

VC-167

Ref. No.	Part No.	Description		Remarks			Ref. No.	Part No.	Description		Remarks		
C446	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V		C602	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C447	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V		C603	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V	
C448	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V		C604	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C449	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V		C605	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C450	1-107-682-11	CERAMIC CHIP	1uF	10%	16V		C606	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C451	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V		C607	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C452	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V		C608	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V	
C453	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V		C609	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C456	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V		C610	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C458	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V		C611	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C504	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V		C612	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C505	1-104-908-11	TANTAL. CHIP	47uF	20%	4V		C613	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C508	1-164-816-11	CERAMIC CHIP	220PF	2%	50V		C614	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
					(TRV11/TRV21)		C615	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C513	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V		C616	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C515	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V		C618	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C520	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V		C619	1-104-752-11	TANTAL. CHIP	33uF	20%	6.3V	
C521	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V		C620	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C522	1-115-412-11	CERAMIC CHIP	680PF	5%	25V		C701	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C523	1-124-778-00	ELECT CHIP	22uF	20%	6.3V		C702	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C525	1-104-847-11	TANTAL. CHIP	22uF	20%	4V		C703	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C526	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V		C704	1-164-346-11	CERAMIC CHIP	1uF		16V	
C529	1-104-847-11	TANTAL. CHIP	22uF	20%	4V		C706	1-135-214-21	TANTAL. CHIP	4.7uF	20%	20V	
C531	1-104-908-11	TANTAL. CHIP	47uF	20%	4V		C707	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C532	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V		C708	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C533	1-216-864-11	METAL CHIP	0	5%	1/16W		C710	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C534	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V		C711	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C535	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V		C712	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C537	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V		C713	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C540	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V		C714	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C543	1-135-155-21	TANTALUM CHIP	4.7uF	10%	16V		C715	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C546	1-126-205-11	ELECT CHIP	47uF	20%	6.3V		C717	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C548	1-135-217-21	TANTALUM CHIP	15uF	20%	6.3V		C718	1-162-919-11	CERAMIC CHIP	22PF	5%	50V	
C550	1-104-847-11	TANTAL. CHIP	22uF	20%	4V		C719	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V	
C554	1-135-091-91	TANTAL. CHIP	1uF	20%	16V		C720	1-162-923-11	CERAMIC CHIP	47PF	5%	50V	
C555	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V		C722	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C556	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V		C724	1-162-924-11	CERAMIC CHIP	56PF	5%	50V	
C557	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V							(TRV11/TRV11E)	
C558	1-109-982-11	CERAMIC CHIP	1uF	10%	10V		C724	1-162-920-11	CERAMIC CHIP	27PF	5%	50V	
C561	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V							(TRV21/TRV21E)	
C571	1-107-682-11	CERAMIC CHIP	1uF	10%	16V		C725	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
					(TRV11E/TRV21E)		C726	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C572	1-164-392-11	CERAMIC CHIP	390PF	5%	50V		C727	1-135-091-91	TANTAL. CHIP	1uF	20%	16V	
					(TRV11E/TRV21E)		C728	1-135-091-91	TANTAL. CHIP	1uF	20%	16V	
C573	1-135-091-91	TANTAL. CHIP	1uF	20%	16V		C729	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V	
					(TRV11E/TRV21E)		C730	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C574	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V		C731	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
					(TRV11E/TRV21E)		C732	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	
C575	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V		C734	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
					(TRV11E/TRV21E)		C735	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C576	1-162-957-11	CERAMIC CHIP	220PF	5%	50V		C736	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
					(TRV11E/TRV21E)		C739	1-162-921-11	CERAMIC CHIP	33PF	5%	50V	
C577	1-162-957-11	CERAMIC CHIP	220PF	5%	50V							(TRV11E/TRV21E)	
					(TRV11E/TRV21E)								
C578	1-107-682-11	CERAMIC CHIP	1uF	10%	16V								
					(TRV11E/TRV21E)								

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
C740	1-164-315-11	CERAMIC CHIP	470PF 2% 50V (TRV11E/TRV21E)	< IC >			
C741	1-135-148-21	TANTAL. CHIP	1.5uF 20% 10V (TRV11E/TRV21E)	IC061	8-759-290-12	IC M62370GP-650D	
C742	1-164-156-11	CERAMIC CHIP	0.1uF 25V (TRV11E/TRV21E)	IC101	8-752-071-48	IC CXA2002R	
C745	1-164-156-11	CERAMIC CHIP	0.1uF 25V	IC201	8-752-075-45	IC CXA2051R	
C746	1-164-156-11	CERAMIC CHIP	0.1uF 25V	IC202	8-759-035-90	IC SC7S02F	
C749	1-135-181-21	TANTALUM CHIP	4.7uF 20% 6.3V	IC204	8-759-234-20	IC TC7S08F	
C750	1-162-970-11	CERAMIC CHIP	0.01uF 10% 25V	IC400	8-752-870-27	IC CXP87460-008R	
C751	1-164-346-11	CERAMIC CHIP	1uF 16V	IC401	8-759-278-57	IC AK6420HF-E2	
C754	1-162-915-11	CERAMIC CHIP	10PF 0.5PF 50V	IC402	8-759-267-62	IC MB4470APFQ-G-BND-ER	
C755	1-164-346-11	CERAMIC CHIP	1uF 16V	IC403	8-759-327-67	IC LB1950V-TLM	
C757	1-135-181-21	TANTALUM CHIP	4.7uF 20% 6.3V	IC404	8-759-327-61	IC LB8112V-TLM (TRV11/TRV21)	
C758	1-162-970-11	CERAMIC CHIP	0.01uF 10% 25V	IC404	8-759-327-62	IC TA8482FN-EL (TRV11E/TRV21E)	
C759	1-164-156-11	CERAMIC CHIP	0.1uF 25V	IC405	8-759-234-20	IC TC7S08F	
C760	1-135-259-11	TANTAL. CHIP	10uF 20% 6.3V (TRV21/TRV21E)	IC501	8-752-075-66	IC CXA1837R	
C761	1-162-970-11	CERAMIC CHIP	0.01uF 10% 25V (TRV21/TRV21E)	IC570	8-759-334-09	IC CXA2003N (TRV11E/TRV21E)	
C764	1-162-928-11	CERAMIC CHIP	120PF 5% 50V (TRV11/TRV21)	IC601	8-759-337-40	IC NJM2904V (TE2)	
C765	1-162-919-11	CERAMIC CHIP	22PF 5% 50V (TRV11/TRV21)	IC602	8-759-337-41	IC NJM2902V (TE2)	
C772	1-135-181-21	TANTALUM CHIP	4.7uF 20% 6.3V	IC603	8-759-247-07	IC MPC17A34VMEI	
< CONNECTOR >				IC604	8-752-365-65	IC CXD2126N-T4	
CN060	1-691-350-21	CONNECTOR, FFC/FPC (ZIF) 12P		IC701	8-752-372-14	IC CXD1267AN-T4	
CN101	1-774-636-21	CONNECTOR, FFC/FPC 11P		IC702	8-752-374-25	IC CXD2415R-T4	
CN102	1-764-708-21	CONNECTOR, FFC/FPC (LIF) 9P		IC703	8-752-073-11	IC CXA2006Q-T4	
CN300	1-774-054-21	CONNECTOR, FFC/FPC (ZIF) 45P		IC704	8-759-329-83	IC AD43063-REEL	
* CN301	1-691-931-11	CONNECTOR, BOARD TO BOARD 38P		IC705	8-752-374-02	IC CXD2418R-T4	
CN400	1-774-635-21	CONNECTOR, FFC/FPC 10P		IC706	8-752-379-66	IC CXD2180AR-T6	
CN401	1-766-673-21	CONNECTOR, FFC/FPC 12P		IC707	8-759-297-76	IC CXD2152AREL (TRV21/TRV21E)	
CN402	1-774-639-21	CONNECTOR, FFC/FPC 15P		IC708	8-759-337-40	IC NJM2904V (TE2)	
CN403	1-766-644-21	CONNECTOR, FFC/FPC 8P		IC709	8-759-198-34	IC TA75S558F (TE85R) (TRV11E/TRV21E)	
CN501	1-764-707-21	CONNECTOR, FFC/FPC (LIF) 8P		IC710	8-759-198-34	IC TA75S558F (TE85R)	
CN601	1-764-529-11	CONNECTOR, FFC/FPC (ZIF) 22P		< COIL >			
CN701	1-750-630-11	CONNECTOR, FFC/FPC (ZIF) 16P		L061	1-412-064-11	INDUCTOR CHIP 100uH	
CN702	1-774-641-21	CONNECTOR, FFC/FPC 18P (TRV21/TRV21E)		L062	1-414-078-11	INDUCTOR 10uH	
< DIODE >				L063	1-412-052-21	INDUCTOR CHIP 1uH	
D101	8-719-404-49	DIODE MA111		L101	1-412-066-21	INDUCTOR CHIP 220uH	
D102	8-719-820-41	DIODE 1SS302		L102	1-412-066-21	INDUCTOR CHIP 220uH	
D103	8-719-027-50	DIODE MA142WK		L103	1-412-066-21	INDUCTOR CHIP 220uH	
D201	8-719-027-50	DIODE MA142WK		L104	1-412-952-11	INDUCTOR 12uH	
D202	8-719-404-49	DIODE MA111 (TRV11E/TRV21E)		L105	1-412-060-11	INDUCTOR CHIP 22uH	
D203	8-719-027-48	DIODE MA142WA		L106	1-412-957-11	INDUCTOR 33uH	
D701	8-719-027-48	DIODE MA142WA		L107	1-412-280-31	INDUCTOR 330uH	
D702	8-719-404-49	DIODE MA111		L108	1-412-282-41	INDUCTOR 470uH	
D703	8-719-404-49	DIODE MA111		L109	1-412-355-41	INDUCTOR 180uH	
D705	8-719-002-81	DIODE 1T363 (TRV11E/TRV21E)		L113	1-414-078-11	INDUCTOR 10uH	
D706	8-713-102-28	DIODE 1T379-04-T8A		L114	1-412-355-41	INDUCTOR 180uH	
				L115	1-412-957-11	INDUCTOR 33uH	
				L116	1-414-078-11	INDUCTOR 10uH	
				L118	1-414-373-31	INDUCTOR CHIP 10uH	
				L118	1-414-373-61	INDUCTOR CHIP 10uH	
				L119	1-412-950-11	INDUCTOR 8.2uH	
				L120	1-410-658-31	INDUCTOR CHIP 220uH	

