1MF 50V
C4	S	1-123-611-00	ELECT 1MF 20% 50V
C5	S	1-123-619-00	ELECT 4.7MF 20% 50V
C6	S	1-123-356-00	ELECT 10MF 20% 25V
CNJ1	O	1-564-979-11	PIN,CONNECTOR (RIGHT ANGLE) 4P
D1	S	8-719-100-38	RD6.2EB2
D2	S	8-719-100-38	RD6.2EB2
D3	S	8-719-940-03	1N4004
D4	S	8-719-940-03	1N4004
D5	S	8-719-940-03	1N4004
D6	S	8-719-100-38	RD6.2EB2
D7	S	8-719-940-03	1N4004
F1	S	1-532-782-11	FUSE,MICRO 4A
F2	S	1-532-779-11	FUSE,MICRO 2A
Q1	S	T-9410-036-1	MJE205
Q2	S	8-729-208-27	2N3055
Q3	S	T-9410-021-1	1T015
Q4	S	8-759-011-84	LM309K
Q5	S	T-9410-021-1	1T015
R1	S	1-247-232-00	CARBON 470 5% 1/2W
R2	S	1-247-240-00	CARBON 1K 5% 1/2W
R3	S	1-247-208-00	CARBON 47 5% 1/2W
R4	S	1-247-208-00	CARBON 47 5% 1/2W
R5	S	1-247-208-00	CARBON 47 5% 1/2W
R6	S	1-247-208-00	CARBON 47 5% 1/2W

Ref. No.	SP	SONY Parts No.	Description

RG-1 BOARD

(APR-5002: Serial No. 20701 and higher
APR-5003V: Serial No. 10001 and higher)

	O	A-7850-517-A	MOUNTED PCB,RG-1
			(This assembly includes the following parts.)
	O	3-711-338-01	RETAINER, TR
	O	4-904-399-01	TUBE (B), TR SARCON
	S	7-682-650-09	+PS 3X12
	S	7-682-648-09	+PSW 3X8
C1	S	1-126-104-11	ELECT 470MF 20% 35V
C2	S	1-161-063-00	CERAMIC 0.1MF 20% 50V
C3	S	1-124-791-11	ELECT 1MF 20% 50V
C4	S	1-123-875-11	ELECT 10MF 20% 50V
C5	S	1-161-063-00	CERAMIC 0.1MF 20% 50V
C6	S	1-124-791-11	ELECT 1MF 20% 50V
C7	S	1-123-382-00	ELECT 33MF 20% 50V
CN960	O	1-560-815-00	PIN, CONNECTOR 4P (WITH LOCK)
CN961	O	1-560-815-00	PIN, CONNECTOR 4P (WITH LOCK)
D1	S	8-719-109-93	RD6.2ES-B2
D2	S	8-719-940-03	1N4004
D3	S	8-719-940-03	1N4004
D4	S	8-719-940-03	1N4004
D5	S	8-719-940-03	1N4004
D6	S	8-719-230-04	30D4
D7	S	8-719-940-03	1N4004
D8	S	8-719-940-03	1N4004
D9	S	8-719-940-03	1N4004
F1	S	1-532-782-11	FUSE, MICRO (SECONDARY) 4A
F2	S	1-532-779-11	FUSE, MICRO (SECONDARY) 2A
F3	S	1-532-782-11	FUSE, MICRO (SECONDARY) 4A
F4	S	1-532-782-11	FUSE, MICRO (SECONDARY) 4A
Q1	S	8-729-313-32	2SD1133
Q2	S	8-729-201-97	2SC3182
Q3	S	8-729-178-54	2SC2785
Q4	S	8-759-171-05	uPC7805
Q5	S	8-729-117-54	2SA1175
Q6	S	8-729-201-89	2SA1265
Q7	S	8-759-925-54	LM2940CT-5.0
R1	S	1-249-413-11	CARBON 470 5% 1/4W
R2	S	1-249-417-11	CARBON 1K 5% 1/4W
R3	S	1-216-401-11	METAL FILM 0.22 5% 5W
R4	S	1-216-365-00	METAL FILM 0.47 5% 2W
R5	S	1-216-401-11	METAL FILM 0.22 5% 5W
R6	S	1-249-393-11	CARBON 10 5% 1/4W

Ref. No.	SP	SONY Parts No.	Description

RGC BOARD

(APR-5002: Serial No. 20001 to 20700)

	O	A-7850-344-A	MOUNTED PCB,RGC (This assembly includes the following parts.)
	O	1-566-163-11	PIN,CONNECTOR (RIGHT ANGLE) 5P
C1	S	1-161-894-11	CERAMIC 0.1MF 50V
C2	S	1-123-611-00	ELECT 1MF 20% 50V
C3	S	1-123-356-00	ELECT 10MF 20% 25V
C4	S	1-123-619-00	ELECT 4.7MF 20% 50V
C5	S	1-161-894-11	CERAMIC 0.1MF 50V
C6	S	1-123-611-00	ELECT 1MF 20% 50V
C7	S	1-123-356-00	ELECT 10MF 20% 25V
C8	S	1-123-619-00	ELECT 4.7MF 20% 50V
C9	S	1-123-352-11	ELECT 1MF 20% 50V
C10	S	1-161-894-11	CERAMIC 0.1MF 50V
C11	S	1-161-894-11	CERAMIC 0.1MF 50V
D1	S	8-719-907-78	PR5534S
D2	S	8-719-911-19	1SS119
D3	S	8-719-230-04	30D4
D4	S	8-719-940-03	1N4004
D5	S	8-719-940-03	1N4004
D6	S	8-719-100-86	RD22EB2
D7	S	8-719-940-03	1N4004
D8	S	8-719-907-78	PR5534S
D9	S	8-719-911-19	1SS119
D10	S	8-719-230-04	30D4
D11	S	8-719-940-03	1N4004
D12	S	8-719-100-86	RD22EB2
D13	S	8-719-940-03	1N4004
D14	S	8-719-940-03	1N4004
D15	S	8-719-940-03	1N4004
D16	S	8-719-940-03	1N4004
F1	S	T-9413-675-1	FUSE,7A
F2	S	T-9413-675-1	FUSE,7A
Q1	S	8-729-139-04	2N3904
Q2	S	8-759-937-23	LM337K
Q3	S	8-729-208-27	2N3055
Q4	S	T-9410-021-1	1T015
Q5	S	8-729-113-08	2N3906
Q6	S	T-9410-021-1	1T015
Q7	S	8-759-011-85	LM317K
Q8	S	T-9413-258-1	MJ2955A

Ref. No.	SP	SONY Parts No.	Description
R1	S	1-247-707-11	CARBON 390 5% 1/4W
R2	S	T-9412-299-1	0.33HM 10% 5W
R3	S	1-217-054-00	RES,WIRE 1 10% 5W
R4	S	1-247-192-00	CARBON 10 5% 1/2W
R5	S	1-247-208-00	CARBON 47 5% 1/2W
R6	S	1-247-208-00	CARBON 47 5% 1/2W
R7	S	1-247-707-11	CARBON 390 5% 1/4W
R8	S	1-217-054-00	RES,WIRE 1 10% 5W
R9	S	1-247-208-00	CARBON 47 5% 1/2W
R10	S	1-247-208-00	CARBON 47 5% 1/2W
R11	S	1-247-192-00	CARBON 10 5% 1/2W
R12	S	T-9412-299-1	0.33HM 10% 5W
R13	S	T-9411-677-1	CARBON 3.16 1% 1/8W
R14	S	1-247-116-00	CARBON 240 5% 1/4W
R15	S	T-9411-677-1	CARBON 3.16 1% 1/8W
R16	S	1-247-116-00	CARBON 240 5% 1/4W

RGD BOARD

(APR-5002: Serial No. 20001 to 20700)

	O	A-7850-345-A	MOUNTED PCB,RGD (This assembly includes the following parts.)
	O	1-566-163-11	PIN,CONNECTOR (RIGHT ANGLE) 5P
C1	S	1-123-611-00	ELECT 1MF 20% 50V
C2	S	1-123-356-00	ELECT 10MF 20% 25V
C3	S	1-123-619-00	ELECT 4.7MF 20% 50V
C4	S	1-161-894-11	CERAMIC 0.1MF 50V
C5	S	1-123-611-00	ELECT 1MF 20% 50V
C6	S	1-123-619-00	ELECT 4.7MF 20% 50V
C7	S	1-161-894-11	CERAMIC 0.1MF 50V
C8	S	1-123-619-00	ELECT 4.7MF 20% 50V
C9	S	1-123-611-00	ELECT 1MF 20% 50V
C10	S	1-123-356-00	ELECT 10MF 20% 25V
C11	S	1-123-611-00	ELECT 1MF 20% 50V
C12	S	1-123-619-00	ELECT 4.7MF 20% 50V
CNJ1-1	O	1-564-979-11	CONNECTOR (RIGHT ANGLE) 4P
CNJ1-2	O	1-566-163-11	CONNECTOR (RIGHT ANGLE) 5P

Ref. No.	SP	SONY Parts No.	Description
D1	S	8-719-940-03	1N4004
D2	S	8-719-940-03	1N4004
D3	S	8-719-100-86	RD22EB2
D4	S	8-719-100-94	RD27EB2
D5	S	8-719-940-03	1N4004
D6	S	8-719-940-03	1N4004
D7	S	8-719-100-94	RD27EB2
D8	S	8-719-940-03	1N4004
D9	S	8-719-100-86	RD22EB2
D10	S	8-719-940-03	1N4004
D11	S	8-719-100-94	RD27EB2
D12	S	8-719-940-03	1N4004
D13	S	8-719-100-94	RD27EB2
D14	S	8-719-940-03	1N4004
D15	S	8-719-100-77	RD18EB2
F1	S	1-532-783-11	FUSE,MICRO (SECONDARY) 5A
F2	S	1-532-783-11	FUSE,MICRO (SECONDARY) 5A
Q2	S	T-9410-036-1	MJE205
Q3	S	T-9410-021-1	1T015
Q4	S	8-729-208-27	2N3055
Q5	S	T-9410-021-1	1T015
Q6	S	T-9410-021-1	1T015
Q8	S	T-9413-258-1	MJ2955A
Q9	S	T-9410-021-1	1T015
Q10	S	T-9410-035-1	MJE105
Q11	S	T-9410-287-1	SP7000-0127-02
R2	S	1-247-208-00	CARBON 47 5% 1/2W
R3	S	1-247-208-00	CARBON 47 5% 1/2W
R4	S	1-247-232-00	CARBON 470 5% 1/2W
R5	S	1-247-240-00	CARBON 1K 5% 1/2W
R6	S	1-247-208-00	CARBON 47 5% 1/2W
R7	S	1-247-208-00	CARBON 47 5% 1/2W
R8	S	1-247-208-00	CARBON 47 5% 1/2W
R9	S	1-247-208-00	CARBON 47 5% 1/2W
R10	S	1-247-240-00	CARBON 1K 5% 1/2W
R11	S	1-247-208-00	CARBON 47 5% 1/2W
R12	S	1-247-208-00	CARBON 47 5% 1/2W
R13	S	1-247-232-00	CARBON 470 5% 1/2W
R14	S	1-215-421-00	METAL FILM 1K 1% 1/6W
R15	S	1-215-419-00	METAL FILM 820 1% 1/6W

Ref. No.	SP	SONY Parts No.	Description

RG-2 BOARD

(APR-5002: Serial No. 20701 and higher
APR-5003V: Serial No. 10001 and higher)

	O	A-7850-518-A	MOUNTED PCB,RG-2
			(This assembly includes the following parts.)
	O	3-711-338-01	RETAINER, TR
	O	4-904-398-01	TUBE (A), TR SARCON
	O	4-904-399-01	TUBE (B), TR SARCON
	S	7-682-650-09	+PS 3X12
	S	7-682-648-09	+PSW 3X8
C1	S	1-124-513-11	ELECT 47MF 20% 50V
C2	S	1-124-513-11	ELECT 47MF 20% 50V
C3	S	1-161-063-00	CERAMIC 0.1MF 20% 50V
C4	S	1-124-791-11	ELECT 1MF 20% 50V
C5	S	1-123-875-11	ELECT 10MF 20% 50V
C6	S	1-124-513-11	ELECT 47MF 20% 50V
C7	S	1-124-513-11	ELECT 47MF 20% 50V
C8	S	1-161-063-00	CERAMIC 0.1MF 20% 50V
C9	S	1-124-791-11	ELECT 1MF 20% 50V
C10	S	1-123-875-11	ELECT 10MF 20% 50V
C11	S	1-161-063-00	CERAMIC 0.1MF 20% 50V
C12	S	1-124-791-11	ELECT 1MF 20% 50V
C13	S	1-123-875-11	ELECT 10MF 20% 50V
C14	S	1-161-063-00	CERAMIC 0.1MF 20% 50V
C15	S	1-124-791-11	ELECT 1MF 20% 50V
C16	S	1-123-875-11	ELECT 10MF 20% 50V
CN962	O	1-564-792-11	WAFER ASSY 5P
CN963	O	1-560-260-00	PIN, CONNECTOR 9P (WITH LOCK)
CN999	O	1-560-299-00	POST HEADER (IL CONNECTOR) 2P
D1	S	8-719-160-80	RD27FB1
D3	S	8-719-940-03	1N4004
D4	S	8-719-940-03	1N4004
D5	S	8-719-940-03	1N4004
D6	S	8-719-160-80	RD27FB1
D8	S	8-719-940-03	1N4004
D9	S	8-719-940-03	1N4004
D10	S	8-719-940-03	1N4004
D11	S	8-719-230-04	30D4
D12	S	8-719-940-03	1N4004
D13	S	8-719-940-03	1N4004
D14	S	8-719-940-03	1N4004
D15	S	8-719-230-04	30D4
D16	S	8-719-940-03	1N4004
D17	S	8-719-940-03	1N4004
D18	S	8-719-940-03	1N4004

Ref. No.	SP	SONY Parts No.	Description
F1	S	1-532-782-11	FUSE, MICRO (SECONDARY) 4A
F2	S	1-532-782-11	FUSE, MICRO (SECONDARY) 4A
F3	S	1-532-782-11	FUSE, MICRO (SECONDARY) 4A
F4	S	1-532-782-11	FUSE, MICRO (SECONDARY) 4A
F5	S	1-532-783-11	FUSE, MICRO (SECONDARY) 5A
F6	S	1-532-783-11	FUSE, MICRO (SECONDARY) 5A
Q1	S	8-729-238-32	2SC2383
Q2	S	8-719-108-08	AC03FGM-AY
Q3	S	8-729-385-82	2SB858
Q4	S	8-729-201-89	2SA1265
Q5	S	8-759-604-52	M5F7915
Q6	S	8-729-201-32	2SA1013
Q7	S	8-719-108-08	AC03FGM-AY
Q8	S	8-729-313-32	2SD1133
Q9	S	8-729-201-97	2SC3182
Q10	S	8-759-604-52	M5F7915
Q11	S	8-729-178-54	2SC2785
Q12	S	8-729-201-97	2SC3182
Q13	S	8-759-179-18	uPC7918H
Q14	S	8-729-117-54	2SA1175
Q15	S	8-729-201-89	2SA1265
Q16	S	8-759-701-81	NJM7818FA
R1	S	1-207-641-00	WIREWOUND 0.1 10% 4W
R2	S	1-249-395-11	CARBON 15 5% 1/4W
R3	S	1-249-417-11	CARBON 1K 5% 1/4W
R4	S	1-249-418-11	CARBON 1.2K 5% 1/4W
R5	S	1-249-421-11	CARBON 2.2K 5% 1/4W
R6	S	1-249-413-11	CARBON 470 5% 1/4W
R7	S	1-207-641-00	WIREWOUND 0.1 10% 4W
R8	S	1-249-395-11	CARBON 15 5% 1/4W
R9	S	1-249-417-11	CARBON 1K 5% 1/4W
R10	S	1-249-418-11	CARBON 1.2K 5% 1/4W
R11	S	1-249-421-11	CARBON 2.2K 5% 1/4W
R12	S	1-249-413-11	CARBON 470 5% 1/4W
R13	S	1-207-917-00	WIREWOUND 0.27 10% 4W
R14	S	1-249-393-11	CARBON 10 5% 1/4W
R15	S	1-216-365-00	METAL FILM 0.47 5% 2W
R16	S	1-207-917-00	WIREWOUND 0.27 10% 4W
R17	S	1-249-393-11	CARBON 10 5% 1/4W
R18	S	1-216-365-00	METAL FILM 0.47 5% 2W
R19	S	1-215-916-00	METAL FILM 680 5% 3W
R20	S	1-215-916-00	METAL FILM 680 5% 3W

Ref. No.	SP	SONY Parts No.	Description
RMD BOARD			
	O	A-7850-337-A	COMPLETE PCB,RMD (This assembly includes the following parts.)
	O	T-9412-726-1	FUSE CLIP
	O	3-157-917-00	SUPPORT(B), PC BOARD
	O	3-577-229-00	INSULATOR, TO-126
	S	7-682-548-09	SCREW, B3x8
	S	7-682-647-09	SCREW, PSW3x6
	S	7-682-648-09	SCREW, PSW3x8
	S	7-682-650-09	SCREW, PSW3x12
C1	S	1-123-357-00	ELECT 22MF 20% 35V
C2	S	1-123-357-00	ELECT 22MF 20% 35V
C3	S	1-123-357-00	ELECT 22MF 20% 35V
C4	S	1-123-357-00	ELECT 22MF 20% 35V
C5	S	1-124-499-11	ELECT 1MF 20% 50V
C6	S	1-161-473-00	CERAMIC 0.01MF 10% 50V
C7	S	1-161-473-00	CERAMIC 0.01MF 10% 50V
C8	S	1-124-499-11	ELECT 1MF 20% 50V
C9	S	1-161-473-00	CERAMIC 0.01MF 10% 50V
C10	S	1-161-473-00	CERAMIC 0.01MF 10% 50V
C11	S	1-161-485-00	CERAMIC 0.1MF 50V
C12	S	1-161-485-00	CERAMIC 0.1MF 50V
C13	S	1-161-485-00	CERAMIC 0.1MF 50V
C14	S	1-161-485-00	CERAMIC 0.1MF 50V
C15	S	1-161-485-00	CERAMIC 0.1MF 50V
C16	S	1-161-485-00	CERAMIC 0.1MF 50V
C17	S	1-161-485-00	CERAMIC 0.1MF 50V
C18	S	1-161-485-00	CERAMIC 0.1MF 50V
CNJ470	O	1-560-304-00	POST HEADER (IL CONNECTOR)8P
CNJ471	O	1-566-415-11	PIN, CONNECTOR (PC BOARD) 2P
CNJ953	O	1-566-416-11	PIN, CONNECTOR (PC BOARD) 3P
D1	S	8-719-109-85	RD5.1ES-B2
D3	S	8-719-940-03	1N4004
D4	S	8-719-911-19	1SS119
D5	S	8-719-911-19	1SS119
D6	S	8-719-911-19	1SS119
D7	S	8-719-911-19	1SS119
D8	S	8-719-911-19	1SS119
D9	S	8-719-911-19	1SS119
D10	S	8-719-911-19	1SS119
D11	S	8-719-911-19	1SS119

Ref. No.	SP	SONY Parts No.	Description
D12	S	8-719-911-19	1SS119
D13	S	8-719-911-19	1SS119
D14	S	8-719-911-19	1SS119
D15	S	8-719-911-19	1SS119
D16	S	8-719-939-10	MR752
D17	S	8-719-939-10	MR752
D18	S	8-719-109-63	RD3.0ES-B2
D19	S	8-719-109-63	RD3.0ES-B2
F1	S	1-532-508-00	FUSE,GLASS TUBE 8A
F2	S	1-532-508-00	FUSE,GLASS TUBE 8A
IC1	S	8-719-901-03	PC525
IC2	S	8-759-910-83	TL072ACP
IC3	S	8-759-990-04	TL074CN
IC4	S	8-759-990-04	TL074CN
IC5	S	8-759-604-34	M5F7815
IC6	S	8-759-604-52	M5F7915
K1	S	1-515-670-11	RELAY,P.C. MOUNT
Q1	S	8-729-139-04	2N3904
Q2	S	8-729-306-92	2SD669A
Q3	S	8-729-300-24	2SA1170
Q4	S	8-729-304-92	2SB649A
Q5	S	8-729-300-18	2SC2774
Q6	S	8-729-306-92	2SD669A
Q7	S	8-729-300-24	2SA1170
Q8	S	8-729-304-92	2SB649A
Q9	S	8-729-300-18	2SC2774
R1	S	1-247-688-11	CARBON 10 5% 1/4W
R2	S	1-249-421-11	CARBON 2.2K 5% 1/4W
R3	S	1-247-688-11	CARBON 10 5% 1/4W
R4	S	1-249-429-11	CARBON 10K 5% 1/4W
R5	S	1-249-417-11	CARBON 1K 5% 1/4W
R6	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R7	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R8	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R9	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R10	S	1-247-836-11	CARBON 1.6K 5% 1/4W
R11	S	1-249-421-11	CARBON 2.2K 5% 1/4W
R12	S	1-249-429-11	CARBON 10K 5% 1/4W
R13	S	1-249-429-11	CARBON 10K 5% 1/4W
R14	S	1-249-429-11	CARBON 10K 5% 1/4W
R15	S	1-249-429-11	CARBON 10K 5% 1/4W
R16	S	1-249-429-11	CARBON 10K 5% 1/4W
R17	S	1-249-429-11	CARBON 10K 5% 1/4W
R18	S	1-249-401-11	CARBON 47 5% 1/4W
R19	S	1-247-688-11	CARBON 10 5% 1/4W
R20	S	1-247-688-11	CARBON 10 5% 1/4W

Ref. No.	SP	SONY Parts No.	Description
R21	S	1-249-401-11	CARBON 47 5% 1/4W
R22	S	1-207-612-00	RES,WIRE 0.1 10% 3W
R23	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R24	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R25	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R26	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R27	S	1-249-429-11	CARBON 10K 5% 1/4W
R28	S	1-247-903-00	CARBON 1M 5% 1/4W
R29	S	1-249-441-11	CARBON 100K 5% 1/4W
R30	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R31	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R32	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R33	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R34	S	1-247-836-11	CARBON 1.6K 5% 1/4W
R35	S	1-249-421-11	CARBON 2.2K 5% 1/4W
R36	S	1-249-429-11	CARBON 10K 5% 1/4W
R37	S	1-249-429-11	CARBON 10K 5% 1/4W
R38	S	1-249-429-11	CARBON 10K 5% 1/4W
R39	S	1-249-429-11	CARBON 10K 5% 1/4W
R40	S	1-249-429-11	CARBON 10K 5% 1/4W
R41	S	1-249-429-11	CARBON 10K 5% 1/4W
R42	S	1-249-401-11	CARBON 47 5% 1/4W
R43	S	1-247-688-11	CARBON 10 5% 1/4W
R44	S	1-247-688-11	CARBON 10 5% 1/4W
R45	S	1-249-401-11	CARBON 47 5% 1/4W
R46	S	1-207-612-00	RES,WIRE 0.1 10% 3W
R47	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R48	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R49	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R50	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R51	S	1-249-429-11	CARBON 10K 5% 1/4W
R52	S	1-247-903-00	CARBON 1M 5% 1/4W
R53	S	1-249-441-11	CARBON 100K 5% 1/4W
RV1	S	1-237-517-21	ADJ,METAL FILM 5K
RV2	S	1-237-521-21	ADJ,METAL FILM 100K
RV3	S	1-237-517-21	ADJ,METAL FILM 5K
RV4	S	1-237-521-21	ADJ,METAL FILM 100K

Ref. No.	SP	SONY Parts No.	Description
RTS-1 BOARD			
	O	A-7850-349-A	MOUNTED PCB,RTS-1 (This assembly includes the following parts.)
C1	S	1-126-096-11	ELECT 10MF 20% 25V
C2	S	1-126-096-11	ELECT 10MF 20% 25V
C3	S	1-126-096-11	ELECT 10MF 20% 25V
C6	S	1-162-710-11	CERAMIC 100PF 5% 50V
C7	S	1-162-710-11	CERAMIC 100PF 5% 50V
C8	S	1-161-485-00	CERAMIC 0.1MF 50V
C9	S	1-161-485-00	CERAMIC 0.1MF 50V
CNJ403	O	1-560-311-00	POST HEADER (IL CONNECTOR) 5P
D1	S	8-719-110-22	RD11ES-B2
D2	S	8-719-109-85	RD5.1ES-B2
D3	S	8-719-109-85	RD5.1ES-B2
IC1	S	8-745-211-00	DM-211
IC2	S	8-759-990-04	TL074CN
R1	S	1-249-393-11	CARBON 10 5% 1/4W
R2	S	1-249-393-11	CARBON 10 5% 1/4W
R3	S	1-247-711-11	CARBON 680 5% 1/4W
R4	S	1-247-711-11	CARBON 680 5% 1/4W
R5	S	1-249-433-11	CARBON 22K 5% 1/4W
R6	S	1-249-433-11	CARBON 22K 5% 1/4W
R7	S	1-249-433-11	CARBON 22K 5% 1/4W
R8	S	1-249-433-11	CARBON 22K 5% 1/4W
R9	S	1-249-421-11	CARBON 2.2K 5% 1/4W
R10	S	1-249-421-11	CARBON 2.2K 5% 1/4W
R11	S	1-247-887-00	CARBON 220K 5% 1/4W
R12	S	1-247-887-00	CARBON 220K 5% 1/4W
R13	S	1-249-421-11	CARBON 2.2K 5% 1/4W
R14	S	1-249-421-11	CARBON 2.2K 5% 1/4W
RV1	S	1-237-501-21	ADJ,METAL FILM 2K
RV2	S	1-237-501-21	ADJ,METAL FILM 2K

Ref. No.	SP	SONY Parts No.	Description
TCC BOARD (For APR-5003A)			
	O	A-7850-378-A	COMPLETE PCB,TCC (This assembly includes the following parts.)
	S	T-9412-185-1	FERRITE BEAD
C1	S	1-123-333-00	ELECT 100MF 20% 25V
C2	S	1-123-333-00	ELECT 100MF 20% 25V
C3	S	1-123-333-00	ELECT 100MF 20% 25V
C4	S	1-123-333-00	ELECT 100MF 20% 25V
C5	S	1-123-333-00	ELECT 100MF 20% 25V
C6	S	1-162-726-11	CERAMIC 470PF 5% 50V
C10	S	1-162-668-11	CERAMIC 12PF 5% 50V
C11	S	1-124-631-11	ELECT 47MF 20% 16V
C18	S	1-161-473-00	CERAMIC 0.01MF 10% 50V
C19	S	1-162-673-11	CERAMIC 33PF 5% 50V
C20	S	1-130-777-00	POLYESTER FILM 0.1MF 5% 100V
C21	S	1-162-720-11	CERAMIC 270PF 5% 50V
C23	S	1-162-724-11	CERAMIC 390PF 5% 50V
C24	S	1-162-730-11	CERAMIC 680PF 5% 50V
C25	S	1-162-736-11	CERAMIC 1500PF 10% 50V
C26	S	1-124-429-00	ELECT 0.68MF 20% 50V
C27	S	1-162-710-11	CERAMIC 100PF 5% 50V
C28	S	1-162-668-11	CERAMIC 12PF 5% 50V
C29	S	1-126-235-11	ELECT 100MF 20% 16V
C30	S	1-126-235-11	ELECT 100MF 20% 16V
C31	S	1-126-235-11	ELECT 100MF 20% 16V
C32	S	1-162-716-11	CERAMIC 180PF 5% 50V
C35	S	1-162-877-11	CERAMIC 82PF 5% 50V
C36	S	1-162-673-11	CERAMIC 33PF 5% 50V
C37	S	1-162-724-11	CERAMIC 390PF 5% 50V
C38	S	1-162-671-11	CERAMIC 22PF 5% 50V
C39	S	1-126-235-11	ELECT 100MF 20% 16V
C40	S	1-162-668-11	CERAMIC 12PF 5% 50V
C41	S	1-162-732-11	CERAMIC 820PF 5% 50V
C42	S	1-162-875-11	CERAMIC 68PF 5% 50V
C43	S	1-162-671-11	CERAMIC 22PF 5% 50V
C44	S	1-162-893-11	CERAMIC 2200PF 10% 50V
C45	S	1-162-734-11	CERAMIC 0.001MF 10% 50V
C46	S	1-162-726-11	CERAMIC 470PF 5% 50V
C48	S	1-162-671-11	CERAMIC 22PF 5% 50V

Ref. No.	SP	SONY Parts No.	Description		
C49	S	1-162-871-11	CERAMIC 47PF	5%	50V
C50	S	1-162-666-11	CERAMIC 0.027MF	10%	50V
C51	S	1-162-671-11	CERAMIC 22PF	5%	50V
C52	S	1-162-718-11	CERAMIC 220PF	5%	50V
C53	S	1-162-710-11	CERAMIC 100PF	5%	50V
C54	S	1-162-871-11	CERAMIC 47PF	5%	50V
C55	S	1-161-473-00	CERAMIC 0.01MF	10%	50V
C56	S	1-161-473-00	CERAMIC 0.01MF	10%	50V
C57	S	1-126-162-11	ELECT 3.3MF	20%	50V
C58	S	1-161-473-00	CERAMIC 0.01MF	10%	50V
C59	S	1-161-473-00	CERAMIC 0.01MF	10%	50V
C60	S	1-126-162-11	ELECT 3.3MF	20%	50V
C62	S	1-161-485-00	CERAMIC 0.1MF		50V
C63	S	1-123-357-00	ELECT 22MF	20%	35V
C64	S	1-123-357-00	ELECT 22MF	20%	35V
C65	S	1-123-357-00	ELECT 22MF	20%	35V
C66	S	1-123-357-00	ELECT 22MF	20%	35V
C67	S	1-124-006-11	ELECT 10MF	20%	25V
C68	S	1-124-499-11	ELECT 1MF	20%	50V
C69	S	1-162-714-11	CERAMIC 150PF	5%	50V
C70	S	1-162-673-11	CERAMIC 33PF	5%	50V
C71	S	1-162-800-11	CERAMIC 0.033MF	10%	50V
C72	S	1-162-800-11	CERAMIC 0.033MF	10%	50V
C73	S	1-161-473-00	CERAMIC 0.01MF	10%	50V
C74	S	1-161-473-00	CERAMIC 0.01MF	10%	50V
C75	S	1-123-357-00	ELECT 22MF	20%	35V
C76	S	1-123-357-00	ELECT 22MF	20%	35V
C80	S	1-161-485-00	CERAMIC 0.1MF		50V
C81	S	1-161-485-00	CERAMIC 0.1MF		50V
C82	S	1-123-357-00	ELECT 22MF	20%	35V
C83	S	1-123-357-00	ELECT 22MF	20%	35V
C90	S	1-123-357-00	ELECT 22MF	20%	35V
C91	S	1-123-357-00	ELECT 22MF	20%	35V
C92	S	1-123-357-00	ELECT 22MF	20%	35V
C93	S	1-123-357-00	ELECT 22MF	20%	35V
C94	S	1-123-357-00	ELECT 22MF	20%	35V
C95	S	1-123-357-00	ELECT 22MF	20%	35V
C96	S	1-162-839-11	CERAMIC 0.01MF	10%	16V
C97	S	1-123-357-00	ELECT 22MF	20%	35V
C98	S	1-123-357-00	ELECT 22MF	20%	35V
C105	S	1-162-839-11	CERAMIC 0.01MF	10%	16V
C109	S	1-162-893-11	CERAMIC 2200PF	10%	50V
C110	S	1-123-357-00	ELECT 22MF	20%	35V
C111	S	1-123-357-00	ELECT 22MF	20%	35V
C112	S	1-123-357-00	ELECT 22MF	20%	35V

Ref. No.	SP	SONY Parts No.	Description			
C113	S	1-123-357-00	ELECT	22MF	20%	35V
C114	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C115	S	1-123-357-00	ELECT	22MF	20%	35V
C116	S	1-123-357-00	ELECT	22MF	20%	35V
C120	S	1-123-357-00	ELECT	22MF	20%	35V
C121	S	1-123-357-00	ELECT	22MF	20%	35V
C125	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C126	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C127	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C128	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C129	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C130	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C131	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C132	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C133	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C134	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C135	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C136	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C137	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C138	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C139	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C140	S	1-123-357-00	ELECT	22MF	20%	35V
C141	S	1-123-357-00	ELECT	22MF	20%	35V
C142	S	1-124-438-00	ELECT	1MF	20%	50V
C143	S	1-124-438-00	ELECT	1MF	20%	50V
C144	S	1-162-839-11	CERAMIC	0.01MF	10%	16V
C147	S	1-162-788-11	CERAMIC	3300PF	10%	50V
C148	S	1-162-732-11	CERAMIC	820PF	5%	50V
C149	S	1-162-667-11	CERAMIC	10PF	5%	50V
C150	S	1-162-670-11	CERAMIC	18PF	5%	50V
C151	S	1-162-663-11	CERAMIC	1200PF	10%	50V
C152	S	1-123-357-00	ELECT	22MF	20%	35V
C153	S	1-123-357-00	ELECT	22MF	20%	35V
C157	S	1-123-357-00	ELECT	22MF	20%	35V
C158	S	1-123-357-00	ELECT	22MF	20%	35V
C159	S	1-123-357-00	ELECT	22MF	20%	35V
C160	S	1-123-357-00	ELECT	22MF	20%	35V
C161	S	1-123-163-11	ELECT	4.7MF	20%	50V
C162	S	1-162-726-11	CERAMIC	470PF	5%	50V
C163	S	1-162-671-11	CERAMIC	22PF	5%	50V
C164	S	1-162-671-11	CERAMIC	22PF	5%	50V
C165	S	1-162-671-11	CERAMIC	22PF	5%	50V
C166	S	1-162-674-11	CERAMIC	39PF	5%	50V
C167	S	1-162-710-11	CERAMIC	100PF	5%	50V
C168	S	1-162-664-11	CERAMIC	1800PF	10%	50V

Ref. No.	SP	SONY Parts No.	Description
C169	S	1-123-357-00	ELECT 22MF 20% 35V
C170	S	1-123-357-00	ELECT 22MF 20% 35V
C171	S	1-124-438-00	ELECT 1MF 20% 50V
C172	S	1-161-473-00	CERAMIC 0.01MF 10% 50V
C173	S	1-123-357-00	ELECT 22MF 20% 35V
C174	S	1-123-357-00	ELECT 22MF 20% 35V
D1	S	8-719-911-19	1SS119
D2	S	8-719-911-19	1SS119
D3	S	8-719-911-19	1SS119
D4	S	8-719-911-19	1SS119
D5	S	8-719-911-19	1SS119
D6	S	8-719-911-19	1SS119
D7	S	8-719-911-19	1SS119
D9	S	8-719-911-19	1SS119
D10	S	8-719-911-19	1SS119
D11	S	8-719-200-90	11DF1
D12	S	8-719-200-90	11DF1
D13	S	8-719-911-19	1SS119
D14	S	8-719-911-19	1SS119
D15	S	8-719-200-90	11DF1
D16	S	8-719-200-90	11DF1
D17	S	8-719-911-19	1SS119
D18	S	8-719-911-19	1SS119
D19	S	8-719-911-19	1SS119
D20	S	8-719-911-19	1SS119
D21	S	T-9410-333-1	1N34
D22	S	8-719-911-19	1SS119
D23	S	8-719-911-19	1SS119
D24	S	8-719-911-19	1SS119
D25	S	8-719-109-83	RD5.1ES-B2
D26	S	8-719-911-19	1SS119
IC1	S	8-759-905-34	NE5534AN
IC2	S	8-759-905-34	NE5534AN
IC3	S	8-759-900-72	NE5532P
IC4	S	8-759-937-40	DG212CJ
IC5	S	8-759-937-20	AD7528AQ
IC6	S	8-741-135-20	BX1352
IC7	S	8-759-910-83	TL072ACP
IC8	S	8-759-910-83	TL072ACP
IC9	S	8-759-910-83	TL072ACP
IC10	S	8-759-905-34	NE5534AN
IC11	S	8-741-135-30	BX1353
IC13	S	8-759-937-40	DG212CJ
IC14	S	8-759-937-40	DG212CJ
IC15	S	8-759-910-83	TL072ACP
IC16	S	8-759-937-40	DG212CJ