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
L121	1-410-655-31	INDUCTOR CHIP 120uH		Q112	8-729-230-63	TRANSISTOR 2SC4116-YG	
L202	1-412-064-11	INDUCTOR CHIP 100uH		Q113	8-729-230-63	TRANSISTOR 2SC4116-YG	
L203	1-412-962-11	INDUCTOR 82uH		Q114	8-729-402-42	TRANSISTOR UN5213 (TRV11E/TRV21E)	
L205	1-412-955-11	INDUCTOR 22uH (TRV11/TRV21)		Q120	8-729-403-35	TRANSISTOR UN5113	
L207	1-412-962-11	INDUCTOR 82uH		Q123	8-729-015-74	TRANSISTOR UN5111-TX	
L210	1-412-951-11	INDUCTOR 10uH (TRV11E)		Q124	8-729-117-73	TRANSISTOR 2SC4178-F14	
L210	1-412-955-11	INDUCTOR 22uH (TRV11/TRV21)		Q125	8-729-230-63	TRANSISTOR 2SC4116-YG	
L211	1-412-058-11	INDUCTOR CHIP 10uH		Q126	8-729-402-42	TRANSISTOR UN5213 (TRV11E/TRV21E)	
L212	1-412-058-11	INDUCTOR CHIP 10uH		Q129	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
L213	1-414-170-41	INDUCTOR 100uH (TRV11/TRV21)		Q130	8-729-012-50	TRANSISTOR 2SC4400-3/4/5	
L213	1-414-196-41	INDUCTOR 47uH (TRV11E/TRV21E)		Q131	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
L214	1-412-056-11	INDUCTOR CHIP 4.7uH		Q202	8-729-230-63	TRANSISTOR 2SC4116-YG	
L215	1-412-962-11	INDUCTOR 82uH		Q206	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
L216	1-414-170-41	INDUCTOR 100uH (TRV11E/TRV21E)		Q208	8-729-402-42	TRANSISTOR UN5213	
L400	1-412-058-11	INDUCTOR CHIP 10uH		Q211	8-729-420-24	TRANSISTOR 2SB1218A-QRS (TRV11/TRV21)	
L401	1-412-951-11	INDUCTOR 10uH		Q212	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
L402	1-216-295-91	CONDUCTOR, CHIP (2012)		Q213	8-729-402-42	TRANSISTOR UN5213	
L570	1-414-078-11	INDUCTOR 10uH (TRV11E/TRV21E)		Q214	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
L601	1-412-058-11	INDUCTOR CHIP 10uH		Q215	8-729-013-15	TRANSISTOR 2SC4909-TL	
L602	1-412-058-11	INDUCTOR CHIP 10uH		Q216	8-729-420-20	TRANSISTOR XN4312	
L603	1-412-951-11	INDUCTOR 10uH		Q217	8-729-420-12	TRANSISTOR XN4213	
L701	1-412-058-11	INDUCTOR CHIP 10uH		Q218	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
L703	1-414-078-11	INDUCTOR 10uH		Q219	8-729-230-63	TRANSISTOR 2SC4116-YG	
L704	1-412-058-11	INDUCTOR CHIP 10uH		Q221	8-729-402-42	TRANSISTOR UN5213	
L706	1-412-058-11	INDUCTOR CHIP 10uH		Q222	8-729-402-42	TRANSISTOR UN5213 (TRV11E/TRV21E)	
L707	1-412-979-21	INDUCTOR 1uH		Q223	8-729-230-63	TRANSISTOR 2SC4116-YG (TRV11/TRV11E/TRV21)	
L708	1-412-979-21	INDUCTOR 1uH		Q224	8-729-420-24	TRANSISTOR 2SB1218A-QRS (TRV11/TRV11E/TRV21)	
L709	1-412-052-21	INDUCTOR CHIP 1uH		Q226	8-729-230-63	TRANSISTOR 2SC4116-YG	
L710	1-412-052-21	INDUCTOR CHIP 1uH		Q227	8-729-013-15	TRANSISTOR 2SC4909-TL	
L712	1-414-078-11	INDUCTOR 10uH		Q228	8-729-403-35	TRANSISTOR UN5113	
L714	1-412-058-11	INDUCTOR CHIP 10uH		Q229	8-729-402-42	TRANSISTOR UN5213	
L715	1-414-078-11	INDUCTOR 10uH		Q400	8-729-230-63	TRANSISTOR 2SC4116-YG	
L716	1-414-078-11	INDUCTOR 10uH (TRV21/TRV21E)		Q401	8-729-230-63	TRANSISTOR 2SC4116-YG	
L751	1-414-078-11	INDUCTOR 10uH		Q501	8-729-420-53	TRANSISTOR UN5115	
L752	1-414-196-41	INDUCTOR 47uH (TRV11/TRV21)		Q507	8-729-421-26	TRANSISTOR UN5214	
L753	1-414-196-41	INDUCTOR 47uH (TRV11/TRV21)		Q570	8-729-402-42	TRANSISTOR UN5213 (TRV11E/TRV21E)	
< TRANSISTOR >				Q601	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q060	8-729-420-24	TRANSISTOR 2SB1218A-QRS		Q602	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q061	8-729-101-07	TRANSISTOR 2SB798-DL		Q603	8-729-420-53	TRANSISTOR UN5115	
Q062	8-729-230-63	TRANSISTOR 2SC4116-YG		Q701	8-729-403-27	TRANSISTOR XN4401	
Q063	8-729-230-63	TRANSISTOR 2SC4116-YG		Q703	8-729-402-42	TRANSISTOR UN5213	
Q064	8-729-230-63	TRANSISTOR 2SC4116-YG		Q704	8-729-403-35	TRANSISTOR UN5113	
Q065	8-729-230-63	TRANSISTOR 2SC4116-YG		Q705	8-729-403-35	TRANSISTOR UN5113	
Q101	8-729-230-63	TRANSISTOR 2SC4116-YG		Q706	8-729-402-42	TRANSISTOR UN5213	
Q102	8-729-402-48	TRANSISTOR UN521E-TX		Q750	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q104	8-729-230-63	TRANSISTOR 2SC4116-YG		Q752	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q106	8-729-905-23	TRANSISTOR 2SA1576-R		Q753	8-729-013-15	TRANSISTOR 2SC4909-TL (TRV11/TRV21)	
Q107	8-729-824-02	TRANSISTOR 2SA1838		Q754	8-729-013-15	TRANSISTOR 2SC4909-TL (TRV11/TRV21)	
Q108	8-729-402-42	TRANSISTOR UN5213					
Q109	8-729-402-42	TRANSISTOR UN5213					
Q110	8-729-012-50	TRANSISTOR 2SC4400-3/4/5					
Q111	8-729-230-63	TRANSISTOR 2SC4116-YG					

Ref. No.	Part No.	Description	Remarks			Ref. No.	Part No.	Description	Remarks		
< RESISTOR >											
R062	1-216-864-11	METAL CHIP	0	5%	1/16W	R150	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R063	1-216-821-11	METAL CHIP	1K	5%	1/16W	R152	1-216-834-11	METAL CHIP	12K	5%	1/16W
R077	1-216-138-00	METAL CHIP	3.3	5%	1/8W	R153	1-216-833-11	METAL CHIP	10K	5%	1/16W
R078	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	R154	1-216-817-11	METAL CHIP	470	5%	1/16W
R079	1-216-820-11	METAL CHIP	820	5%	1/16W	R155	1-216-807-11	METAL CHIP	68	5%	1/16W
						R156	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R080	1-216-836-11	METAL CHIP	18K	5%	1/16W	R157	1-216-816-11	METAL CHIP	390	5%	1/16W
R081	1-216-818-11	METAL CHIP	560	5%	1/16W	R158	1-216-819-11	METAL CHIP	680	5%	1/16W
R082	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	R159	1-216-864-11	METAL CHIP	0	5%	1/16W
R083	1-216-837-11	METAL CHIP	22K	5%	1/16W	(TRV11/TRV21)					
R084	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	R159	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
						(TRV11E/TRV21E)					
R085	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	R160	1-216-821-11	METAL CHIP	1K	5%	1/16W
R086	1-216-834-11	METAL CHIP	12K	5%	1/16W	R161	1-216-864-11	METAL CHIP	0	5%	1/16W
R087	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	R162	1-216-835-11	METAL CHIP	15K	5%	1/16W
R088	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	R163	1-216-840-11	METAL CHIP	39K	5%	1/16W
R091	1-216-841-11	METAL CHIP	47K	5%	1/16W	R164	1-216-864-11	METAL CHIP	0	5%	1/16W
						R165	1-216-845-11	METAL CHIP	100K	5%	1/16W
R092	1-216-841-11	METAL CHIP	47K	5%	1/16W	R166	1-216-836-11	METAL CHIP	18K	5%	1/16W
R094	1-216-864-11	METAL CHIP	0	5%	1/16W	R167	1-216-836-11	METAL CHIP	18K	5%	1/16W
R101	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	R168	1-216-821-11	METAL CHIP	1K	5%	1/16W
						R169	1-216-864-11	METAL CHIP	0	5%	1/16W
						(TRV11/TRV21)					
R102	1-216-815-11	METAL CHIP	330	5%	1/16W	R169	1-216-804-11	METAL CHIP	39	5%	1/16W
R103	1-216-815-11	METAL CHIP	330	5%	1/16W	(TRV11E/TRV21E)					
R104	1-216-797-11	METAL CHIP	10	5%	1/16W	R170	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R105	1-216-821-11	METAL CHIP	1K	5%	1/16W	R171	1-216-840-11	METAL CHIP	39K	5%	1/16W
R106	1-218-875-11	METAL CHIP	15K	0.50%	1/16W	R172	1-216-835-11	METAL CHIP	15K	5%	1/16W
						R173	1-216-864-11	METAL CHIP	0	5%	1/16W
R107	1-216-836-11	METAL CHIP	18K	5%	1/16W	R176	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R108	1-216-864-11	METAL CHIP	0	5%	1/16W	(TRV11/TRV21)					
R109	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	R176	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R110	1-216-836-11	METAL CHIP	18K	5%	1/16W	(TRV11E/TRV21E)					
R111	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	R177	1-216-821-11	METAL CHIP	1K	5%	1/16W
						(TRV11E/TRV21E)					
R114	1-216-833-11	METAL CHIP	10K	5%	1/16W	R178	1-216-821-11	METAL CHIP	1K	5%	1/16W
R115	1-216-845-11	METAL CHIP	100K	5%	1/16W	R179	1-216-817-11	METAL CHIP	470	5%	1/16W
R116	1-216-853-11	METAL CHIP	470K	5%	1/16W	R180	1-216-818-11	METAL CHIP	560	5%	1/16W
R117	1-216-847-11	METAL CHIP	150K	5%	1/16W	R181	1-216-818-11	METAL CHIP	560	5%	1/16W
R120	1-216-839-11	METAL CHIP	33K	5%	1/16W	R182	1-216-809-11	METAL CHIP	100	5%	1/16W
						R183	1-216-818-11	METAL CHIP	560	5%	1/16W
R121	1-216-836-11	METAL CHIP	18K	5%	1/16W	R184	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R122	1-216-818-11	METAL CHIP	560	5%	1/16W	R185	1-216-818-11	METAL CHIP	560	5%	1/16W
R123	1-216-815-11	METAL CHIP	330	5%	1/16W	R186	1-216-818-11	METAL CHIP	560	5%	1/16W
R125	1-216-821-11	METAL CHIP	1K	5%	1/16W	R187	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R126	1-216-797-11	METAL CHIP	10	5%	1/16W						
						R188	1-216-837-11	METAL CHIP	22K	5%	1/16W
R127	1-216-837-11	METAL CHIP	22K	5%	1/16W	R189	1-216-837-11	METAL CHIP	22K	5%	1/16W
R128	1-216-837-11	METAL CHIP	22K	5%	1/16W	R190	1-216-837-11	METAL CHIP	22K	5%	1/16W
R129	1-216-819-11	METAL CHIP	680	5%	1/16W	R191	1-216-839-11	METAL CHIP	33K	5%	1/16W
R130	1-216-835-11	METAL CHIP	15K	5%	1/16W	R192	1-216-814-11	METAL CHIP	270	5%	1/16W
R131	1-216-839-11	METAL CHIP	33K	5%	1/16W						
						R193	1-216-813-11	METAL CHIP	220	5%	1/16W
R132	1-216-813-11	METAL CHIP	220	5%	1/16W	R194	1-216-803-11	METAL CHIP	33	5%	1/16W
R133	1-216-818-11	METAL CHIP	560	5%	1/16W	R196	1-216-818-11	METAL CHIP	560	5%	1/16W
R134	1-216-821-11	METAL CHIP	1K	5%	1/16W	R197	1-216-864-11	METAL CHIP	0	5%	1/16W
R141	1-216-816-11	METAL CHIP	390	5%	1/16W	R201	1-216-833-11	METAL CHIP	10K	5%	1/16W
R149	1-216-821-11	METAL CHIP	1K	5%	1/16W						