Ref. No.	SP	SONY Parts No.	Description
IC17	S	8-759-937-20	AD7528AQ
IC18	S	8-759-905-34	NE5534AN
IC19	S	8-759-937-40	DG212CJ
IC21	S	8-759-937-20	AD7528AQ
IC22	S	8-759-903-16	LM318P
IC23	S	8-759-937-40	DG212CJ
IC24	S	8-759-903-16	LM318P
IC25	S	8-759-903-16	LM318P
IC26	S	8-759-937-26	LM13006N
IC27	S	8-759-910-83	TL072ACP
IC28	S	8-759-202-55	TC74HC244P
IC29	S	8-759-203-48	TC74HC573P
IC30	S	8-759-203-48	TC74HC573P
IC31	S	8-759-203-48	TC74HC573P
IC32	S	8-759-202-14	TC74HC08P
IC33	S	8-759-202-21	TC74HC32P
IC34	S	8-759-202-21	TC74HC32P
IC35	S	8-759-202-12	TC74HC02P
IC36	S	8-759-245-16	TC4516BP
IC37	S	8-759-245-16	TC4516BP
IC38	S	8-759-340-13	HD14013BP
IC39	S	8-759-340-13	HD14013BP
IC40	S	8-759-140-69	uPD4069UBC
IC41	S	8-759-140-01	uPD4001BC
IC42	S	8-759-140-81	uPD4081BC
IC47	S	8-759-202-21	TC74HC32P
IC48	S	8-759-907-01	TL071CP
JW5	S	1-566-388-11	PIN, SHORT
K2	S	1-515-716-11	RELAY,DPDT 5V
L1	S	1-408-092-00	INDUCTOR,MICRO 330MH 5%
L2	S	1-409-339-00	COIL,SN
L3	S	1-408-092-00	INDUCTOR,MICRO 330MH 5%
Q1	S	T-9410-286-1	SP7000-0127-01
Q2	S	8-729-313-32	2SD1133
Q3	S	8-729-385-72	2SB857C
Q4	S	8-729-313-32	2SD1133
Q5	S	8-729-385-72	2SB857C
Q6	S	8-729-904-15	VN10KM
Q7	S	8-759-937-24	LM394H
Q8	S	T-9410-286-1	SP7000-0127-01
Q9	S	8-729-904-18	P1086
		(APR-5002: Up to NO. 20300)	

Ref. No.	SP	SONY Parts No.	Description
R2	S	1-214-533-00	METAL FILM 100 1% 1/8W
R3	S	1-214-533-00	METAL FILM 100 1% 1/8W
R4	S	1-214-533-00	METAL FILM 100 1% 1/8W
R5	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R6	S	1-247-887-00	CARBON 220K 5% 1/4W
R11	S	1-214-745-00	METAL FILM 4.7K 1% 1/4W
R12	S	1-214-769-00	METAL FILM 47K 1% 1/4W
R23	S	1-214-773-00	METAL FILM 68K 1% 1/4W
R24	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R25	S	1-247-888-00	CARBON 240K 5% 1/4W
R26	S	1-214-549-00	METAL FILM 470 1% 1/8W
R27	S	1-214-533-00	METAL FILM 100 1% 1/8W
R28	S	1-247-887-00	CARBON 220K 5% 1/4W
R30	S	1-214-748-00	METAL FILM 6.2K 1% 1/4W
R31	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R32	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R33	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R35	S	1-218-197-11	METAL FILM 2.43K 1% 1/8W
R36	S	1-214-757-00	METAL FILM 15K 1% 1/4W
R37	S	1-214-564-00	METAL FILM 2K 1% 1/8W
R38	S	1-214-564-00	METAL FILM 2K 1% 1/8W
R39	S	1-214-573-00	METAL FILM 4.7K 1% 1/8W
R42	S	1-214-533-00	METAL FILM 100 1% 1/8W
R45	S	1-215-826-11	METAL FIlM 68K 1% 1/8W
R46	S	1-215-826-11	METAL FIlM 68K 1% 1/8W
R47	S	1-218-194-11	METAL FILM 1.62K 1% 1/8W
R48	S	1-214-757-00	METAL FILM 15K 1% 1/4W
R49	S	1-218-201-11	METAL FILM 4.12K 1% 1/8W
R50	S	1-218-221-11	METAL FILM 40.2K 1% 1/8W
R51	S	1-214-760-00	METAL FILM 20K 1% 1/4W
R52	S	1-214-760-00	METAL FILM 20K 1% 1/4W
R53	S	1-214-753-00	METAL FILM 10K 1% 1/4W
R54	S	1-218-213-11	METAL FILM 21K 1% 1/8W
R56	S	1-218-220-11	METAL FILM 39.2K 1% 1/8W
R57	S	1-214-760-00	METAL FILM 20K 1% 1/4W
R58	S	1-214-749-00	METAL FILM 6.8K 1% 1/4W
R59	S	1-214-549-00	METAL FILM 470 1% 1/8W
R60	S	1-214-760-00	METAL FILM 20K 1% 1/4W
R61	S	1-214-760-00	METAL FILM 20K 1% 1/4W
R63	S	1-218-200-11	METAL FILM 3.74K 1% 1/8W
R64	S	1-218-194-11	METAL FILM 1.62K 1% 1/8W
R65	S	1-214-743-00	METAL FILM 3.9K 1% 1/4W
R66	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R67	S	1-247-888-11	CARBON 240K 5% 1/4W
R68	S	1-214-572-00	METAL FILM 4.3K 1% 1/8W

Ref. No.	SP	SONY Parts No.	Description
R69	S	1-215-830-11	METAL FILM 100K 1% 1/8W
R70	S	1-214-573-00	METAL FILM 4.7K 1% 1/8W
R71	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R73	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R74	S	1-247-888-11	CARBON 240K 5% 1/4W
R75	S	1-218-223-11	METAL FILM 36K 1% 1/4W
R76	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R77	S	1-214-772-00	METAL FILM 62K 1% 1/4W
R78	S	1-214-557-00	METAL FILM 1K 1% 1/8W
R79	S	1-214-573-00	METAL FILM 4.7K 1% 1/8W
R80	S	1-247-893-11	CARBON 390K 5% 1/4W
R81	S	1-215-827-11	METAL FILM 75K 1% 1/8W
R82	S	1-214-739-00	METAL FILM 2.7K 1% 1/4W
R83	S	1-249-441-11	CARBON 100K 5% 1/4W
R84	S	1-214-533-00	METAL FILM 100 1% 1/8W
R85	S	1-247-889-00	CARBON 270K 5% 1/4W
R86	S	1-214-773-00	METAL FILM 68K 1% 1/4W
R87	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R88	S	1-214-753-00	METAL FILM 10K 1% 1/4W
R89	S	1-214-753-00	METAL FILM 10K 1% 1/4W
R90	S	1-214-746-00	METAL FILM 5.1K 1% 1/4W
R91	S	1-214-753-00	METAL FILM 10K 1% 1/4W
R92	S	1-214-746-00	METAL FILM 5.1K 1% 1/4W
R93	S	1-214-753-00	METAL FILM 10K 1% 1/4W
R94	S	1-214-746-00	METAL FILM 5.1K 1% 1/4W
R95	S	1-214-746-00	METAL FILM 5.1K 1% 1/4W
R96	S	1-214-578-00	METAL FIML 7.5K 1% 1/8W
R97	S	1-214-578-00	METAL FIML 7.5K 1% 1/8W
R98	S	1-214-753-00	METAL FILM 10K 1% 1/4W
R99	S	1-214-753-00	METAL FILM 10K 1% 1/4W
R100	S	1-214-746-00	METAL FILM 5.1K 1% 1/4W
R101	S	1-214-753-00	METAL FILM 10K 1% 1/4W
R102	S	1-214-746-00	METAL FILM 5.1K 1% 1/4W
R103	S	1-214-753-00	METAL FILM 10K 1% 1/4W
R104	S	1-214-746-00	METAL FILM 5.1K 1% 1/4W
R105	S	1-214-746-00	METAL FILM 5.1K 1% 1/4W
R106	S	1-214-578-00	METAL FIML 7.5K 1% 1/8W
R107	S	1-214-578-00	METAL FIML 7.5K 1% 1/8W
R108	S	1-214-563-00	METAL FILM 1.8K 1% 1/8W
R109	S	1-214-567-00	METAL FILM 2.7K 1% 1/8W
R110	S	1-214-563-00	METAL FILM 1.8K 1% 1/8W
R111	S	1-214-567-00	METAL FILM 2.7K 1% 1/8W
R112	S	1-214-719-00	METAL FILM 390 1% 1/4W
R113	S	1-214-584-00	METAL FILM 13K 1% 1/8W
R114	S	1-214-719-00	METAL FILM 390 1% 1/4W

Ref. No.	SP	SONY Parts No.	Description
R115	S	1-214-585-00	METAL FILM 15K 1% 1/8W
R116	S	1-214-719-00	METAL FILM 390 1% 1/4W
R117	S	1-214-584-00	METAL FILM 13K 1% 1/8W
R118	S	1-214-719-00	METAL FILM 390 1% 1/4W
R119	S	1-214-585-00	METAL FILM 15K 1% 1/8W
R120	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R121	S	1-214-565-00	METAL FILM 2.2K 1% 1/8W
R122	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R123	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R124	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R125	S	1-214-565-00	METAL FILM 2.2K 1% 1/8W
R126	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R127	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R128	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R129	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R130	S	1-214-533-00	METAL FILM 100 1% 1/8W
R131	S	1-215-822-11	METAL FILM 47K 1% 1/8W
R132	S	1-214-533-00	METAL FILM 100 1% 1/8W
R133	S	1-218-203-11	METAL FILM 5.9K 1% 1/8W
R134	S	1-214-573-00	METAL FILM 4.7K 1% 1/8W
R135	S	1-214-588-00	METAL FILM 20K 1% 1/8W
R136	S	1-214-542-00	METAL FILM 240 1% 1/8W
R137	S	1-214-573-00	METAL FILM 4.7K 1% 1/8W
R138	S	1-214-573-00	METAL FILM 4.7K 1% 1/8W
R139	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R140	S	1-215-822-11	METAL FILM 47K 1% 1/8W
R141	S	1-214-573-00	METAL FILM 4.7K 1% 1/8W
R142	S	1-206-456-00	CARBON 5.1 5% 1/2W
R143	S	1-206-456-00	CARBON 5.1 5% 1/2W
R144	S	1-206-456-00	CARBON 5.1 5% 1/2W
R145	S	1-206-456-00	CARBON 5.1 5% 1/2W
R146	S	1-215-822-11	METAL FILM 47K 1% 1/8W
R147	S	1-215-822-11	METAL FILM 47K 1% 1/8W
R148	S	1-215-822-11	METAL FILM 47K 1% 1/8W
R149	S	1-215-822-11	METAL FILM 47K 1% 1/8W
R150	S	1-214-585-00	METAL FILM 15K 1% 1/8W
R151	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R152	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R153	S	1-218-216-11	METAL FILM 28K 1% 1/8W
R154	S	1-214-738-00	METAL FILM 2.4K 1% 1/4W
R157, R158	S	1-214-757-00	METAL FILM 15K PAIR
R159, R160	S	1-216-786-11	METAL FILM 180 PAIR
R161	S	1-214-743-00	METAL FILM 3.9K 1% 1/4W

Ref. No.	SP	SONY Parts No.	Description
R162 R163	S	1-216-787-11	METAL FILM 5.1K PAIR
R164 R165	S	1-216-787-11	METAL FILM 5.1K PAIR
R166	S	1-214-589-00	METAL FILM 22K 1% 1/8W
R171	S	1-215-826-11	METAL FILM 68K 1% 1/8W
R172	S	1-214-738-00	METAL FILM 2.4K 1% 1/4W
R173	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R174	S	1-214-570-00	METAL FILM 3.6K 1% 1/8W
R175	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R176	S	1-214-574-00	METAL FILM 5.1K 1% 1/8W
R177	S	1-214-573-00	METAL FILM 4.7K 1% 1/8W
R178	S	1-218-213-11	METAL FILM 21K 1% 1/8W
R179	S	1-218-228-11	METAL FILM 140K 1% 1/8W
R180	S	1-214-564-00	METAL FILM 2K 1% 1/8W
R181	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R182	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R183	S	1-215-830-11	METAL FILM 100K 1% 1/8W
R184	S	1-215-830-11	METAL FILM 100K 1% 1/8W
RV1	S	1-237-521-21	ADJ,METAL FILM 100K
RV2	S	1-237-514-21	ADJ,METAL FILM 500
RV3	S	1-237-518-21	ADJ,METAL FILM 10K
RV4	S	1-230-838-11	ADJ,METAL FILM 200
RV5	S	1-230-838-11	ADJ,METAL FILM 200

Ref. No.	SP	SONY Parts No.	Description
TCM BOARD (For APR-5003V)			
	O	A-7850-372-A	MOUNTED PCB,TCM
			(This assembly includes the following parts.)
	O	T-9412-217-1	SOCKET,LAMP 25-212
	O	1-937-553-11	HARNESS(METER CONTROL)
	O	1-937-554-12	HARNESS(METER INPUT)
C1	S	1-161-473-00	CERAMIC 0.01MF 10% 50V
C7	S	1-161-473-00	CERAMIC 0.01MF 10% 50V
D6	S	8-719-911-19	1SS119
D7	S	8-719-911-19	1SS119
D13	S	8-719-911-19	1SS119
D14	S	8-719-404-08	LN48YP
D15	S	8-719-404-06	LN28RP
D16	S	8-719-404-06	LN28RP
IC1	S	8-759-202-14	TC74HC08P
IC2	S	8-759-202-14	TC74HC08P
Q1	S	8-729-113-08	2N3906
Q2	S	8-729-113-08	2N3906
Q3	S	8-729-904-15	VN10KM
Q9	S	8-729-904-15	VN10KM
R1	S	1-214-575-00	METAL FILM 5.6K 1% 1/8W
R2	S	1-214-575-00	METAL FILM 5.6K 1% 1/8W
R3	S	1-214-539-00	METAL FILM 180 1% 1/8W
R4	S	1-214-539-00	METAL FILM 180 1% 1/8W
R5	S	1-247-886-11	CARBON 200K 5% 1/4W
R11	S	1-247-886-11	CARBON 200K 5% 1/4W
R12	S	1-214-531-00	METAL FILM 82 1% 1/8W
R18	S	1-214-531-00	METAL FILM 82 1% 1/8W
S3	S	1-554-750-31	SWITCH,KEY BOARD (WITH LED)

Ref. No.	SP	SONY Parts No.	Description
TIB BOARD			
	O	A-7850-362-A	COMPLETE PCB,TIB (This assembly includes the following parts.)
	S	1-561-832-00	SOCKET,SHORT
C1	S	1-161-473-00	CERAMIC 0.01MF 10% 50V
C2	S	1-162-714-11	CERAMIC 150PF 5% 50V
C3	S	1-162-673-11	CERAMIC 33PF 5% 50V
C5	S	1-161-473-00	CERAMIC 0.01MF 10% 50V
C6	S	1-161-473-00	CERAMIC 0.01MF 10% 50V
C7	S	1-161-473-00	CERAMIC 0.01MF 10% 50V
C8	S	1-161-473-00	CERAMIC 0.01MF 10% 50V
C9	S	1-161-485-00	CERAMIC 0.1MF 50V
C10	S	1-161-485-00	CERAMIC 0.1MF 50V
C11	S	1-130-477-00	PE TEREPHTHALATE 0.0033MF 5% 50V
C12	S	1-162-765-11	CERAMIC 0.001MF 5% 50V
C13	S	1-124-499-11	ELECT 1MF 20% 50V
C14	S	1-162-871-11	CERAMIC 47PF 5% 50V
C15	S	1-162-726-11	CERAMIC 470PF 5% 50V
C16	S	1-124-499-11	ELECT 1MF 20% 50V
C17	S	1-161-485-00	CERAMIC 0.1MF 50V
C18	S	1-161-485-00	CERAMIC 0.1MF 50V
C19	S	1-161-485-00	CERAMIC 0.1MF 50V
C20	S	1-161-485-00	CERAMIC 0.1MF 50V
C21	S	1-124-584-00	ELECT 100MF 20% 10V
C22	S	1-123-357-00	ELECT 22MF 10% 35V
C23	S	1-123-357-00	ELECT 22MF 10% 35V
C24	S	1-123-357-00	ELECT 22MF 10% 35V
C25	S	1-161-485-00	CERAMIC 0.1MF 50V
C26	S	1-161-485-00	CERAMIC 0.1MF 50V
C27	S	1-161-485-00	CERAMIC 0.1MF 50V
C28	S	1-161-485-00	CERAMIC 0.1MF 50V
C29	S	1-161-485-00	CERAMIC 0.1MF 50V
C30	S	1-161-485-00	CERAMIC 0.1MF 50V
C31	S	1-161-485-00	CERAMIC 0.1MF 50V
C32	S	1-161-485-00	CERAMIC 0.1MF 50V
C33	S	1-161-485-00	CERAMIC 0.1MF 50V
C34	S	1-161-485-00	CERAMIC 0.1MF 50V
C35	S	1-161-485-00	CERAMIC 0.1MF 50V
C36	S	1-161-485-00	CERAMIC 0.1MF 50V

Ref. No.	SP	SONY Parts No.	Description
C37	S	1-161-485-00	CERAMIC 0.1MF 50V
C38	S	1-161-485-00	CERAMIC 0.1MF 50V
C39	S	1-161-485-00	CERAMIC 0.1MF 50V
C40	S	1-161-485-00	CERAMIC 0.1MF 50V
CNJ400	O	1-564-699-21	RIBBON CABLE 34P
CNJ402	O	1-560-301-00	POST HEADER 4P
CNJ405	O	1-560-304-00	POST HEADER 8P
CNJ407	O	1-560-302-00	POST HEADER 5P
CNJ408	O	1-560-300-00	POST HEADER 3P
CNJ409	O	1-560-300-00	POST HEADER 3P
CNJ410	O	1-560-300-00	POST HEADER 3P
CNJ411	O	1-560-300-00	POST HEADER 3P
CNJ412	O	1-560-301-00	POST HEADER 4P
CNJ413	O	1-560-304-00	POST HEADER 8P
CNJ954	O	1-560-304-00	POST HEADER 8P
D2	S	8-719-940-03	1N4004
D3	S	8-719-940-03	1N4004
D4	S	8-719-940-03	1N4004
D5	S	8-719-940-03	1N4004
D6	S	8-719-940-03	1N4004
D7	S	8-719-940-03	1N4004
D8	S	8-719-940-03	1N4004
D9	S	8-719-940-03	1N4004
D10	S	8-719-911-19	1SS119
D11	S	8-719-911-19	1SS119
D12	S	8-719-911-19	1SS119
D13	S	8-719-911-19	1SS119
IC1	S	8-759-202-55	TC74HC244P
IC2	S	8-759-202-56	TC74HC245P
IC3	S	8-759-202-55	TC74HC244P
IC4	S	8-759-202-26	TC74HC138P
IC5	S	8-759-937-40	DG212CJ
IC6	S	8-759-906-79	AD7574JN
IC7	S	8-759-918-28	AD7545JN
IC8	S	8-759-990-04	TL074CN
IC9	S	8-759-937-40	DG212CJ
IC10	S	8-759-990-04	TL074CN
IC11	S	8-759-990-04	TL074CN
IC12	S	8-759-202-17	TC74HC14P
IC13	S	8-759-202-17	TC74HC14P
IC14	S	8-759-202-24	TC74HC86P
IC15	S	8-759-000-XX	MC74HC74N

Ref. No.	SP	SONY Parts No.	Description
IC16	S	8-759-000-XX	MC74HC74N
IC17	S	8-759-203-30	TC74HC365P
IC18	S	8-759-001-42	MC74HC174N
IC19	S	8-759-001-42	MC74HC174N
IC20	S	8-759-203-21	TC74HC273P
IC21	S	8-759-354-52	HD75452
IC22	S	8-759-354-52	HD75452
IC23	S	8-759-990-04	TL074CN
IC24	S	8-759-933-90	VFC32KP
IC25	S	8-759-910-56	2150A
IC26	S	8-759-990-04	TL074CN
IC27	S	8-759-982-48	RC79L12A
JU1	S	1-566-388-11	PIN,SHORT
JU2	S	1-566-388-11	PIN,SHORT
L1	S	1-421-329-00	COIL,CHOKE
Q1	S	8-729-208-04	2SK422
Q2	S	8-729-208-04	2SK422
Q3	S	8-729-208-04	2SK422
Q4	S	8-729-208-04	2SK422
Q5	S	8-729-905-68	J-111
Q6	S	8-729-905-68	J-111
R1	S	1-249-429-11	CARBON 10K 5% 1/4W
R2	S	1-249-429-11	CARBON 10K 5% 1/4W
R3	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R5	S	1-247-881-00	CARBON 120K 5% 1/4W
R6	S	1-214-549-00	METAL FILM 470 1% 1/8W
R7	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R8	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R9	S	1-214-578-00	METAL FILM 7.5K 1% 1/8W
R11	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R12	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R13	S	1-249-429-11	CARBON 10K 5% 1/4W
R14	S	1-249-437-11	CARBON 47K 5% 1/4W
R15	S	1-249-429-11	CARBON 10K 5% 1/4W
R16	S	1-215-827-11	METAL FILM 75K 1% 1/8W
R17	S	1-214-774-00	METAL FILM 75K 1% 1/4W
R18	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R19	S	1-214-591-00	METAL FILM 27K 1% 1/8W
R20	S	1-214-568-00	METAL FILM 3K 1% 1/8W

Ref. No.	SP	SONY Parts No.	Description
R21	S	1-214-588-00	METAL FILM 20K 1% 1/8W
R22	S	1-214-525-00	METAL FILM 47 1% 1/8W
R23	S	1-214-572-00	METAL FILM 4.3K 1% 1/8W
R24	S	1-214-588-00	METAL FILM 20K 1% 1/8W
R25	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R26	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R27	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R28	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R29	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R30	S	1-249-421-11	CARBON 2.2K 5% 1/4W
R31	S	1-247-887-00	CARBON 220K 5% 1/4W
R32	S	1-247-881-00	CARBON 120K 5% 1/4W
R33	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R34	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R35	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R36	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R37	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R38	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R39	S	1-214-581-00	METAL FILM 10K 1% 1/8W
R40	S	1-249-405-11	CARBON 100 5% 1/4W
R41	S	1-249-405-11	CARBON 100 5% 1/4W
R42	S	1-249-405-11	CARBON 100 5% 1/4W
R43	S	1-249-405-11	CARBON 100 5% 1/4W
R44	S	1-249-426-11	CARBON 5.6K 5% 1/4W
R45	S	1-249-426-11	CARBON 5.6K 5% 1/4W
RN1	S	1-231-409-00	RES,BLOCK 5.6K
RN2	S	1-231-409-00	RES,BLOCK 5.6K
RN3	S	1-231-409-00	RES,BLOCK 5.6K
RV1	S	1-228-110-00	ADJ,CERMET 2K
RV2	S	1-228-120-00	ADJ,CERMET 20K
RV3	S	1-228-120-00	ADJ,CERMET 20K
RV4	S	1-237-521-21	ADJ,METAL FILM 100K

Ref. No.	SP	SONY Parts No.	Description
TTS BOARD			
	O	A-7850-381-A	MOUNTED PCB,TTS
			(This assembly includes the following parts.)
C1	S	1-126-096-11	ELECT 10MF 20% 25V
C2	S	1-126-096-11	ELECT 10MF 20% 25V
C3	S	1-126-096-11	ELECT 10MF 20% 25V
C6	S	1-162-710-11	CERAMIC 100PF 5% 50V
C7	S	1-162-710-11	CERAMIC 100PF 5% 50V
C8	S	1-161-485-00	CERAMIC 0.1MF 50V
C9	S	1-161-485-00	CERAMIC 0.1MF 50V
CNJ1	O	1-560-302-00	POST HEADER (IL CONNECTOR) 5P
D1	S	8-719-110-22	RD11ES-B2
D2	S	8-719-109-85	RD5.1ES-B2
D3	S	8-719-109-85	RD5.1ES-B2
IC1	S	8-745-211-00	DM-211
IC2	S	8-759-990-04	TL074CN
R1	S	1-249-393-11	CARBON 10 5% 1/4W
R2	S	1-249-393-11	CARBON 10 5% 1/4W
R3	S	1-247-711-11	CARBON 680 5% 1/4W
R4	S	1-247-711-11	CARBON 680 5% 1/4W
R5	S	1-249-433-11	CARBON 22K 5% 1/4W
R6	S	1-249-433-11	CARBON 22K 5% 1/4W
R7	S	1-249-433-11	CARBON 22K 5% 1/4W
R8	S	1-249-433-11	CARBON 22K 5% 1/4W
R9	S	1-249-421-11	CARBON 2.2K 5% 1/4W
R10	S	1-249-421-11	CARBON 2.2K 5% 1/4W
R11	S	1-247-887-00	CARBON 220K 5% 1/4W
R12	S	1-247-887-00	CARBON 220K 5% 1/4W
R13	S	1-249-421-11	CARBON 2.2K 5% 1/4W
R14	S	1-249-421-11	CARBON 2.2K 5% 1/4W
RV1	S	1-237-501-21	ADJ,METAL FILM 2K
RV2	S	1-237-501-21	ADJ,METAL FILM 2K

Ref. No.	SP	SONY Parts No.	Description

VVT BOARD

	O	A-7850-626-A	COMPLETE PCB, VVT (T-9482-436-1) (This assembly includes the following parts.)
	O	1-565-413-11	RECEPTACLE, CONNECTOR 2P
C1	S	1-161-485-00	CERAMIC 0.1 50V
C2	S	1-161-485-00	CERAMIC 0.1 50V
C3	S	1-123-611-00	ELECT 1 20% 50V
C4	S	1-162-671-11	CERAMIC 22P 5% 50V
C5	S	1-162-671-11	CERAMIC 22P 5% 50V
C6	S	1-162-871-11	CERAMIC 47P 5% 50V
C7	S	1-162-795-21	CERAMIC 0.012 10% 50V
C8	S	1-162-795-21	CERAMIC 0.012 10% 50V
C9	S	1-136-175-00	FILM 0.68 5% 50V
C10	S	1-162-795-21	CERAMIC 0.012 10% 50V
C11	S	1-162-795-21	CERAMIC 0.012 10% 50V
C12	S	1-136-175-00	FILM 0.68 5% 50V
C13	S	1-162-795-21	CERAMIC 0.012 10% 50V
C14	S	1-161-485-00	CERAMIC 0.1 50V
C15	S	1-161-485-00	CERAMIC 0.1 50V
C16	S	1-161-485-00	CERAMIC 0.1 50V
C17	S	1-161-485-00	CERAMIC 0.1 50V
C18	S	1-161-485-00	CERAMIC 0.1 50V
C19	S	1-161-485-00	CERAMIC 0.1 50V
C20	S	1-161-485-00	CERAMIC 0.1 50V
C21	S	1-161-485-00	CERAMIC 0.1 50V
C22	S	1-161-485-00	CERAMIC 0.1 50V
C23	S	1-161-485-00	CERAMIC 0.1 50V
C24	S	1-161-485-00	CERAMIC 0.1 50V
C25	S	1-161-485-00	CERAMIC 0.1 50V
C26	S	1-161-485-00	CERAMIC 0.1 50V
C27	S	1-161-485-00	CERAMIC 0.1 50V
C28	S	1-161-485-00	CERAMIC 0.1 50V
C29	S	1-161-485-00	CERAMIC 0.1 50V
C30	S	1-161-485-00	CERAMIC 0.1 50V
C31	S	1-161-485-00	CERAMIC 0.1 50V
C32	S	1-161-485-00	CERAMIC 0.1 50V
C33	S	1-161-485-00	CERAMIC 0.1 50V
C34	S	1-161-485-00	CERAMIC 0.1 50V
C35	S	1-161-485-00	CERAMIC 0.1 50V
C36	S	1-161-485-00	CERAMIC 0.1 50V
C37	S	1-161-485-00	CERAMIC 0.1 50V
CNJ480	O	1-560-300-00	POST HEADER (IL CONNECTOR) 3P
CNJ481	O	1-564-693-21	CONNECTOR, RIBBON CABLE 10P

Ref. No.	SP	SONY Parts No.	Description
D1	S	8-719-109-85	RD5.1ES-B2
D2	S	8-719-109-85	RD5.1ES-B2
D3	S	8-719-991-40	1N914
D4	S	8-719-109-85	RD5.1ES-B2
D5	S	8-719-109-85	RD5.1ES-B2
D6	S	8-719-991-40	1N914
D7	S	8-719-991-40	1N914
D8	S	8-719-991-40	1N914
DS1	S	8-719-812-43	TLG124A
DS2	S	8-719-812-41	TLR124
IC1A	S	8-759-202-86	TC74HC123P
IC2A	S	8-759-202-86	TC74HC123P
IC3A	S	8-759-202-32	TC74HC163P
IC4A	S	8-759-202-32	TC74HC163P
IC5A	S	8-759-202-93	TC74HC153P
IC6A	S	8-759-045-57	MC14557BCP
IC7A	S	8-759-202-83	TC74HC107P
IC8A	S	8-759-202-93	TC74HC153P
IC9A	S	8-759-202-86	TC74HC123P
IC2B	S	8-759-202-11	TC74HC00P
IC3B	S	8-759-202-32	TC74HC163P
IC4B	S	8-759-202-32	TC74HC163P
IC5B	S	T-9413-794-1	TBP24S10N-VVT, PROM
IC6B	S	8-759-004-64	MC74HC126N
IC7B	S	8-759-901-89	SN74LS189AN
IC8B	S	8-759-202-92	TC74HC151P
IC9B	S	8-759-952-07	SN75207BN
IC1C	S	8-759-007-18	MC74HC4046N
IC2C	S	8-759-202-17	TC74HC14P
IC3C	S	8-759-000-99	MC74HC74N
IC4C	S	8-759-202-86	TC74HC123P
IC5C	S	8-759-000-99	MC74HC74N
IC7C	S	8-759-910-76	CX7913A
IC9C	S	8-759-900-72	NE5532P
JU1	S	1-566-388-11	PIN, CONNECTOR 2P
JU2	S	1-566-388-11	PIN, CONNECTOR 2P
L1	S	1-421-329-00	COIL, CHOKE
Q1	S	8-729-139-04	2N3904
Q2	S	8-729-139-04	2N3904
Q3	S	8-729-139-04	2N3904

Ref. No.	SP	SONY Parts No.	Description			
R1	S	1-214-557-00	METAL	1K	1%	1/8W
R2	S	1-215-829-11	METAL	91K	1%	1/8W
R3	S	1-214-581-00	METAL	10K	1%	1/8W
R4	S	1-214-553-00	METAL	680	1%	1/8W
R5	S	1-214-557-00	METAL	1K	1%	1/8W
R6	S	1-247-903-00	CARBON	1M	5%	1/4W
R7	S	1-249-417-11	CARBON	1K	5%	1/4W
R8	S	1-214-564-00	METAL	2K	1%	1/8W
R9	S	1-214-551-00	METAL	560	1%	1/8W
R10	S	1-249-421-11	CARBON	2.2K	5%	1/4W
R11	S	1-249-441-11	CARBON	100K	5%	1/4W
R12	S	1-249-421-11	CARBON	2.2K	5%	1/4W
R13	S	1-249-441-11	CARBON	100K	5%	1/4W
R14	S	1-249-417-11	CARBON	1K	5%	1/4W
R15	S	1-247-903-00	CARBON	1M	5%	1/4W
R16	S	1-249-426-11	CARBON	5.6K	5%	1/4W
R17	S	1-249-426-11	CARBON	5.6K	5%	1/4W
R18	S	1-249-426-11	CARBON	5.6K	5%	1/4W
R19	S	1-249-417-11	CARBON	1K	5%	1/4W
R20	S	1-249-417-11	CARBON	1K	5%	1/4W
R21	S	1-247-903-00	CARBON	1M	5%	1/4W
R22	S	1-214-584-00	METAL	13K	1%	1/8W
R23	S	1-215-828-11	METAL	82K	1%	1/8W
R24	S	1-249-417-11	CARBON	1K	5%	1/4W
R25	S	1-247-887-00	CARBON	220K	5%	1/4W
R26	S	1-214-580-00	METAL	9.1K	1%	1/8W
R27	S	1-214-593-00	METAL	33K	1%	1/8W
R28	S	1-215-827-11	METAL	75K	1%	1/8W
R29	S	1-215-822-11	METAL	47K	1%	1/8W
R30	S	1-214-588-00	METAL	20K	1%	1/8W
R31	S	1-249-417-11	CARBON	1K	5%	1/4W
R32	S	1-249-426-11	CARBON	5.6K	5%	1/4W
R33	S	1-247-896-11	CARBON	510K	5%	1/4W
R34	S	1-249-426-11	CARBON	5.6K	5%	1/4W
R35	S	1-247-896-11	CARBON	510K	5%	1/4W
R36	S	1-249-426-11	CARBON	5.6K	5%	1/4W
R37	S	1-249-393-11	CARBON	10	5%	1/4W
R38	S	1-249-393-11	CARBON	10	5%	1/4W
R39	S	1-249-441-11	CARBON	100K	5%	1/4W
Y1	S	1-527-977-00	OSCILLATOR, CRYSTAL			
Y2	S	1-527-227-00	OSCILLATOR, CRYSTAL			

Ref. No.	SP	SONY Parts No.	Description

FRAME

FRONT PANEL ASSY

S	T-9413-284-1	HEADPHONE JACK 3FP
O	1-509-988-00	HOUSING (IL CONNECTOR) 8P
S	1-509-991-00	SOCKET,11P
O	1-560-298-00	TERMINAL,SOLDERLESS

HEAD STACK (1/4) SUB ASSY

S	T-9410-181-1	1/4" 2TRK (NAB) REC HEAD
S	T-9412-251-1	CN CONTACT 204351-1
S	1-543-447-11	1/4" 2TRK (NAB) REP 80MH
S	T-9412-410-1	ERASE HEAD (For APR-5002A)
S	1-543-450-11	HEAD,1/4",TC ERASE/TC RP (For APR-5003V)
S	1-543-449-11	HEAD,1/4",2TRK,ERASE, TC FORMAT (For APR-5003V)
O	1-937-559-12	HARNESS (HEAD STACK)
		(This assembly includes the following parts.)
S	1-9412-251-1	CN CONTACT 204351-1

LIFTER & SHIELD ASSY

S	1-454-426-41	SOLENOID,PLUNGER
O	1-937-558-11	HARNESS (EOT-KBD)
		(This assembly includes the following parts.)
O	1-509-985-00	HOUSING (IL CONNECTOR) 4P

MAIN ASSY

O	T-9482-689-1	HARNESS ASSY
O	1-937-527-11	HARNESS (TTS,HES-TIB SUB)
O	1-937-528-11	HARNESS (POWER SUPPLY SUB)
O	1-937-529-11	HARNESS (I/O UNCAL SUB)
O	1-937-530-11	HARNESS (BIAS/ER/REC SUB)
O	1-937-531-11	HARNESS (SYNC SUB)
O	1-937-532-11	HARNESS (RTS-TIB(R))
O	1-937-533-11	HARNESS (RELAY CONTROL)
O	1-937-534-11	HARNESS (PROCESSOR INTRFC)
O	1-937-535-11	HARNESS (CPU-LNT)
O	1-937-536-11	HARNESS (CPU-TIB)
O	1-937-537-11	HARNESS (LOGIC INTERCONNECT)
O	1-937-538-11	HARNESS (METER & CH STATUS)
O	1-937-539-11	HARNESS (RTS-TIB(L))
O	1-937-561-11	HARNESS (HBH)

Ref. No.	SP	SONY Parts No.	Description
		METER MODULE ASSY	
	S	T-9412-212-1	METER,VU WS-250
	S	T-9412-216-1	LAMP ML7352
	S	1-237-945-11	RES, VAR, CARBON 5K
	O	1-564-792-11	WAFER ASSY 5P
		METER MODULE TC ASSY (For APR-5003V)	
	S	T-9412-212-1	METER,VU WS-250
	S	T-9412-216-1	LAMP ML7352
		MONITOR HOUSING (TC) ASSY	
	O	1-937-552-11	HARNESS (MUTE SWITCHING)
		PINCH ROLLER ASSY	
	S	1-454-427-11	SOLENOID,PLUNGER
		POWER CSL SUB ASSY	
	S	1-548-100-31	TIMER
	O	1-937-545-11	HARNESS (LIFE METER)

Ref. No.	SP	SONY Parts No.	Description
		POWER SUPPLY ASSY	
	S	T-9412-405-2	POWER TRANSFORMER
	S	1-125-454-11	ELECT 10000MF 50V
	S	1-125-455-11	ELECT 22000MF 50V
	S	1-125-484-11	ELECT 39000MF 25V
	O	1-535-446-00	TERMINAL,FASTEN
	O	1-535-419-00	TAB,FASTEN (PCB)
	S	1-541-409-21	MOTOR,FAN
	S	1-554-066-00	SWITCH, SEESAW (AC POWER)
	O	1-620-303-11	PC BOARD,SBR
	O	1-937-540-12	HARNESS (POWER SUB)
	O	⚠1-937-541-12	HARNESS (POWER SWITCH)
	O	1-937-543-12	HARNESS (BRIDGE 1) (This assembly includes the following parts.)
	S	⚠8-719-500-27	S15VB60
	O	1-937-921-12	HARNESS (BRIDGE 2) (This assembly includes the following parts.)
	S	⚠8-719-500-27	S15VB60
	O	1-937-922-11	HARNESS (BRIDGE 3) (This assembly includes the following parts.)
	S	⚠8-719-500-27	S15VB60
		(SBR BOARD)	(This board has been deleted from Serial No. 20701 (APR-5002))
D1	S	8-719-940-68	SBD1640T
D2	S	8-719-940-68	SBD1640T

Ref. No.	SP	SONY Parts No.	Description
		REAR PANEL ASSY	
	S	⚠T-9412-524-1	AC INLET
	S	1-161-051-00	CERAMIC 0.01MF 10% 50V
	S	1-214-105-00	METAL FILM 75 1% 1/4W
	S	1-509-176-51	CONNECTOR (RECEPTACLE) 3P
	S	1-509-184-51	CONNECTOR (RECEPTACLE) 3P
	O	1-509-984-00	HOUSING (IL CONNECTOR) 3P
	S	1-516-783-XX	SWITCH, SLIDE
	S	⚠1-533-167-00	HOLDER,FUSE
	S	1-533-169-00	HOLDER,FUSE
	O	1-535-279-11	TERMINAL,SOLDERLESS
	O	1-560-298-00	TERMINAL,SOLDERLESS
	S	1-560-764-21	TERMINAL,SOLDERLESS
	S	1-561-781-21	CONNECTOR,BNC (RECEPTACLE)
	O	1-562-665-11	SOCKET,CONNECTOR (WITH LOCK) 4P
	O	1-937-546-12	HARNESS (REAR PANEL SUB)
	O	1-937-547-11	HARNESS (NOISE REDUCTION)
		SPEAKER MODULE ASSY	
	S	1-237-946-11	RES, VAR, CARBON 5K/5K
	S	1-503-291-00	SPEAKER
	O	1-937-555-11	HARNESS (SPEAKER)
	O	1-937-556-11	HARNESS (MONITOR ATTEN)
		S-REEL BRAKE ASSY	
	S	1-454-426-41	SOLENOID,PLUNGER
		T-REEL BRAKE ASSY	
	S	1-454-426-41	SOLENOID,PLUNGER

10-3 ACCESSORIES SUPPLIED (APR-5002/5003V)

Ref. No.	SP	SONY Parts No.	Description
ACCESSORIES SUPPLIED			
	S	A-7850-380-A	MOUNTED PCB,EXT
	S	T-9412-748-1	FUSE,FAST ACTING 5A
	S	⚠T-9413-261-1	FUSE,FAST ACTING 4A
	S	T-9413-262-1	FUSE,FAST ACTING 2A
	S	T-9450-121-1	NAB REEL LOCK
	S	⚠1-551-812-00	CORD,POWER
	S	3-711-185-01	REEL SHIM
	O	3-711-294-01	COVER,HEAD PLATE
	S	7-682-547-09	SCREW +B 3x6

SECTION 11
RM-5010 REMOTE CONTROLLER INSTALLATION

11.1 INTRODUCTION

The RM-5010 Remote Controller is the optional parallel remote control accessory for the **APR-5000**. This will connect to the 50-pin parallel remote connector on the rear door, providing remote control and status from up to 10 meters away.