Ref. No.	Part No.	Description	Remarks		
R202	1-216-836-11	METAL CHIP	18K	5%	1/16W (TRV11/TRV11E)
R202	1-216-864-11	METAL CHIP	0	5%	1/16W (TRV21/TRV21E)
R203	1-216-832-11	METAL CHIP	8.2K	5%	1/16W (TRV11E)
R203	1-216-827-11	METAL CHIP	3.3K	5%	1/16W (TRV11)
R204	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R206	1-216-815-11	METAL CHIP	330	5%	1/16W (TRV11/TRV21)
R210	1-216-837-11	METAL CHIP	22K	5%	1/16W (TRV21)
R210	1-216-864-11	METAL CHIP	0	5%	1/16W (TRV11/TRV11E)
R210	1-216-836-11	METAL CHIP	18K	5%	1/16W (TRV21E)
R211	1-216-825-11	METAL CHIP	2.2K	5%	1/16W (TRV21)
R211	1-216-828-11	METAL CHIP	3.9K	5%	1/16W (TRV21E)
R212	1-216-841-11	METAL CHIP	47K	5%	1/16W
R213	1-216-841-11	METAL CHIP	47K	5%	1/16W
R214	1-216-807-11	METAL CHIP	68	5%	1/16W
R215	1-216-821-11	METAL CHIP	1K	5%	1/16W
R216	1-216-821-11	METAL CHIP	1K	5%	1/16W
R218	1-218-879-11	METAL CHIP	22K	0.50%	1/16W
R219	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R220	1-216-833-11	METAL CHIP	10K	5%	1/16W
R221	1-216-833-11	METAL CHIP	10K	5%	1/16W
R222	1-216-818-11	METAL CHIP	560	5%	1/16W
R223	1-216-821-11	METAL CHIP	1K	5%	1/16W
R225	1-216-833-11	METAL CHIP	10K	5%	1/16W
R226	1-216-833-11	METAL CHIP	10K	5%	1/16W (TRV11E/TRV21E)
R228	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R229	1-218-863-11	METAL CHIP	4.7K	0.50%	1/16W
R230	1-216-821-11	METAL CHIP	1K	5%	1/16W
R232	1-216-821-11	METAL CHIP	1K	5%	1/16W
R234	1-218-849-11	METAL CHIP	1.2K	0.50%	1/16W
R235	1-216-821-11	METAL CHIP	1K	5%	1/16W
R239	1-216-864-11	METAL CHIP	0	5%	1/16W
R241	1-218-839-11	METAL GLAZE	470	0.50%	1/16W
R243	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R244	1-216-843-11	METAL CHIP	68K	5%	1/16W
R245	1-216-864-11	METAL CHIP	0	5%	1/16W (TRV11/TRV21)
R246	1-216-864-11	METAL CHIP	0	5%	1/16W
R247	1-216-833-11	METAL CHIP	10K	5%	1/16W
R248	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R249	1-216-827-11	METAL CHIP	3.3K	5%	1/16W (TRV11/TRV21)
R249	1-216-824-11	METAL CHIP	1.8K	5%	1/16W (TRV11E/TRV21E)
R254	1-216-841-11	METAL CHIP	47K	5%	1/16W
R255	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R256	1-216-833-11	METAL CHIP	10K	5%	1/16W
R257	1-216-821-11	METAL CHIP	1K	5%	1/16W
R259	1-216-833-11	METAL CHIP	10K	5%	1/16W
R260	1-216-817-11	METAL CHIP	470	5%	1/16W
R261	1-216-841-11	METAL CHIP	47K	5%	1/16W (TRV11E/TRV21E)

Ref. No.	Part No.	Description	Remarks		
R262	1-216-837-11	METAL CHIP	22K	5%	1/16W (TRV11E/TRV21E)
R263	1-216-829-11	METAL CHIP	4.7K	5%	1/16W (TRV11/TRV21)
R265	1-216-821-11	METAL CHIP	1K	5%	1/16W (TRV11E)
R265	1-216-817-11	METAL CHIP	470	5%	1/16W (TRV11/TRV21)
R266	1-216-864-11	METAL CHIP	0	5%	1/16W
R267	1-216-864-11	METAL CHIP	0	5%	1/16W
R268	1-216-818-11	METAL CHIP	560	5%	1/16W (TRV11E)
R268	1-216-820-11	METAL CHIP	820	5%	1/16W (TRV11/TRV21)
R270	1-216-817-11	METAL CHIP	470	5%	1/16W (TRV11E/TRV21E)
R271	1-216-825-11	METAL CHIP	2.2K	5%	1/16W (TRV11E/TRV21E)
R272	1-216-823-11	METAL CHIP	1.5K	5%	1/16W (TRV11E/TRV21E)
R273	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R274	1-216-821-11	METAL CHIP	1K	5%	1/16W
R276	1-216-864-11	METAL CHIP	0	5%	1/16W
R277	1-216-819-11	METAL CHIP	680	5%	1/16W
R279	1-216-823-11	METAL CHIP	1.5K	5%	1/16W (TRV11/TRV11E/TRV21)
R281	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R282	1-216-823-11	METAL CHIP	1.5K	5%	1/16W (TRV21E)
R283	1-216-819-11	METAL CHIP	680	5%	1/16W (TRV11/TRV11E/TRV21)
R284	1-216-819-11	METAL CHIP	680	5%	1/16W (TRV11/TRV11E/TRV21)
R286	1-216-836-11	METAL CHIP	18K	5%	1/16W (TRV11/TRV11E/TRV21)
R287	1-216-864-11	METAL CHIP	0	5%	1/16W (TRV11/TRV11E/TRV21)
R289	1-216-839-11	METAL CHIP	33K	5%	1/16W (TRV11/TRV11E/TRV21)
R290	1-216-864-11	METAL CHIP	0	5%	1/16W (TRV11E/TRV21E)
R291	1-216-864-11	METAL CHIP	0	5%	1/16W
R292	1-216-857-11	METAL CHIP	1M	5%	1/16W
R293	1-216-817-11	METAL CHIP	470	5%	1/16W
R294	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R295	1-216-852-11	METAL CHIP	390K	5%	1/16W
R296	1-216-849-11	METAL CHIP	220K	5%	1/16W
R297	1-216-842-11	METAL CHIP	56K	5%	1/16W
R298	1-216-833-11	METAL CHIP	10K	5%	1/16W
R299	1-218-272-11	METAL GLAZE	5.1K	5%	1/16W
R301	1-216-833-11	METAL CHIP	10K	5%	1/16W
R302	1-216-833-11	METAL CHIP	10K	5%	1/16W
R303	1-216-841-11	METAL CHIP	47K	5%	1/16W
R304	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R305	1-216-841-11	METAL CHIP	47K	5%	1/16W
R314	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R315	1-218-290-11	METAL GLAZE	6.2K	5%	1/16W
R316	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R317	1-218-290-11	METAL GLAZE	6.2K	5%	1/16W
R318	1-216-836-11	METAL CHIP	18K	5%	1/16W
R319	1-216-853-11	METAL CHIP	470K	5%	1/16W

Ref. No.	Part No.	Description	Remarks			Ref. No.	Part No.	Description	Remarks		
R320	1-216-853-11	METAL CHIP	470K	5%	1/16W	R446	1-216-836-11	METAL CHIP	18K	5%	1/16W
R321	1-216-853-11	METAL CHIP	470K	5%	1/16W	R447	1-216-833-11	METAL CHIP	10K	5%	1/16W
R327	1-216-853-11	METAL CHIP	470K	5%	1/16W	R448	1-216-833-11	METAL CHIP	10K	5%	1/16W
R328	1-216-853-11	METAL CHIP	470K	5%	1/16W	R449	1-216-833-11	METAL CHIP	10K	5%	1/16W
R329	1-216-833-11	METAL CHIP	10K	5%	1/16W	R450	1-216-833-11	METAL CHIP	10K	5%	1/16W
R330	1-216-833-11	METAL CHIP	10K	5%	1/16W	R451	1-216-845-11	METAL CHIP	100K	5%	1/16W
R331	1-216-864-11	METAL CHIP	0	5%	1/16W	R452	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R333	1-216-864-11	METAL CHIP	0	5%	1/16W	R453	1-217-671-11	METAL CHIP	1	5%	1/10W
R335	1-216-864-11	METAL CHIP	0	5%	1/16W	R454	1-217-671-11	METAL CHIP	1	5%	1/10W
R337	1-216-864-11	METAL CHIP	0	5%	1/16W	R455	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R400	1-216-845-11	METAL CHIP	100K	5%	1/16W	R456	1-216-841-11	METAL CHIP	47K	5%	1/16W
R401	1-216-845-11	METAL CHIP	100K	5%	1/16W	R458	1-217-671-11	METAL CHIP	1	5%	1/10W
R402	1-216-845-11	METAL CHIP	100K	5%	1/16W	R459	1-217-671-11	METAL CHIP	1	5%	1/10W
R403	1-216-845-11	METAL CHIP	100K	5%	1/16W	R460	1-217-671-11	METAL CHIP	1	5%	1/10W
R404	1-216-845-11	METAL CHIP	100K	5%	1/16W	R461	1-216-845-11	METAL CHIP	100K	5%	1/16W
R405	1-216-845-11	METAL CHIP	100K	5%	1/16W	R462	1-216-833-11	METAL CHIP	10K	5%	1/16W
R406	1-216-833-11	METAL CHIP	10K	5%	1/16W	R463	1-216-833-11	METAL CHIP	10K	5%	1/16W
R407	1-216-841-11	METAL CHIP	47K	5%	1/16W	R464	1-216-833-11	METAL CHIP	10K	5%	1/16W
R408	1-216-821-11	METAL CHIP	1K	5%	1/16W	R465	1-216-808-11	METAL CHIP	82	5%	1/16W
R409	1-216-821-11	METAL CHIP	1K	5%	1/16W	R466	1-216-845-11	METAL CHIP	100K	5%	1/16W
R410	1-216-821-11	METAL CHIP	1K	5%	1/16W	R467	1-216-019-00	METAL CHIP	56	5%	1/10W
R411	1-216-864-11	METAL CHIP	0	5%	1/16W	R468	1-216-833-11	METAL CHIP	10K	5%	1/16W
R412	1-216-821-11	METAL CHIP	1K	5%	1/16W	R469	1-216-833-11	METAL CHIP	10K	5%	1/16W
R413	1-216-821-11	METAL CHIP	1K	5%	1/16W	R471	1-216-821-11	METAL CHIP	1K	5%	1/16W
R414	1-216-821-11	METAL CHIP	1K	5%	1/16W	R472	1-216-833-11	METAL CHIP	10K	5%	1/16W
R417	1-216-821-11	METAL CHIP	1K	5%	1/16W	R473	1-216-833-11	METAL CHIP	10K	5%	1/16W
R418	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	R474	1-216-821-11	METAL CHIP	1K	5%	1/16W
R419	1-216-845-11	METAL CHIP	100K	5%	1/16W	R475	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R420	1-216-833-11	METAL CHIP	10K	5%	1/16W	R476	1-216-845-11	METAL CHIP	100K	5%	1/16W
R421	1-216-821-11	METAL CHIP	1K	5%	1/16W	R477	1-216-841-11	METAL CHIP	47K	5%	1/16W
R422	1-216-845-11	METAL CHIP	100K	5%	1/16W	R478	1-216-821-11	METAL CHIP	1K	5%	1/16W
R423	1-216-845-11	METAL CHIP	100K	5%	1/16W	R479	1-216-817-11	METAL CHIP	470	5%	1/16W
R424	1-216-821-11	METAL CHIP	1K	5%	1/16W	R481	1-216-817-11	METAL CHIP	470	5%	1/16W
R425	1-216-833-11	METAL CHIP	10K	5%	1/16W	R482	1-216-817-11	METAL CHIP	470	5%	1/16W
R426	1-216-833-11	METAL CHIP	10K	5%	1/16W	R501	1-216-853-11	METAL CHIP	470K	5%	1/16W
R427	1-216-849-11	METAL CHIP	220K	5%	1/16W	R503	1-216-864-11	METAL CHIP	0	5%	1/16W
R428	1-216-841-11	METAL CHIP	47K	5%	1/16W	R505	1-216-810-11	METAL CHIP	120	5%	1/16W
R429	1-216-800-11	METAL GLAZE	18	5%	1/16W	R506	1-218-893-11	METAL CHIP	82K	0.50%	1/16W
R430	1-216-821-11	METAL CHIP	1K	5%	1/16W	R514	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R434	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	R515	1-216-864-11	METAL CHIP	0	5%	1/16W
R435	1-216-864-11	METAL CHIP	0	5%	1/16W	R517	1-216-845-11	METAL CHIP	100K	5%	1/16W
R436	1-216-845-11	METAL CHIP	100K	5%	1/16W	R519	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R437	1-216-841-11	METAL CHIP	47K	5%	1/16W	R520	1-216-864-11	METAL CHIP	0	5%	1/16W
R439	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	R522	1-216-817-11	METAL CHIP	470	5%	1/16W
R440	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	R523	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R441	1-216-837-11	METAL CHIP	22K	5%	1/16W	R525	1-216-841-11	METAL CHIP	47K	5%	1/16W
R442	1-216-845-11	METAL CHIP	100K	5%	1/16W	R530	1-216-857-11	METAL CHIP	1M	5%	1/16W
R443	1-216-837-11	METAL CHIP	22K	5%	1/16W	R531	1-216-817-11	METAL CHIP	470	5%	1/16W
					(TRV11/TRV21)	R534	1-216-864-11	METAL CHIP	0	5%	1/16W
R444	1-216-837-11	METAL CHIP	22K	5%	1/16W	R537	1-216-864-11	METAL CHIP	0	5%	1/16W
R445	1-216-833-11	METAL CHIP	10K	5%	1/16W						
					(TRV11/TRV21)						
R445	1-216-864-11	METAL CHIP	0	5%	1/16W						
					(TRV11E/TRV21E)						

Ref. No.	Part No.	Description	Remarks			Ref. No.	Part No.	Description	Remarks		
R538	1-216-864-11	METAL CHIP	0	5%	1/16W	R724	1-216-810-11	METAL CHIP	120	5%	1/16W
R556	1-216-853-11	METAL CHIP	470K	5%	1/16W	R725	1-216-864-11	METAL CHIP	0	5%	1/16W
R570	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	R726	1-216-846-11	METAL CHIP	120K	5%	1/16W
					(TRV11E/TRV21E)	R727	1-216-839-11	METAL CHIP	33K	5%	1/16W
R571	1-218-871-11	METAL CHIP	10K	0.50%	1/16W	R728	1-216-853-11	METAL CHIP	470K	5%	1/16W
					(TRV11E/TRV21E)						
R575	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	R729	1-216-864-11	METAL CHIP	0	5%	1/16W
					(TRV11E/TRV21E)	R730	1-216-864-11	METAL CHIP	0	5%	1/16W
R581	1-216-833-11	METAL CHIP	10K	5%	1/16W	R732	1-216-841-11	METAL CHIP	47K	5%	1/16W
					(TRV11E/TRV21E)	R733	1-216-841-11	METAL CHIP	47K	5%	1/16W
R601	1-216-001-00	METAL CHIP	10	5%	1/10W	R734	1-216-841-11	METAL CHIP	47K	5%	1/16W
R603	1-216-825-11	METAL CHIP	2.2K	5%	1/16W						
R604	1-216-845-11	METAL CHIP	100K	5%	1/16W	R735	1-216-841-11	METAL CHIP	47K	5%	1/16W
R605	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	R740	1-216-839-11	METAL CHIP	33K	5%	1/16W
R606	1-216-836-11	METAL CHIP	18K	5%	1/16W	R741	1-216-841-11	METAL CHIP	47K	5%	1/16W
						R742	1-216-837-11	METAL CHIP	22K	5%	1/16W
R607	1-216-848-11	METAL CHIP	180K	5%	1/16W	R743	1-216-839-11	METAL CHIP	33K	5%	1/16W
R608	1-216-848-11	METAL CHIP	180K	5%	1/16W						
R609	1-216-848-11	METAL CHIP	180K	5%	1/16W	R744	1-216-841-11	METAL CHIP	47K	5%	1/16W
R610	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	R745	1-216-837-11	METAL CHIP	22K	5%	1/16W
R611	1-216-815-11	METAL CHIP	330	5%	1/16W	R751	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
						R756	1-216-864-11	METAL CHIP	0	5%	1/16W
R612	1-216-845-11	METAL CHIP	100K	5%	1/16W	R757	1-216-864-11	METAL CHIP	0	5%	1/16W
R613	1-216-834-11	METAL CHIP	12K	5%	1/16W						
R614	1-216-834-11	METAL CHIP	12K	5%	1/16W	R758	1-216-833-11	METAL CHIP	10K	5%	1/16W
R615	1-216-845-11	METAL CHIP	100K	5%	1/16W						(TRV11E/TRV21E)
R616	1-216-837-11	METAL CHIP	22K	5%	1/16W	R759	1-216-836-11	METAL CHIP	18K	5%	1/16W
											(TRV11E/TRV21E)
R618	1-216-837-11	METAL CHIP	22K	5%	1/16W	R760	1-216-864-11	METAL CHIP	0	5%	1/16W
R619	1-216-837-11	METAL CHIP	22K	5%	1/16W						(TRV11/TRV21)
R620	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	R761	1-216-813-11	METAL CHIP	220	5%	1/16W
R621	1-216-833-11	METAL CHIP	10K	5%	1/16W						(TRV11/TRV21)
R623	1-216-864-11	METAL CHIP	0	5%	1/16W	R775	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R628	1-216-821-11	METAL CHIP	1K	5%	1/16W	< SWITCH >					
R629	1-216-821-11	METAL CHIP	1K	5%	1/16W	S301	1-692-088-41	SWITCH, TACTILE (EDIT SEARCH +)			
R630	1-216-841-11	METAL CHIP	47K	5%	1/16W	S302	1-692-088-41	SWITCH, TACTILE (EDIT SEARCH -)			
R631	1-216-841-11	METAL CHIP	47K	5%	1/16W	S303	1-692-088-41	SWITCH, TACTILE (PLAY)			
R632	1-216-848-11	METAL CHIP	180K	5%	1/16W	S304	1-692-088-41	SWITCH, TACTILE (PAUSE)			
						S305	1-692-088-41	SWITCH, TACTILE (REW)			
R701	1-216-845-11	METAL CHIP	100K	5%	1/16W						
R702	1-216-845-11	METAL CHIP	100K	5%	1/16W	S306	1-692-088-41	SWITCH, TACTILE (FF)			
R703	1-216-857-11	METAL CHIP	1M	5%	1/16W	S307	1-692-088-41	SWITCH, TACTILE (STOP)			
R704	1-216-845-11	METAL CHIP	100K	5%	1/16W						
R706	1-216-839-11	METAL CHIP	33K	5%	1/16W	< VIBRATOR >					
R707	1-216-845-11	METAL CHIP	100K	5%	1/16W	X400	1-760-314-11	VIBRATOR, CRYSTAL 11.718MHz (TRV11/TRV21)			
R708	1-216-864-11	METAL CHIP	0	5%	1/16W	X400	1-760-315-11	VIBRATOR, CRYSTAL 11.718MHz			
R709	1-218-847-11	METAL CHIP	1K	0.50%	1/16W						(TRV11E/TRV21E)
R710	1-218-876-11	METAL CHIP	16K	0.50%	1/16W	X701	1-760-320-11	VIBRATOR, CRYSTAL 28.375MHz (TRV11/TRV21)			
R713	1-216-833-11	METAL CHIP	10K	5%	1/16W	X701	1-760-321-11	VIBRATOR, CRYSTAL 28.375MHz			
					(TRV11E/TRV21E)						(TRV11E/TRV21E)
R714	1-216-857-11	METAL CHIP	1M	5%	1/16W	X702	1-579-780-21	VIBRATOR, CRYSTAL 17.7MHz (TRV11E/TRV21E)			
					(TRV11E/TRV21E)						
R715	1-216-845-11	METAL CHIP	100K	5%	1/16W						
					(TRV11E/TRV21E)						
R717	1-216-829-11	METAL CHIP	4.7K	5%	1/16W						
					(TRV11E/TRV21E)						
R719	1-216-810-11	METAL CHIP	120	5%	1/16W						
R720	1-164-156-11	CERAMIC CHIP	0.1uF		25V						
R721	1-216-825-11	METAL CHIP	2.2K	5%	1/16W						
R722	1-216-825-11	METAL CHIP	2.2K	5%	1/16W						
R723	1-164-156-11	CERAMIC CHIP	0.1uF		25V						