11.2 INSTALLATION

The RM-5010 is easily connected and disconnected to or from the **APR-5000** by means of the 50-pin parallel remote connector on the rear door. Always be sure to turn power OFF whenever connecting or disconnecting the RM-5010.

11.3 OPERATIONAL CHECKOUT

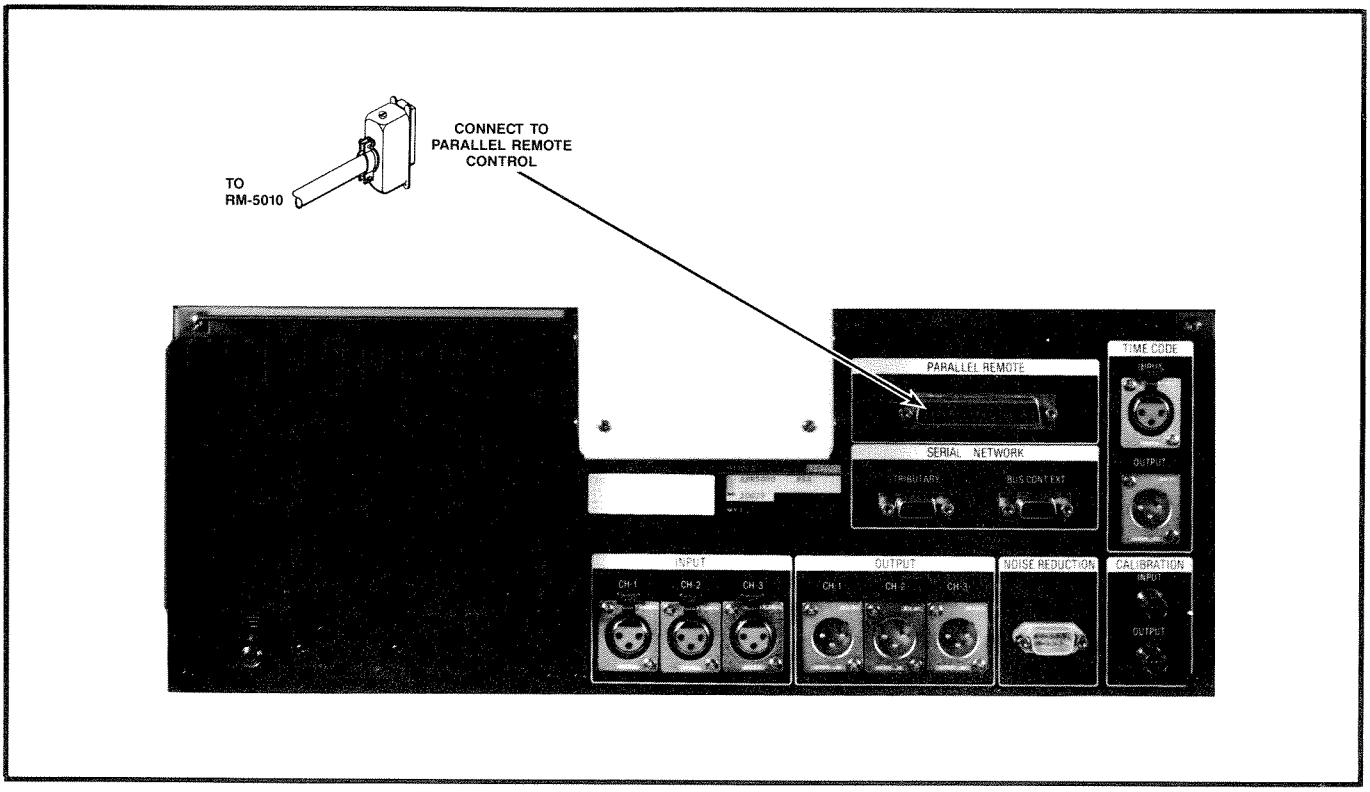
When the RM-5010 is first connected to the **APR-5000**, perform this operational checkout to make sure that all of the remote control functions are operational.

STEP 1 Turn the **APR-5000** power switch OFF.

STEP 2 Plug the 50-pin connector from the RM-5010 into the parallel remote connector on the rear door of the **APR-5000**.

STEP 3 Turn the power switch ON and thread a work tape onto the reels. Make sure that the tape breaks the EOT sensor beam.

STEP 4 On the RM-5010, press each of the remote control buttons listed below. Observe that the appropriate actions occur on the **APR-5000**:



Connection of RM-5010

PLAY	The transport enters PLAY mode and the PLAY button on the RM-5010 illuminates.
FF	The transport enters FAST FORWARD mode with tape shuttling from the supply reel to the take-up reel. The FF button illuminates.
STOP	The transport motion stops and the deck enters STOP mode. The STOP button illuminates.
TAPE TIME RESET	The TAPE TIME display on the Transport Control Panel resets to zero.
REW	The transport enters FAST REWIND mode and the tape shuttles in the rewind direction. The REW button illuminates.
Touch the MVC knob momentarily	The transport enters SPOOL WIND mode and the wind speed becomes slower. The MVC indicator LED illuminates.
LIFTER DEFEAT	The LIFTER DEFEAT button illuminates and the lifters disengage, causing the tape to be shuttled over the heads. All of the audio channels are unmuted.
LOCATE	The REW button extinguishes and the LOCATE and FF buttons illuminate. The transport enters LOCATE mode shuttling tape in the forward direction until the TAPE TIME display reads "0", then the machine enters STOP mode with the STOP button illuminated.

STEP 5 Press the RECORD READY buttons for each of the channels on the machine. If the machine is an APR-5001, then only the leftmost RECORD READY button is operational. If the machine is an APR-5002, then the middle button corresponds to channel 2. The rightmost button is only used on the APR-5003 for setting the Time Code channel Record Ready. As each of the buttons is pressed, its condition (RECORD READY or SAFE) toggles. Leave all channels in the RECORD READY mode with the RECORD READY buttons illuminated.

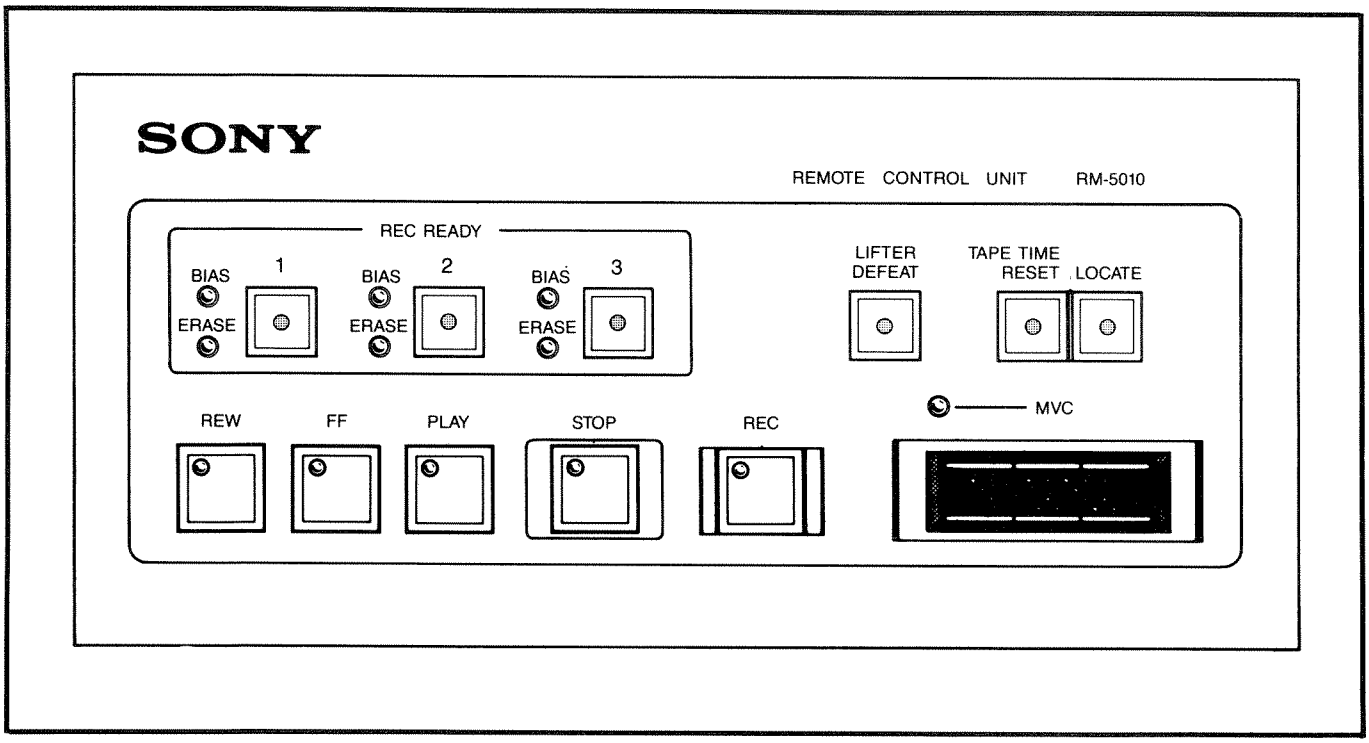
STEP 6 Press the RECORD button. The transport enters the RECORD RECORD mode and the PLAY and RECORD buttons illuminate. The BIAS and ERASE LEDs for each of the channels on the Meter Housing and the corresponding LEDs on the RM-5010 are all illuminated.

STEP 7 Press the STOP button. The transport exits RECORD MODE ON ALL CHANNELS, then enters STOP mode.

STEP 8 Check the action of the MVC knob. This operates in exactly the same way as the MVC knob on the Transport Control Panel. The MVC indicator LED illuminates as soon as the MVC knob is touched, and the speed and direction of the tape are directly related to the physical position of the knob. When the knob is released, the MVC indicator LED extinguishes and the knob automatically self-centers. The transport returns to STOP mode.

11.4 ENGINEERING DRAWINGS

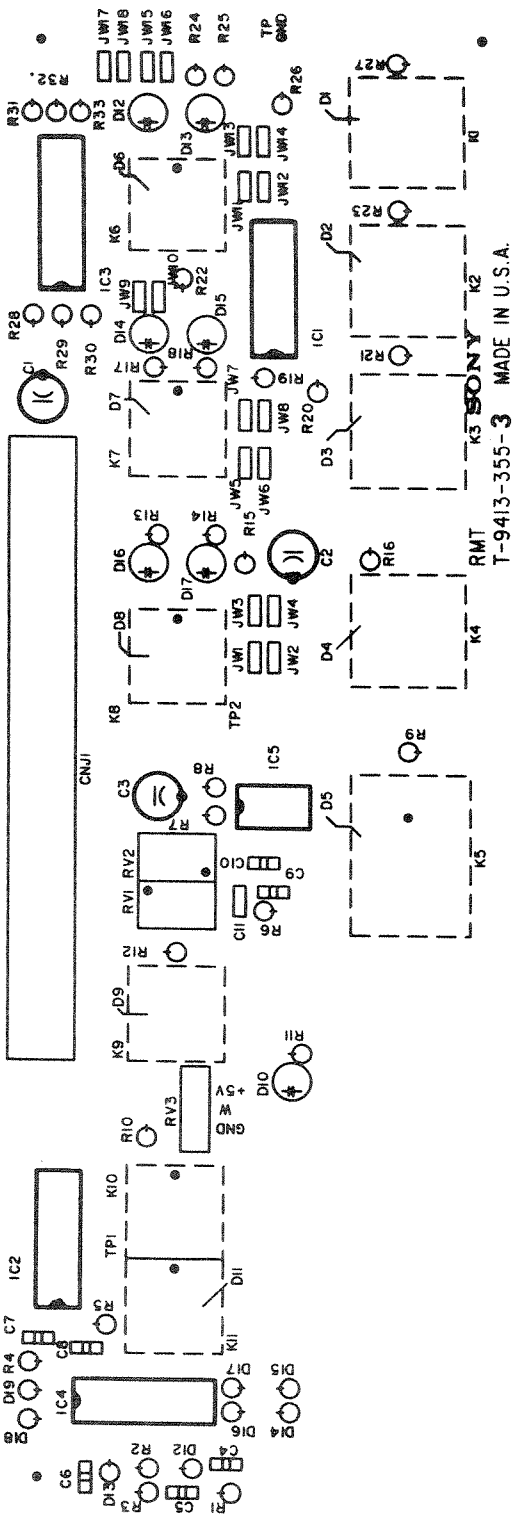
This section contains the engineering drawings for the RM-5010. For the principles of operation please refer to Section 3.3.



RM-5010 Mechanical Drawing

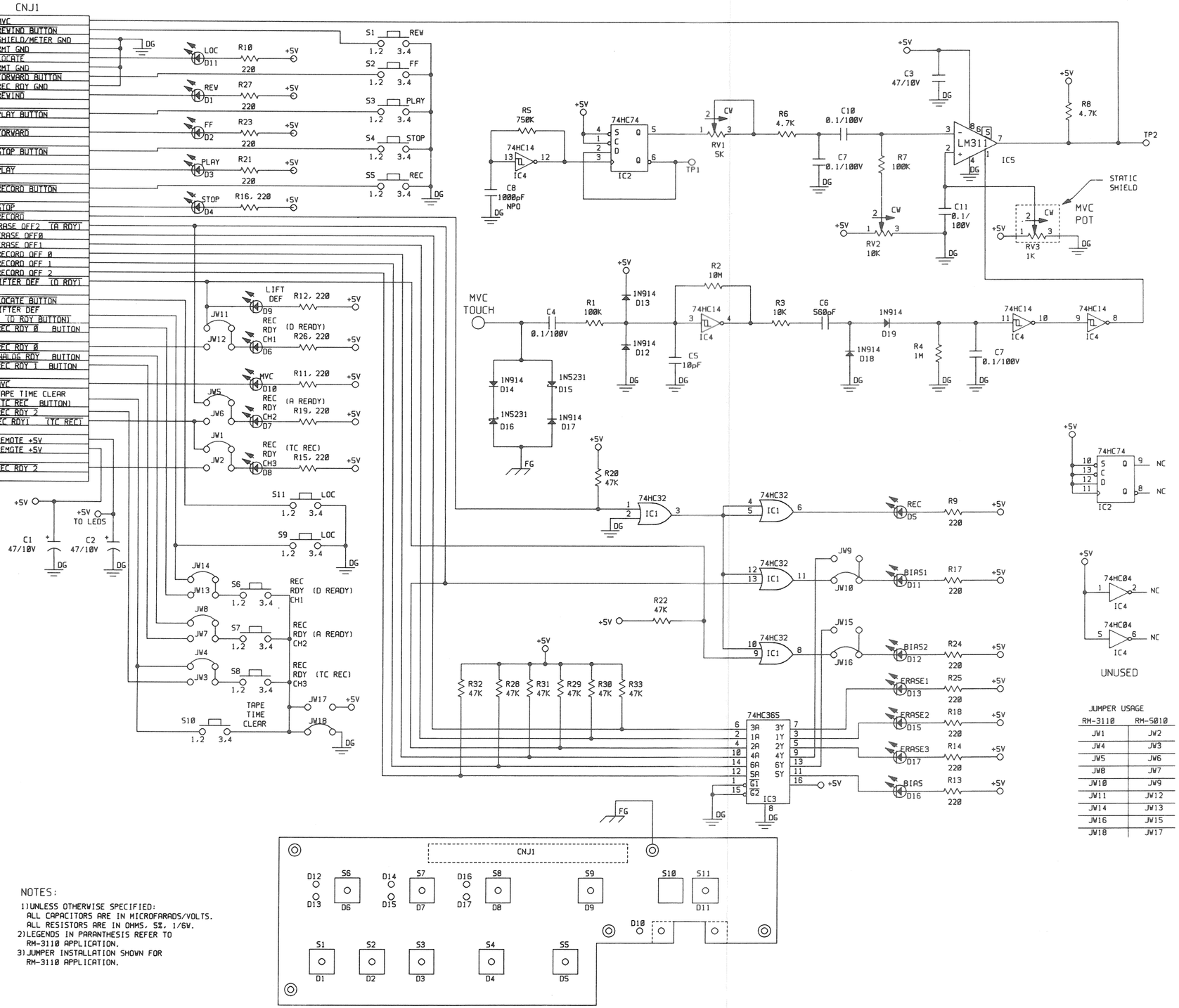
11-5. SCHEMATIC AND CIRCUIT BUARD DIAGRAMS

RMT COMPONENT LAYOUT



RMT

RMT SCHEMATIC DIAGRAM



NOTES:

1) UNLESS OTHERWISE SPECIFIED:
   ALL CAPACITORS ARE IN MICROFARADS/VOLTS.
   ALL RESISTORS ARE IN OHMS, 5%, 1/6W.
2) LEGENDS IN PARANTHESIS REFER TO
   RM-3110 APPLICATION.
3) JUMPER INSTALLATION SHOWN FOR
   RM-3110 APPLICATION.

JUMPER USAGE

RM-3110	RM-5010
JW1	JW2
JW4	JW3
JW5	JW6
JW8	JW7
JW10	JW9
JW11	JW12
JW14	JW13
JW16	JW15
JW18	JW17

RM-5010 ASSEMBLY PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	SERVICE CODE
C1 C2 C3	1-123-822-11	47UF/10V R,PO,LYTIC	S
RV1	1-228-763-11	TAPCPOT5K-18T	S
R10 R13 THRU R19 R21 R23 R25 R26 R27 R9 R11 R12 R24	1-247-815-51	220 OHM 1/6W 5% V,C	S
R8 R6	1-247-847-51	4.7K 1/6W 5% V,C	S
R3	1-247-855-51	10K 1/6W 5% V,C	S
R1 R7	1-247-879-51	100K 1/6W 5% V,C	S
R5	1-247-900-51	75OK 1/6W 5% VERT FORMED	S
R4	1-247-903-51	1M 1/6W 5% V,C	S
JW1 THRU JW18	1-560-733-11	JUMPER-PINS	S
	1-561-832-11	JUMPER SOCKET	O
CNJ1	1-564-734-21	CN STRAIGHT HDR 50P	O
	7-621-972-15	PS M2.6 x 5	S
	7-686-527-01	SCREW TOTSU PSW M3x6	S
D12 D13 D14 D17 D18 D19	8-719-991-40	DIODE 1N914	S

REF. NO.	PART NO.	DESCRIPTION	SERVICE CODE
IC2	8-759-000-99	IC 74HC74	S
IC4	8-759-202-17	IC 74HC14	S
IC1	8-759-202-21	IC 74HC32	S
IC3	8-759-203-30	IC 74HC365	S
IC5	8-759-909-33	IC LM311P T.I.	S
D15 D16	T-9410-338-1	DIODE 1N5231B	S
R2	T-9411-045-1	10M 1/4W 5% A,C	S
K9 K11	T-9411-068-1	SW PUSHBUTTON TM201L2	S
K10	T-9411-069-1	SW KEY W/O LED TM1-01	S
K6 THRU K11	T-9411-072-1	SW BEZEL TZ-2110	S
C5	T-9411-274-1	10PF/100V CERAMIC	S
C6	T-9411-295-1	560PF/100V CERAMIC	S
C8	T-9411-298-1	1000PF/100V CERAMIC	S
C4 C7 C9 C10 C11	T-9411-323-1	0.1UF/100V CERAMIC	S
K6 K7 K8	T-9412-170-1	SW PUCH AMBER TM2-01-L8	S
K6 K7 K8 K9 K11	T-9412-171-1	SW CVR SUB MINI TZ0811	S
D12 D13 D14 D15 D16 D17	T-9412-400-1	LED RED LN 29RP	S
D10	T-9412-403-1	LED GREEN LN 39GP	S
	T-9413-355-3	PCB RMT	S

REF. NO.	PART NO.	DESCRIPTION	SERVICE CODE
K1 THRU K5	T-9413-418-1	SWITCH TM4-L2	S
	T-9452-801-1	HOLDER VARIABLE RESISTOR	O
	T-9452-842-1	GUARD SW (LG)	O
K10	T-9452-844-1	SW CAP WHITE W/O WINDOW	S
	T-9452-848-1	SW FRAME, TM-04 (TZ-2210)	S
	T-9481-815-1	MVC ASSY.	S
	T-9481-862-1	ENGRAVED SW CAP SET	0
R20 R22 R28 THRU R33	1-247-871-51	47K, 1/6W, 5% V,C	S
RV2	1-226-698-11	POT 10K, 10T TOP	S

APPENDIX A
ERROR CODES

HE Headstack Error

This indicates that the identifcation code on the headstack is not properly set. Turn power switch OFF and remove the headstack. Make sure the DIP switiches are set to a proper identification code.

HI Headstack Invalid

This indicates that the headstack configuration cannot be used with the machine (i.e., 4 track or 8 track headstack).

HO Headstack Off

Indicates that the headstack connector is not properly mated with the connector on the deck. To correct the error make sure that the headstack is properly installed on the deck.

PE Preset Error

This indicates that the alignment stored in the preset memory location last chosen is invalid. To correct the error, either choose another preset memory location or store a valid alignment into the preset memory location which had the preset error.

APPENDIX B
LIST OF MNEMONICS

A ..... Amperes
AC ..... Alternating Current
ACM ..... Audio Control Motherboard
A/D ..... Analog-to-Digital
ADC..... Analog-to-Digital Converter
ADM ..... Audio Motherboard
ALN..... Aligment Control Panel

BCD..... Binary-coded Decimal
BIT ..... Binary Digit

CAL..... Calibrate or Calibrated
CMOS ..... Complementary Metal Oxide Semiconductor
CNL..... Channel Board
CNX..... Connector Board
CPU..... Central Processing Unit
CSL ..... Capstan Servo Loop
CTM..... Control/Meter Board

D/A ..... Digital-to-Analog
DAC..... Digital-to-Analog Converter
dB ..... Decibels
dBm..... A decibel power ratio measurement based on the standard reference level of 1 milliwatt of power dissipated in a 600 ohm line.
DC ..... Direct Current
DEC..... Decrease or decrement
DSP..... Display Board

EOT..... End Of Tape
EQ ..... Equalization

FEX..... Front End Transformer Board
FF ..... Fast Forward

HC ..... High Speed CMOS
HES..... Hall Effect Sensor
HFREQ ..... High Frequency
HE ..... Headstack Error (error code)
HI ..... Headstack Invalid (error code)
HO..... Headstack Off (error code)
Hz ..... Hertz (cycles per second)

IEC ..... International Electro-mechanical Commission
IN ..... Input
INC ..... Increase or increment
IND ..... Individual
I/O..... Input/Output
ips..... Inches per second

KBD..... Keyboard
kHz ..... Kilohertz (1000 Hz)

LED..... Light Emitting Diode
LFREQ ..... Low Frequency
LNT..... Local Network Transceiver
LS ..... Low Power Schottky
LVL ..... Level

MAX ..... Maximum
MHz ..... Megahertz
MID ..... Middle Speed
MIN ..... Minimum
MON ..... Monitor
MSB ..... Mute Switching Board
MST ..... Master Board
MVC ..... Manual Velocity Control

NAB ..... National Association of Broadcasters

OUT ..... Output

PDB ..... Power Distribution Board
PE ..... Preset Error

R ..... Reset
RCB ..... Record Feed Back Compensation
RCF ..... Record Feed Forward Compensation
RCL ..... Recall
REP ..... Repeat
REPRO ..... Reproduce or Playback
REW ..... Rewind
RGA ..... Regulator Board A (+5V)
RGB ..... Regulator Board B (+5V)
RGC ..... Regulator Board C (±18V)
RGC ..... Repro Gap Compensation
RGD ..... Regulator Board D (±15V and ±18V)
RMD ..... Reel Motor Driver
RMS ..... Root Mean Square
RTS ..... Reel Tach Sensor
RV ..... Variable Resistor or Potentiometer

SGC ..... Sync Gap Compensation
SMPTE ..... Society of Motion Picture and Television Engineers
STO ..... Store
SYNC ..... Record or Cue Mode

TC ..... Time Code
TC GEN ..... Time Code Generator
TC/DISPL .... Time Code/Display
TIB ..... Transport Interface Board
TK ..... Track or Channel
TP ..... Test Point
TRK ..... Track or Channel
TTS ..... Tape Tachometer Sensor

UNCAL ..... Uncalibrated

V ..... Volts
VRMS ..... AC RMS Volts
VARI ..... Variable Speed Play
VU ..... Volume Units

APPENDIX C
APR-5000 UNIQUE TOOLS

AMP #M24308/18-1 91067-1 Head Connector Pin Ext. Tool

DMC #M22520/2-01, Crimp Tool
#M22520/2-06, Crimp Tool Die Socket
#M22520/2-09, Crimp Tool Die Pin

ADDRESSES OF TOOL MANUFACTURERS

DMC
6103 Anno Avenue
Orlando, FL 32809

OHAUS Scale Corporation
29 Hanover Road
Florham Park, NJ 07932

Tentel Corporation
1506 Dell Avenue
Campbell, CA

APPENDIX D

SERIAL CONTROL WITH SONY BVE-900 and BVE-9000 EDITORS

GENERAL COMMENTS

The general behavior of the **APR-5003V** as a source machine is similar enough to that of a VTR as to be largely transparent to the operator. The machine's handling of time code, manual transport controls, and source selection in an edit appears to be virtually the same as normal VTR operation, but, because of limitations in editor architecture, certain edit types may require Mixer Setup changes.

Operation of the ATR with the editor does not utilize the ATR's CHASE, or other higher order features such as PREVIEW, EDIT or REVIEW. The editor simply instructs the ATR to shuttle and stop at specific points. VARIABLE SPEED PLAY commands provide the means to position the ATR to be synchronous before the IN POINT is reached. Once the correct synchronous operation is attained, the ATR is commanded to RESOLVE to the external video reference. The editor is the sole controlling entity in the process of the edit sequence.

CONNECTIONS AND SETUP

For proper serial control with SONY **BVE-900** and **BVE-9000** Editors, the following conditions must be met.

1. The Editor must be connected to the **APR-5003V** via the **TRIBUTARY** serial port on the rear panel of the machine. (See Figure 1.)

2. The house video reference must be connected to either one of the **VIDEO** ports on the rear panel, and the **TERMINATION** switch must be set as follows:

   a. Where the **APR-5003V** is the video reference terminating link, the switch must be set to **ON**.

   b. Where the video reference is daisy-chained to another device, the switch must be set to **OFF**.

3. Storage Location 37 must be set to 1, thereby selecting video as the resolving reference.

4. The correct tape speed must be selected relative to the Time Code on tape, and a consistent Time Code type must be used throughout the system.

5. The Setup Menus for VTR BLOCK #1 and VTR BLOCK #2 must be in accordance with the data given in the **Recommended Menu Setup for ATR usage as Player** section given later in this document.

It should be noted that, at power-up, the Editor disables the machine's local control with its initial commands. This can be re-established by pressing the **LOCAL** key on the Transport Control Panel. Furthermore, the serial control capability can be disengaged by deselecting the **NETWORK** key on the same panel.

METHODS OF USE

Stand Alone, Audio Only, Source Edits

In this application, the ATR operates as a stand-alone audio source, and programming an edit does not differ from normal VTR operation. Specifically, an audio only Cut or Dissolve from the ATR is programmed in the same manner as it would be for a video source. The ATR is not linked with any other Player. Time Code match frames are listed in the same manner as with VTR applications. Edit data for the ATR is preserved in the EDL.

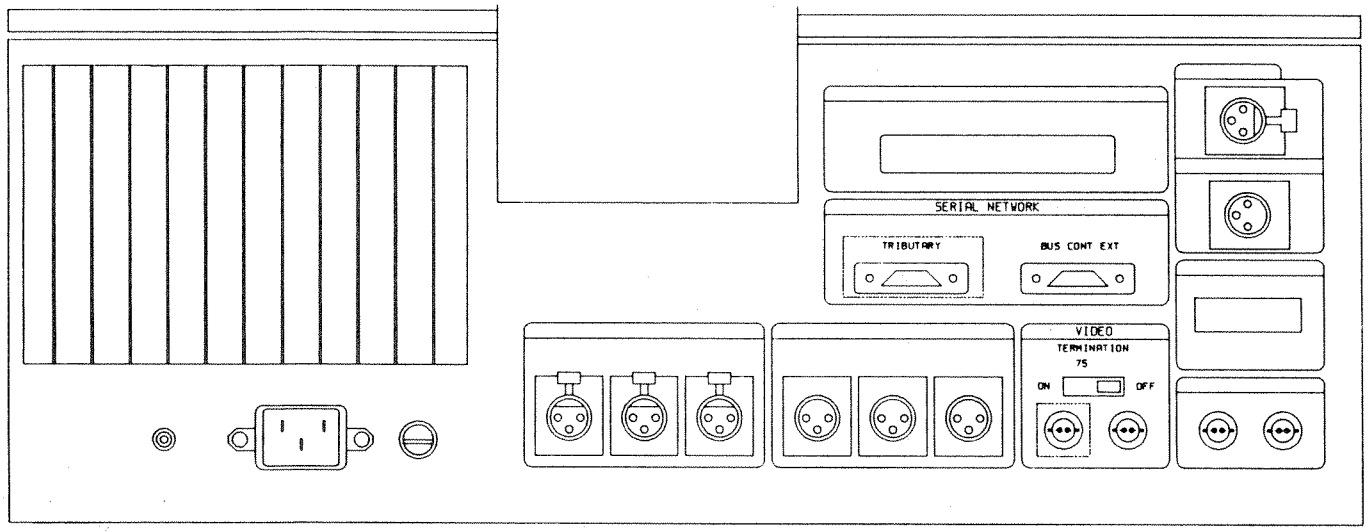


Figure 1. Rear Panel Connectors

Effect Type (Manual)

A Manual effect type allows the operator to choose a background and a foreground source for the edit. Selecting the ATR as the background source and a VTR as the foreground source allows the user to record Video from the VTR while recording audio from the ATR. Edit data relative to each source is preserved in the EDL. This application is most suitable for matching "sync-sound" with previously recorded video material.

CAUTION: Audio from the Foreground (VTR) source also is present in this edit unless the Fader associated with this player is muted or faded down.

ATR as Audio Source in a Cut with Video from another Player

This is an alternate method to the Effect Type (Manual) for combining audio from the ATR with Video from a player ATR. This method requires the manual re-assignment of the Mixer cross-points in the **BVE-900** Setup menu, as follows:

Mixer Block Reassignment

The Mixer Block Setup identifies for the editor the interconnections between mixer inputs and player outputs, i.e. which input channels of the mixer are connected with which output signals of the players. In this application, the user will simply exchange the identities of the audio and video sources so that the editor controls the ATR Fader as if it were the audio from the designated Video source.

Depending upon the mixer and its configuration, each cross-point assignment represents either two Mono Faders or one Stereo Line Input Fader. The SONY **MXP-29** will always provide two Mono channels for each source. The SONY **MXP-2000** can be configured either for dual Mono Fader operation, or can be configured with a single Stereo Line Input channel for each player.

EXAMPLE:

Initial Assignment:

P1 is designated Video Source Byte #2 assigned "01" (hex)

P3 is selected Audio Source (ATR) Byte #4 assigned "03" (hex)

Assignment Exchanged:

P1 is designated Video Source Byte #2 assigned "03" (hex)

P3 is selected Audio Source (ATR) Byte #4 assigned "01" (hex)

In this example, P1 is designated as the source of the edit. P3 should be selected with an asterisk "*" to assign the tandem roll of the ATR with P1. The ATR's Fader should be set to the desired level. The P1 VTR Fader position will have no effect on the audio edit. The P3 (ATR) Fader will be controlled by the editor as if it were the P1 (VTR) Fader.

It is very important to realize that no indication will appear in the EDL to identify P3 as the audio source in this edit.

ATR as Audio Source in a Dissolve or Wipe

The following examples illustrate situations in which one VTR's (P1) sync-sound is located on an ATR (P3).

Two Event Method:

The first event is programmed as a video only transition effect between P1 and P2. This preserves the video edit data in the EDL. The edit data specific to this event needs to be manually brought forward for use in the second event. The second event is programmed as an audio only transition effect between the **P3 (ATR)** and P2. This would register the sync-sound audio edit data in the EDL, thus providing sufficient data for the operator to re-create this edit sequence. The Mixer cross-points need not be reassigned when using this technique.

Single Event Methods:

General Notes

The Single event techniques identified below require that Mixer cross-points be reassigned. Please refer to the section above on "Mixer Block reassignment".

It also is helpful to remember that, in any effect, by selecting the ATR (P3) with an asterisk "*", the ATR is thus selected to perform a tandem roll with the **first** source in the edit process.

Match Frame; ATR in Tandem roll with "From" or "To" Machine

In this example, the P1 VTR is the video source whose sync-sound is located on the P3 ATR. A match frame transition effect from P1 to P2 or from P2 to P1 would be programmed in the customary manner, with the additional requirement that a tandem roll with the ATR be invoked by means of the asterisk "*" selection.

It is important to ensure that P1's mixer block assignment is exchanged with that of the P3 ATR. After the edit is complete, the assignment may be returned to its original settings.

As in any edit where the mixer block is reassigned, this setup information will not appear in the EDL, neither will P3's participation in this edit be preserved.

Delayed Transition; ATR in tandem with "From" Machine

In this example, the P1 VTR is the video source whose sync-sound is located on the P3 ATR. A delayed transition effect from P1 to P2 would be programmed in the customary manner, with the additional requirement that a tandem roll with the ATR be invoked by means of the asterisk "*" selection.

It is important to ensure that P1's mixer block assignment is exchanged with that of the P3 ATR.

After the edit is complete, the assignment may be returned to its original settings.

As in any edit where the mixer block is reassigned, this setup information will not appear in the EDL, neither will P3's participation in this edit be preserved.

Delayed Transition; ATR in tandem with "To" Machine

In this example, the P1 VTR is the video source whose sync-sound is located on the P3 ATR. A delayed transition effect from **P2** to **P1** would be programmed in the customary manner, with two additional requirements.

First, that a tandem roll with the ATR be invoked by means of the asterisk "*" selection.

Second, that the duration of the P2 edit ("From machine") be subtracted from the P3 (ATR) IN POINT. Remember, by selecting the ATR (P3) with an asterisk "*", the ATR is selected to perform a tandem roll with the **first** source in the edit process.

Again, it is important to ensure that the P1 Mixer Block assignment is exchanged with that of the P3 ATR. After the edit, the assignment may be returned to its original settings.

As in any edit where the mixer block is reassigned, this setup information will not appear in the EDL, neither will P3's participation in this edit be preserved.

Other restrictions to the use of the APR-5003V as a Player

The **APR-5003V** will not perform a synchronous DMC edit. The APR cannot provide synchronous and frame accurate operation with video at anything other than normal forward speed. However, if the ATR is assigned a sync grade of "Preroll and Play" (SYC4) the ATR will accept and perform a programmed DMC edit in the forward direction only. The **APR-5003V** will allow audio monitoring at DMC variable speeds in the forward direction without any special Auxiliary Menu changes.

For best results, 15 ips tape speed should be used with SONY **BVE900/9000** Editors. 30 ips has good performance, but program duration is limited by the rapid rate of tape usage. In addition, LOCATE times become longer at 30 ips. At 7.5 ips operation the editor is at somewhat of a disadvantage in that, in pursuit of synchronization, the editor's control actions tend to compromise Time Code read integrity. Thus, while both 7.5 and 30 ips speeds are fully functional, the best combination of fidelity, tape utilization, and locking integrity is realized at 15 ips operation.

Recommended Menu Setup for ATR usage as Player.

"VTR BLOCK #1" SETUP MENU

		NSTC Settings		PAL settings	
Byte 1	(Device Type)	01010000	50	01010000	50
Byte 2	(Device Type)	00000000	00	00000000	00
Byte 3	(Preroll Duration)	00000001	01	00000000	00
Byte 4	(Preroll Duration)	00101100	2C	11111010	FA
Byte 5	(Edit Delay)				
	For 30 ips	00000011	03	00000011	03
	For 15 ips	00000100	04	00000100	04
	For 7.5 ips	00000110	06	00000110	06
Byte 6	(EE Delay)	00000001	01	00000001	01
Byte 7	(Overrun):				
	For 30 ips	00001011	0B	00001010	0A
	For 15 ips	00000111	07	00000110	06
	For 7.5 ips	00001011	0B	00001010	0A
Byte 8	(Trajectory Const)				
	With **BVE-900** Editor				
	For 30 and 15 ips	00111111	3F	00111111	3F
	For 7.5 ips	00010101	15	00010101	15
	With **BVE-9000** Editor				
	For 30 and 15 ips	10111111	BF	10111111	BF
	For 7.5 ips	10010101	95	10010101	95

"VTR BLOCK #2" SETUP MENU

		NSTC Settings		PAL settings	
Byte 1	(TC Read Delay)	00011111	1F	00011010	1A
Byte 2	(Start Delay):				
	For 30 ips	00001101	0D	00001011	0B
	For 7.5 and 15 ips	00001011	0B	00001010	0A
Byte 3	(After Sync Delay −)	11111101	FD	11111101	FD
Byte 4	(After Sync Delay +)	00000010	02	00000010	02
Byte 5	(Max Framing Enable)	00000000	00	00000000	00
Byte 6	(CF Status Enable)	01111000	78	01111000	78
Byte 7	(Pre roll speed)	00001010	0A	00001010	0A
Byte 8	(Quick Preroll)				
	With **BVE-900** Editor	n/a		n/a	
	With **BVE-9000** Editor	00111011	3B	00111011	3B

APPENDIX E

APR-5003V STORAGE/RECALL REGISTER INDEX

Location Number	Location Name	Argument Range
Position Registers 00-29		
00	Synchronization Offset, Frames	time
01	Current IN POINT Preset	time
02	Current OUT POINT Preset	time
03-27	LOCATE Time (Cue Position Data)	time
28	REPEAT Start Time	time
29	REPEAT Stop Time	time
Enables/Disables and Selects 30-49		
30	Auto TC Enable	0/1
31	Time Code Type (SMPTE, EBU, FILM) Select	0/1/2
32	Drop Frame Select (SMPTE only)	0/1/2
33	Remote CHASE Enable	0/1
34	*Reserved*	
35	Burst Time Code Enable	0/1
36	Wind Speed Limit Enable	0/1
37	Establish Lock Reference Select	0/1
38	Maintain Lock Reference Select	0/1/2/3
39	RESOLVE ON PLAY Enable	0/1
40	Auto Shift Down Enable	0/1
41	Ips/Semitone VARI SPEED Display Select	0/1
42	*Reserved*	
43	Triggered EDIT Operation Enable	0/1
44-49	Not Assigned	
Presets 50-59		
50	Acceleration Allowance Preset	time
51	PREROLL DURATION Preset	time
52	POSTROLL DURATION Preset	time
53-59	Not Assigned	
Reserved and non-assigned Registers 60-74		
60-64	*Reserved*	
65-69	Not Assigned	
70-74	*Reserved*	
Special Operations 90-99		
90	Not Assigned	
91	Current IN POINT Bit Delay	00-79
92	Current OUT POINT Bit Delay	00-79
93	FIND Enable	0/1-10
94	Not Assigned	
95	PREVIEW Enable	0/1
96	EDIT Enable	0/1
97	REVIEW Enable	0/1
98	BIT BUMP (Sub-frame Offset)	dial
99	Offset Calculation, Frames	none

APPENDIX F

BAUD RATE SELECTION

For **APR-5003V** operations with all SONY Editor equipments, the baud rate is fixed at 38.4 kilobauds (kbaud). However, the **APR-5003V** may be used at slower baud rates to accomodate other applications. Such other applications could be software created by either the user or by independent developers, this software most likely being run on personal computers. Documentation on the **APR-5003V** serial control facilities will be made at a future date for use by independent developers.

Three baud rates are selectable via the DIP switch S1 on the LNT board, the switch functions being specified as follows:

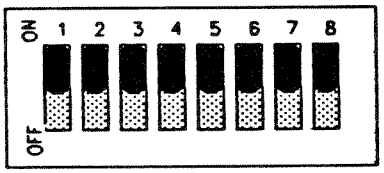
S1-1	Baud Rate Selection
S1-2	Baud Rate Selection
S1-3	Disable Video/Tone referenced operation*
S1-4	Not Assigned
S1-5	Not Assigned
S1-6	Not Assigned
S1-7	Not Assigned
S1-8	Reserved

* The facility provided by S1-3 is for use with those **APR-5003** models manufactured before the introduction of the **APR-5003V** which have been upgraded to accept **APR-5003V** software. This upgrade does not offer video or tone facilities, all synchronous operations being in reference to external Longitudinal Time Code.

DIP Switch Settings

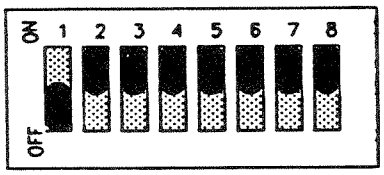
1. Normal Operation at 38.4 kbaud

S1-1	ON	S1-5	ON
S1-2	ON	S1-6	ON
S1-3	ON	S1-7	ON
S1-4	ON	S1-8	ON



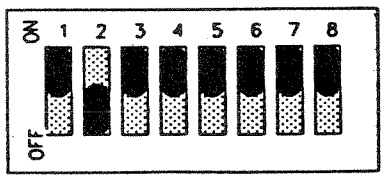
2. Special Operation at 19.2 kbaud

S1-1	OFF	S1-5	ON
S1-2	ON	S1-6	ON
S1-3	ON	S1-7	ON
S1-4	ON	S1-8	ON



3. Special Operation at 9.6 kbaud

S1-1	ON	S1-5	ON
S1-2	OFF	S1-6	ON
S1-3	ON	S1-7	ON
S1-4	ON	S1-8	ON



APPENDIX G
GLOSSARY

The following glossary of terms are defined to reflect their use in the **APR-5000** manual.

Alignment — The electronic adjustment of the audio amplifiers and equalization circuitry to conform to specifications.

Azimuth — This is an adjustment of the position of the upper and lower head surfaces relative to the tape entering and leaving the head gap. It performs the phase relationship adjustment on a multiple channel head.

Bias — A high frequency signal that is combined with the audio signal and is recorded on the tape.

Capstan Motor — The capstan motor has a white ceramic shaft which is used to drive the tape in PLAY or RECORD mode. It contains a tachometer which is used for ensuring precise speed.

Captive Screw — These are used on the rear door and on the neck brace assembly. They can be adjusted without tools (with the hands) or with a screwdriver. When they are fully unscrewed, they remain attached to the assembly into which they are screwed.

Center Track Time Code — This is done when a time code data track is inserted between the two tracks of a half track recording. The **APR-5003** is a center track time code machine.

Cue Head — This is another name for the sync head (see "sync head").

De-magnetize — The process of removing stray magnetic flux from the heads. This also referred to as de-gaussing. De-magnetizing of a recorded tape will cause it to be erased.

Dim — The audio output is disconnected (same as mute).

Equalization — The electronic readjustment of the frequency response characteristics of an audio signal (either playback or record). This is generally done to compensate for the irregular frequency response of the playback or record mediums (tape, heads, etc.).

Fast Wind — Whenever the machine is entered into a mode where the tape is shuttled by the reel motors (not the capstan motor). This includes FAST FORWARD, REWIND, SPOOL WIND, LOCATE, and MVC.

Flutter — Describes small variaations of play speed. This fluctuation is measured as a percentage of deviation from standard speed.

Flutter Dampening Arm — This device is mounted between the S-roller and the timer roller. There is a magnetic sensor under the arm which indicates to the computerized tape tension system the position of the arm. Its provides feedback to the supply reel motor which reduces flutter which is caused by motor cogging, out of round tape supply, and improper tape pack.

Full Track Recording — A full track recording is made when one track covers ¼-inch of tape. This can be done with the **APR-5001**.

Half Track Recording — A half track recording is made when two tracks cover ¼-inch of tape. The **APR-5002** can do this in either of the two standard formats: NAB or DIN.

Headstack — The headstack is mounted on the deck. It consists of all the parts mounted to the head block including right and left hand fast guides, all of the heads, the headstack identification code switch, and the headstack connector.

Meter Housing — The portion of the tape machine which contains the audio and time code control/meter boards as well as the monitor speaker assembly. This is mounted on the neck brace assembly.

Monitor — The monitor circuitry in the audio channels provides the signal output at the output connectors on the rear door of the tape machine. The user can select the source of this output from the meter housing.

Nanoweber - A measurement of magnetic flux.

Overbias — Since the level of the bias signal is set so that the high frequency response is attenuated, the process of setting the bias level is often called overbias.

Pinch Roller Puck — The rubber wheel which is used to press the tape against the capstan motor in PLAY or RECORD mode.

Record/Cue Head — This is another name for the sync head (see sync head).

Record/Sync Head — This is another name for the sync head (see sync head).

Reel Motor — The reel motors are used for moving the reels of tape which are mounted on the turntables.

Repro Head — This playback head is specifically designed to receive signals from tape.

Supply Reel — The supply reel is mounted on the left side reel motor. It supplies the tape in forward motion.

Sync Head — This is a multiple purpose head. It can be used for playing back signals or recording them onto tape. Generally this head is not used for playback purposes. However, when it is desired to record one track referencing to the other, it is necessary to do so.

Take-Up Reel — The take-up reel is mounted on the right side reel motor. It takes up the slack tape in forward motion.

Time Code — A digital signal which contains information on hours, minutes, seconds, frames,flag bits, and user bits. It provides a time reference on the magnetic tape for ease in editing purposes.

Tape Pack — The way the tape is deposited into the reel. Ideally, all of the tape on the reel will be evenly centered between the two reel flanges. The best tape pack is achieved in PLAY or SPOOL WIND mode.

Tape Tachometer — The tape tachometer is derived from the magneto-resistive sensor circuity of the Tape Tach Sensor (TTS) board. This is equivalent to a roller guide counter which is used to approximate the tape position and velocity in real time.

Tentelometer — A device used to measure the tension exerted on recording tape.

Transport — The part of the tape machine which is used to handle the tape, shuttling it from one reel to the other and causing it to pass before the heads at a precise velocity for playback or recording.

Wow — Decribes a very slowly changing play speed. This fluctuation can be heard during playback of sustained tones.

SONY

ANALOG TAPE RECORDER

APR-5003

SUPPLEMENT

This supplement is applicable to APR-5000 Series operation and maintenance manual.

ADDENDUM SHEET

APR-5000 SERIES OPERATION AND MAINTENANCE MANUAL T-9481-766-1

1. START-UP ERROR ROUTINE

In machines with 2TK PROMs P2.01.04.2 or higher, the following start-up error routine is incorporated:

Any failure in start-up diagnostics causes the STOP indicator to flash on and off. As the diagnostic tests are performed, the diagnostic codes are displayed and errors are displayed immediately after the code. Specific failures are displayed in numerical sequence before the LOCATE display is cleared on power-up.

The diagnostic codes, their meanings, and the appropriate corrective actions are listed below.

E.00.1 ROM has failed checksum. Replace the ROM or service the CPU board.

E.00.2 The scratch RAM area has failed read/write test. Replace the RAM or service the CPU board.

E.00.3 The parameter RAM has failed checksum. Replace the RAM or service the CPU board. The locator or user parameter may be incorrect, and, if this error is observed, remove any external connections, such as Time Code or Synchronizer, and retest. External equipment may cause this diagnostic failure. It should be noted that this indication may be normal when the machine is powered up for the first time after PROM replacement.

CAUTION

WHERE A DIAGNOSTIC FAILURE OCCURS, THE MACHINE SHOULD BE USED WITH CAUTION, SINCE ITS OPERATION MAY BE ERRATIC OR UNDEFINED.

2. TAPE TENSION

After power-up or an EOT (end of tape) condition, the APR-5000 series processor defaults to a general purpose tape tension condition. Any small, motor-controlled tape movement allows the processor to derive the necessary information concerning current supply reel and takeup reel radii. This information permits the processor to optimize tape handling, particularly in the area of start-up performance.

In instances where start time is not critical this need be of no concern, since the radius information will be established very quickly through any subsequent commanded tape movement.

In the stopped condition, the establishment of valid radii can be verified by simply touching the MVC wheel without moving it from the center detent. If the MVC indicator becomes illuminated when the wheel is touched, then valid radii have been established. If the indicator does not become illuminated when the wheel is touched, then some tape movement is necessary to establish optimum start-up performance. This is most easily accomplished by setting the MVC wheel to either end of its travel range, and holding it until the indicator becomes illuminated. The tape position then can be set in advance of the desired start-up point.

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SECTION 1
INTRODUCTION

1.1 GENERAL

The APR-5003 Tape Recorder/Reproducer differs from other machines in the APR-5000 Series in that it has provision for recording a third (center) track. The primary purpose of the third track is to record Time Code signals, these being used to provide frame-accurate reference points throughout the length of the tape.

1.2 TIME CODE

Time Code is a digitally derived signal which is recorded on the third track. Time Codes originally were standardized by the Society of Motion Picture and Television Engineers (SMPTE) for use in videotape editing, and they provide a unique identifying address for each frame on the tape. These addresses are expressed in terms of hours, minutes, seconds and frames, and usually are written in the general form HH:MM:SS:FF.

Time Code, whether used for video or other applications, offers the most efficient of all currently available methods of tape editing. In addition to speeding up the editing process, Time Code also provides an extremely accurate method of locating any point on the tape. Further, when under control from a computer, edit points can be identified with Time Code addresses and compiled in memory as edit lists. These can be retrieved later to perform automatic editing.

The major advantages of using Time Codes are described in paragraphs 1.2.1 through 1.2.3 below.

1.2.1 Time Reference Precision

The length of any program interval can be determined to within a fraction of a second (1/30th or 1/25th depending upon Time Code format). This allows a schedule to be blocked out while the program is being recorded so that post-production editing can be carried out with minimum search time.

1.2.2 Interchangeability

The edit in and edit out points selected on one system can be listed, in accordance with their Time Codes, for input to any other system. This allows edits carried out on a remote second system to exactly duplicate those selected on the first system.

1.2.3 Ease of Synchronization

The Time Code provides divisions on magnetic tape similar to those provided by sprocket holes on film. These divisions allow an editing system or synchronization unit to bring any number of tapes into synchronization automatically, offering perfect frame to frame match-up at the edit points.

1.3 TIME CODE FORMATS

The Time Code signal can be in any one of three formats, namely SMPTE non-drop frame (NDF) code, SMPTE drop frame (DF) code and EBU code. The different codes are intended for use in particular video applications, as described below, but any one of them can be used for audio recording applications.

The SMPTE DF code is used in applications associated with color videotapes made at the frame rate of 29.97 frames per second (Fr/s) in accordance with NTSC (National Television Standards Committee) color television standards.

The SMPTE NDF code is used in applications associated with monochrome videotapes made at frame rate of 30 Fr/s.

The EBU code is used in applications associated with videotapes made, in accordance with European standards, at frame rate of 25 Fr/s.

All of the Time Code formats are based on a data stream driven at the frame rate, and each contains a special data block known as the sync word. Occurring once per frame, the sync word denotes the frame ending, and also can be used to determine the direction of tape movement.

For more detailed information on Time Code signal formats, refer to Section 3 of this Supplement.

1.4 APR-5003 TIME CODE FEATURES

The APR-5003 has full provisions for generating and reading Time Code. In addition to generating and reading internal Time Code, the system can accept Time Code from an external source, and also can provide longitudinally corrected Time Code to an exter-

nal device. All readers and generators have SMPTE (DF and NDF) and EBU code capability.

The system also is equipped with an internal synchronizer which allows it to be time-locked to a second machine, making possible the CHASE mode of operation.

1.4.1 Time Code Readers

The APR-5003 incorporates two reader channels, one dedicated to external Time Code, and the other dedicated to playback. Both readers can decipher any of the longitudinal Time Code formats, the required format being selected as required. Alternatively, the machine can be programmed for automatic Time Code selection.

A high speed interpolator is provided as an adjunct to the external reader channel. This uses synchronization pulses to determine tape direction and position information from a high speed Time Code source. These signals are used in the CHASE Mode of operation.

1.4.2 Time Code Outputs

As with the Time Code readers, two output channels are incorporated in the machine, one being dedicated to providing longitudinally corrected Time Code from tape, and the other being used for internal recording operations.

The internal Recording Generator is used primarily for alignment and checkout of the Time Code channel operations. It also functions as a regenerator when an external Time Code is being recorded, deriving its clock from the external signal, and longitudinally offsetting the Time Code.

It is most important to note that internal and external recording operations must NEVER be performed simultaneously, since this will result in a longitudinal offset between the recorded Time Codes.

1.4.3 Internal Operation

For internal machine operations, the generator timing is derived from the CPU clock, and is not related to any external events. The generator starts when the Time Code channel is set into RECORD and normally begins from the time shown on the TAPE TIME display.

1.4.4 External Operation

When an external Time Code is being recorded, the incoming signal is received by the external reader and passed via software to the Recording Generator. The purpose of the software is to introduce the longitudinal offset, i.e. to compensate for the time shift caused by head placement.

Because of the need to play back Time Code tapes that have been recorded on different machines (whose head spacings can vary widely), it is essential that the Time Code track and the corresponding program tracks be recorded in such a manner that the Time Code and the program material are recorded with identical longitudinal positioning on the tracks. This is accomplished by introducing a longitudinal offset.

Longitudinal offset is used to compensate for the distances between the Time Code, recording, and repro heads. When program material is recorded on a tape striped with Time Code, the program material appears on the tape at a point which is longitudinally displaced from the Time Code reference by a distance equal to the spacing between the Time Code head and the recording head. When the tape is played back in the normal mode, the Time Code reference is in error, because the distance between the Time Code head and the repro head differs from that between the Time Code head and the recording head. If the tape be played back on a different machine, whose head spacings could be quite different, this problem is compounded further. To overcome this, the longitudinal offset is introduced.

To illustrate the method used to achieve the required offset, it is convenient to assume that Time Code is recorded on the program track simultaneously with the dedicated Time Code Track. This convention allows the relationship between the two tracks to be more clearly seen.

NOTE: The longitudinal offsets illustrated in Figures 1-1, 1-2 and 1-3 are shown for explanatory purposes only. The actual offsets used in the APR-5003 do not fall on these specific frame boundaries.

Figure 1-1 is a conceptual illustration of the physical arrangement of the various heads, together with the program and Time Code tape tracks. As Time Code frame N+2 arrives at the Time Code input, it is passed directly to the record head and recorded on the program track. At the same time, Time Code frame N+2 is passed through the processor and advanced by two frames, thereby producing future Time Code frame N+4. This signal is impressed upon the Time Code record head and recorded on the Time Code track.

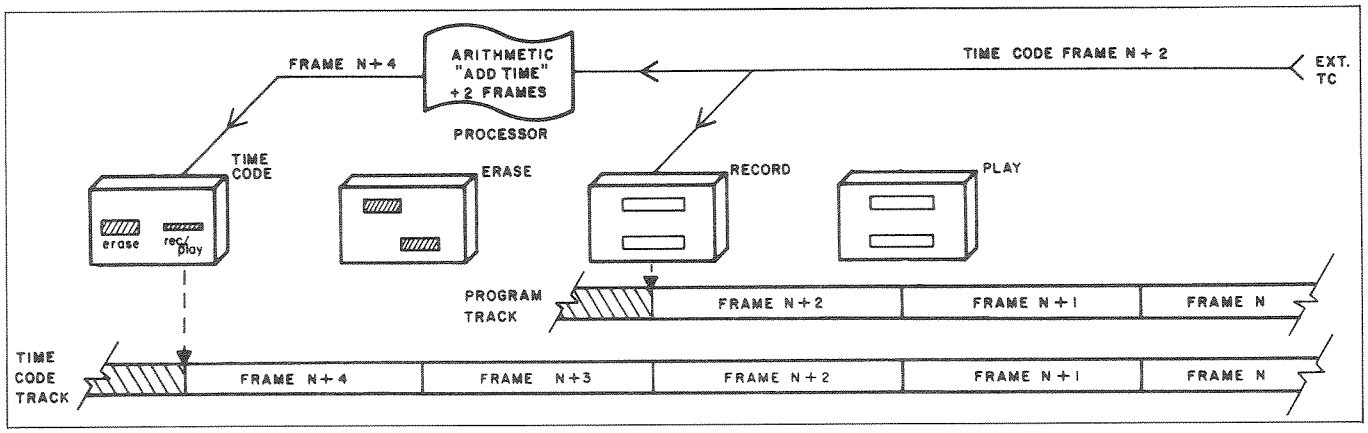


Figure 1-1. Time Code Logitudinal Offset (Recording)

The illustrated track sections show the condition that exists just after frame N+2 has been recorded on the program track. As frame N+2 was recorded on the program track, the future Time Code N+4 was recorded on the Time Code track, frames N+2 and N+3 on this track having been recorded as future Time Codes while frames N and N+1 were being recorded on the program track. As can be seen, this results in similar Time Code frames being recorded at the same longitudinal position on the tape.

The reverse process is performed when playing back tapes striped with Time Code. This is illustrated in Figure 1-2. It should be noted that, in playback mode, the processor delays the Time Code. Further, in normal playback mode, the processor retards the Time Code by a factor of three frames rather than two, because of the different placement of the playback head in relation to the Time Code head.

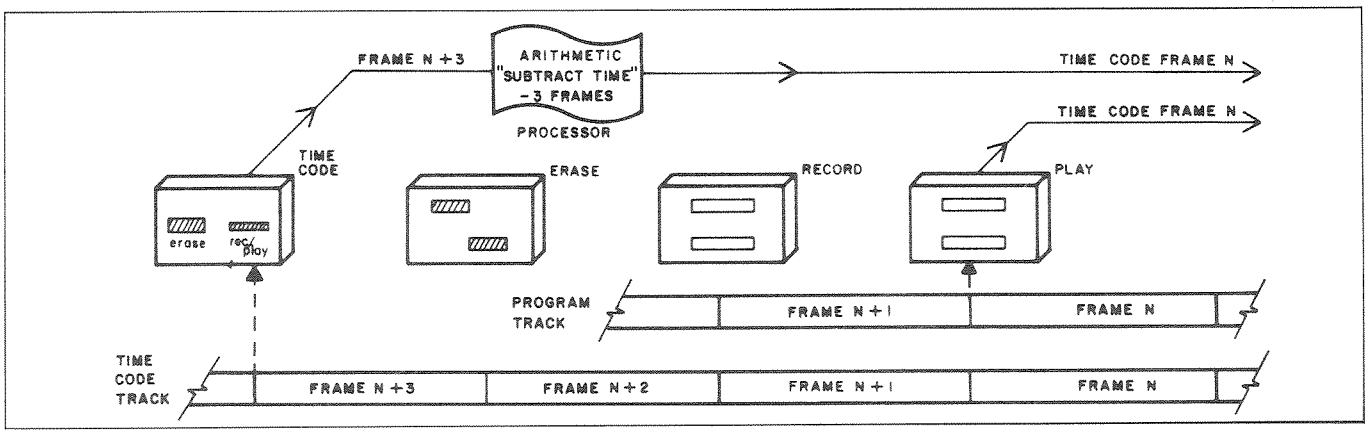


Figure 1-2. Time Code Longitudinal Offset (Normal Playback)

In the synchronous playback mode, when playback is derived from the recording head, the longitudinal offset is made in accordance with the position of that head, and the correction factor is −2, reversing the +2 factor used when recording. This is illustrated in Figure 1-3.

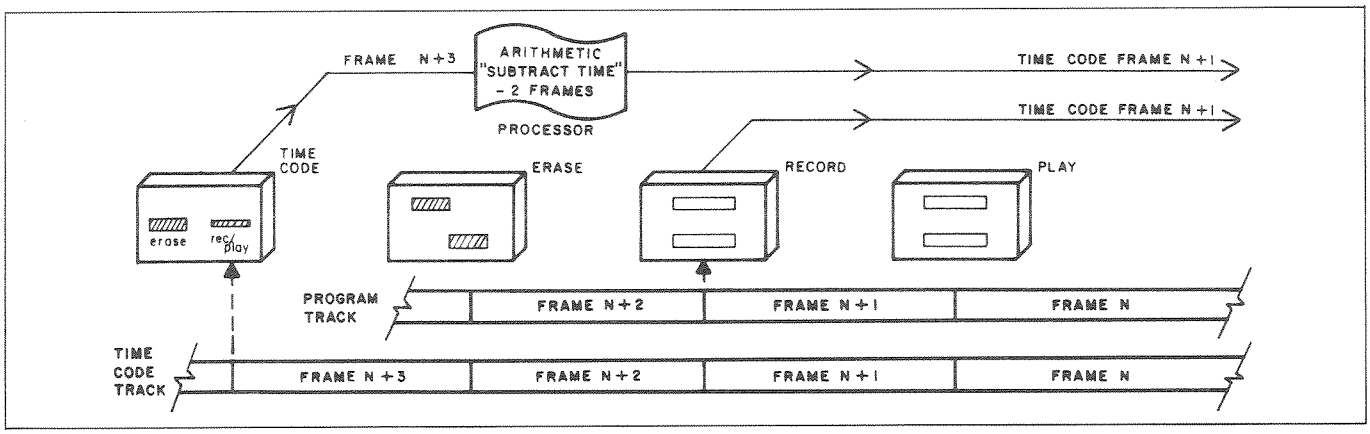


Figure 1-3. Time Code Longitudinal Offset (Synchronous Playback)

The requisite longitudinal offset compensation factors are defined by the physical placement of the record, repro, and Time Code heads, and are not user-adjustable. The offset arithmetic is fixed by firmware, and is adjusted automatically by the machine in accordance with tape speed.

1.4.5 Synchronizer

For CHASE Mode operation, the internal synchronizer is used to slave the APR-5003 to a Master machine. Synchronization can be performed with or without frame offsets, as required.

The APR-5003 can serve as either Master or Slave. When acting as Master, the Time Code signal from the TIME CODE OUT connector provides the reference for the Slave. As the Slave, the external Time Code from the Master is inserted at the TIME CODE IN connector.

In the CHASE Mode, the Slave machine echoes the Master's Time Code on its output. In modes other than CHASE, the Slave provides longitudinally corrected Time Code.

1.4.5.1 Master/Slave CHASE Synchronization

Where two tapes are striped with the same type of Time Code and played on two separate machines, the synchronizer can lock together the Time Code signals from the two tapes, causing them to run at identical speeds, and thereby slaving the two machines together. In this mode (CHASE), the machine providing the Time Code source is called the Master, and the following machine is called the Slave (see Figure 1-4). No external video reference is required for CHASE mode operations.

In CHASE Mode, synchronization can be accomplished with a Master Time Code source with confidence that any reasonable level of flutter which may be present in the Master will not be transmitted to the APR-5003. The following preconditions must be met to ensure proper operation:

1. The Master Time Code signal must be continuous and sequential, OR
2. Any Master Time Code discontinuity must be matched by an identical discontinuity in the APR-5003 Time Code. Where matched discontinuities are allowed, offsets cannot be requested. (See paragraph 1.4.5.2.)
3. No dropouts in the Master Time Code may exceed two seconds duration.

In order to maintain the Master/Slave lock requirement for CHASE Mode, certain limits are applicable to the relative Master and Slave tape speeds. For CHASE operation, both Master and Slave machine speeds must be set so that their Time Codes play back at their correct nominal speeds. For instance, if the Time Code on the Master tape was recorded at 15 IPS, and the Time Code on the Slave tape was recorded at 30 IPS, the Master and Slave machine speeds should be set at 15 IPS and 30 IPS respectively.

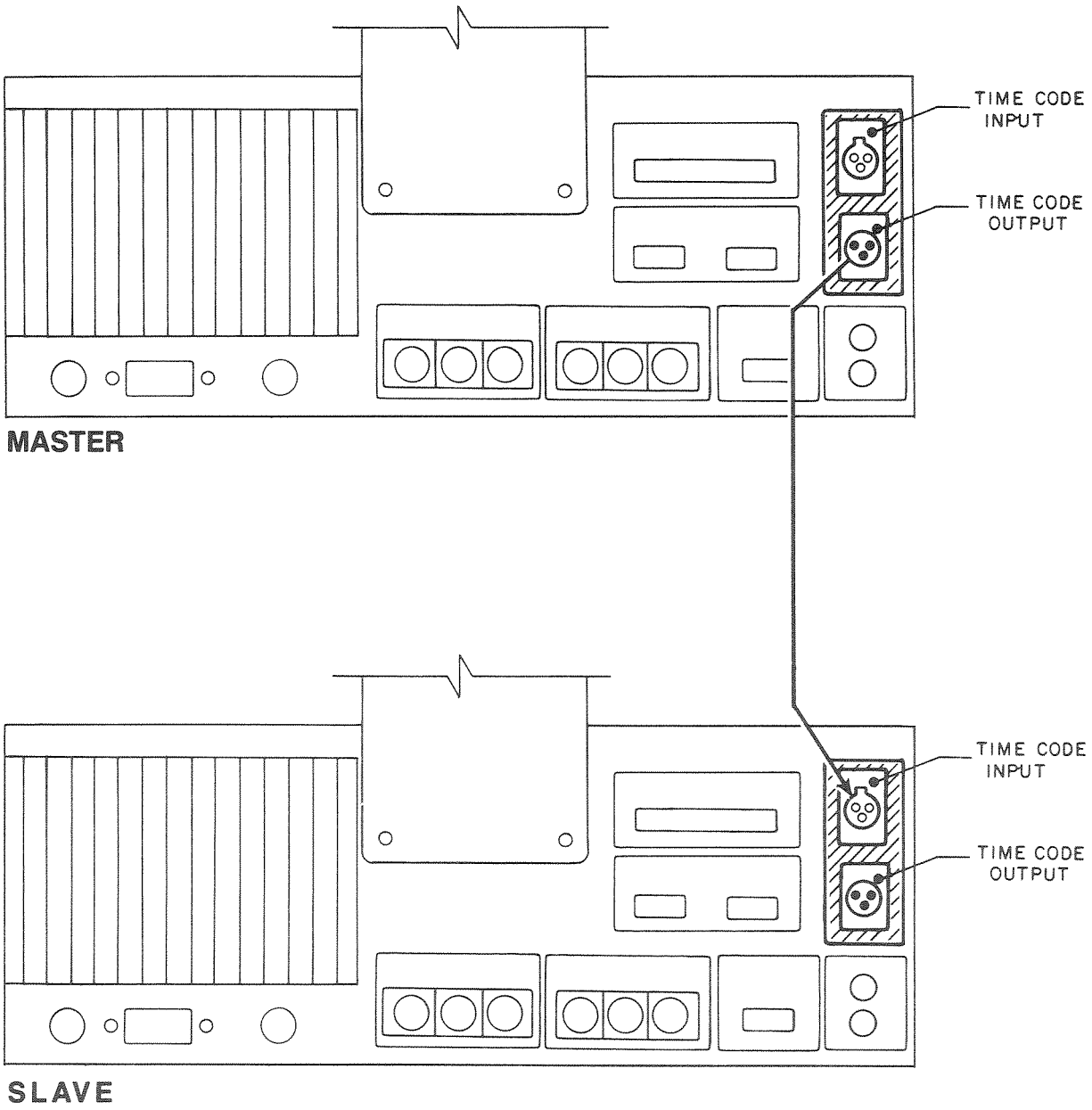
If Master is set to FAST FORWARD, MVC, REWIND, or any other high speed mode, the Slave attempts to follow at high speed, and subsequently re-synchronizes when it once again receives a reasonable real time Time Code. For further details of the synchronization limits, refer to the specifications given in paragraph 1.5.