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
	A-7072-362-A	VF-102 BOARD, COMPLETE (TRV11/TRV21)				< RESISTOR >	

	A-7072-357-A	VF-102P BOARD, COMPLETE (TRV11E/TRV21E)		R901	1-216-817-11	METAL CHIP 470 5% 1/16W	
		*****		R902	1-216-817-11	METAL CHIP 470 5% 1/16W	
		(Ref.No.6, 000 Series)		R903	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
				R904	1-216-833-11	METAL CHIP 10K 5% 1/16W	
						(TRV11:US,Canadian/TRV21:US,Canadian)	
		< CAPACITOR >		R905	1-216-822-11	METAL CHIP 1.2K 5% 1/16W	
						(TRV11:US,Canadian/TRV21:US,Canadian)	
C902	1-163-038-91	CERAMIC CHIP 0.1uF	25V	R906	1-216-813-11	METAL CHIP 220 5% 1/16W	
C903	1-135-091-91	TANTAL. CHIP 1uF	20% 16V	R907	1-216-845-11	METAL CHIP 100K 5% 1/16W	
C904	1-162-965-11	CERAMIC CHIP 0.0015uF	10% 50V	R908	1-216-852-11	METAL CHIP 390K 5% 1/16W	
C905	1-104-752-11	TANTAL. CHIP 33uF	20% 6.3V	R909	1-216-833-11	METAL CHIP 10K 5% 1/16W	
C906	1-162-638-11	CERAMIC CHIP 1uF	16V	R910	1-216-835-11	METAL CHIP 15K 5% 1/16W	
C907	1-137-306-11	FILM CHIP 0.1uF	5% 16V	R911	1-216-160-00	METAL GLAZE 27 5% 1/8W	
C908	1-162-920-11	CERAMIC CHIP 27PF	5% 50V	R912	1-216-857-11	METAL CHIP 1M 5% 1/16W	
△C910	1-164-758-11	CERAMIC CHIP 0.0039uF	5% 50V	R913	1-216-820-11	METAL CHIP 820 5% 1/16W	
△C911	1-164-715-11	CERAMIC CHIP 0.0068uF	5% 50V	R914	1-216-813-11	METAL CHIP 220 5% 1/16W	
C912	1-107-854-11	TANTAL. CHIP 68uF	20% 6.3V	R915	1-216-793-11	METAL GLAZE 4.7 5% 1/16W	
C914	1-128-007-11	ELECT CHIP 2.2uF	20% 35V	R916	1-218-879-11	METAL CHIP 22K 0.50% 1/16W	
C915	1-163-037-11	CERAMIC CHIP 0.022uF	10% 25V			(TRV11/TRV21)	
C916	1-164-611-11	CERAMIC CHIP 0.001uF	10% 500V	R916	1-218-881-11	METAL CHIP 27K 0.50% 1/16W	
C917	1-165-319-11	CERAMIC CHIP 0.1uF	50V			(TRV11E/TRV21E)	
C918	1-107-854-11	TANTAL. CHIP 68uF	20% 6.3V	R917	1-218-891-11	METAL CHIP 68K 0.50% 1/16W	
						(TRV11/TRV21)	
		< CONNECTOR >		R917	1-218-893-11	METAL CHIP 82K 0.50% 1/16W	
CN901	1-566-537-11	CONNECTOR, FPC (NON ZIF) 5P				(TRV11E/TRV21E)	
CN902	1-573-290-21	PIN, CONNECTOR (1.5MM) (SMD) 4P		R918	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
				R919	1-216-839-11	METAL CHIP 33K 5% 1/16W	
		< DIODE >		R920	1-216-837-11	METAL CHIP 22K 5% 1/16W	
D901	8-719-951-21	DIODE PR1102W-TR		R921	1-216-795-11	METAL GLAZE 6.8 5% 1/16W	
D903	8-719-404-49	DIODE MA111		R922	1-216-847-11	METAL CHIP 150K 5% 1/16W	
				R923	1-216-857-11	METAL CHIP 1M 5% 1/16W	
		< IC >		R924	1-216-862-11	METAL GLAZE 2.7M 5% 1/16W	
IC901	8-759-196-14	IC BA7149F-E2		R925	1-216-862-11	METAL GLAZE 2.7M 5% 1/16W	
				R926	1-216-821-11	METAL CHIP 1K 5% 1/16W	
		< COIL >		R927	1-216-821-11	METAL CHIP 1K 5% 1/16W	
L901	1-412-031-11	INDUCTOR CHIP 47uH		R928	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
L902	1-410-387-11	INDUCTOR CHIP 33uH		R929	1-216-818-11	METAL CHIP 560 5% 1/16W	
△L903	1-402-680-21	COIL, FERRITE (HCL)		R930	1-216-815-11	METAL CHIP 330 5% 1/16W	
				R931	1-216-810-11	METAL CHIP 120 5% 1/16W	
		< TRANSISTOR >		R933	1-216-811-11	METAL CHIP 150 5% 1/16W	
Q901	8-729-120-28	TRANSISTOR 2SC1623-L5L6				< VARIABLE RESISTOR >	
		(TRV11:US,Canadian/TRV21:US,Canadian)		RV904	1-238-862-11	RES, ADJ, CERMET 1M	
Q902	8-729-106-68	TRANSISTOR 2SD1615A-GP				< TRANSFORMER >	
Q903	8-729-216-31	TRANSISTOR 2SA1163-G		△T901	1-453-124-11	TRANSFORMER ASSY, FLYBACK	
Q904	8-729-120-28	TRANSISTOR 2SC1623-L5L6					

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

Note:
Les composants identifiés par une marque △ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifique.

Ref. No.	Part No.	Description	Remarks
		< THERMISTOR >	
TH901	1-809-350-21	THERMISTOR, NTC (2125)	
		< FLAT CABLE >	
W901	1-540-019-21	SOCKET ASSY, CRT	
MISCELLANEOUS			

70	1-542-259-11	MICROPHONE, CAP	
104	1-775-520-11	CABLE, FLEXIBLE FLAT 45P	
117	1-801-191-11	INDICATOR MODULE, LIQUID CRYST	
△118	1-517-524-11	TUBE, FLUORESCENT, COLD CATHODE	
126	1-505-291-11	SPEAKER (DIA 2.8CM)	
△154	1-452-673-31	CRT ASSY (M01KXX90WB)	
203	1-775-518-11	CABLE, FLEXIBLE FLAT 12P	
209	1-547-739-21	LENS, ZOOM (VCL-5412WB)	
211	1-547-558-21	FILTER BLOCK, OPTICAL (TRV11/TRV11E)	
211	1-547-735-51	FILTER BLOCK, OPTICAL (TRV21/TRV21E)	
220	1-660-435-11	FP-402 FLEXIBLE BOARD (TRV21/TRV21E)	
D001	8-719-988-42	DIODE GL453S	
IC790	A-7030-368-A	CCD BLOCK ASSY (ICX-054AK-11) (TRV11)	
IC790	A-7030-369-A	CCD BLOCK ASSY (ICX-055AK-11) (TRV11E)	
IC790	A-7030-373-A	CCD BLOCK ASSY (ICX-059AK-41) (TRV21)	
IC790	A-7030-495-A	CCD BLOCK ASSY (ICX-060AK-41) (TRV21E)	
M901	A-7048-804-A	DRUM BLOCK ASSY(DGH-0C1A-R)	
		(TRV11/TRV21)	
M901	A-7048-806-A	DRUM BLOCK ASSY(DGH-0C2A-R)	
		(TRV11E/TRV21E)	
M902	8-835-531-02	MOTOR, DC SCE-0601A (CAPSTAN)	
M903	X-3945-401-1	MOTOR ASSY, DC (LOADING)	
S901	1-762-436-11	SWITCH, ROTARY (ENCODER)	
ACCESSORIES & PACKING MATERIALS			