1.4.5.2 Offset Lock in CHASE Mode

In many instances, it is required to synchronize two tapes on which the time relationships between the Time Code and program tracks are not the same, i.e. the program material starts at one Time Code on the first tape, and at a different Time Code on the second. In this situation, an offset value must be added to or subtracted from the Slave Time Code so as to compensate for the differences. The APR-5003 has provisions for such offsets to be implemented.

The CHASE Mode offset may be described as an advance or a retardation of the Slave Time Code in relation to the Master Time Code. Where it is required that the Master Time Code should lead the Slave Time Code, a negative offset value is entered at the Slave machine. For example, assuming that the Master Time Code is required to lead the Slave Time Code, by three minutes, an offset of −3:00:00 is entered at the Slave machine. With this offset entered, the Slave follows the Master in such a manner that the Master Time Code indication is always 00:03:00:00 greater than the Slave Time Code indication.

In the case where it is required that the Slave lead the Master by three minutes, a positive offset of 3:00:00 is entered at the Slave machine, causing the Slave Time Code indication to be always 00:03:00:00 greater than the Master Time Code indication.



NOTES:

1. Slave machine is set to CHASE mode
2. Master can be any device with Logitudinal Time Code Output

Figure 1-4. CHASE Mode Connections

1.5 SPECIFICATIONS

GENERAL:

IEC center Time Code track width	0.36 mm
Nominal Time Code recording level	700 nWB/m (equivalent to 250 nWB/m measured RMS)

CROSSTALK TO AUDIO:

Residual Time Code on audio tracks	Less than 85 dB at 15 IPS

TAPE TACHOMETER:

Relationship to Time Code	16 pulses/frame SMPTE (at 30 IPS) 19.2 pulses/frame EBU (at 30 IPS)

TIME CODE READING CHARACTERISTICS:*

External Time Code (FWD or REV)	
Min guaranteed reading range (in PLAY mode)	±50% of nominal speed
Interpolated reading range**	Up to transport limit speed
Readable range lower limit	0.05 times nominal speed
Readable range upper limit	70 times nominal speed
Internal Time Code (FWD or REV)	
Min guaranteed reading range	+50% of nominal speed
Interpolated reading range**	Up to transport limit speed

*Specified performance assumes ideal Time Code integrity

**Interpolation reading on external Time Code is performed by means of Sync word detection, and interpolation reading of internal Time Code relies upon roller guide information.

TIME CODE INPUT/OUTPUT:

Balanced Input	
Min level	0.6 V differential p-p
Max level	20 V differential p-p
Common mode rejection	10 V p-p (10 Hz to 100 kHz)
Unbalanced Input	
Min level	0.6 V differential p-p
Max level	20 V differential p-p
Differential analog output (CNX, JU1 & JU3 installed)	
Balanced 600 Ohm load	
Max level	7.5 V differential p-p
Nominal level	4.0 V differential p-p
Unbalanced analog output	
Max level	7.5 V differential p-p
Nominal level	4.0 V differential p-p
RS422 type output (CNX, JU2 and JU4 installed)	
Max "0" level	4.0 V differential p-p
Min "1" level	6V differential p-p

(No damage will result to the above outputs if they become shorted to ground)

OUTPUT SIGNAL SELECTION:

CHASE Mode	Buffered input Time Code
Non-CHASE Mode	
Throughout forward Time Code data reading range (in PLAY mode)	Longitudinally corrected Time Code from tape ± 1/40th frame
Outside Time Code data reading range and in non-PLAY modes	Wide bandwidth Time Code from tape
Recording Generator accuracy	±0.005% SMPTE NDF, EBU
Synchronization accuracy	Less than ±50 uSec at nominal speed

Wind speed limit (Available in TC DISPLAY mode. May be defeated through storage register # 36)

30 IPS	No limit imposed other than max motor rpm (approximately 9 x nominal speed)
15 IPS	225 IPS limit (15 x nominal speed)
7.5 IPS	112.5 IPS limit (15 x nom. speed)

SECTION 2
OPERATION

2.1 INTRODUCTION

This section provides operational information applicable to the APR-5003 system. It includes descriptions of the pertinent controls and indicators, inputs and outputs, basic operations, and other similar information.

For details of the standard APR-5000 Series operations, refer to Sections 4 and 5 of the APR-5000 Series Operation and Maintenance Manual.

2.2 CONTROLS AND INDICATORS

Controls and indicators pertinent to Time Code operations are located in three places: the Transport Control Panel, the Alignment Control Panel, and the Meter Housing. The functions of the various controls are listed in paragraphs 2.2.1 through 2.2.3 below.

2.2.1 Transport Control Panel

Those controls and indicators that are mounted on the Transport Control Panel are illustrated in Figure 2-1. Their functions are as follows:

- **Time Code Display** — Key/Indicator: The key causes the playback Time Code to be displayed on the TAPE TIME indicator. The indicator illuminates when that Time Code is being displayed.

- **TC GEN** — Key/Indicator: The key is used to select internal or external Time Code. The indicator illuminates when the internal Time Code Record Generator is selected for recording.

- **CHASE** — Key/Indicator: The key selects CHASE mode in which the APR-5003 is slaved to a second machine or vice versa. The indicator illuminates when CHASE is selected.

- **LOCATE TIME** — Numeric Display: Indicates the locate target Time Code in HH:MM:SS:FF format, except when:

  1. CHASE Mode is first selected. At this time, the frame offset stored in memory location 00 is displayed. (See paragraph 2.4, Parameter Selection.)

  2. Machine is placed in Vari-Speed program mode. This causes the speed variation percentage to be displayed.

  3. Executing STO (store) or RCL (recall) for non- parameter storage locations. The display then shows the addressed memory location.

- **TAPE TIME** — Numeric Display: Is used to indicate time in the HH:MM:SS:FF format when TC Display is selected. The displayed Time Codes depend upon Time Code source and current mode, as shown in Table 2-1. The frame digits will flash should the interpolated Time Code lose the reference established by a valid Time Code read. A "tape break" condition constitutes a loss of reference. However, it should be noted that the flashing indication is not provided in the TC REC READY mode.

  In the CHASE mode, the M and S decimal points become illuminated to indicate Time Code validity for the Master and Slave respectively.

- **Numeric Keypad** — Ten-key pad containing numeric keys 0 through 9 plus RCL (Recall), STO (Store) and +/– keys: Is used to enter parameters for Time Code operations.

MODE	DISPLAYED TIME CODE	
	INTERNAL TC SOURCE	EXTERNAL TC SOURCE
STOP	TC generator start time or most recent playback TC	External generator TC
PLAY	Playback TC or -- -- -- --	Playback TC or -- -- -- --
FAST MVC	TC from tape transport timer	TC from tape transport timer
TC RECORD	Internal generator TC	External generator TC

TABLE 2-1. TAPE TIME Displays

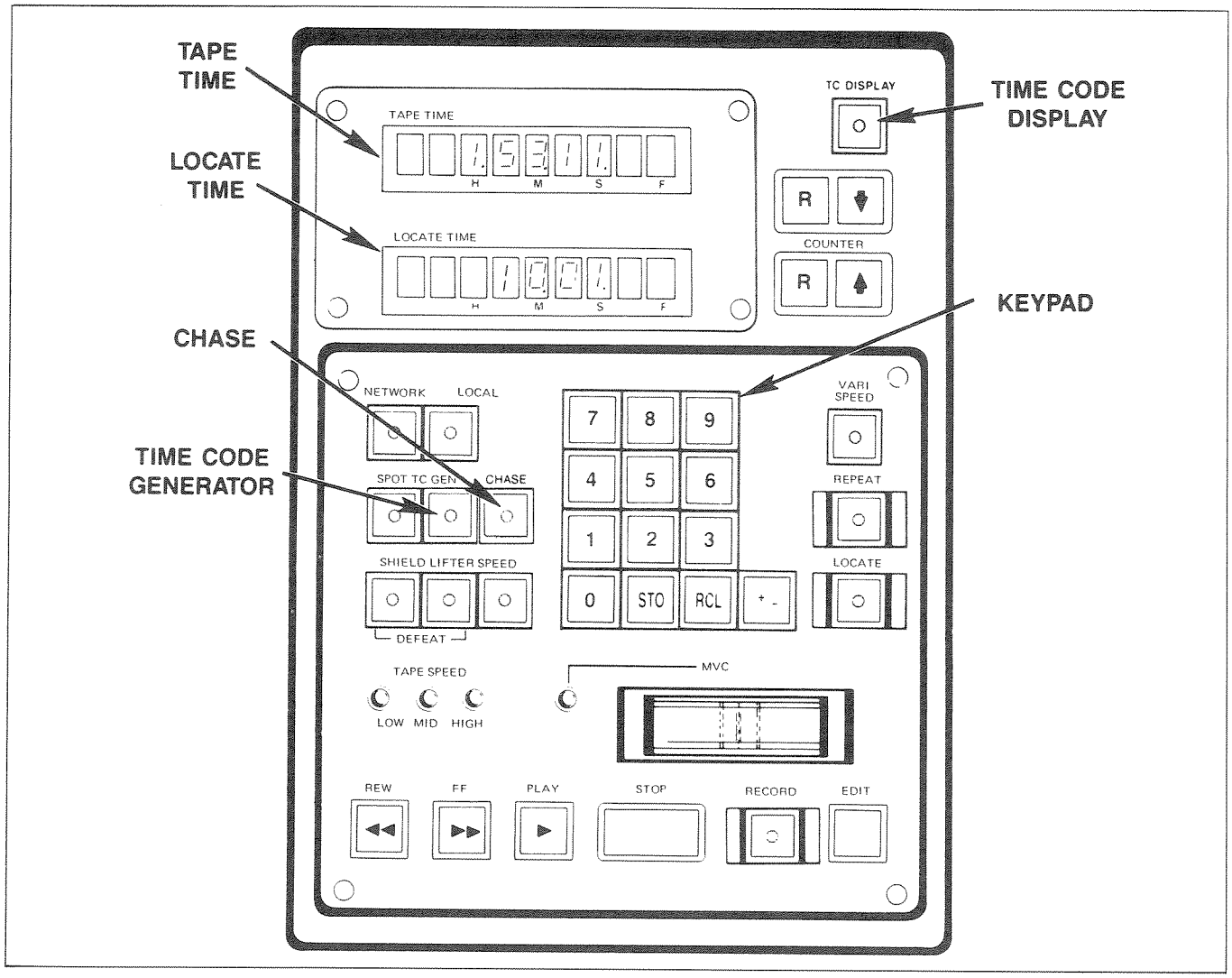


Figure 2-1. Transport Control Panel

2.2.2 Alignment Control Panel

Only one of the controls pertinent to Time Code operations is located on the Alignment Control Panel, namely the TC Control/Indicator in the EQ STD (Equalization Standards) section (see Figure 2-2). The TC control is used to select that special equalization standard which is best suited for digital data transmissions.

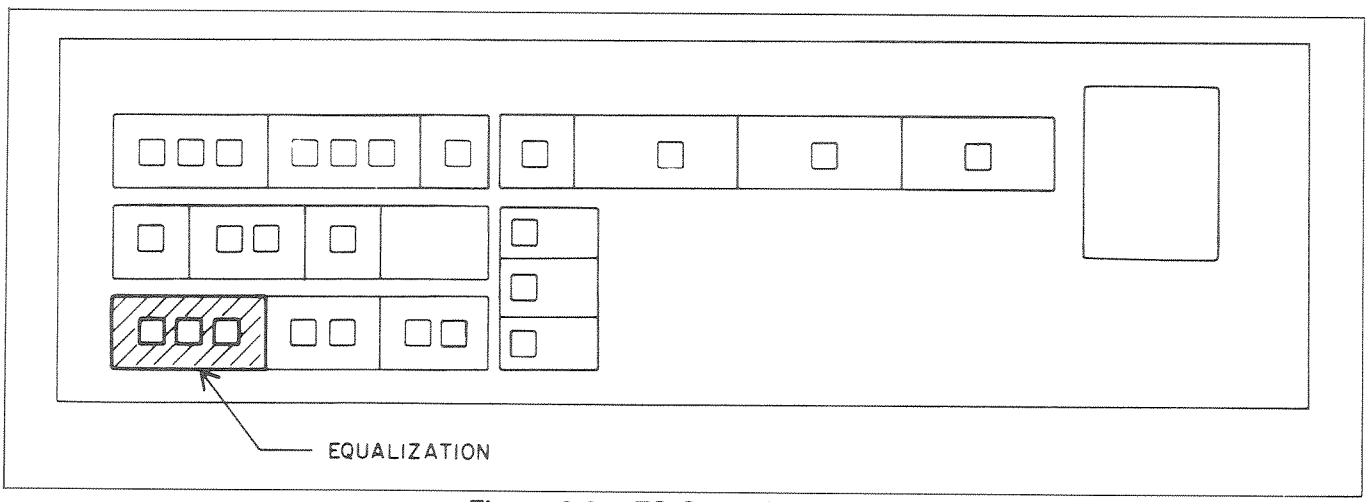


Figure 2-2. TC Control/Indicator

2.2.3 Meter Housing

One control/indicator and three LED indicators are located directly below the Time Code VU meter on the Meter Housing (Figure 2-3). These are described below.

- **ALN SELECTED** — LED Indicator (amber): Illuminates when a Time Code channel has been selected during an alignment procedure.
- **RECORD BIAS** — LED Indicator (red): Illuminates when the BIAS signal is active.
- **RECORD ERASE** — LED Indicator (red): Illuminates when the ERASE signal is active.
- **RECORD READY** — Key/Indicator: the key selects the RECORD READY mode, and the indicator becomes illuminated when that mode is selected.

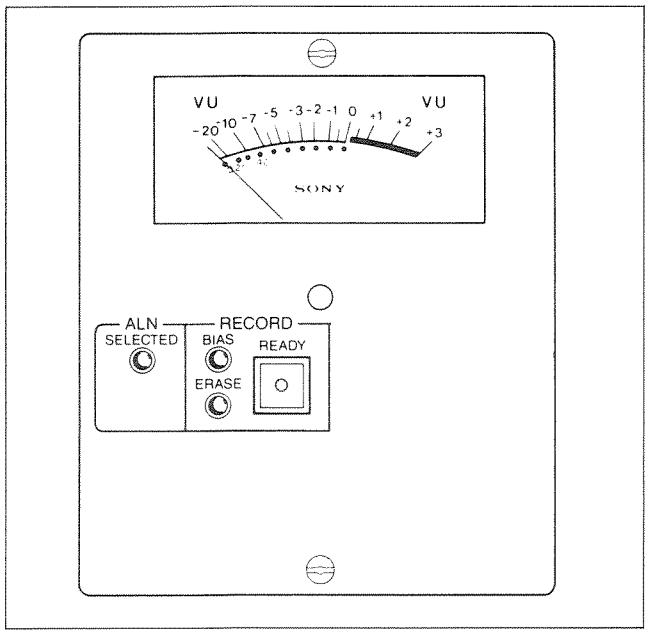


Figure 2-3. Meter Housing

NOTE: Time Code recordings made on the **SONY APR-2003** Analog Tape Recorder are at a higher signal level than those made on **APR-5003.** As a result, when **APR-2003** recordings are reproduced on the **APR-5003**, the VU meter tends to go beyond full-scale deflection. However, this is not detrimental to equipment operation, and need be of no concern to the operator.

2.3 Inputs and Outputs

Two connector pairs are provided for Time Code inputs and outputs, these being labelled TIME CODE IN, TIME CODE OUT, INPUT CH 3 and OUTPUT CH 3. These connectors are located on the rear panel of the machine, and are illustrated in Figure 2-4.

2.3.1 TIME CODE Connectors

The signal on the TIME CODE OUT connector is a real time signal, i.e. is longitudinally offset. This offset also is provided within the machine for signals input to the TIME CODE IN connector.

2.3.2 CH 3 Connectors

The INPUT CH 3 and OUTPUT CH 3 connectors provide direct access to the center track audio channel. The Time Code signals at these connectors are not processed, nor are they longitudinally offset. The primary purpose of these connectors is to serve as monitor points for the Time Code signals.

If so desired, signals other than Time Code can be recorded on the center track. To implement this facility, connector CNP-453 MUST be disconnected from the Connector (CNX) board. Access to the audio channel then can be made via the CH 3 connectors.

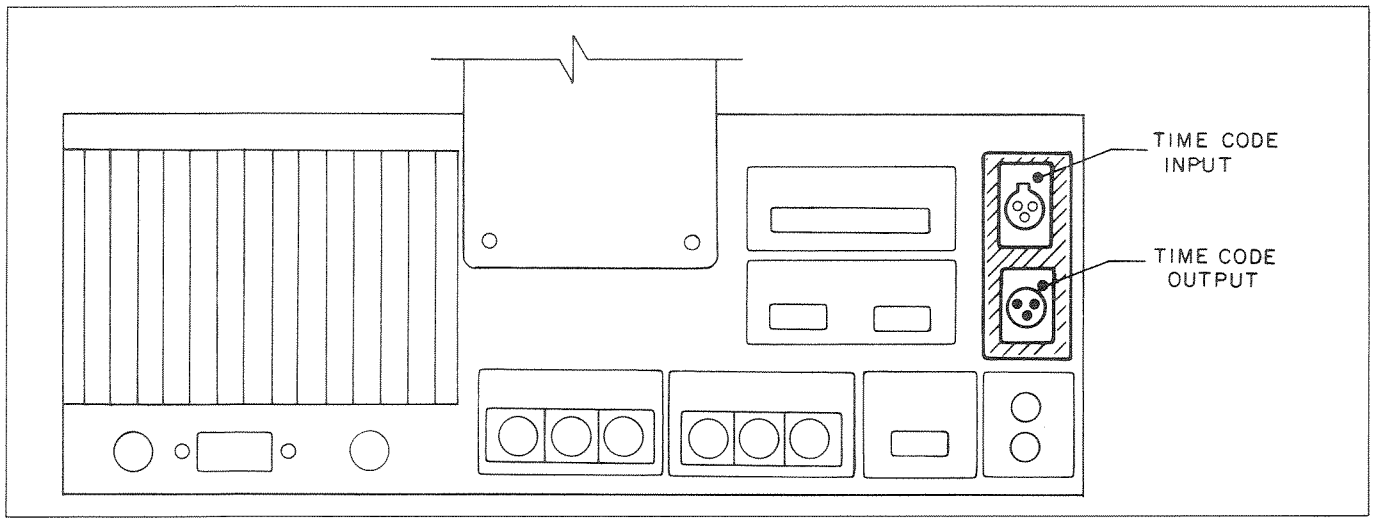


Figure 2-4. Time Code Input and Output Connectors

2.3.3 Output Signals

Time Code outputs are available as standard RS-422 signals or as differential analog signals. Selection of the desired standard is made by means of jumpers on the CNX board. Where an RS-422 output is required, jumpers JU 2 and JU 4 are installed. For differential analog output signals, jumpers JU 1 and JU 3 are installed.

The RS-422 signal is derived from a line driver whose output impedance is 60 ohms. This is a differential signal, and cannot be connected as a single-ended output.

The differential analog signal is derived from a differential line output (DLO) device which is provided with level and balance controls, and whose output impedance is 120 ohms. Either side of the DLO can be tied to ground without loss of signal amplitude, and this characteristic permits a single-ended output connection.

2.3.4 Input Signals

The TIME CODE IN connector accepts both RS-422 and processed signals, either balanced or single-ended. Since the Time Code is insensitive to phase reversal, the single-ended signal can be connected to either the high side (pin 2) or the low side (pin 3). However, it should be noted that the unused line must be connected to shield (pin 1) to ensure correct operation.

2.4 PARAMETER SELECTION

For Time Code operations, five operational parameters are required to be set. In addition, the CHASE mode frame offset may be adjusted as described in paragraph 2.4.1. The operational Parameters are described in paragraphs 2.4.2 through 2.4.6, and summarized in Table 2-2.

Entered parameters are not lost when power is removed from the machine. At next power-up, the previously entered parameters are re-established automatically.

The Operational Parameters are set by entering values into specific memory locations. The value entered for each Operational Parameter is either a one or a zero, these signifying a desired ON or OFF condition for the parameter.

Operational Parameter entries are made on the numeric keypad section of the Transport Control Panel. The method of entry differs from the standard store so as to preclude inadvertent changes in these Operational Parameters. To enter a parameter, the following procedure is used:

1. Press RCL .
2. Type the Memory Location number — the current parameter value in the selected location is displayed on the LOCATE TIME indicator.
3. Type the desired parameter value on the numeric keypad.
4. Press STO .

It should be noted that the Operational Parameter value is displayed for one minute only, and that the new value must be entered during this period. If it is desired to erase the display without entering a new value, this is done by pressing the LOCATE TIME reset switch.

MEMORY LOCATION	OPERATIONAL PARAMETER
30	Automatic Time Code OFF (0) or ON (1)
31	EBU (1) or SMPTE (0) selection
32	Drop frame (1) or Non-drop Frame (0) Selection
33	CHASE Disable (1) or Enable (0)
34	Reserved
35	Reserved
36	Wind Speed Limit for High Speed Reader

Table 2-2. Time Code Parameter Summary

2.4.1 CHASE Mode Frame Offset (Memory Location 00)

In CHASE Mode, in which the APR-5003 follows the Time Code from a Master machine, provision is made for offsetting so that either Slave is ahead of Master of Master is ahead of Slave. The offset must be entered as a valid time, a positive time being entered to set Slave ahead, or a negative time being entered to set Master ahead.

The required offset time is determined by cueing up the tapes to the desired program points and then reading the Time Codes at those points.

The following procedure is used to enter the offset:

1. Reset the LOCATE TIME display
2. Enter the desired offset time (HH:MM:SS:FF) on the keyboard (Press +/- if a negative time is required)
3. Press STO on the keyboard
4. Press 0 0 on the keyboard

The entered offset is displayed (with sign if negative) on the LOCATE TIME display.

2.4.2 Automatic Time Code (Memory Location 30)

Automatic Time Code is turned ON or OFF by storing either a zero (OFF) or a one (ON) in memory location 30. With Automatic Time Code ON, the machine automatically determines the Time Code format. Time Code determined in this manner automatically changes the parameters entered in memory locations 31 and 32 (see paragraphs 2.4.3 and 2.4.4).

2.4.3 EBU/SMPTE Selection (Memory Location 31)

The required Time Code format is entered into memory location 31, a zero being entered for SMPTE, or a one being entered for EBU. It should be noted that where SMPTE is selected, a further entry, selecting DF or NDF, may be entered into memory location 32. The EBU/SMPTE parameter is set automatically for SMPTE when a one (drop frame) is entered in memory location 32 (see paragraph 2.4.4).

2.4.4 DF/NDF Selection (Memory Location 32)

This parameter selection is valid only for SMPTE Time Code operation. An entered "1" selects drop frame code, while a "0" entry selects non-drop frame code.

If memory location 31 is subsequently set for EBU format, memory location 32 will be automatically cleared to zero (non-drop code).

2.4.5 CHASE Disable/Enable (Memory Location 33)

The CHASE control on the Transport Control Panel is enabled "0" or disabled "1" by this parameter selection.

2.4.6 Wind Speed Limit (Memory Location 36)

This parameter is used to limit the fast wind speed in MID (15 IPS) and LOW (7.5 IPS) ranges so as to allow for reliable performance of an external high speed reader in all modes of operation. When a one is entered into memory location 36, the wind speeds are limited to those levels shown in Table 2-3. Normal wind speeds prevail when a zero is entered.

TAPE SPEED	FAST SPEED
7.5 IPS	112 IPS
15 IPS	225 IPS
30 IPS	275 IPS (normal maximum speed)

Table 2-3. Wind Speed Limits

2.5 DUPLICATING TIME CODES

Since each new generation track made by audio copying methods is subject to signal deterioration, and poor quality recording on the center track can lead to misreading of the Time Code, duplicating Time Code tracks by means of audio copying is inadvisable. Because of this, the design of the APR-5003 is such as to mandate against audio copying of Time Code tracks.

To duplicate a Time Code track, the master track should be played back on a second machine whose Time Code output is coupled to the TIME CODE IN connector on the APR-5003. The APR-5003 then reads the incoming Time Code and generates a new signal for recording on its own Time Code track.

2.6 CHASE MODE

For many CHASE operations, it is recommended that the APR-5003 be supplied with an external Time Code and have Time Code recorded on its center track. In addition, the following parameters must be established.

- Time Code Format (or automatic selection)
- CHASE Mode enabled
- Frame offset (where required)
- Network Disabled (see APR-5000 Operation and Maintenance Manual)

When these preconditions have been met, CHASE is pressed to enter the mode. When CHASE is first pressed, its indicator flashes on and off, showing that the mode is selected but that the machines are not yet locked. The indicator illuminates solidly when lock is attained.

It should be noted that VARISPEED mode is disallowed in CHASE and TIME CODE RECORD operations. VARISPEED is cancelled automatically as soon as either one of these modes is selected.

2.6.1 PARK

Before entering CHASE Mode, it is sometimes desirable to set up the tapes on the Master and Slave machines to positions such that both machines are sure to enter synchronism at, or before, some specific time on the Master Time Code track. This is sometimes referred to as "parking" the machines.

Where it is required to park the machines before synchronizing them, the Master is first cued to a pre-roll point earlier than the time at which synchronism is desired. The pre-roll is provided to allow a "run up" time for the Slave to synchronize to Master. The required pre-roll time varies from installation to installation, being dependent on the Master device's starting ballistics and the nominal fixed tape speed. A method of determining a suitable pre-roll time for any installation is given in paragraph 2.6.2.

As the Master is played to the pre-roll point, the Slave (in CHASE Mode) follows Master and is brought up to approximately the same Time Code. When the Master is started after this set-up, Slave has sufficient time to lock to Master and settle down before the required lock position is reached.

2.6.2 Establishing Pre-roll

To establish a suitable pre-roll time for any given installation, the following procedure can be used:

1. Run both machines in CHASE Mode, and ensure that they are fully synchronized
2. Stop the Master machine, and allow the Slave to stop and position itself on the last received Master Time Code
3. Using a stop watch, or other suitable timer, set the Master to PLAY and note the time required for the slave to fully lock to the Master
4. Add 20% to the time noted in step 4. The result provides a reasonably reliable pre-roll time for the installation

2.6.3 Indications

When CHASE Mode is first selected, the Synchronizer Frame Offset value (memory location 00) is shown on the LOCATE TIME numeric display. This provides the user with the opportunity to verify the offset value before continuing with the CHASE Operation.

In most circumstances, the TAPE TIME numeric display shows the internal playback Time Code. The exception to this is where the machine is in STOP Mode, when the displayed Time Code depends upon which Time Code source was selected before entering CHASE Mode. If the previously selected Time Code source were external, the most recent internal Time Code is displayed. This feature is most useful during initial setup.

2.6.4 Effect of Cancelling CHASE

Should the CHASE Mode be cancelled after lock is attained, the machine continues to play at the speed which prevailed at the time CHASE was cancelled.

SECTION 3
TIME CODE STANDARDS

3.1 INTRODUCTION

Before the advent of the SMPTE/EBU Time code, the methods used for keeping track of specific points on audio or video tape were many and varied, each method having its own advantages and drawbacks.

In 1969, the SMPTE Time Code standard was established by the Society of Motion Picture and Television Engineers, and has virtually superseded all of the previous hit-or-miss electronic editing systems. This standard also has been accepted by the European Broadcasting Union (EBU), and is generally referred to as the SMPTE/EBU code.

Time Code offers accuracy and repeatability standards far greater than those attained previously, and is not subject to errors caused by tape slippage, signal dropout, or any of the other problems which detracted from earlier systems.

There are two versions of the SMPTE/EBU code, namely Longitudinal (serial) Time Code, and Vertical Interval Time Code (VITC). The form and content of both codes are essentially similar, the major difference being in their recording methods. Since the APR-5003 uses Longitudinal coding, VITC need not be discussed in this document.

3.2 LONGITUDINAL TIME CODE

In the APR-5003, the Longitudinal Time Code is recorded on the third track in the form of a string of bits (binary digits). For the US television standard of 30 frames per second (Fr/s), the recording frequency is 2400 bits per second. Thus, 80 bits are recorded for each frame of the program material, and each of these bits can have a value assigned so that the 80 bits for any frame represent a specific Time Code. This series of 80 bits is called the Time Code word.

For the European television standard of 25 Fr/s, exactly the same principle is used, the only difference being that to produce a total of 80 bits per frame, the recording frequency is lower, i.e. 2000 bits per second.

3.2.1 Bit Values and Coding

Before any values are assigned, the 80 bits are in the form of a square wave, with 40 positive excursions and 40 negative excursions. In this form, each bit has a value of zero. Figure 3-1A illustrates a sequence of zero-value bits.

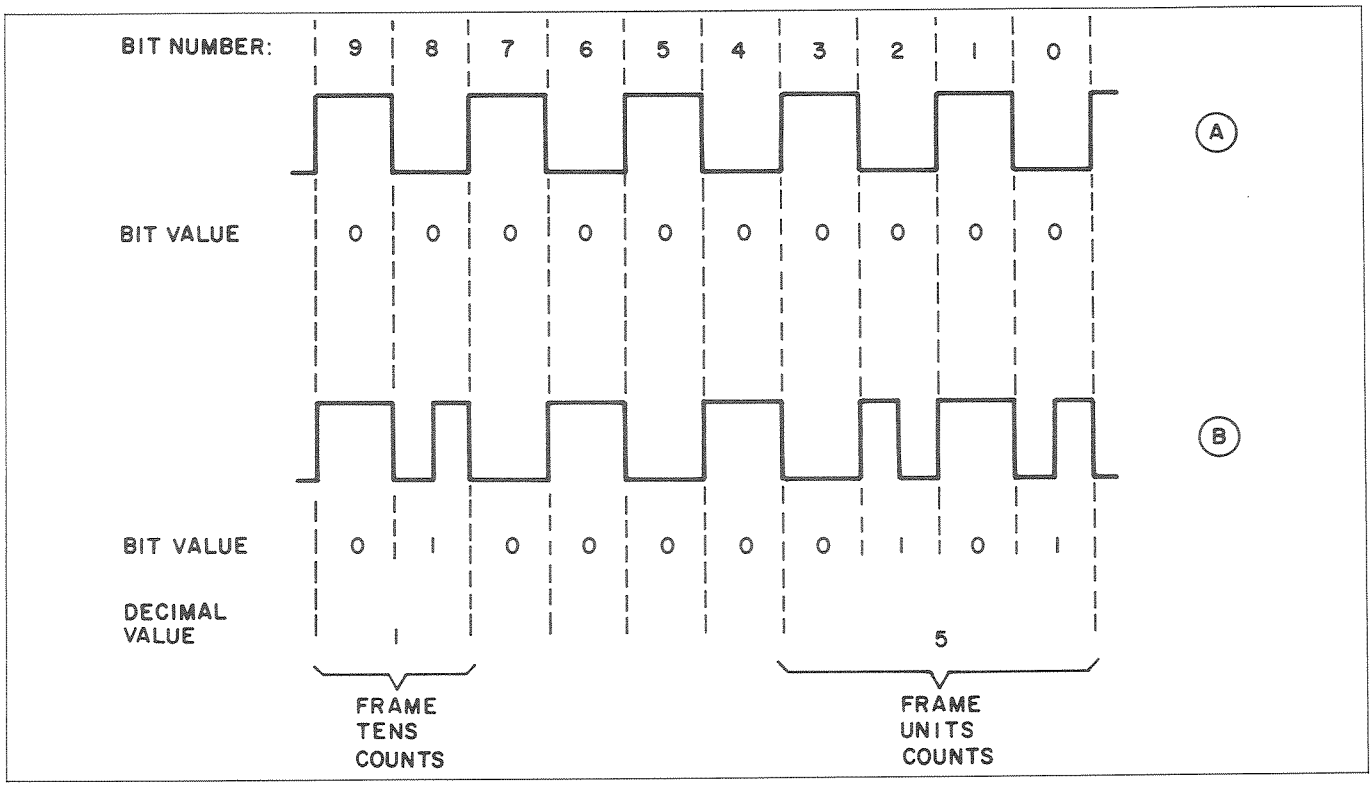


Figure 3-1. Time Code Signal Format

A value of one is assigned to any desired bit by generating a 1/2 bit, i.e. by switching the voltage level at the center of the bit. Figure 3-1B illustrates bits 0 through 9 in the Time Code word. Bits 0 through 3, together with bits 8 and 9 are used for the frame count. (The purpose of bits 4 through 7 will be discussed later.)

The Time Code signal is in BCD (Binary Coded Decimal) format, and the LSB (least significant bit) appears first in the sequence. Thus, referring to Figure 3-1B, bits 0-3, with a binary count of 0101, represent a units count of 5 for the frame number. Similarly, bits 8 and 9, with a binary count of 01, represent a decimal value of 1 for the tens count in the frame number. From this, it is readily seen that the code shown in Figure 3-1B is that for the fifteenth frame in the sequence.

3.2.2 Time Code Bit Assignments

Of the 80 bits generated for each frame, 28 bits are used for counting Time Code. Six bits are assigned for the frame count, seven bits each are assigned for the seconds and minutes counts, and eight bits are assigned for the hours count. The specific bits assigned for each part of the count are setailed in Table 3-1.

BIT NUMBERS	ASSIGNED TO
0-3	Frame Count, Units
8-9	Frame Count, Tens
16-19	Seconds Count, Units
24-26	Seconds Count, Tens
32-35	Minutes Count, Units
40-42	Minutes Count, Tens
48-51	Hours Count, Units
56-59	Hours Count, Tens

Table 3-1. Time Code Bit Assignments

3.2.3 Synchronization Word

The last 16 bits (64 through 79) of the Time Code word are devoted to the sync Word, and are the same in every frame. The sync word is used to notify the machine that the end of the frame has arrived. In addition, the bit pattern is such that it can be used to indicate whether the tape is moving in the forward or reverse direction.

3.2.4 Drop Frame Bit

The SMPTE Time Code is generated at a frame rate of exactly 30 Fr/s, this being compatible with monochrome video recordings. However, for color videotapes, the frame rate is reduced to approximately 29.97 Fr/s, and a reader that counted 30 frames before incrementing each second would introduce a cumulative display error of 3.6 seconds, or 108 frames, every hour. In other words, the Time Code display would not be in agreement with clock time.

To preclude this error, 108 frames counts are dropped from each hour of the Time Code sequence, two frame counts being dropped on every minute except the 10th., 20th., 30th., etc. Each tenth minute is excepted because dropping two frame counts in every minute would result in a total of 120 frames being dropped every hour.

Frame dropping occurs only at the minute changeover points. For example, as the Time Code changes from 01:08:59:29, the next frame number identified (in drop-frame format) becomes 01:09:00:02, frame numbers 00 and 01 having been dropped.

Bit 10 of the Time Code word is used to indicate whether the SMPTE format is DF or NDF, a one in Bit 10 signifying that the format is DF.

Since EBU signals are generated at 25 Fr/s for both color and monochrome video, no drop frame bit is required for the EBU code.

3.2.5 Color Frame Bit

Bit 11 in the Time Code word is used for the color frame bit, since this is required in some systems to indicate adherence to the SMPTE RS 107A standard. This standard prescribes that the Time Code be specifically aligned with (or "framed to") the video signal.

The term "Framing" refers to the specific coding for the frames used in the composition of the video picture. An even code is used to identify the first (A) frame in the Y field color frame sequence, and an odd code is used to identify the second (B) frame in the sequence. In a correctly color framed Time Code, the start of the Time Code coincides with the fifth (+1) line of field 1.

3.2.6 User Bits

Between the Time Code counter bits, the drop frame bit and the color frame bit, are interspersed 32 bits, these being arranged in eight groups of four bits each. These are bits 4-7, 12-15, 20-23, 28-31, 36-39, 44-47, 52-55 and 60-63. These are, in essence, leftover bits, since all of the requirements for time coding are met by those bits described in paragraphs 3.2.1 through 3.2.5.

The leftover bits are generally referred to as "user'bits, and they are available for such auxiliary functions as the user may desire. At this time, the APR-5003 does not support the implementation of the user bits.

SECTION 4
ALIGNMENT

4.1 INTRODUCTION

The information presented in this Section pertains to the Time Code channel and headstack alignments for the APR-5003. It is recommended that all of this material be read and thoroughly understood before any alignment procedures are attempted.

4.2 TEST EQUIPMENT

The equipment required in the performance of these alignment procedures is listed below.

Mono Time Code Checkout Tape 7.5 IPS
(Local fabrication: see paragraph 4.4)
Dual Trace High Speed Oscilloscope Tek 545 or eq.
Time Code Generator Sony BVG-1600.
Time Code Reader Sony BVG-1500
J2: Zenith Block J-6105-960-A
AC Voltmeter HP 400FL or eq.
Standard Alignment Tapes (250 nWB/m)
Mag. Ref. Labs. 7.5, 15 and 30 IPS
J6: Time Code Decoder Box J-6106-140-A
J7: Center Track Time Code Head Gauge
Sony Part # T-0940-579-(Rev)
Work Tapes
Dry Erase Marker Sanford Corp. EXPO or eq.

4.3 ALIGNMENT PROCEDURES

Each of the procedures given below is prefaced with a brief explanation of what is being adjusted and why the adjustment is necessary. It should be noted that the mechanical MUST be completed before the electrical adjustments are carried out. In addition, before the adjustments are carried out, the DIP swithes in the headstack assembly must be set as follows:

S1, S2, S5, S7 and S8 — Closed
S3, S4, and S6 — Open

4.3.1 Head Position Adjustment

The purpose of these adjustments is to optimize Time Code head placement so that the audio and Time Code channels are properly aligned. The Time Code head adjustments are the similar to those for the erase head.

NOTE: Time Code head adjustment is necessary only after a head has been removed and is being replaced, or when the tape is not properly centered on the head surface.

Time Code head height is checked visually, using the center track Time Code head height gauge, as detailed below:

STEP 1 Remove the pinch roller puck and thread the gauge onto the head stack.

STEP 2 Ensure that the gauge is correctly positioned in the left and right fast guides.

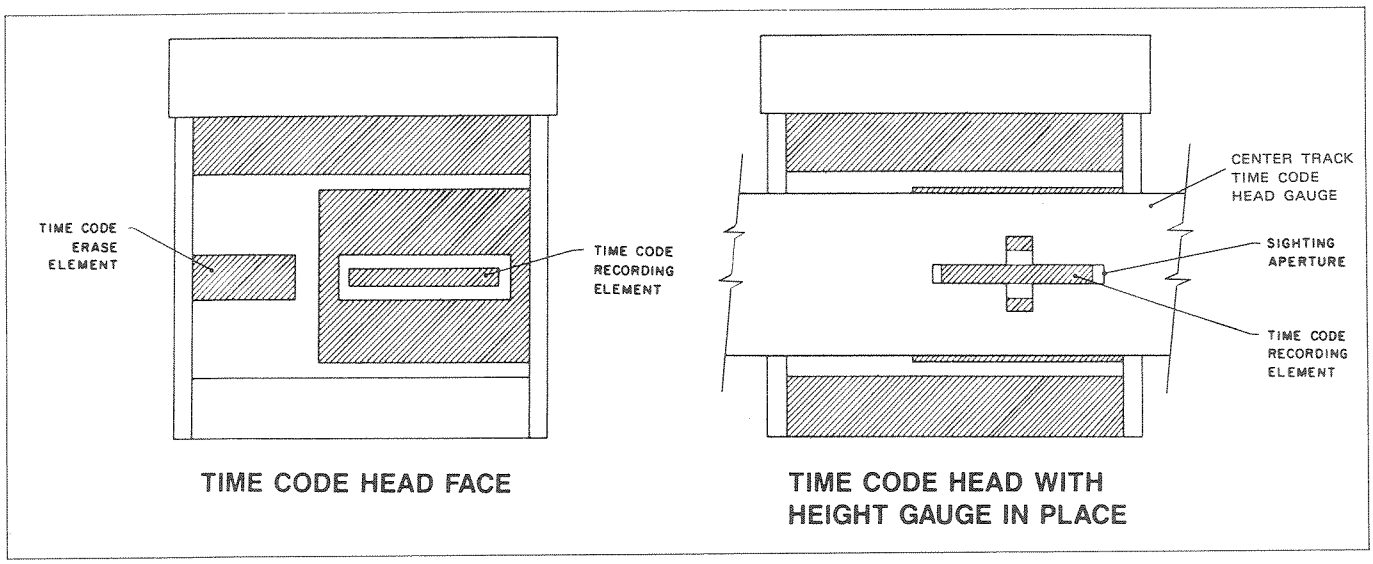


Figure 4-1. Time Code Head Height

STEP 3 Adjust the position of the gauge so that the Time Code recording element is visible through the sighting aperture in the gauge.

STEP 4 Verify that the Time Code recording element is centered exactly along the lateral slot in the sighting aperture, as illustrated in Figure 4-1. If this condition is met, go to STEP 5. Otherwise, go to STEP 6.

STEP 5 Remove the gauge and reinstall the pinch roller puck.

STEP 6 Using the procedure described in paragraphs 6.5.6 (Head Height) and 6.5.7 (Head Zenith Adjustment) in the APR-5000 Operation and Maintenance Manual, adjust the Time Code head height. To verify the adjustment, repeat the procedure given in STEP 1 through STEP 4.

4.3.2 Tape Lifter Adjustment

Tape lifter adjustment is required only if the lifters do not properly move the tape away from the heads when the machine is in a fast wind mode, or if the lifters cause the tape to be mishandled when they are engaged.

To check the lifter operation, the machine is set to a fast wind mode (FFWD or REW), and the tape position and movement is observed. The tape should be in contact with the Time Code head, but not touching any of the other heads, and should move smoothly across the headstack with no tendency toward riding up or down. If these conditions are properly met, lifter adjustment is not necessary.

The lifte spacing should be adjusted with the following procedure:

STEP 1 Unfasten the three mounting screws, and remove the headstack.

STEP 2 Remove the pinch cap and roller.

STEP 3 Unfasten the four mounting screws, and remove the top front overlay panel.

STEP 4 Replace the head stack and the pinch cap and roller. Thread a working tape onto the machine and set the machine power switch to on.

STEP 5 Loosen the tape lifter solenoid mounting screws (Figure 4-2.) and position the solenoid so that the tape is in contact with the Time Code head, but not touching the erase, record or repro heads.

STEP 6 Tighten the solenoid mounting screws, and verify that the adjustment remains unchanged.

STEP 7 Set the machine to FFWD mode. Verify that the tape remains in contact with the Time Code head but does not touch any other head. It should be noted that, when correctly adjusted, the tape is very close to the erase head, but does NOT touch.

STEP 8 Verify that the tape moves smoothly and with no tendency toward riding upward or downward.

STEP 9 Repeat STEP 7 and STEP 8 with the machine in REW mode.

STEP 10 Set the machine power switch to off and unthread the tape. Remove the head stack and the pinch cap and roller.

STEP 11 Replace the top front overlay panel, the pinch cap and roller, and the head stack, ensuring that all parts are properly secured.

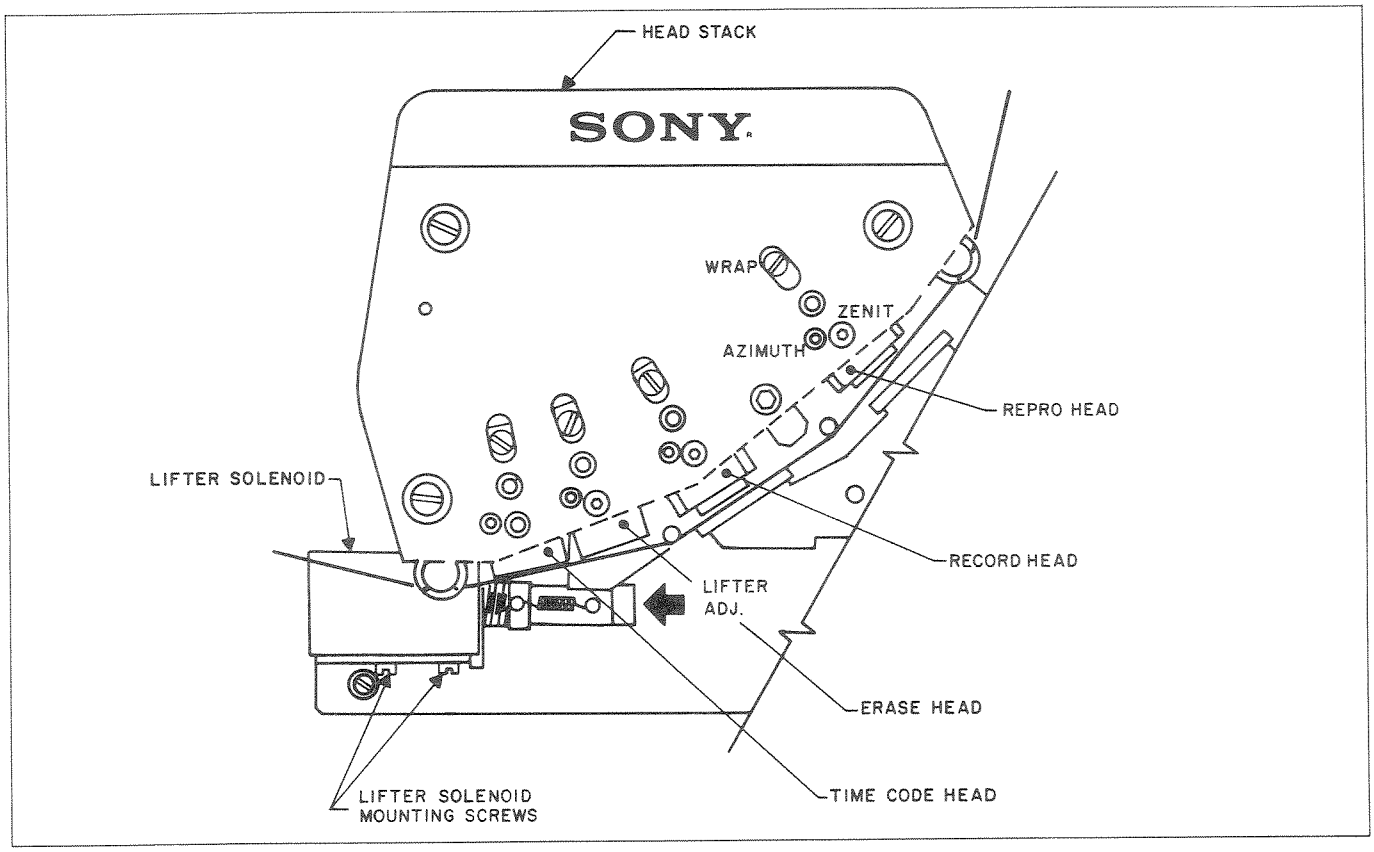


Figure 4-2. Tape Lifter Adjustment

4.3.3 Time Code Channel Alignments

The following paragraphs provide the electrical alignment procedures for the Time Code (SYNC TK 3) Channel. These procedures should not be carried out until all of the mechanical adjustments on the machine have been completed.

It should be noted that the following procedures are for the Time Code channel only, the audio channels being calibrated in accordance with the procedures given in the APR-5000 Operation and Maintenance Manual.

4.3.3.1 Time Code Output and VU Meter

Time Code output level adjustment and VU meter calibration are carried out using the standard audio test tape, as detailed in the procedure given below.

STEP 1 Set the power switch to off and remove the TCC (Time Code Channel) card from the amplifier case. Re-install the TCC card on the PC card extender.

STEP 2 Set the power switch to on, set the tape transport to HIGH (30 IPS) speed, and set all channels to SAFE mode.

STEP 3 Thread the 30 IPS audio test tape on the machine, and connect the AC Voltmeter to the OUTPUT CH-3 connector on the rear door of the machine. (Pin 2 high, pin 3 low.)

STEP 4 Locate the 1 kHz. test tone on the tape, and press IND until the STATUS display indicates "3". Press SYNC LEVEL and observe that the indicator on the switch becomes illuminated.

STEP 5 Press INC (increment) or DEC (decrement) as necessary so that the AC Voltmeter indication becomes +4 dBu.

STEP 6 Adjust RV3 on the TCC card so that the Time Code channel VU meter indication becomes 0 VU.

STEP 7 Set the power switch to off, and remove the TCC card from the extender. Re-install the TCC card in the amplifier case.

4.3.3.2 TRK 3 Presets

Before making INPUT and RECORD adjustments, it is necessary to preset the TRK 3 alignments listed in Table 4-1. These presets establish starting points for the adjustment procedures, as well as setting compensation values to their minimum values. The procedure for entering presets is given in the APR-5000 Operation and Maintenance Manual.

TRK 3	30 IPS	15 IPS	7.5 IPS
Sync Gap Compensation (SGC)	C0	C4	C5
Record Feed Forward	C0	C0	C0
Record Feed Back	C0	C0	C0
Bias Level	30	20	10
Sync Low Frequency	FF	FF	FF
Sync High Frequency	00	00	00
Record High Frequency	FF	FF	FF

Table 4-1. Track 3 Presets

It should be noted that very little bias is required to reproduce Time Code efficiently in high speed wind modes.

4.3.3.3 Sync Level Adjustments

Sync level adjustments are made with separate test tapes for each speed. Before these adjustments are made, the VU meter must be calibrated and the TRK 3 presets must be set in accordance with Table 4-1.

STEP 1 Thread the high speed test tape on the machine, and set the tape transport speed to HIGH (30 IPS).

STEP 2 Locate the 1 kHz. tone on the test tape. Press SYNC LEVEL and observe that the indicator on the switch becomes illuminated.

STEP 3 Press INC or DEC as necessary so that the Time Code channel VU meter indication becomes 0 VU.

STEP 4 Using the appropriate test tapes, repeat STEP 1 through STEP 3. at MED (15 IPS) and LOW (7.5 IPS) speeds.

4.3.3.4 Fine Wrap and Azimuth Adjustments

To achieve optimum positioning of the Time Code head, its azimuth and wrap must be fine tuned. These adjustments are made using the 16 kHz tone on the high speed audio test tape.

The following procedure is used to adjust the Time Code head for optimum performance.

STEP 1 Thread the high speed test tape on the machine, and set the tape transport speed to HIGH (30 IPS).

STEP 2 Locate the 16 kHz. test tone, and adjust the Time Code head azimuth and wrap for maximum output at that frequency.

STEP 3 Manually engage the lifters, and verify that no change occurs in the output level. Should a change occur, repeat the tape lifter adjustment procedure given in paragraph 4.3.2 of this Supplement.

4.3.4 Record Level Adjustments

The Time Code channel automatically switches between INPUT and SYNCHRONOUS REPRO modes as the tape transport is switched between RECORD and PLAY. The Time Code INPUT level is adjusted with the machine in play, and the REPRO level then is adjusted by recording the internal Time Code generator and playing back the result. The setup procedure is given below.

STEP 1 Press CHANNEL 3 READY on the Meter Housing, and then press TC GEN on the Transport Control Panel. Observe that the TC GEN indicator becomes illuminated.

STEP 2 Thread a tape on the transport, and select HIGH (30 IPS) speed.

STEP 3 Press R for both the TAPE TIME and LOCATE TIME indicators.

STEP 4 Press LVL on the INPUT section of the ALN panel.

STEP 5 Press INC or DEC as necessary to set the Time Code VU meter indication to zero.

STEP 6 Press PLAY and RECORD simultaneously, and record at least 30 seconds of Time Code.

STEP 7 Press LOCATE and then PLAY. When the machine enters PLAY mode, observe the Time Code channel VU meter. If the meter indication is zero, no adjustment is required.

STEP 8 If the meter indication is greater than 0 VU, reduce the Channel 3 Record Level parameter. If the meter indication is less than 0 VU, increase that parameter.

STEP 9 If the Record Level parameter has been changed in accordance with STEP 8., repeat STEP 3 through STEP 7 to verify the results of the adjustment.

4.3.5 High Speed Reader Test

This test is performed to verify the results of the preceding alignment procedures, and will show up any errors caused by improper alignment.

NOTE: To allow proper reading of Time Code recorded at MED (15 IPS) or LOW (7.5 IPS) speeds, the wind speed limits must be set. Refer to paragraph 2.4.6 in this Supplement.

STEP 1 Connect the High Speed Time Code Reader (Sony BVG-1500) to the TIME CODE OUTPUT connector on the rear panel.

STEP 2 Set the tape transport speed to HIGH and press TC GEN.

STEP 3 Press R for both the TAPE TIME and LOCATE TIME indicators, then press PLAY and RECORD simultaneously.

STEP 4 When the TAPE TIME becomes 00:05:00:00, press STOP.

STEP 5 Press LOCATE. When the TAPE TIME becomes 00:00:00:00, press PLAY.

STEP 6 Verify that the VALID DATA indicator on the High Speed Time Code Reader remains illuminated while the tape is being played back.

STEP 7 When the TAPE TIME becomes 00:05:00:00, press STOP then REW. Verify that the VALID DATA indicator on the High Speed Time Code Reader remains illuminated in REWIND mode.

STEP 8 Press FFWD and verify that the VALID DATA indicator on the High Speed Time Code Reader remains illuminated in FAST FORWARD mode.

STEP 9 Set the tape speed to MED, and repeat STEP 3 through STEP 8.

STEP 10 Set the tape speed to LOW, and repeat STEP 3 through STEP 8.

4.3.6 Time Code Head Block Longitudinal Offset

Two Time Code longitudinal offsets need to be adjusted for correct operation, one for recording and one for playback, and this is accomplished by fine-tuning the wraps on the record and repro heads.

Before carrying out the following procedures, all of the adjustments given in paragraphs 4.3.1 through 4.3.5 must have been completed.

STEP 1 Connect the equipment as illustrated in Figure 4-3. Set the Time Code Generator to OFF. On the Oscilloscope, set Channel 1 for normal operation, Channel 2 for inverted operation, and the function switch for an algebraic sum display.

STEP 2 Thread the 7.5 IPS mono Time Code test tape on the transport and set the transport speed to LOW. Set the Time Code source to internal (TC GEN indicator illuminated).

STEP 3 For both channels, press REPRO on the MONITOR section of the Meter Housing panel.

STEP 4 Press PLAY and observe the Oscilloscope display. Adjust the repro head wrap so that the two Time Codes are brought into alignment within ± 0.5 bit cells. This condition is achieved when the positive and negative excursions on the display are equal in width and of minimum duration.

STEP 5 For both channels, press SYNC on the MONITOR section of the Meter Housing panel.

STEP 6 Press PLAY and observe the Oscilloscope display. Adjust the record head wrap so that the two Time Codes are brought into alignment within ± 0.5 bit cells. This condition is achieved when the positive and negative excursions on the display are equal in width and of minimum duration.

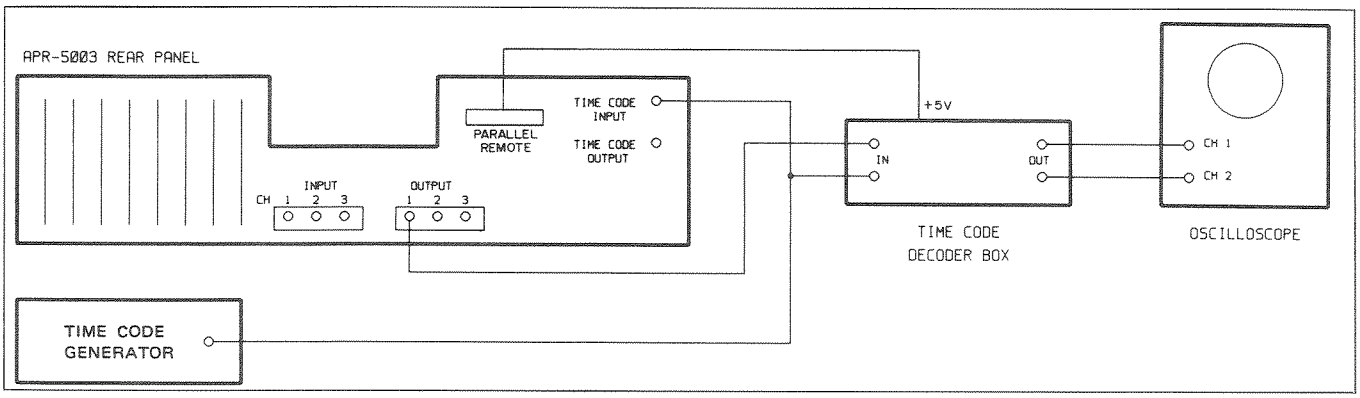


Figure 4-3. Longitudinal Offset Test Connections

NOTE: STEP 7 and STEP 8 are carried out to verify the wrap of the repro and record heads. If the longitudinal offset adjustments cannot be completed without upsetting these head wraps, all heads should be checked for correct parts placement and fore and aft positioning.

STEP 7 Move the tape away from the head stack, and use the dry erase marker to ink the faces of the repro and record heads. Ensure that the marking is symmetrical with respect to the crown of each head, as illustrated in Figure 4-4.

CAUTION

Do not use any marker pen other than the dry erase type. A permanent marker, or one requiring wet erasure can cause damage to the heads.

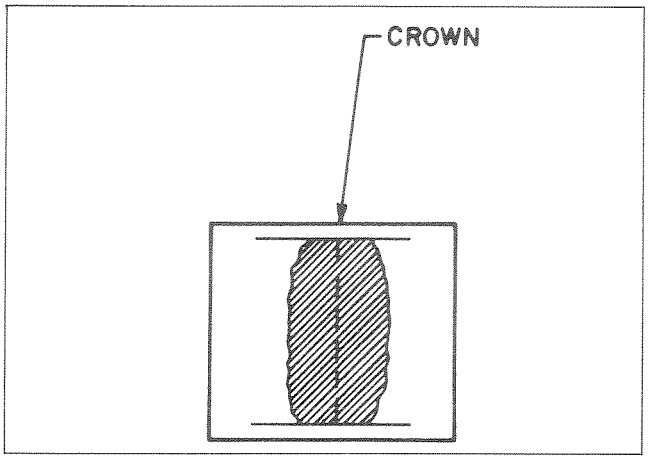


Figure 4-4. Ink Distribution on Head Surface

STEP 8 Set the machine to PLAY mode, and allow it to run for five seconds. Move the tape away from the head stack, and inspect both of the marked heads. Verify that the ink is worn away to an equal distance on either side of the crown, as illustrated in Figure 4-5. If the wear pattern is correct, go to STEP 9. Otherwise, repeat the procedure given in STEP 1. through STEP 6.

STEP 9 Press TC GEN to select external Time Code (TC GEN indicator illuminated), and set the Time Code Generator to ON.

STEP 10 Set the Time Code channel to the RECORD READY mode, then press PLAY and RECORD simultaneously. Record about one minute of Time Code.

STEP 11 Rewind the tape and play back the recorded Time Code while observing the Oscilloscope display. The Time Codes should be aligned within ±1.0 bit cells. This condition is achieved when the positive and negative excursions on the display are of equal width and are less than 41.5 microseconds in duration.

4.3.7 CHASE Mode Verification

The CHASE mode verification test is carried out to check the correct operation of the Time Code synchronizer at all three tape speeds. This test requires the use of a master machine capable of delivering high speed Time Code.

STEP 1 Connect the equipment as illustrated in Figure 4-6. On the Oscilloscope, set Channel 1 for normal operation, set Channel 2 for inverted operation, and set the function switch for an algebraic sum display.

STEP 2 On the APR-5000, set memory location 00 to 0 (see paragraph 2.4.1 in this Supplement).

STEP 3 Thread a 7.5 IPS mono Time Code tape on

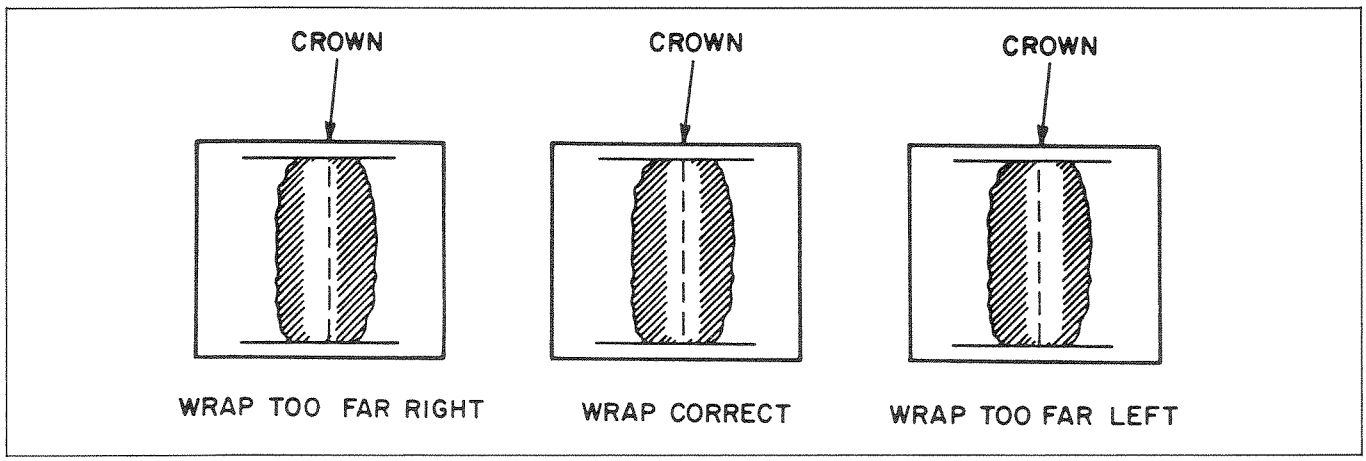


Figure 4-5. Ink Wear Patterns

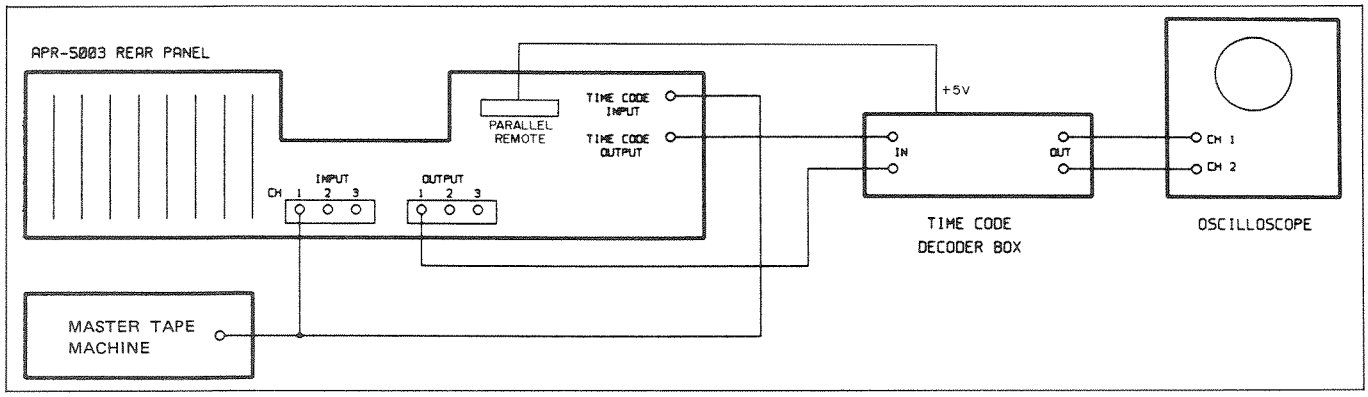


Figure 4-6. CHASE Mode Verification Connections

the APR-5000, and thread a tape striped with a similar Time Code format on the master machine.

STEP 4 For both channels on the APR-5000, press REPRO on the MONITOR section of the Meter Housing panel.

STEP 5 Set the master machine into PLAY mode.

STEP 6 On the APR-5000, press CHASE . Verify that the APR-5000 becomes slaved to the master machine.

STEP 7 Observe the Oscilloscope display. The Time Codes should be aligned within ±1.0 bit cells. This condition is achieved when the positive and negative excursions on the display are of equal width and are less than 41.5 microseconds in duration.

STEP 8 For both channels on the APR-5000, press SYNC on the MONITOR section of the Meter Housing panel. Verify that the APR-5000 is slaved to the master machine.

STEP 9 Observe the Oscilloscope display. The Time Codes should be aligned within ±1.0 bit cells. This condition is achieved when the positive and negative excursions on the display are of equal width and are less than 41.5 microseconds in duration.

STEP 10 Set the master machine to FAST FORWARD mode for three seconds. Verify that the APR-5000 follows into the FAST FORWARD mode.

STEP 11 Set the master machine into REWIND mode for three seconds. Verify that the APR-5000 follows into the REWIND mode.

STEP 12 Repeat STEP 4 through STEP 11 with a 15 IPS Time Code tape on the APR-5000 and an appropriate tape on the master machine.

STEP 13 Repeat STEP 4 through STEP 11 with a 30 IPS Time Code tape on the APR-5000 and an appropriate tape on the master machine.

4.4 TIME CODE CHECKOUT TAPE FABRICATION

A suitable Time Code Checkout Tape can be fabricated using any full track Mono Tape machine and any Time Code source. (The TIME CODE OUT connector on the APR-5003 provides an excellent Time Code source.) The following procedure details the tape fabrication method.

CAUTION

CHECKOUT TAPES FABRICATED AS DETAILED BELOW SHOULD BE USED FOR NO OTHER PURPOSE THAN TIME CODE CHECKOUTS AND SETUPS

STEP 1. Using a 7.5 IPS Standard Alignment Tape, adjust the repro level on the Mono Tape Machine for an indication of 0 VU at 250 nWB/m (nanowebers per meter).

STEP 2. Remove the Alignment Tape from the Mono Tape Machine, and reload the machine with a blank tape.

STEP 3 Connect the Time Code source to the recording input on the Mono Tape Machine.

STEP 4 Set the Mono Tape machine for simultaneous record/repro operation at 7.5 IPS.

STEP 5 Set the Time Code source to supply SMPTE Non-Drop Frame code. (If APR-5003 is used as the Time Code source, refer to paragraphs 2.4.3 and 2.4.4 of this document.

STEP 6 Turn on the Time Code source and set the Mono Tape machine to record mode. On the Mono Tape machine, adjust the recording level so that the VU meter indicates 0 VU.

STEP 7 Record approximately 3-5 minutes of Time Code, then turn off both the Time Code source and the Mono Tape machine.

STEP 8 Remove the completed Time Code Checkout Tape from the Mono Tape machine.

SONY

ANALOG TAPE RECORDER

APR-5003V

SUPPLEMENT

This supplement is applicable to APR-5001/5002/5003V Series operation and maintenance manual.

TABLE OF CONTENTS

SECTION 2 OPERATION

SECTION 1
CONTROLS AND INDICATORS

1.1 OVERVIEW

In this section of the manual, the functions of all control keys and indicators on the Tape Transport, the Alignment Control Panel, and the Meter Housing are described, together with the basic operating sequences.

1.2 TRANSPORT CONTROL PANEL

The functions of all the keys and indicators on the tape transport control panel are described in the following paragraphs. Refer to Figure 4-1 for all key and indicator locations.

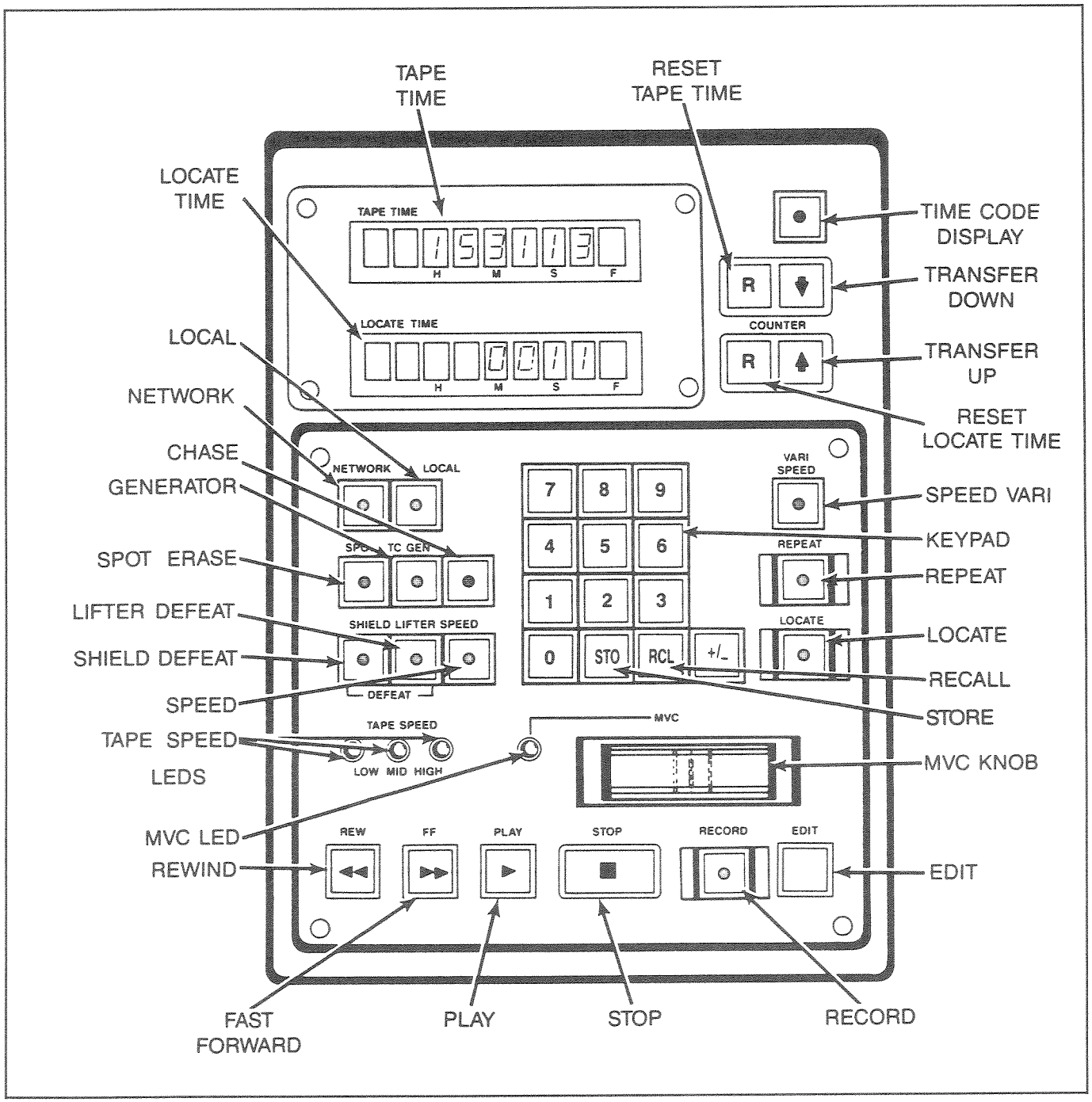


Figure 1-1. Transport Control Panel

1.2.1 Key and Display Functions

REW

Pressing REW (REWIND) causes the transport to go into fast rewind mode. This operation cancels any previous motion command such as FAST FORWARD, PLAY or RECORD. Except when used in conjunction with SHIELD DEFEAT, REW also causes the audio channels to be muted.

Touching the MVC control during FAST REWIND causes the transport to enter SPOOL mode. In this mode, the wind speed is reduced to about 75 ips (inches per second) so as to allow more uniform packing of the tape.

FF

Pressing FF (FAST FORWARD) causes the transport to enter the FAST FORWARD mode, this overriding any previously selected motion command such as REWIND, PLAY or RECORD. Except when used in conjunction with SHIELD DEFEAT, FF also causes the audio channels to be muted.

As with REWIND mode, touching the MVC control during FAST REWIND causes the transport to enter SPOOL mode.