△	A-7003-839-A	AC-V15 AC POWER (US/Canadian)	
△	A-7003-840-A	AC-V15 AC POWER (E/Australian/AEP)	
△	A-7003-842-A	AC-V15 AC POWER (UK)	
△	A-7003-843-A	AC-V15 AC POWER (Tourist)	
△	A-7003-969-A	AC-V15 AC POWER (Hong Kong)	
	A-7092-697-A	CASE (N) ASSY (2), BATTERY	
		(TRV11:US, Canadian/TRV21:US, Canadian)	
	1-473-342-11	REMOTE COMMANDER (RMT-713)	
	1-569-008-11	ADAPTER, CONVERSION 2P	
		(TRV11:E, Hong Kong/TRV11E:E, Hong Kong/ TRV21:E, Tourist/TRV21E:E, Tourist)	
	1-574-039-21	CORD, CONNECTION (AV CABLE) (1.5m)	

Ref. No.	Part No.	Description	Remarks
	1-764-622-11	ADAPTOR, CONVERSION	
		(TRV11E:AEP, UK/TRV21E:AEP, UK)	
	3-336-764-01	SHEET, PROTECTION (TRV21PK ONLY)	
*	3-704-291-01	BAG (STANDARD), PROTECTION	
		(TRV21PK ONLY)	
	3-810-780-11	MANUAL, INSTRUCTION (ENGLISH/SPANISH)	
		(TRV11E:AEP, UK/TRV21E:AEP, UK)	
	3-810-780-21	MANUAL, INSTRUCTION (ENGLISH)	
		(TRV11:US, Canadian/TRV21:US, Canadian)	
	3-810-780-31	MANUAL, INSTRUCTION (FRENCH)	
		(TRV11:Canadian/TRV21:Canadian)	
	3-810-780-41	MANUAL, INSTRUCTION (GERMAN/ITALIAN)	
		(TRV11E:AEP/TRV21E:AEP)	
	3-810-780-51	MANUAL, INSTRUCTION (FRENCH/DUTCH)	
		(TRV11E:AEP/TRV21E:AEP)	
	3-810-780-61	MANUAL, INSTRUCTION	
		(SWEDISH/PORTUGUESE)	
		(TRV11E:AEP/TRV21E:AEP)	
	3-810-780-71	MANUAL, INSTRUCTION (ENGLISH/RUSSIAN)	
		(TRV11E:AEP/TRV21E:AEP)	
	3-856-152-11	MANUAL, INSTRUCTION (ENGLISH/RUSSIAN)	
		(TRV11E:E, Australian, Hong Kong/ TRV21E:E, Tourist)	
	3-856-152-21	MANUAL, INSTRUCTION (FRENCH/GERMAN)	
		(TRV11E:E, Hong Kong/TRV21E:E, Tourist)	
	3-856-152-31	MANUAL, INSTRUCTION (ARABIC/PORTUGUESE)	
		(TRV11E:E/TRV21E:E)	
	3-856-152-41	MANUAL, INSTRUCTION (CHINESE)	
		(TRV11E:E, Hong Kong/TRV21E:E, Tourist)	
	3-856-152-51	MANUAL, INSTRUCTION (ENGLISH/SPANISH)	
		(TRV11:E, Hong Kong/TRV21:E, Tourist)	
	3-856-152-61	MANUAL, INSTRUCTION (CHINESE)	
		(TRV11:E, Hong Kong/TRV21:E)	
	3-947-969-21	BELT (S), SHOULDER	
	3-967-166-01	CASE (330), SOFT (TRV21PK ONLY)	
*	3-968-092-01	PAT, PROTECTION (TRV21PK ONLY)	
*	3-968-618-01	CUSHION, ACC	
		(TRV11/TRV11E/TRV21:US, Canadian, E/ TRV21E:AEP, UK, E)	
*	3-968-619-01	CUSHION (LOWER)	
*	3-968-620-01	INDIVIDUAL CARTON (TRV11:US, Canadian)	
*	3-968-620-11	CARTON, INDIVIDUAL (TRV11:E, Hong Kong)	
*	3-968-620-21	CARTON, INDIVIDUAL (TRV21:US, Canadian)	
*	3-968-620-31	CARTON, INDIVIDUAL (TRV11E:AEP, UK)	
*	3-968-620-41	CARTON, INDIVIDUAL (TRV21E:AEP, UK)	
*	3-968-620-51	CARTON, INDIVIDUAL (TRV21E:E, Tourist)	
*	3-970-001-02	INDIVIDUAL CARTON	
		(TRV11E:E, Australian, Hong Kong)	
*	3-970-001-11	INDIVIDUAL CARTON (TRV21:E, Tourist)	
*	3-970-688-01	INDIVIDUAL CARTON (TRV21)	

**NP-33 BATTERY PACK

NOTE.

**MARK PARTS IS AVAILABLE AS AN OPTIONAL ACCESSORY.

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

Note:
Les composants identifiés par une marque △ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifique.

5. V SUB adjustment

Subject	Not required
Adjustment Page	F
Adjustment Address	26

Related Adjustments:

“MAX gain adjustment”, “Auto white balance reference data input”, “Auto white balance adjustment”, “Color reproductivity adjustment”.

Adjustment method:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	26		Reading a voltage code of V SUB indicated by CCD imager then input data of a table (Fig.6-1-7)
3	F	26		Press the PAUSE button.
4	6	00	00	After setting the data, press the PAUSE button. (End)

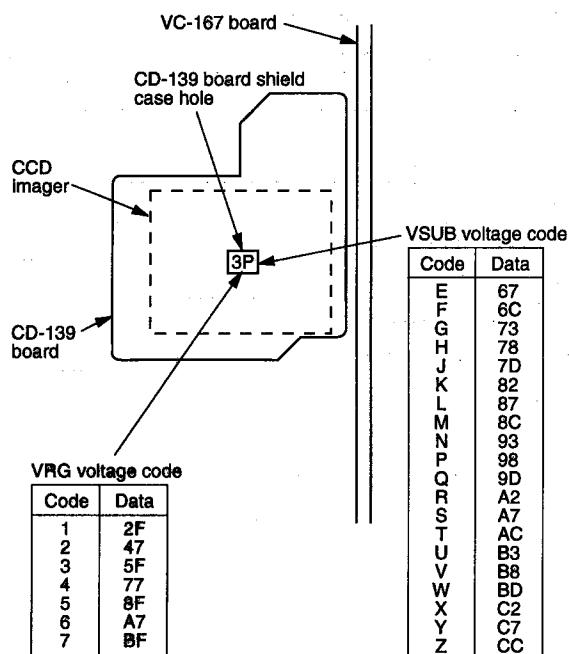


Fig 6-1-7

6. VRG adjustment

Subject	Not required
Adjustment Page	F
Adjustment Address	27

Adjustment method:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	27		Reading a voltage code of V SUB indicated by CCD imager then input data of a table (Fig.6-1-7)
3	F	27		Press the PAUSE button.
4	6	00	00	After setting the data, press the PAUSE button. (End)

7. Page F data modification

All the data of page F are automatically initialized if the initialization is executed. However, among the initialized data, the following addresses require manual modification of data after the page F data is initialized.

*CND : Canadian model

Modification procedure:

Order	Page	Address	Data								Procedure
			TRV11		TR11E		TRV21/21PK		TRV21E		
			US,CND	others	AEP,UK	others	x24	x48	x24	x48	
1	6	00	01								After setting the data, Press the PAUSE button. (Preparation)
2	F	03	22	23	24	25	22	23	24	25	Set each data to each address, and press the PAUSE button.
		04	18		18		68		68		
		05	E1		E1		E1		E1		
		06	18		18		18		18		
		07	—		—		07		07		
		08	—		14		24		24		
		17	B9		—		B9		—		
		19	53		—		53		—		
		1A	7D		—		7D		—		
		1E	8D		—		8D		—		
		1F	9E		—		9E		—		
		20	8E		—		8E		—		
		21	85		—		85		—		
		31	FB		—		FC		FC		
		32	F4		—		F4		F4		
		44	96		66		96		66		
		45	68		48		68		48		
		47	95		—		95		—		
		49	77		—		77		—		
		4B	77		—		77		—		
		4D	76		—		76		—		
		4F	76		—		76		—		
		53	A8		AD		A8		AD		
		54	AF		AF		AF		AF		
		5A	7A		—		7A		—		
		5C	1B		—		17		—		
		5D	34		—		32		32		
		5E	24		24		—		24		
		60	—		—		15		16		
		61	A6		A4		BA		A8		
		62	—		—		C3		—		
		63	B5		85		B2		83		
		64	40		42		1E		2A		
		65	—		—		00		00		
		67	05		—		01		03		
		68	—		—		6B		6B		
		6B	—		—		6C		6C		
		6C	—		—		5C		5C		
		72	—		—		20		20		
		74	—		—		3C		3C		
		76	00		—		00		—		
		78	E8		—		E0		D8		
		79	30		—		30		—		
		7A	10		—		10		—		
		7D	26		—		26		—		
		87	—		—		1F		1F		
		88	—		—		20		20		
		89	—		—		02	32	02	32	
		8B	—		D0		—		—		
	E4-EF	00			00		00		00		
	F5	A8			A8		A8		A8		
	F6	5E			5E		5E		5E		
	F7	CC			C4		A8		94		

8. 28 MHz crystal oscillator adjustment

Purpose: Adjusts 28 MHz crystal controlled oscillation for synchronizing clock.

Adjustment error: Loss of synchronization or loss of color.

Subject	Note required
Measurement Point	IC201 ④ pin
Measuring Instrument	Frequency counter
Adjustment Page	F
Adjustment Address	25
Specification	3579545 ± 17Hz (4433618.75 ± 17Hz)

() : CCD-TRV11E/TRV21E

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	25		Change the data using PLAY, STOP buttons until the frequency satisfies the specification.
3	6	00	00	After setting the data, press the PAUSE button. (End)

Reference: Conversion between the hexadecimal number and decimal number.

In some adjustment items, data appears in hexadecimal numbers on the DDS display or on the adjustment remote commander. Maintenance engineers are expected to convert the displayed hexadecimal numbers to the corresponding decimal numbers using the following conversion table.

Make a required calculation described in each adjustment item. Then re-convert the result of calculation back from the decimal numbers to the corresponding hexadecimal numbers using the following conversion table.

Hexadecimal-Decimal Conversion Table

Lower digit of hexadecimal Upper digit of hexadecimal	0	1	2	3	4	5	6	7	8	9	A (H)	B (b)	C (C)	D (d)	E (E)	F (F)
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A(H)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
① → B(b)	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
C(C)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D(d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E(E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F(F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note : The characters shown in the parenthesis () shows the display on the adjustment remote commander.