STOP

Pressing STOP cancels any previously selected motion command and stops the tape. This causes the STOP key to illuminate (so long as there is tape across the End of Tape sensor). The audio channels will be muted unless either LIFTER DEFEAT or SHIELD DEFEAT is selected.

PLAY

Pressing PLAY initiates the PLAY mode, causing the tape to shuttle across the heads at the selected play speed. PLAY also is used to trigger RESOLVE ON PLAY operation (paragraph 1.5.1), to manually trigger PREVIEW/EDIT/REVIEW operations, or to exit the RECORD operation.

Unless SHIELD DEFEAT is selected, the audio channels are muted during the period between start-up and the time that play speed is achieved.

RECORD

Pressing RECORD together with PLAY sets those channels that are in RECORD READY (see paragraph 1.4.1 — **RECORD** section) into RECORD Mode, which can be entered from the STOP, FAST FORWARD or REWIND modes. To enter RECORD from the PLAY mode, it is necessary only to press RECORD . If no channels are in RECORD READY (all channels in SAFE) the transport will not enter RECORD mode.

Once the transport is in RECORD mode, the recording status of any channel can be changed by first pressing the channel's **RECORD** READY key (see paragraph 1.4.1 — **RECORD** section), and then pressing RECORD . For instance, let it be assumed that the transport has been set into RECORD with only Channel 1 actually recording. Channel 2 can be set into RECORD at any time by simply pressing the CH 2 READY key, and then pressing RECORD . Conversely, given the same situation, Channel 1 can be taken out of RECORD by pressing CH 1 READY and then pressing RECORD .

SPEED

This key is used to set the desired PLAY speed. Each time the key is pressed the speed advances to the next higher speed, which then is shown on the **HIGH**, **MID**, or **LOW TAPE SPEED** indicator. The range of these speeds is set by the headstack identification code. At machine power-up, the most recently used speed will be automatically selected.

LIFTER

Pressing LIFTER (LIFTER DEFEAT) causes the lifters to be defeated, allowing them to remain disengaged when in any FAST WIND mode, i.e. FAST FORWARD, REWIND, LOCATE or SPOOL.

SHIELD

The SHIELD (SHIELD DEFEAT) key is used to deactivate the shields. When this key is pressed, it illuminates to indicate that the shield will stay down during PLAY or RECORD, and that the audio channels will stay unmuted.

EDIT

The EDIT mode is used to facilitate the splicing and edit-assembly operations, and offers two different methods, as follows:

EDIT — In EDIT, all tape tensions are relaxed, making it possible to use the splicing block.

DUMP EDIT — In this mode, the tape is played across the heads, but the take-up reel is turned off so that the tape runs off the machine into a suitable waste container.

EDIT is entered from the STOP position by pressing EDIT, this key becoming illuminated to show that EDIT mode has been entered and that all tape tensions are relaxed. EDIT mode can be cancelled either by pressing EDIT again, or by pressing STOP.

DUMP EDIT is entered from the EDIT mode by pressing PLAY. Before entering this mode, the tape should first be cut, and have its leading edge dressed off the machine to the right. From DUMP EDIT, pressing STOP causes the transport to revert to EDIT mode, which then can be cancelled by pressing either EDIT or STOP.

LOCATE

Selecting LOCATE causes the transport to fast wind from the current location shown in the **TAPE TIME** display to the location shown in the **LOCATE TIME** display, the direction of wind being determined by the relative values in the two displays. If so desired, the SPOOL Mode can be entered by momentarily touching MVC after entering LOCATE Mode.

REPEAT

In the REPEAT mode, the tape transport repeatedly plays the same tape segment. The mode can be cancelled by pressing STOP.

To program the REPEAT function, the START time is entered into Storage Location 28 and the END time is entered into Storage Location 29. In order for the REPEAT function to operate, the specified END time must be later than the START time. Negative numbers are permissible so long as a positive number results when the value in Storage Location 28 is subtracted algebraically from that in Location 29.

MVC

The MVC (MANUAL VELOCITY CONTROL) knob provides a number of functions, depending upon the current mode of operation.

In the STOP mode, MVC can be used to shuttle the tape backward or forward at a selectable winding speed, the direction and speed depending upon the way the control is operated. With the control pushed to the right, the tape winds in the forward direction. Conversely, with the control pushed to the left, the tape rewinds. In either case, the wind speed depends upon the distance from center that the control is moved. With the control pushed fully left or fully right, the tape shuttles at a speed somewhat greater than that of the SPOOL mode. MVC operation in the STOP mode is summarized in Figure 1-2.

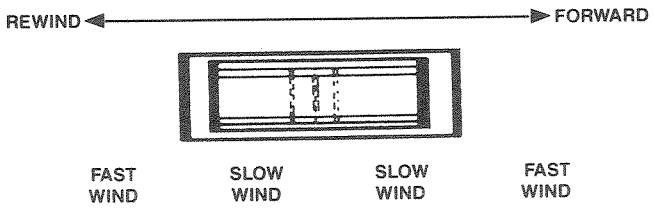


Figure 1-2. MVC Operation

In the LOCATE, FAST FORWARD and REWIND modes, simply touching the MVC control causes transport to enter SPOOL mode, with the wind speed reduced to 75 ips.

In PLAY mode, the MVC control is disabled, except when VARI SPEED EXECUTE mode also is selected. In the VARI SPEED EXECUTE mode, the MVC control can be moved to the right to increase the play speed or to the left to reduce the play speed.

VARI SPEED

The VARI SPEED key is used to enable the VARIABLE SPEED mode which allows the selected play speed to be either increased or reduced by up to 50% of its nominal rate. Desired VARIABLE SPEED values are entered in terms of percentage, positive values leading to an increase in speed, and negative values leading to a reduction in speed. Where any value greater than 50% is entered, it becomes automatically truncated to 50%.

VARIABLE SPEED entries can be made via either one of two modes, as illustrated in Figure 1-3 and described below:

To enter the DIRECT SPEED ENTRY mode, VARI SPEED is pressed once. At this time, the key indicator flashes on and off, and any VARI SPEED value that may have been previously entered is shown on the **LOCATE TIME** display. In this mode, the desired percentage is entered via the numeric keypad.

Once the VARISPEED value has been entered in this manner, the transport can be made to play at the modified speed by simply pressing VARI SPEED again. (It should be noted that this automatically sets the transport into the MANUAL SPEED ENTRY mode described below.)

The MANUAL SPEED ENTRY mode can be entered by pressing VARI SPEED twice. In this mode, any existing VARI SPEED value also is shown in the **LOCATE TIME** display, but the key indicator is solidly illuminated. The desired VARI SPEED percentage now can be entered by means of the MVC control.

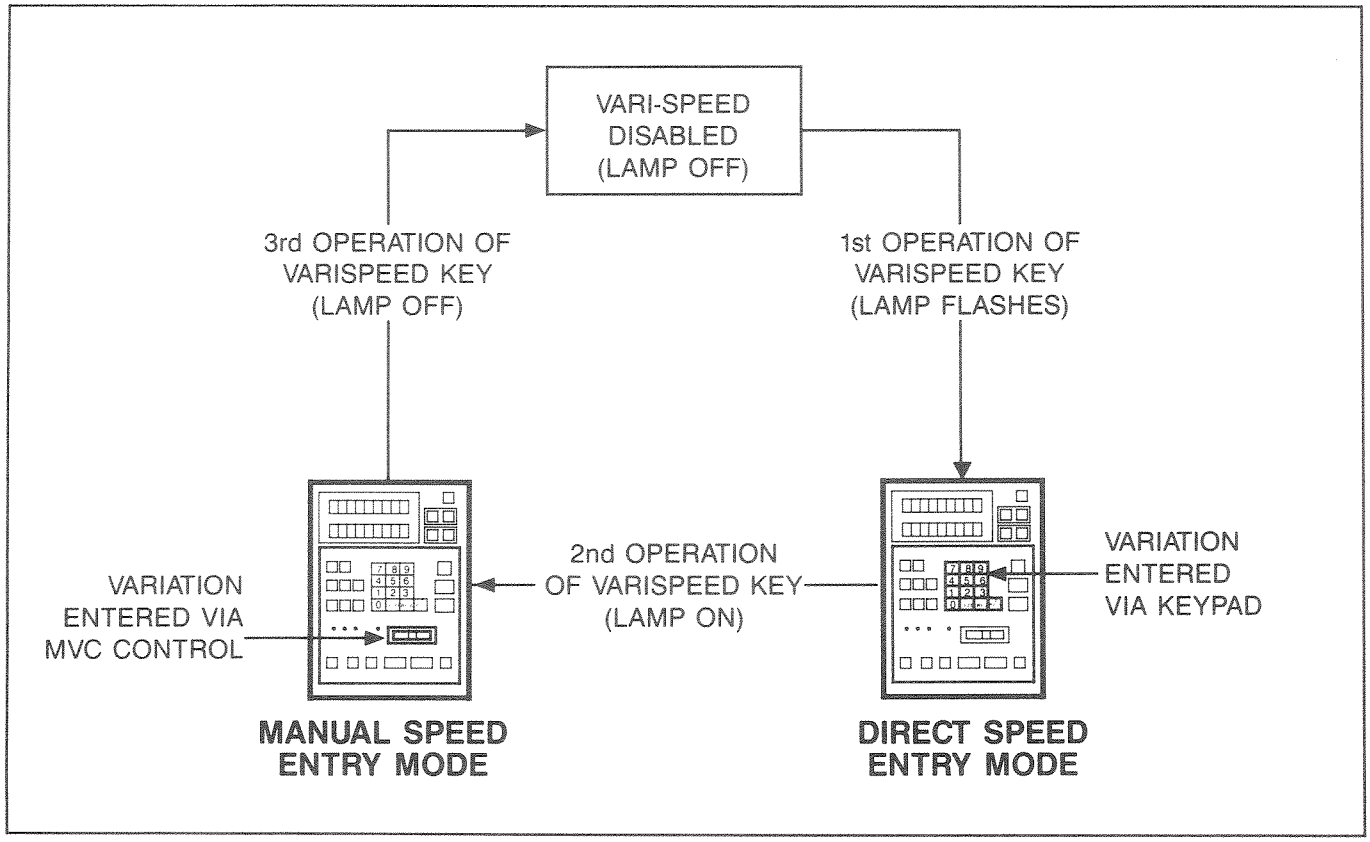


Figure 1-3. VARIABLE SPEED Modes

Moving this control to the right causes the percentage to increase (become more positive), while moving it to the left causes the percentage to decrease.

In MANUAL SPEED ENTRY mode, the VARI SPEED value can be displayed, if so desired, in terms of semitones up or down and inches per second. This display can be invoked by presetting Storage Location 41 to a value of 1. It should be noted that the semitone values are displayed only in increments of 0.25 semitones.

When the VARISPEED value is entered in MANUAL SPEED ENTRY mode, the transport automatically plays at the modified speed, no further action being necessary. To exit VARI SPEED, the VARI SPEED key should be pressed.

TC GEN

Time Code can be recorded from either an internal or an external reference. Further, the Time Code data can be either VITC (Vertical Interval Time Code) or LTC (Longitudinal Time Code). The TC GEN (TIME CODE GENERATOR) key is used to select the desired reference and data options for the Time Code Generator by cycling through three mutually exclusive modes, each of which is identified by the condition of the key indicator.

At power-up, the TC GEN indicator is not illuminated, and this condition indicates that, when activated, the generator will record Time Code in accordance with external reference and data. It should be noted that Storage Location 37 must be preset in accordance with the external reference, i.e.:

LOCATION 37 0 = LTC data
1 = VITC data

From the state described above, pressing TC GEN causes the key indicator to flash on and off, showing that the recorded Time Code will be in step with the external reference (selected in accordance with Location 37), but can be started from a preset internal start time.

NOTE: The Time Code Channel must be in RECORD READY before the entered Time Code can be transferred in the manner described below.

The desired start time can be preset by entering the time into the LOCATE TIME display via the numeric keypad, and then moving it into the TAPE TIME display by pressing the TRANSFER UP key.

From the flashing-key mode, the next operation of the TC GEN key causes the key indicator to become

TC GEN INDICATOR	TIME CODE REFERENCE	TIME CODE DATA
OFF (Power-up default)	EXTERNAL As selected in Storage Location 37 0 = LTC DATA 1 = VITC DATA	EXTERNAL
FLASHING	EXTERNAL As selected in Storage Location 37 0 = LTC CLOCK 1 = VITC CLOCK	INTERNAL START POINT
ON	INTERNAL	INTERNAL START POINT

Table 1-1. Time Code Options

solidly illuminated, showing that the generated Time Code will be in accordance with internal reference and start point. In this mode, Storage Location 37 has no bearing, but Storage Locations 31 and 32 must be preset in accordance with the desired Time Code type, as follows:

NOTE: Where EBU or FILM Time Code types are selected, Storage Location 32 is automatically set to a value of 0.

Storage Location 31: 0 = SMPTE
1 = EBU
2 = FILM

Storage Location 32: 0 = Non-Drop Frame
1 = Drop Frame

CAUTION: The internal crystal references for SMPTE NDF, EBU, and FILM Time Code types is accurate to ± 50 ppm. Where SMPTE DF Time Code generation is required, it is advisable to use an external reference (house video). All SMPTE Time Code produced by the internal generator is at 30 Frames/sec.

Once the Time Code parameters have been set, as described above, the generator is activated by pressing PLAY and RECORD simultaneously.

TAPE TIME

The **TAPE TIME** display provides tape time information in either one of two formats, the format depending upon whether or not the TC DISPLAY key is selected.

Where TC DISPLAY is not selected, the key is extinguished, and the **TAPE TIME** display shows a real time representation of tape position. The format for this display is:

Hh Mm Ss n

in which: H = tens of hours
h = hours
M = tens of minutes
m = minutes
S = tens of seconds
s = seconds
n = tenths of seconds

Where TC DISPLAY is enabled, TC DISPLAY is illuminated, and the **TAPE TIME** display shows either the external Time Code presented to the machine (STOP mode) or the internal Time Code from tape (modes other than STOP), the format in this case being:

Hh. Mm. Ss. Ff.

in which Hh, Mm, and Ss remain as defined above, but F = tens of frames and f= frames.

LOCATE TIME

This display is used for all generalized data entry and recall procedures. The machine will LOCATE to the time presented in this display. In addition, other information which may be monitored on this display are STO (STORE) and RCL (RECLAIM) setup/confirmation and VARI SPEED percentage, inches per second, and semitones

TC DISPLAY

This key is used to toggle the **TAPE TIME** display between TIME CODE DISPLAY and TAPE TIME, becoming illuminated when TC DISPLAY is selected.

R

Each of the time displays has an associated **R** (RESET) key. When pressed, the upper **R** key clears the **TAPE TIME** display down to 00.00. Similarly, the lower **R** key clears the **LOCATE TIME** display.

↑ and ↓

The Up/Down arrow keys allow location and time data to be transferred between displays. Pressing ↓ transfers the contents of the **TAPE TIME** display down to the **LOCATE TIME** display, and can be used to capture tape time or Time Code information. Pressing ↑ transfers the contents of the **LOCATE TIME** display up to the **TAPE TIME** display, allowing the Time Code recording start point or the tape time position to be preset.

CHASE

The CHASE (follow and lock) facility provides for synchronization of the machine to an external Time Code reference, a necessary pre-requisite being that the external Time Code reference be of the same type as that on the tape. Provision is made for offsetting so that either Slave is ahead of Master or vice versa. Refer to Storage Locations 00 and 98 for Frame and Bit offsets respectively.

The external Time Code reference can be either LTC or VITC, and the External Lock Reference must be entered into Storage Location 37, as follows:

LOCATION 37 0 = Longitudinal Time Code
1 = Vertical Interval Time Code

Once the desired offset and External Lock Reference have been entered, **CHASE** is pressed to enable the facility. When **CHASE** is first pressed, the indicator flashes on and off to show that the mode is selected but that the Master and Slave machines are not locked. Once lock is attained, the indicator becomes solidly illuminated.

SPOT

The **SPOT** (SPOT ERASE) key disables the record head but leaves the erase head on so that tape can be erased (with no bias frequency from the record circuitry). When **SPOT** is pressed, the key flashes to indicate that this mode is armed.

Once armed, the SPOT ERASE mode can be entered by pressing **RECORD**, so long as at least one channel is in RECORD READY. The erase head will turn on, this being indicated by the Meter Housing **ERASE** indicators for all active channels becoming illuminated. At this time, the desired section of tape can be erased by passing it manually over the erase head. To cancel SPOT ERASE, **STOP** should be pressed.

LOCAL and NETWORK

The **LOCAL** and **NETWORK** keys are used to select the transport control source. Each of these keys becomes illuminated when selected.

When **LOCAL** is selected, all transport control is derived from the panel keys or from a parallel remote control.

When **NETWORK** is selected, machine control originates from the network (serial remote control), and the machine transport and audio controls are all disabled.

If both **LOCAL** and **NETWORK** are selected (BOTH mode), parallel control is available from either the serial remote control or from the machine panel keys on a first come, first served basis.

1.2.2 Numeric Keypad

The Numeric Keypad section of the Transport Control Panel is used to make numeric entries, to store data, and to reclaim data. The functions of all of the keypad controls are described briefly below.

+/–

Pressing **+/–** reverses the sign of the contents of the **LOCATE TIME** display. Where it is desired to change the sign of the **TAPE TIME** display value, it can be transferred down into the **LOCATE TIME** display, changed, and then transferred back up to **TAPE TIME**.

0 through 9

These keys provide the means of entering specific values into the **LOCATE TIME** display. They also are used in conjunction with **STO** and **RCL** to store and reclaim data to and from Memory and Storage locations.

STO and RCL

The **STO** (STORE) and **RCL** (RECALL) keys are used in conjunction with the numeric keys to store and reclaim data to and from Memory and Storage locations.

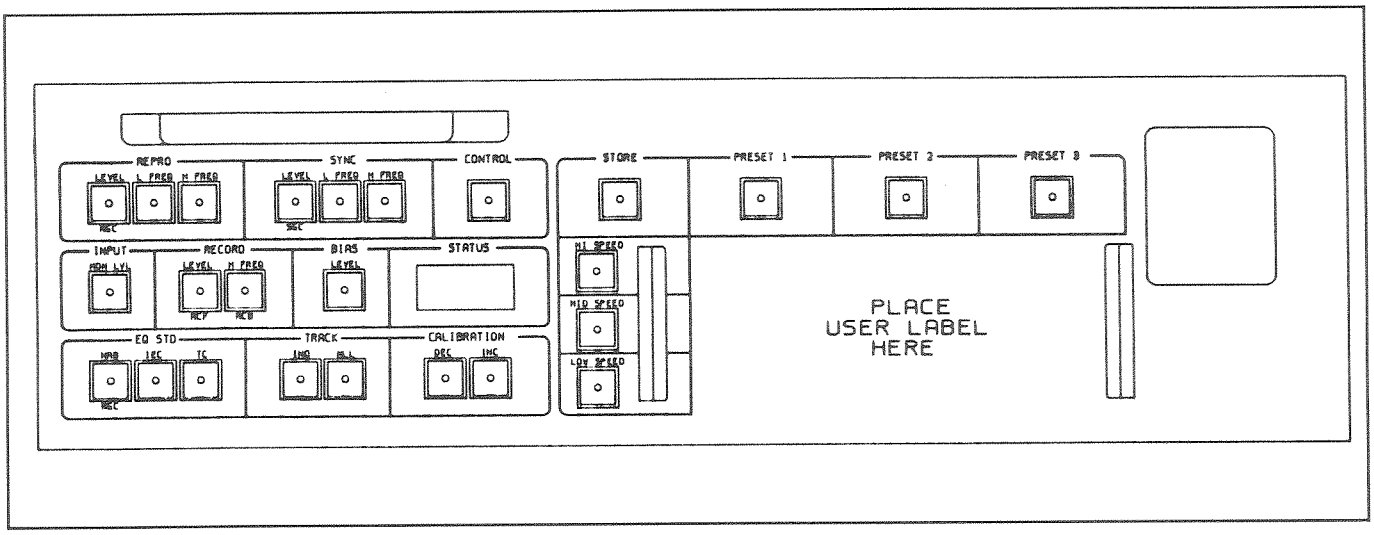


Figure 1-4. Alignment Control Panel

1.3 ALIGNMENT CONTROL PANEL

This section describes the operations associated with the Alignment Control Panel (Figure 1-4). It should be noted that four of the keys on this panel have secondary functions, these being indicated by means of blue markings below the keys.

1.3.1 Alignment Procedures

In general, the machine's alignment procedure is much the same as that for the traditional professional analog recorder. However, it differs in that it does not require manual adjustments, all parameter selection and calibration being performed by keystroke operations. In general, the alignment procedure follows the sequence shown in Figure 1-5.

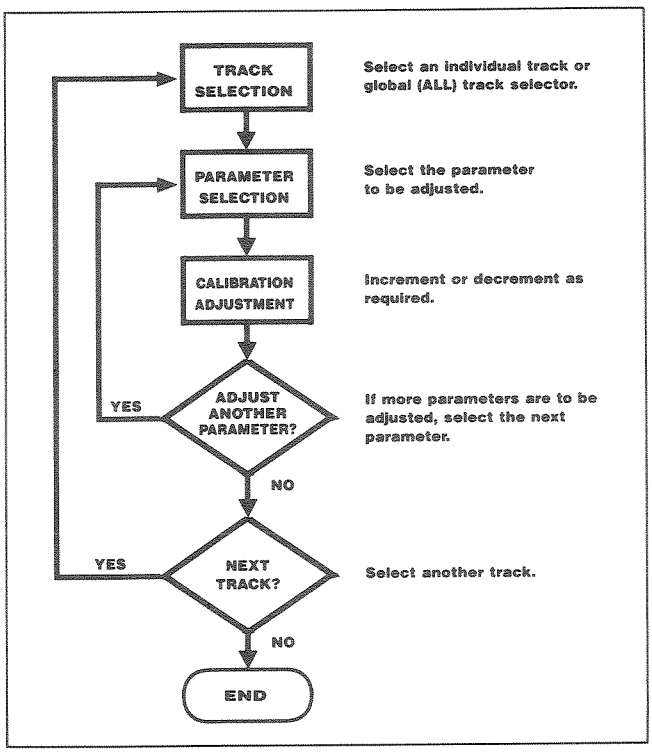


Figure 1-5. Alignment Procedure Flow Chart

1.3.2 STATUS Display

This two-digit display indicates either the track that is selected for calibration or a specific parameter value, a single digit indication denoting the track being adjusted. When any parameter is selected, both decimal points become illuminated and the display shows a two-digit hexadecimal number which is representative of the parameter value.

00 to FF	Indicate the hex value of a specific alignment function
ALL	Selects all tracks to be active
1	Track 1 active
2	Track 2 active
3	Track 3 active
PE	Preset Error
HI	Headstack Invalid
HE	Headstack Error
HO	Headstack Off

Table 1-2. Status Display Codes

It should be noted that the hexadecimal values shown in the display are not intended for use in setting absolute parameter values. Parameters should be adjusted in accordance with the appropriate meter indications, the hexadecimal values being used primarily for storage purposes.

As well as performing the functions described on the preceding page, the **STATUS** Display is used to show error codes. Table 1-2 lists all of the possible display indications, and Appendix A to the **APR-5000** Series Operation and Maintenance Manual further describes the error codes.

1.3.3 Track Selection

Track selection is made by means of the IND and ALL keys on that section of the panel labelled **TRACK**.

IND

Selects an individual track for adjustment. The first operation of the key selects Track 1, and each subsequent operation advances the selection to the next track. When pressed while CONTROL is held down (in the same manner as a typewriter shift key), IND moves the selection back to the preceding track.

ALL

This key selects both audio tracks for calibration. It does NOT select the time code track.

1.3.4 Parameter Selection

The ten parameter selection keys are located on the **REPRO** (3 keys), **SYNC** (3 keys), **INPUT** (1 key), **RECORD** (2 keys) and **BIAS** (1 key) sections in the upper left corner of the panel. These sections are discussed below.

REPRO

The three keys in this section are used in calibrating the reproduction circuitry.

LEVEL

This key selects the **REPRO** output level for calibration. A secondary function is associated with this key, this being **RGC** (REPRO GAP COMPENSATION).

L. FREQ

Selects **REPRO** Low Frequency Equalization adjustment.

H. FREQ

Selects **REPRO** High Frequency Equalization adjustment.

SYNC

The three keys in this section are used in calibrating the **SYNC** circuitry.

LEVEL

This key selects the **SYNC** output level for calibration. The secondary function for this key is **SGC** (SYNC GAP COMPENSATION).

L. FREQ

Selects **SYNC** Low Frequency Equalization adjustment.

H. FREQ

Selects **SYNC** High Frequency Equalization adjustment.

INPUT

The **INPUT** section has only one key.

MON LVL

With this key selected, the **INPUT** level is chosen for adjustment.

RECORD

The two keys in this section are used in calibrating the RECORD circuitry.

LEVEL

Selects RECORD level for calibration. Pressing this key also causes the selected track(s) to enter the RECORD READY Mode. This key also controls the secondary function **RCF** (RECORD FEED FORWARD).

H. FREQ

Selects the record circuitry High Frequency gain for calibration. Also controls the secondary function **RCB** (RECORD FEED BACK).

BIAS

The **BIAS** section also has only one key.

LEVEL

When this key is selected the bias signal amplitude is selected for adjustment.

1.3.5 Audio Parameter Calibration Adjustment

The **CALIBRATION** section of the panel has two keys which are used to make the desired adjustments after both the track and the parameter have been defined.

DEC

The first operation of this key causes the selected parameter to start decrementing at a rate of about 1 dB per second. Decrementation continues until either the end of the range (00) is reached or until DEC is pressed again. Rapid decrementing can be performed by holding down the CONTROL key and pressing DEC .

INC

The first operation of this key causes the selected parameter to start incrementing at a rate of about 1 dB per second. Incrementation continues until either the end of the range (FF) is reached or until INC is pressed again. Rapid incrementing can be performed by holding down the CONTROL key and pressing INC .

NOTE: When incrementing the parameters **RECORD** H. FREQ , **REPRO** L. FREQ , or **SYNC** L. FREQ , the value displayed on the **STATUS** Display becomes lower, even though the audio level is increasing. Similarly, decrementing these three parameters causes the displayed value to become greater as the audio level becomes lower. This is true only for these three adjustments. All others will show increasing values when incremented and reducing values when decremented.

1.3.6 Equalization Standards

The three Equalization Standard keys are located on the **EQ STD** section of the panel. The Equalization Standard for the audio tracks can be changed only when ALL is selected on the **TRACK** Section of the panel, and that for the Time Code track can be changed only when the Time Code track is selected.

NAB

This key selects NAB equalization for the audio tracks. NAB cannot be selected for a transport operating at 30 ips, because no NAB equalization standard exists for this speed.

IEC

This key selects **IEC**, and is the default value for 30 ips operation.

TC

This key selects a special equalization standard which is best suited for digital data stream transmissions such as Time Code or automation data. This equalization is totally unsuitable for the audio channels and should be used only for the Time Code track.

1.3.7 Alignment Presets

The three PRESET keys are located along the upper right edge of the panel, and these are used for storing alignment-related data into memory for later recall. These memory functions are used to allow for multiple tape formulation, alternative reference fluxivities, alternative over-bias settings, alternative equalization standards, or any desired combinations of the above.

In addition to the PRESET keys, the CONTROL and STORE keys also are used in the storage process.

Nine memory locations are provided for any given headstack, this allowing three locations for each of the three tape speeds, and the User Label provides a means of recording the parameters stored for a specific headstack.

CONTROL

This key calls up the secondary functions for those keys marked with blue silkscreen labels. These secondary functions become valid only when ALL channels are selected and CONTROL is pressed.

CONTROL also is used to arm the STORE function. When CONTROL is pressed simultaneously with STORE (in the same manner as the shift key on a typewriter), it causes the STORE function to become armed, this being indicated by the illumination of the STORE key.

STORE

This key is used to store the current adjusted values into one of the three PRESET memory locations.

As a safety feature, this key can be activated only in conjunction with CONTROL . When the function is armed, (CONTROL and STORE pressed simultaneously) the STORE key becomes illuminated, and pressing any PRESET key erases the previously stored data and replaces it with the current adjusted value.

PRESET 1 , PRESET 2 and PRESET 3

These PRESET keys are used to either store new data into memory (**STORE** function is armed) or recall previously stored data from memory (**STORE** function

	TAPE TYPE ________ FLUXIVITY ________ nWb/m EQ STD ________ OVERBIAS ____ dB@ ____ kHz	TAPE TYPE ________ FLUXIVITY ________ nWb/m EQ STD ________ OVERBIAS ____ dB@ ____ kHz	TAPE TYPE ________ FLUXIVITY ________ nWb/m EQ STD ________ OVERBIAS ____ dB@ ____ kHz
	TAPE TYPE ________ FLUXIVITY ________ nWb/m EQ STD ________ OVERBIAS ____ dB@ ____ kHz	TAPE TYPE ________ FLUXIVITY ________ nWb/m EQ STD ________ OVERBIAS ____ dB@ ____ kHz	TAPE TYPE ________ FLUXIVITY ________ nWb/m EQ STD ________ OVERBIAS ____ dB@ ____ kHz
	TAPE TYPE ________ FLUXIVITY ________ nWb/m EQ STD ________ OVERBIAS ____ dB@ ____ kHz	TAPE TYPE ________ FLUXIVITY ________ nWb/m EQ STD ________ OVERBIAS ____ dB@ ____ kHz	TAPE TYPE ________ FLUXIVITY ________ nWb/m EQ STD ________ OVERBIAS ____ dB@ ____ kHz

Figure 1-6. User Label

NOT armed). Where PRESET data is being used, this is indicated by the appropriate PRESET key remaining illuminated.

NOTE: If any PRESET key for which there is no previously stored value is pressed, the **STATUS** Display will indicate "PE" (Preset Error).

1.3.8 User Label

The User Label (Figure 1-6) provides a pre-formatted writing surface which can be used to record the results of a particular calibration. Nine alternative alignments are available, three for each tape speed. Since these software calibrations are unique to each headstack, this user card travels with its corresponding headstack. When tape format, head and guide changes are required, the label changes accordingly. Once calibrated for a particular headstack these calibrations need not be repeated each time a format change is required. The headstack identification code allows the machine to call up the correct grouping of alignment presets.

1.3.9 Speed Select Keys

The Speed Select keys, HI SPEED, MID SPEED and LOW SPEED , are located directly to the left of the User Label. These keys offer an alternative to the SPEED key as a means of entering the desired transport speed. However, unlike SPEED (which is used to cycle through all of the available speeds), each of these keys selects a separate transport speed. As an indication of the selected speed, the appropriate Speed Select key becomes illuminated, together with the appropriate **TAPE SPEED** indicator on the Transport Control Panel.

It should be noted that, as a different speed is selected (either at the Alignment Control Panel or with the SPEED key), the stored PRESET and EQ STD parameters are selected automatically to agree with the new speed.

1.3.10 Secondary Functions

As has been previously stated, four of the keys on the Alignment Control Panel have secondary functions, these being denoted by their blue labels. Although not used in normal alignment procedures, these secondary functions allow for adjustments which provide a flexibility rarely encountered in traditional analog recorders.

The secondary functions are activated by holding down CONTROL while pressing the appropriate key. Where a secondary function is selected, both CONTROL and the secondary function key become illuminated to indicate that the secondary function is in effect.

Of the four secondary functions, **RGC** and **SGC** are concerned with adjustments necessitated by differing head gaps. Adjustment of the gap compensation setting normally becomes necessary if heads of significantly different gap-width are used. Further, should extensive relapping of tape heads cause a change in high frequency performance, the gap compensation setting should be adjusted.

The remaining secondary functions, **RCF** and **RCB** are related to the type of tape being used. These alignments are used to adjust the RECORD frequency response so that the playback will be flat over a wide range of diverse tape formulations.

Table 1-3 lists the appropriate settings for various tapes at three different speeds, these settings being given in terms of the hex values shown on the **STATUS** Display.

RGC

REPRO GAIN COMPENSATION (**RGC**)is the secondary function associated with the **REPRO** **LEVEL** key. When **RGC** is selected, compensation can be made for the high frequency loss caused by the Repro head gap. This is a useful alignment, because it allows headstacks of differing construction and gap widths to be adjusted for optimum performance with a variety of different tape types. For **RGC** settings, refer to the appropriate headstack specifications.

SGC

SYNC GAP COMPENSATION (**SGC**) is the secondary function for the **RECORD** **LEVEL** key. When **SGC** is selected, the high frequency loss caused by the Sync head gap can be adjusted out. For **SGC** settings, refer to the appropriate headstack specifications.

TAPE TYPE		30 IPS	15 IPS	7.5 IPS
3M Scotch 226	RCF	C0	CB	C4
	RCB	C1	C7	C4
3M Scotch 250	RCF	C0	CB	C4
	RCB	C2	C7	C4
AGFA 469	RCF	C0	CB	C4
	RCB	C1	C7	C4
Ampex 456	RCF	C0	CB	C4
	RCB	C1	C7	C4
BASF LGR50	RCF	C0	CB	C4
	RCB	C1	C7	C1
AGFA PER528	RCF	C0	CB	C6
	RCB	C2	C7	C2
AGFA LGR30	RCF	C0	CB	C6
	RCB	C2	C7	C2
3M Scotch 176	RCF	C0	C8	C4
	RCB	C2	C7	C4

Table 1-3. RCB and RCF Settings

RCB

RECORD FEED BACK (RCB) is the secondary function for **RECORD** **HI-FREQ** . This selects the RECORD FEED BACK compensation adjustment.

RCF

RECORD FEED FORWARD (**RCF**) is the secondary function for **RECORD** **LEVEL** . This selects the RECORD FEED FORWARD compensation adjustment.

1.4 METER HOUSING CONTROLS

This section describes all of the Audio channel and Monitor speaker controls and indicators. These controls, used in conjunction with those on the Transport Control and Alignment Control Panels, comprise all of the audio controls for the **APR-5000**.

1.4.1 Audio Channel Functions

As illustrated in Figure 1-7, each audio channel is subdivided into six major sections, these being: **ALN** (Alignment Select Indicator), **RECORD**, **MONITOR**, **RECORD LEVEL**, **OUTPUT LEVEL** and **VU** Meter.

ALN

The **ALN** section contains a single, amber **SELECTED** indicator which becomes illuminated to show that this particular audio channel is selected during any adjustment at the Alignment Control Panel. When **ALN** is selected for any channel, all of the controls for that channel, except for **RECORD** **READY**, become disabled.

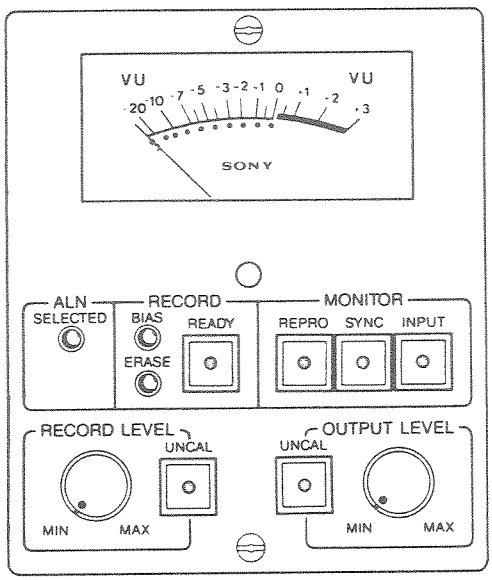


Figure 1-7. Audio Channel Controls

RECORD

The **RECORD** block contains two status indicators and one key. The **BIAS** and **ERASE** indicators become illuminated to show which, if any, of these functions is currently active. During a normal recording operation, both of these indicators become illuminated. During **SPOT ERASE**, the **BIAS** indicator is extinguished to show that the record head bias is turned off, and the **ERASE** indicator is illuminated to show that the erase head is active.

The READY key is used to set the channel into RECORD READY before the transport is placed in RECORD mode. When READY is selected, the key becomes illuminated to indicate that the channel is ready to record.

MONITOR

The MONITOR block contains three keys which are used to select the source of the audio channel output.

REPRO

When REPRO is pressed, it becomes illuminated to indicate that the audio channel output is being derived from the reproduce head.

SYNC

When SYNC is selected, it illuminates to indicate that the audio channel output is being derived from the sync (or cue) head. During a RECORD operation, this will be the same as INPUT. During a PLAY operation, the playback signal will come from the sync head instead of the repro head.

INPUT

When INPUT is selected, the key illuminates to indicate that the audio channel output is derived directly from the audio channel input.

RECORD LEVEL

The recording level can be either internally preset or controlled from the rotary level control on the **RECORD LEVEL** section of the panel, selection between these options being made by means of the UNCAL (UNCALIBRATED) key on the same panel section.

UNCAL

When this key is selected, it becomes illuminated to show that the recording level is UNCALIBRATED, i.e. it can be controlled by adjustment of the **RECORD LEVEL** rotary control. When the UNCAL key is extinguished, the control is ineffective, and the recording level is adjusted by the internal preset level.

OUTPUT LEVEL

The **OUTPUT LEVEL** section is similiar to the **RECORD LEVEL** section, differing only in that it controls the channel's audio output level rather than its recording level.

VU Meter

Each audio channel incorporates a **VU** Meter with a range of −20VU to +3VU. The meters are preset at the factory so that an indication of 0 VU corresponds to a level of +4 dBu. (0dBu = 0.775 vrms). If so desired, this reference can be changed by an adjustment on the CNL (channel) board, the procedure being as given in the **APR-5000** Operation and Maintenance Manual.

The **VU** Meter monitors the signals selected at the **MONITOR** section, i.e. when INPUT is selected, the **VU** Meter indicates the audio channel input level, etc.

1.4.2 Monitor Speaker

The machine is fitted with a Monitor Speaker whose output is derived from the signal(s) displayed on the **VU** Meter(s). Track 1, Track 2, or both tracks can be selected by pressing the appropriate key(s), these keys becoming illuminated to indicate the track(s) being monitored. When both keys are selected, the input signals are summed in the monitor amp. The **LEVEL** control is used to adjust the volume of the monitored signal.

1.5 STORAGE LOCATION RELATED OPERATIONS

Paragraphs 1.5.1 through 1.5.4 describe various Storage Location related operations, these being RESOLVE ON PLAY, PREVIEW/EDIT/REVIEW, TRIGGERED EDIT SYNCHRONIZATION and FIND. All of these operations require argument or time entries into various Storage Locations. Paragraphs 1.6 through 1.6.4 give the specific procedures used for making these entries.

1.5.1 RESOLVE ON PLAY

The PLAY operation can be preset to RESOLVE, which establishes and maintains data independent synchronism between between the Time Code from tape and some external reference. Being data independent, this occurs in a manner which is independent of any offset. The external reference can be either Longitudinal Time Code (LTC) or a video signal or ex-

INPUT SIGNAL	TIME CODE ON TAPE			
	SMPTE NDF	SMPTE DF	EBU	FILM
LTC @ 30 f/s	Resolve	+0.1%	n/a	n/a
60 Hz NTSC B¿W Video	Resolve	+0.1%	n/a	Resolve*
LTC @ 29.97 f/s	−0.1%	Resolve	n/a	n/a
59.54 Hz NTS Color Video	−0.1%	Resolve	n/a	−0.1%*
LTC @ 25 f/s	n/a	n/a	Resolve	n/a
50 Hz PAL/SECAM Video	n/a	n/a	Resolve	n/a
LTC @ 24 f/s	n/a	n/a	n/a	Resolve

*NOTE: One of the most interesting applications of RESOLVE ON PLAY is the ability to resolve 60 Hz input reference signals to the 24 f/s Film Time Code, by maintaining a 4:5 Time Code to reference signal resolving ratio.

Table 1-4. Resolve Capabilities

ternal tone. RESOLVE ON PLAY is initiated by presetting Storage Locations 37 and 39 as follows:

Storage Location 39 — Set to 1 to initiate the mode

Storage Location 37 — Set to 0 for Longitudinal Time Code reference
Set to 1 for Video signal or Tone reference

1.5.1.1 Resolve Capabilities

Table 1-4 shows the resolve capabilities of the machine. The percentage values in the table indicate the deviation from the nominal recorded tape speed at which the transport will operate in Play-Resolve mode. The non-applicable (n/a) pairings shown in the table are those with more substantially mis-matched clock rates. These pairings do not provide reliable or repeatable results.

1.5.2 PREVIEW, EDIT AND REVIEW

These facilities provide a series of editing operations, as follows:

PREVIEW — Allows the user to rehearse the edit, without actually recording the changes.

EDIT — Performs the edit and records the results.

REVIEW — Allows the user to monitor the results of the edit.

In any of the editing modes, IN POINT, OUT POINT, PREROLL DURATION and POSTROLL DURATION must be defined:

IN POINT — Start of edit
OUT POINT — End of edit
PREROLL DURATION — Time that tape rolls before the IN POINT is reached.
POSTROLL DURATION — Time that tape continues to roll after the OUT POINT is passed.

It should be noted that, where no IN POINT, OUT POINT, PREROLL DURATION and/or POSTROLL DURATION values are entered, these parameters will default to the most recent values entered into the appropriate Storage Locations.

Initiating PREVIEW, EDIT or REVIEW causes the following events to occur:

PREVIEW and EDIT causes both audio channels to monitor the Sync head.

REVIEW causes both audio channels to monitor the Repro head.

In PREVIEW and REVIEW, the PLAY key flashes to indicate that the operation is cued and ready to perform the remainder of the process.

In EDIT, the PLAY and RECORD keys flash to indicate that the operation is cued and ready to perform the remainder of the process, which may include a RECORD operation.

1.5.2.1 PREVIEW

The PREVIEW facility provides a rehearsal mode in which the user can adjust the IN POINT, OUT POINT, PREROLL DURATION and POSTROLL DURATION for an edit. In PREVIEW, the recording facility is inhibited globally, and the Record-Readied tracks do not enter RECORD.

The following procedure is used to initiate PREVIEW. Additional steps relating to fine adjustment of the IN POINT and OUT POINT are given in paragraph 1.5.2.1.1

STEP 1 Set the desired audio channel(s) into RECORD READY.

STEP 2 Enter the desired IN POINT time into Storage Location 01.

STEP 3 Enter the desired OUT POINT time into Storage Location 02.

STEP 4 Enter the PREROLL DURATION time into Storage Location 51.

STEP 5 Enter the POSTROLL DURATION time into Storage Location 52.

STEP 6 Set Storage Location 95 to 1 to enable PREVIEW. At this time the machine automatically cues to the appropriate preroll position ahead of the IN POINT. Once the machine is cued, the PLAY key flashes on and off to indicate that the machine is ready.

NOTE: The machine is preprogrammed with an Acceleration Allowance which allows time for the transport to reach the selected speed. Because of this, the machine always cues to a position slightly ahead of the nominal preroll point.

STEP 7 Press PLAY to start the PREVIEW operation. It should be noted that the operation can be cancelled at any time by pressing STOP .

NOTE: The PREVIEW, EDIT AND REVIEW operations can be actuated by an external Time Code trigger. This method of operation is described in paragraph 4.5.3.

1.5.2.2 IN POINT and OUT POINT Bit Delays

To allow for very precise settings, the IN POINT and OUT POINT times can be delayed for up to one frame in one-bit (1/80th frame) increments. A number (up to 79) entered into Storage Location 91 causes the IN POINT to be delayed by that number of bits. Similarly, a number (up to 79) entered into Storage Location 92 delays the OUT POINT.

1.5.2.3 EDIT

The EDIT operation is similar to PREVIEW in that IN POINT, OUT POINT, PREROLL DURATION, and POSTROLL DURATION are set in the same manner, but differs in that the results of the EDIT become recorded.

The procedure for initiating EDIT remains the same as for PREVIEW, except that STEP 6 becomes:

STEP 6 Set Storage Location 96 to 1 to enable EDIT. At this time the machine automatically cues to the appropriate preroll position ahead of the IN POINT. Once the machine is cued, the PLAY and RECORD keys flash on and off to indicate that the machine is ready.

1.5.2.4 REVIEW

REVIEW allows the user to listen to the results of the edit after it is completed. To initiate the review, the IN POINT, OUT POINT, PREROLL DURATION and POSTROLL DURATION parameters are left unchanged after the edit. All that is required is to set Storage Location 97 to 1 and then, when the PLAY key begins to flash, press PLAY .

1.5.3 TRIGGERED EDIT SYNCHRONIZATION

Any of the three Edit sequences can be actuated automatically by being triggered from the external reference. In this mode, it it not necessary to set the audio tracks into RECORD READY, and the IN POINT and OUT POINT only define the duration of the synchronous operation.

It is most important to note that, for successful operation in this mode, the external reference must be presented to the machine in a reasonably accurate real time manner during the preroll time period.

The procedure used to enter TRIGGERED EDIT SYNCHRONIZATION is as follows:

STEP 1 Enter the desired OFFSET, IN POINT, OUT POINT, PREROLL DURATION and POSTROLL DURATION times into storage Locations 00, 01, 02, 51 and 52 respectively.

STEP 2 Set Storage Location 43 to 1 to enable TRIGGERED EDIT SYNCHRONIZATION.

STEP 3 Set Storage Location 37 to the appropriate ESTABLISH LOCK reference.

0 = Longitudinal Time Code
1 = Vertical Interval Time Code

(This selects the source from which the machine establishes synchronism ahead of the IN POINT.)

STEP 4 Set Storage Location 38 to the appropriate MAINTAIN LOCK reference. (This selects the source from which the machine maintains lock after the IN POINT.)

0 = External LTC, Data Independent
1 = External LTC, Data Dependent
2 = Video signal or external Tone, Data Independent
3 = VITC, Data Dependent

STEP 5 Set the appropriate Storage Location to 1 to actuate the desired facility.

Storage Location 95 = PREVIEW
Storage Location 96 = EDIT
Storage Location 97 = REVIEW

As STEP 5 is completed, the machine automatically cues to the appropriate position ahead of the IN POINT. Once the machine is cued, the PLAY key flashes on and off, and the machine begins to monitor the ascending Time Code reference (Establish Lock Reference). At Lock Actuation Time the controlled device is triggered automatically to synchronize its own internal LTC from tape with the selected External Time Code reference. Figure 1-8 illustrates the TRIGGERED EDIT SYNCHRONIZATION operation.

The Lock Actuation Time is defined as follows:

Lock Actuation Time = IN POINT
– (PREROLL DURATION + SYNC OFFSET)

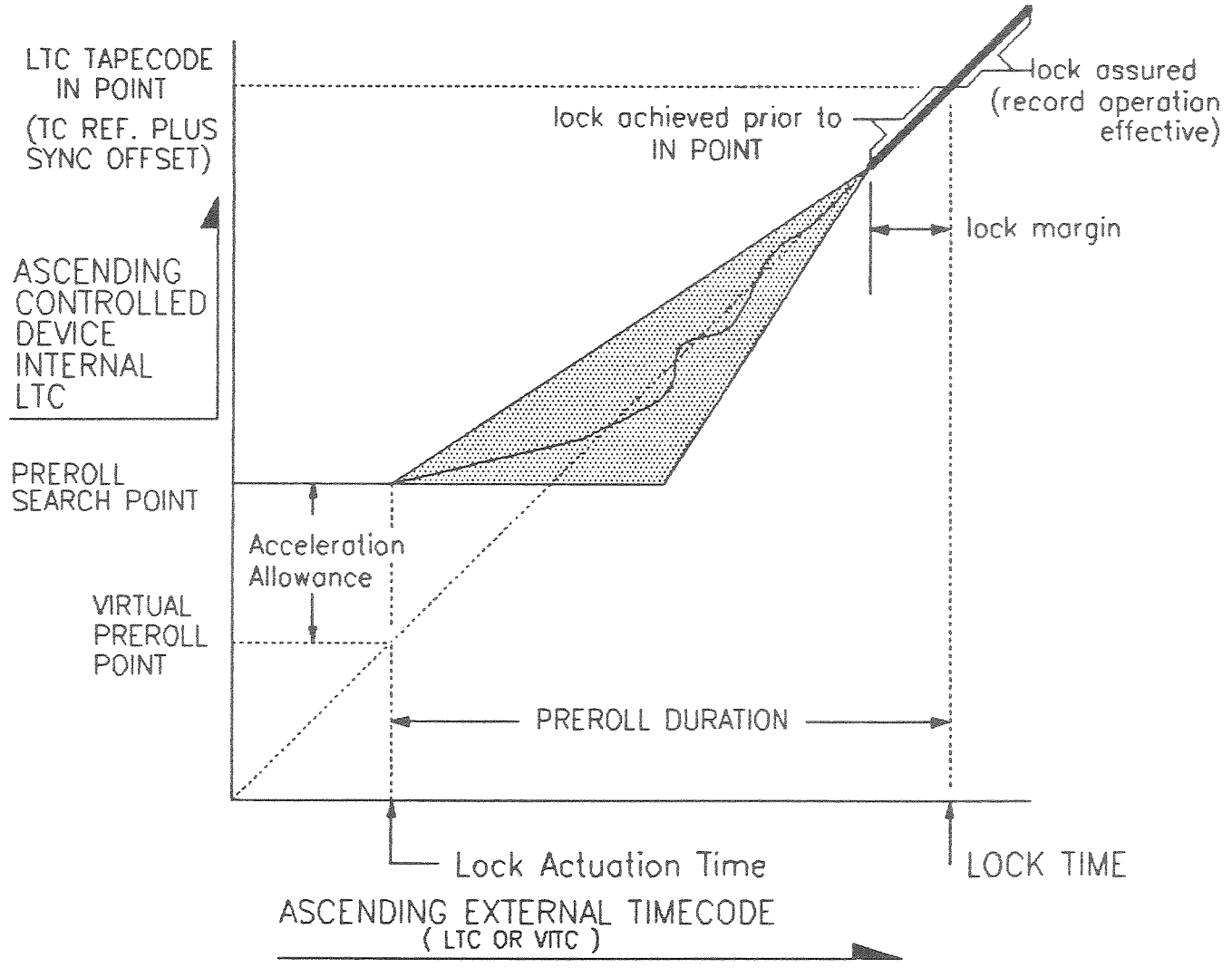


Figure 1-8. Triggered Edit Synchronization

1.5.4 FIND

Some tapes may include a number of live action audio sequences, each starting with a different Longitudinal Time Code. This is frequently the case where audio for Film is recorded, each Take starting with with a Time Code which corresponds to the time of day at which it was recorded. Consequently, these sequences begin at widely separated time-of-day start points.

FIND is a feature that aids in the LOCATE process, allowing speedy access to a Time Code location among any number of discontiguous Takes.

At full speed wind, the **APR-5003V** does not read Time Code, but interpolates Time Code from the counter roller. When performing a LOCATE, FIND enables the machine to slow down periodically, sample the tape Time Code, and update it's interpolated position. Each time the transport is required to change LOCATE direction, the distance between samples is halved, and, in this manner, the transport can approach its target location quickly and accurately.

FIND can be activated by setting Storage Location 93 to any value other than 0. For speediest operation, it is desirable to set the Storage Location to a value roughly equal to the length (in minutes) of the Take durations on the tape. (Values greater than 10 will be truncated internally to a value of 10.) The preset value is not critical in any way, since the FIND process itself is not critical, but presetting the duration between the Time Code updates allows the process to be performed in a shorter time.

1.5.4.1 FIND Operation

The following procedure presupposes a situation in which the user wishes to find the audio corresponding to the film starting at 15:12:02:00, on a tape which has many Takes of about 3:20 minutes each. Intermixed with these Takes, there are several which were cut to be significantly shorter.

The procedure to be used in this instance would be:

STEP 1 Set Storage Location 93 to 3 to enable FIND.

STEP 2 Enter the desired LOCATE time of 15:12:02:00.

STEP 3 Press LOCATE . This causes the machine to locate to the desired tape position, regardless of the breaks in the Time Code data.

1.6 STORE/RECALL SEQUENCE OPERATIONS

The following paragraphs define the procedures to be used for STORE and RECALL operations. It should be noted that procedures differ somewhat for different Storage Locations, but that all procedures have these two things in common when entering the two-digit Storage Location codes

a. If the first digit is entered incorrectly, RCL (or STO) can be pressed and the entry can be started again.

b. If more than three seconds elapses between entering the first and second digits, **LOCATE TIME** will revert to is former display.

A complete index of Storage/Recall Registers is given in Appendix A to this Supplement.

1.6.1 Locations 00 through 29 — Position Registers
Location 50 — Acceleration Allowance Preset
Location 51 — PREROLL DURATION Preset
Location 52 — POSTROLL DURATION Preset

For these Storage Locations, the STORE and RECALL functions are separate entities and can be invoked independently.

1.6.1.1 RECALL Procedure

STEP 1 Press RCL .

STEP 2 At the Numeric Keypad, enter the two digits representing the desired Storage Location. The two-digit code becomes displayed for a short time, then the display shows the value currently stored in the selected Storage Location.

1.6.1.2 STORE Procedure

STEP 1 Verify that the time data to be stored is shown in the **LOCATE TIME** display. (This may be recalled data or newly entered data.)

STEP 2 Press STO . Note that the time data remains displayed.

STEP 3 At the Numeric Keypad, enter the two digits representing the desired Storage Location. The two-digit code becomes displayed for a short time, then the display shows the time data which has been stored in the selected Storage Location.

It should be noted that this data is non-volatile, and remains in memory, even when machine power is removed.

1.6.2 Locations 30 through 49 — Enables and Selects

Location 91 — IN POINT Bit Delay
Location 92 — OUT POINT Bit Delay
Location 93 — FIND Enable
Location 95 — PREVIEW Enable
Location 96 — EDIT Enable
Location 97 — REVIEW Enable

For any of these locations, a new argument can be entered only after the current stored value has been reclaimed.

1.6.2.1 RECALL and/or STORE Procedure

STEP 1 Press RCL .

STEP 2 At the Numeric Keypad, enter the two-digit number for the desired Storage Location. The **LOCATE TIME** display shows the entered number, then immediately changes so as to show both the Storage Location number and the previously stored argument.

STEP 3 Within ten seconds, enter the new argument on the Numeric Keypad, then press STO .

STEP 4 If it is desired to retain the previously stored argument in the Storage Location, no action should be taken for STEP 3. In this event, the **LOCATE TIME** display reverts to its original indication after ten seconds, and the previously stored value is retained in the Storage Location.

1.6.3 Location 98 — BIT BUMP

BIT BUMP is a special operation that allows Synchronization Offsets to be set with an accuracy of 1/80th of a Frame. This facility is adjusted by means of the MVC control rather than by entry at the Numeric Keypad.

1.6.3.1 Adjustment Procedure

To adjust the BIT BUMP value, first press RCL and enter 9 8 on the Numeric Keypad. This recalls the contents of Storage Location 98 in the format:

Ss.Ff -Bb-

Where: S = Tens of seconds
s = seconds
F = Tens of frames
f = Frames
— = Dash
B = Tens of bits
b = bits
(Modulo 80)
(preceded by a minus sign for negative values).

The seconds and frames in this display represent the seconds and frames portion of the Synchronization Offset, and any change made to this value results in a concomitant change in the contents of Storage Location 00.

NOTE: Within the machine, the Bit Offset resolution is considerably finer than 1/80th of a frame, and the displayed frame count is a rounded-off number.

To change the contents of the display, press MVC to the right for an increment or to the left for a decrement. Changes that overflow the modulo 80 bit count upward increment the frame count, and changes that overflow downward decrement the frame count. If it is desired to clear the sub-frame offsets, this can be accomplished quickly by pressing 0 on the Numeric Keypad.

Once the desired offset is displayed, press STO and enter 9 8 on the Numeric Keypad to store the new offset into Storage Location 98. It is important to note that, even where the BIT BUMP value remains unchanged, STO 9 8 must be entered to escape the display.

NOTE: All sub-frame offsets become cleared automatically when RESOLVE ON PLAY (paragraph 1.5.1) is actuated. This is a safety feature which ensures that the important Video to tape LTC framing relationship is preserved.

1.6.4 Location 99 — Offset Calculation

Offset Calculation is a special operation that allows the offset between the Master Time Code and the tape Time Code to be captured. This data can be displayed for identification and/or subsequent storage in any of those Storage Locations whose contents are time values.

1.6.4.1 Offset Capture and Display

To capture and display the offset, first press RCL , then enter 9 9 on the Numeric Keypad. The **LOCATE TIME** display now shows the offset between the Master and tape Time Codes.

1.6.4.2 Offset Capture, Display and Store

To capture and display the offset, and then store it into Location 00 (Synchronization Offset), all that is required is to capture, as described in paragraph 4.6.4.1, then press STO and enter 9 9 on the Numeric Keypad.

SECTION 2
OPERATION

2.1 MACHINE OPERATIONS

2.1.1 Mounting the Reels

The machine can accomodate plastic or metal reels with diameters ranging from 3 inches to 12.5 inches. Depending upon the size of the reel flange, which varies between reels of different manufacture, some reels may require the use of rubber reel platter shims (supplied accessory), these being inserted between the reel and the reel platter to center the tape between the reel flanges.

Reels with diameters ranging from 3 inches to 7 inches are mounted directly on the reel transport spindle (see Figure 2-1), and the reel hubs are installed to secure the reel to the platter. For the larger 10.5-inch to 12.5-inch NAB type reels, the reel hubs are installed first, and the reels then are seated directly on the hubs.

2.1.2 Threading the Tape

Figure 4-10 illustrates the tape path through the transport. When correctly installed, the tape should ride smoothly across the various rollers, the headstack, and the flutter damping arm.

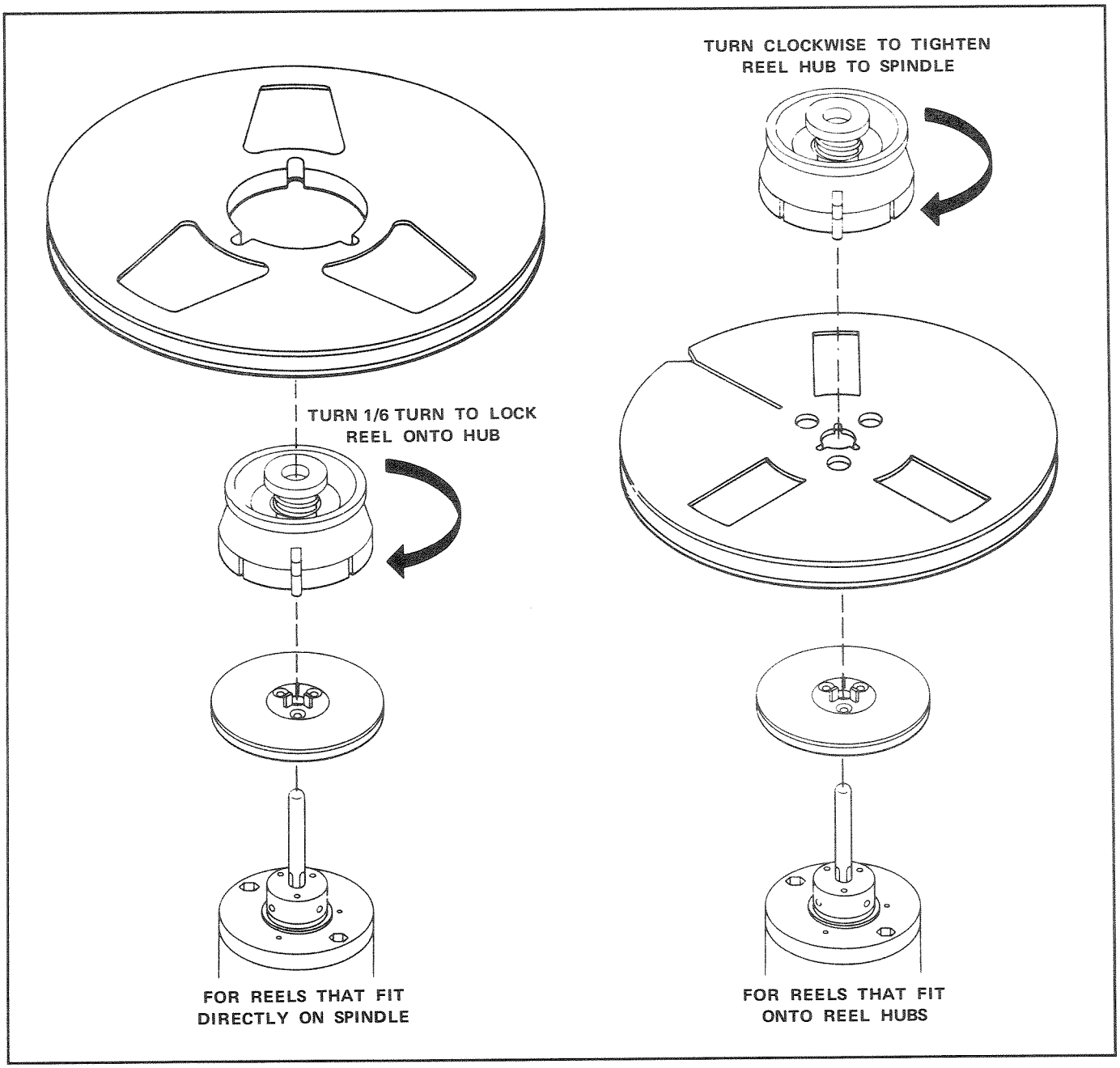


Figure 2-1. Mounting the Reels

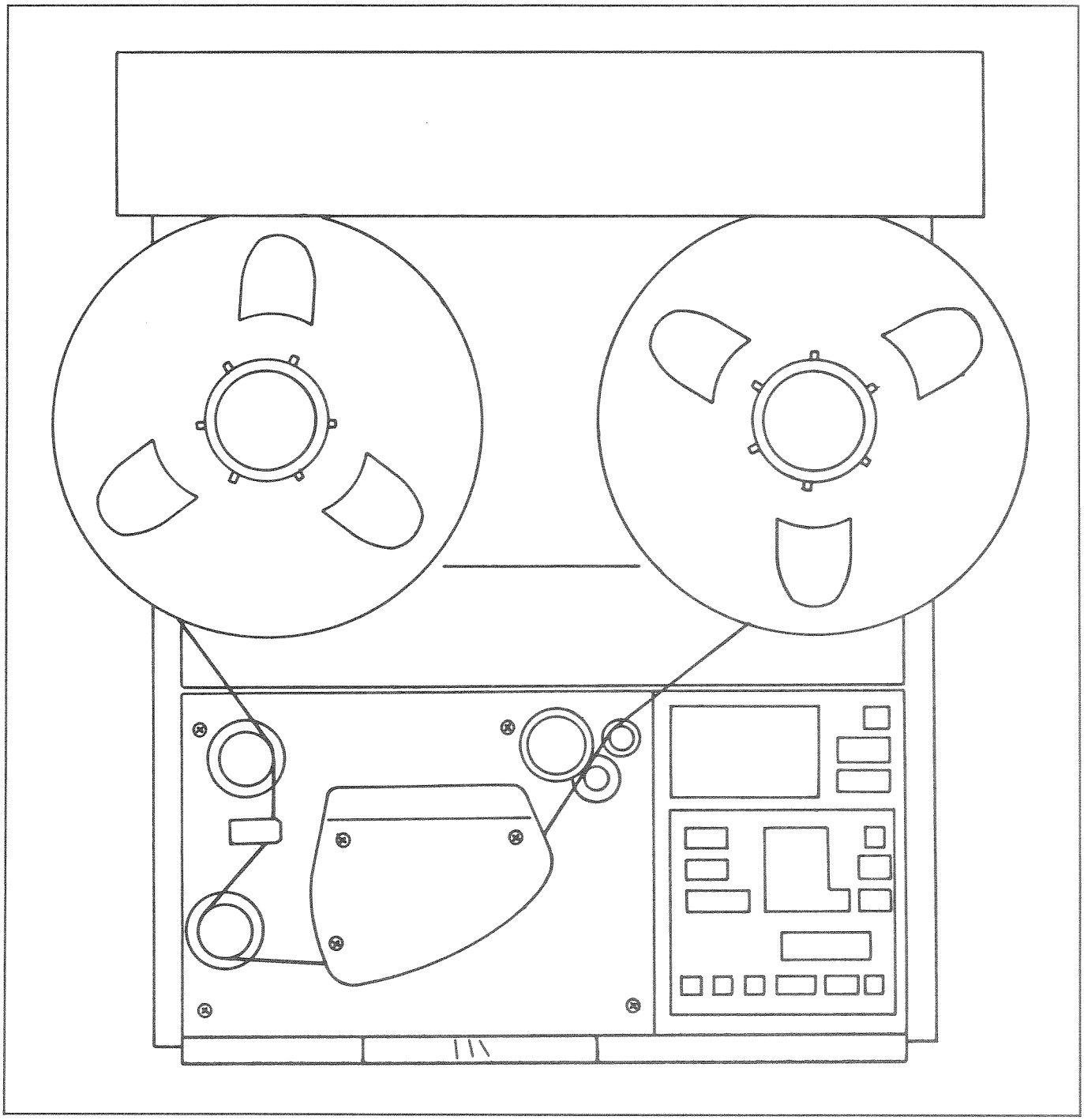


Figure 2-2. Tape Path

2.1.3 Transport Control

2.1.3.1 Fast Wind Modes

This paragraphs describes the modes in which the tape is moved from reel to reel at high speed. All of the mentioned controls and indicators are illustrated in Figure 1-1.

FAST FORWARD — To advance the tape to a forward position, press FF . This causes the tape to fast wind from the supply reel to the takeup reel.

REWIND — To move the tape in the reverse direction, press REW . This causes the tape to fast wind back from the takeup reel to the supply reel.

LOCATE — To wind to a specific position on the tape, enter the time for that position into the **LOCATE TIME** display via the Numeric Keypad, and then press LOCATE . This causes the tape to fast wind to the desired position. During the LOCATE operation, depending upon the direction of wind, either FF or REW becomes illuminated.

During any fast winding mode, the lifters automatically come forward to lift the tape off the heads, this being done to avoid subjecting the tape to unnecessary wear and tear. If so desired, the LIFTER key can be pressed during fast wind to allow the tape to ride across the heads.

Where it is desired to ensure that the tape be packed more evenly on the reel, SPOOL mode can be entered from any of the fast wind modes by simply touching the MVC control while the tape is winding.

2.1.3.2 MVC Operation

The MVC control can be used to shuttle the tape back and forth while the transport is in STOP mode. Tilting MVC to the left causes the tape to rewind, and tilting it to the right causes the tape to wind forward, the speed of the wind depending upon the distance through which the control is tilted. It should be noted that the lifters cannot be defeated while winding or rewinding in MVC mode.

2.1.4 PLAY

The various requirements of a PLAY operation are given in paragraphs 2.1.4.1 and 2.1.4.2. Unless otherwise stated, all of the mentioned controls and indicators are illustrated in Figures 1-1 and 1-7.

2.1.4.1 Initial Setup

STEP 1 Connect the inputs to the mixing console, audio amplifier, or other playback device to the **OUTPUT CH-1** and **OUTPUT CH-2** connectors on the rear panel of the machine.

STEP 2 Set the **POWER** switch to ON and set the audio channels for the desired playback source. This can be either the repro head (select REPRO on the **MONITOR** section) or the sync head (select SYNC on the **MONITOR** section). It should be noted that the repro head gives the better frequency response.

2.1.4.2 PLAY Operation

Before entering PLAY mode, the machine should be cued to the point where RECORD was started. Once the machine is cued, pressing PLAY on the Transport Control Panel initiates the playback, during which the PLAY key is illuminated.

If so desired, the playback level can be adjusted by selecting UNCAL on the **OUTPUT LEVEL** section of the Audio Channel Control Panel. In the UNCALIBRATED mode, the rotary control can be used to set the desired playback volume.

2.1.5 Recording

The various requirements of a RECORD operation are given in paragraphs 2.1.5.1 through 2.1.5.3. All of the mentioned controls and indicators are illustrated in Figures 1-1 and 1-7.

2.1.5.1 Initial Setup

STEP 1 Connect the sources of the material to be recorded to the **INPUT CH-1** and **INPUT CH-2** connectors on the rear panel of the machine.

STEP 2 Set the **POWER** switch to ON and verify that no error message is shown on the **STATUS** Display on the Alignment Control Panel.

STEP 3 Select READY on the **RECORD** section of the Audio Channel Control Panel(s) to set the desired channel(s) into RECORD READY. Verify that the appropriate READY keys become illuminated.

STEP 4 Select INPUT on the **MONITOR** section of the appropriate Audio Channel Control Panel(s).

STEP 5 While watching the **VU** meter, play a section of the material to be recorded and adjust the input level so that the audio peaks cause meter deflections of about 0 VU. The input peaks should never be allowed to cause meter deflections greater than +3 dB. (It is recommended that this adjustment be done using that part of the audio input that has the greatest volume.)

STEP 6 Cue the machine to the desired tape starting position.

2.1.5.2 RECORD Operation

At the Transport Control Panel, press PLAY and RECORD simultaneously. This causes the record-readied channels to enter RECORD mode, as indicated by their **BIAS** and **ERASE** indicators becoming illuminated, together with the PLAY and RECORD keys.

2.1.5.3 Monitoring During Record

During the RECORD operation the user has the option of monitoring either the input material or the repro signal that is being recorded.

To monitor the input signal, either INPUT or SYNC can be selected on the **MONITOR** section of the Audio Channel Control Panel. To monitor the repro signal,

the REPRO key should be selected. The selected function is indicated by the illumination of the appropriate key.

2.1.6 Other Operations

2.1.6.1 SPOT ERASE

The SPOT ERASE operation provides a method of erasing a section of tape with the transport under manual control. Use the following procedure:

STEP 1 Set the **POWER** switch to **ON**.

STEP 2 Select READY on the Audio Channel Control Panel for the track to be erased.

STEP 3 At the Numeric Keypad, enter the time for the tape position where the erasure is to be made into the **LOCATE TIME** display, and then press LOCATE on the Transport Control Panel to wind the tape to that position.

STEP 4 Press SPOT on the Transport Control Panel to arm the SPOT ERASE mode. Verify that the SPOT key is flashing.

STEP 5 Press RECORD on the Transport Control Panel. Verify that the SPOT key becomes solidly illuminated, together with the **ERASE** indicator for the selected channel.

STEP 6 Upon completion of STEP 5, the tape tension is released, and the reels can be turned by hand to move the desired section of the tape over the erase head.

STEP 7 When the erasure is completed, press STOP on the Transport Control Panel.

2.1.6.2 REPEAT

The REPEAT function is used to create a "looping mode" in which the same section of the tape is played back repeatedly. The tape section to be repeated is programmed by entering START and STOP times into Storage Locations 28 and 29, respectively. Note that the STOP time must be later than the START time.

The procedure used to enter REPEAT mode is detailed below.

STEP 1 Set up the machine for PLAY mode.

STEP 2 Enter the START time into the **LOCATE TIME** Display.

STEP 3 Press STO 2 8 on the numeric keypad to enter the START time into memory.

STEP 4 Enter the STOP time into the **LOCATE TIME** Display.

STEP 5 Press STO 2 9 on the numeric keypad to enter the STOP time into memory.

STEP 6 Press REPEAT to enter the mode.

STEP 7 Upon completion of the REPEAT operation, press STOP to escape the mode.

Where the START and STOP locations are not known in terms of their Time Codes, the following procedure can be used:

STEP 1 Set up the machine for PLAY mode.

STEP 2 Cue the tape to the desired START point.

STEP 3 Press the DOWN ARROW to transfer **TAPE TIME** into **LOCATE TIME**.

STEP 4 Press STO 2 8 on the numeric keypad to enter the START time into memory.

STEP 5 Cue the tape to the desired STOP point.

STEP 6 Press the DOWN ARROW to transfer **TAPE TIME** into **LOCATE TIME**.

STEP 7 Press STO 2 9 on the numeric keypad to enter the STOP time into memory.

STEP 8 Press REPEAT to enter the mode.

STEP 9 Upon completion of the REPEAT operation, press STOP to escape the mode.

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