(Example) If the DDS display or the adjustment remote commander shows BD (bd);

Because the upper digit of the hexadecimal number is B (b), and the lower digit is D (d), the meeting point "189" of (1) and (2) in the above table is the corresponding decimal number.

< How to convert the decimal number to hexadecimal number >

The decimal numbers are divided into following three categories.
Calculation method is different in three categories respectively.

- (1) 0 ~ 255 → 00h ~ FFh
- (2) 256 ~ 4095 → 0100h ~ 0FFFh
- (3) 4096 ~ 65536 → 1000h ~ FFFFh

If the decimal number fall into the category (1);

- 1) Divide the decimal number by 16. Result is "A".
- 2) Take the integer portion of the number "A" as "B".
- 3) Calculate the equation $(A-B) \times 16$. Result is "C".
- 4) "B" is the second digit number of the hexadecimal number and "C" is the first digit number of the hexadecimal number. (BC)h

(Example)

If the decimal number is "189";

- 1) $189 \div 16 = 11.8125$ (A)
↑
- 2) (B)
- 3) $(11.8125 - 11) \times 16 = 13$ (C)
- 4) 189 → (BD)h is obtained.

If the decimal number fall into the category (2);

- 1) Divide the decimal number by 256. Result is "A".
- 2) Take the integer portion of the number "A" as "B".
- 3) Calculate the equation $(A-B) \times 256$. Result is "C".
- 4) Take the integer portion of the number "C" as "D".
- 5) Calculate the equation $(C-D) \times 16$. Result is "E".
- 6) "B" is the third digit number, "D" is the second digit number and "E" is the first digit number of the hexadecimal number. (BDE)h

(Example)

If the decimal number is "2100";

- 1) $2100 \div 256 = 8.203125$ (A)
↑
- 2) (B)
- 3) $(8.203125 - 8) \times 256 \div 16 = 3.25$ (C)
↑
- 4) (D)
- 5) $(3.25 - 3) \times 16 = 4$ (E)
- 6) 2100 → (834)h is obtained.

If the decimal number fall into the category (3);

- 1) Divide the decimal number by 4096. Result is "A".
- 2) Take the integer portion of the number "A" as "B".
- 3) Calculate the equation $(A-B) \times 4096 \div 256$. Result is "C".
- 4) Take the integer portion of the number "C" as "D".
- 5) Calculate the equation $(C-D) \times 256 \div 16$. Result is "E".

- 6) Take the integer portion of the number "E" as "F".
- 7) Calculate the equation $(E-F) \times 16$. Result is "G". (Round the number "G" to count fractions of 0.5 and over as a unit and cut away the rest.)
- 8) "B" is the fourth digit number, "D" third digit number, "F" is the second digit number and "G" is the first digit number of the hexadecimal number. (BDFG)h

(Example)

If the decimal number is "31814";

- 1) $31814 \div 4096 = 7.7670898$ (A)
↑
- 2) (B)
- 3) $(7.7670898 - 7) \times 4096 \div 256 = 12.273436$ (C)
↑
- 4) (D)
- 5) $(12.273436 - 12) \times 256 \div 16 = 4.374976$ (E)
↑
- 6) (F)
- 7) $(4.374976 - 4) \times 16 = 5.999616$
(Round the number to count fractions of 0.5 and over as a unit and cut away the rest.)
↓
- 8) 6(G)
- 9) 31814 → (7C46)h is obtained.

< How to convert the hexadecimal number to decimal number >

If the hexadecimal number is (ABCD)h, the decimal number is calculated by the following equation.

$$(A \times 4096) + (B \times 256) + (C \times 16) + (D \times 1) = \text{decimal number}$$

(Example) If the hexadecimal number is "(3BA4)h":

$$(3 \times 4096) + (11 \times 256) + (10 \times 16) + (4 \times 1) = 15268$$

9. HALL adjustment

Purpose: Variation of the HALL element outputs is removed by adjusting amplifier gain and offset. The HALL elements detect the lens iris position.

Adjustment error: Oscillation of lens iris, or incorrect white balance indoor and outdoor.

Subject	Not required
Measurement Point	DDS display on the EVF or monitor TV
Measuring Instrument	
Adjustment Page	F
Adjustment Address	2A 2B
Specification	13 to 17h when iris is opened. 77 to 7Bh when iris is closed.

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	02	21	After setting the data, press the PAUSE button.
3				Turn off the UNREG power supply once, then turn it on.
4	6	00	01	After setting the data, press the PAUSE button.
5	6	02	03	After setting the data, press the PAUSE button.
6	6	01	03	After setting the data, press the PAUSE button.
7	F	2A	40	After setting the data, press the PAUSE button. Read the data appearing on the DDS display note. The read-out data is W ₂ .
8	F	2A	30	After setting the data, press the PAUSE button. Read the data appearing on the DDS display note. The read-out data is W ₁ .
9	6	01	01	After setting the data, press the PAUSE button.
10	F	2A	30	After setting the data, press the PAUSE button. Read the data appearing on the DDS display note. The read-out data is K ₁ .
11	F	2A	40	After setting the data, press the PAUSE button. Read the data appearing on the DDS display note. The read-out data is K ₂ .
12				Convert the data W ₁ , W ₂ , K ₁ and K ₂ into the decimal numbers. The result decimal numbers are W ₁ ', W ₂ ', K ₁ ' and K ₂ '. (Use the < How to convert the hexadecimal number to decimal number > or "Hexadecimal-Decimal Conversion Table". Calculate the following equation (decimal number calculation) to obtain X ₁ '.
13				$A' = W_2' + K_1' - W_1' - K_2' \dots\dots\dots \text{equation 1}$ $B' = W_1' - K_1' \dots\dots\dots \text{equation 2}$ $X_1' = \frac{1600 + (48 \times A') - (16 \times B')}{A'} \dots\dots\dots \text{equation 3}$
14				Convert the decimal number X ₁ ' to the hexadecimal number to obtain X ₁ . (Round the number X ₁ to count fractions of 0.5 and over as a unit and cut away the rest.)
15	F	2A		Set the data X ₁ (obtained at step 14).
16				Press the PAUSE button.
17	F	2B		Change the data using the PLAY and STOP until 15 appears on the DDS display.
18				Press the PAUSE button.
19	6	01	03	After setting the data, press the PAUSE button.
20				If the DDS display shows the data in the range from 77 to 7B, it indicates the end of adjustment, and proceed to the item "Processing after Adjustments". If it is not, use the DDS display data as W ₀ and proceed to step 21 and followings.

Note : Lower two digits of the data which is displayed at the right bottom of the EVF or TV monitor

Order	Page	Address	Data	Procedure
21				Convert the value W0 to a decimal value to obtain the value W0'.
22				Calculate the value X2' from the following equation (decimal calculation). $C' = W_0' + K_1' - W_1' - 20$equation 4 $X_2' = \frac{(100 - B') \times (X_1' - 48) + (48 \times C')}{C'}$equation 5 (The values X1' and B' are obtained from the equations 2 and 3 in step 13.)
23				Convert the value X2' to a hexadecimal number to obtain X2. (Round the number X2 to count fractions of 0.5 and over as a unit and cut away the rest.)
24	F	2A		Set the data X2 (which is the result of calculation in step 23).
25	F	2A		Press the PAUSE button.
26	F	2B		Change data using PLAY and STOP button until 79 appears on the DDS display.
27	F	2B		Press the PAUSE button.
28	6	01	01	After setting the data, press the PAUSE button.
29				Confirm that the DDS display shows the data in the range from 13 to 17.

Processing after Adjustments:

Order	Page	Address	Data	Procedure
1	6	02	00	After setting the data, press the PAUSE button.
2	6	01	00	After setting the data, press the PAUSE button.
3	F	02	00	After setting the data, press the PAUSE button.
4				Turn off the UNREG power supply once, then turn it on.
5	6	00	00	After setting the data, press the PAUSE button. (End)

Related adjustments:

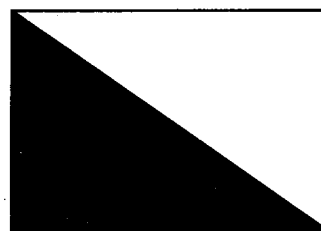
“IRIS IN/OUT adjustment”

10. Flange back adjustment

Purpose: Automatic flange back adjustment of inner focus lens.

Adjustment error: Loss of focus when switched between auto focus and manual focus.

Subject	Chart for flange back adjustment (Placed 2000 \pm 5 mm in front of the lens with illumination of 300 \pm 50 lux.)
Measurement Point	Confirm the focus on monitor TV.
Measuring Instrument	Confirm focus on monitor TV
Adjustment Page	F
Adjustment Address	3C 3D 3E 3F 40 41



(Chart for flange back adjustment)
(See Page 6-2)

Note : Confirm that the “Camera-shaking correction” and “Digital Zoom” are turned Off.
(CCD-TRV21/TRV21E)

Adjustment procedure:

Order	Page	Address	Data	Procedure
1				Check that the center of the flange back adjustment chart coincides with that of the display on the monitor at both ends: TELE end and the WIDE end of the zoom lens.
2	6	00	01	After setting the data, press the PAUSE button. (Preparation)
3				Confirm that the data at page F, address 1B is the initial value, referring to the “Page F address list”.
4	6	11		Confirm that the data is 00.
5	6	42	02	After setting the data, press the PAUSE button.
6	6	43	01	After setting the data, press the PAUSE button.
7	6	01	13	After setting the data, press the PAUSE button.
8	6	01	15	After setting the data, press the PAUSE button. The adjustment data is automatically input to page: F, addresses: 3C to 41.
9	6	11		Confirm that the data is 01.

Processing after Adjustments:

Order	Procedure
1	Turn the main power supply (7.2 V) OFF, then ON. (If this step is not performed, the camera will be out of focus.)

11. Flange back check

Subject	Siemens star (Placed 2000 ±5 mm in front of the lens with illumination of about 200 lux.)
Measurement Point	Confirm focus on monitor TV
Measuring Instrument	
Specification Value	Picture must have good focus at both TELE and WIDE ends.

Note 1: Confirm that the “Camera-shaking correction” and “Digital Zoom” are turned Off.

(CCD-TRV21/TRV21E)

Note 2: It is judged from the page A display on the adjustment remote commander if the picture has good focus while the auto focus is ON.

- 1) Set data: 0B to the page:6, address: 02.
- 2) Focus condition can be known from the page A display.

A: 00 : XX



See the right table.

(Bit 2 value 0 : Picture is out of focus.
 1 : Picture is in focus.)

In focus

Display on the adjustment remote commander	Bit values
	bit2
0	0
1	0
2	0
3	0
4	1
5	1
6	1
7	1
8	0
9	0
A(F)	0
B(b)	0
C(L)	1
D(d)	1
E(E)	1
F(F)	1

Adjustment procedure:

Order	Page	Address	Data	Procedure
1				Place a Siemens star at 2 meters in front of lens.
2				Decrease illumination to the chart down to a point before noise appears on monitor TV, in order to fully open the IRIS.
3	6	43	01	After setting the data, press the PAUSE button. (CCD-TRV21/TRV21E)
4				Shoot the Siemens star at TELE end.
5				Confirm that the image is in focus. (Note 2).
6	6	21	10	After setting the data, press the PAUSE button.
7				Shoot the Siemens star at WIDE end.
8				Confirm that the image is in focus.

Processing after Adjustments:

Order	Page	Address	Data	Procedure
1	6	02	00	After setting the data, press the PAUSE button.
2	6	21	00	After setting the data, press the PAUSE button. (END) (CCD-TRV11/TRV11E)
3	6	43	00	After setting the data, press the PAUSE button. (END) (CCD-TRV21/TRV21E)

12. Picture frame setting

Subject	Color bar chart standard picture frame
Measurement Point	VIDEO output terminal (Terminated in 75Ω)
Measuring Instrument	Oscilloscope and monitor TV
Specification Value	$A=B$, $C=D$, $t=0\pm 0.1\text{msec}$

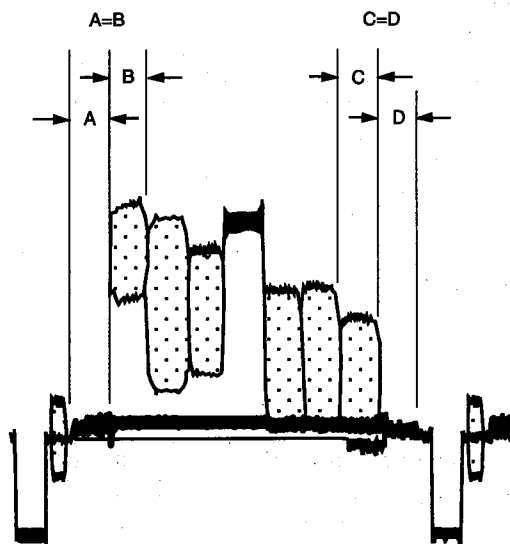
Note : Confirm that the "Camera-shaking correction" and "Digital Zoom" are turned Off.
(CCD-TRV21/TRV21E)

Setting procedure:

Order	Procedure
1	Turn OFF the auto focus.
2	Adjust the focus using the focus knob.
3	Adjust direction and zoom of camera so that the picture frame is adjusted as specified by Fig. 6-1-8 and Fig. 6-1-9.
4	Write down markings on the picture frame on the monitor screen. If the "color bar chart standard picture frame" or "white pattern standard picture frame" is specified in the following adjustment items, obtain this picture frame.

Confirm with an oscilloscope

1. Horizontal rate



2. Vertical rate

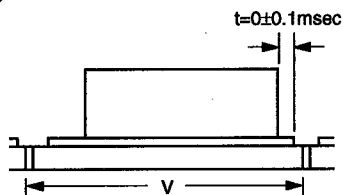


Fig. 6-1-8

Confirm on TV monitor (underscanned display)

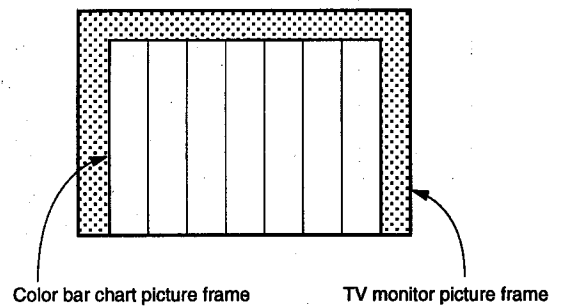


Fig. 6-1-9

13. Color reproduction adjustment

Purpose: Adjust the three primary color matrix coefficients for correct color reproduction.

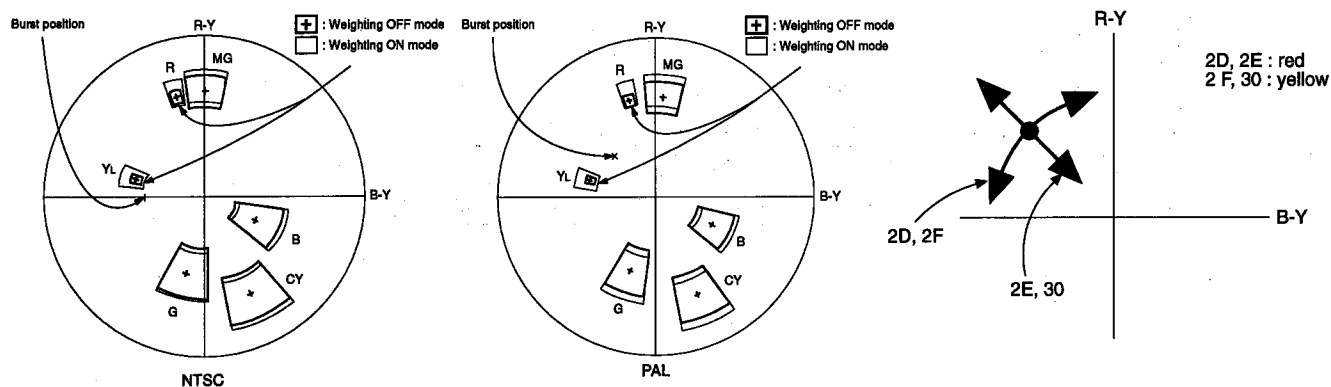
Adjustment error: Poor color reproduction.

Subject	Color bar chart standard picture frame
Measurement Point	VIDEO output terminal (Terminated in 75 Ω)
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	2D, 2E, 2F, 30
Specification Value	Each spot must be located within the specified color reproduction zone on a vectorscope display.

Note : Confirm that the "Camera-shaking correction" and "Digital Zoom" are turned Off.
(CCD-TRV21/TRV21E)

Adjustment procedure:

Order	Page	Address	Data	Procedure	Condition
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)	
2	6	03	00	After setting the data, press the PAUSE button. (Setting)	
3	6	01	37	After setting the data, press the PAUSE button.	
4	F	2D, 2E 2F, 30		Change the data so that each spot must be located within the specified color reproduction zone on a vectorscope display. Press the PAUSE button for each address.	Weighting OFF mode.



Processing after Adjustments:

Order	Page	Address	Data	Procedure
1	6	01	00	After setting the data, press the PAUSE button.
2	6	03	10	After setting the data, press the PAUSE button. (Setting)
3	6	42	00	After setting the data, press the PAUSE button. (CCD-TRV11E/TRV21E)
4	6	00	00	After setting the data, press the PAUSE button. (End)

Related Adjustments:

"Auto white balance reference data input"

"Auto white balance adjustment"

14. IRIS IN/OUT adjustment

Purpose: Measure the light level and write into EE
PROM for indoor/outdoor identification in
auto white balance.

Adjustment error: Incorrect white balance.

Subject	White pattern standard picture frame
Measurement Point	EVF or DDS display of monitor TV
Measuring Instrument	
Adjustment Page	F
Adjustment Address	3A 3B

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	02	21	After setting the data, press the PAUSE button.
3				Turn off the UNREG power supply once, then turn it on.
4	6	00	01	After setting the data, press the PAUSE button.
5	6	11		Confirm that the data is 00,,
6	6	01	4B	After setting the data, press the PAUSE button.
7	6	01	49	After setting the data, press the PAUSE button.
8	6	11		If data is 01, this is the end of data read.

Note : Confirm that the “Camera-shaking correction” and
“Digital Zoom” are turned Off.
(CCD-TRV21/TRV21E)

Processing after Adjustments:

Order	Page	Address	Data	Procedure
1	6	01	00	After setting the data, press the PAUSE button.
2	F	02	00	After setting the data, press the PAUSE button.
3				Turn off the UNREG power supply once, then turn it on.
4	6	00	00	After setting the data, press the PAUSE button. (End)

The page: A data appears on DDS of monitor TV.

15. MAX gain adjustment

Purpose: Sets the minimum illumination level.

Adjustment error: Normal video level cannot be obtained at low illumination (dark).

Subject	White pattern standard picture frame
Measurement Point	VIDEO output terminal (Terminated in 75 Ω)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	2C
Specification Value	A = 600 \pm 10 mV

Note : Confirm that the "Camera-shaking connection" and "Digital Zoom" are turned Off.
(CCD-TRV21/TRV21E)

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	6	01	19	After setting the data, press the PAUSE button.
3	F	2C		Change data using PLAY and STOP buttons so that the Y signal level (A) satisfies the specification. The data which satisfies the Y signal level (A) is called "D2c".
4	F	2C		Set the data "D2c" and press the PAUSE button.

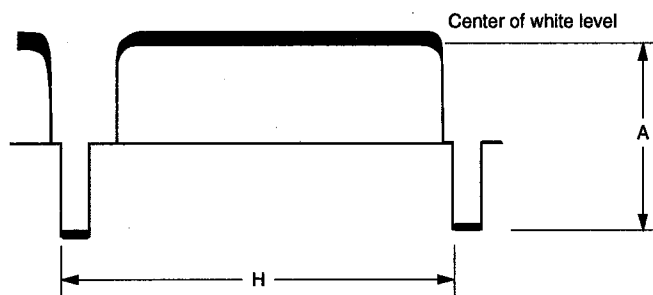


Fig. 6-1-10.

Processing after Adjustments:

Order	Page	Address	Data	Procedure
1	6	01	00	After setting the data, press the PAUSE button.
2	6	00	00	After setting the data, press the PAUSE button. (End)

16. Auto white balance reference data input

Subject	White pattern standard picture frame
Adjustment Page	F
Adjustment Address	33, 34, 35, 36

Note 1: Confirm that the “Camera-shaking correction” and
“Digital Zoom” are turned Off.
(CCD-TRV21/TRV21E)

Note 2: The “Color reproduction adjustment” must have been
completed before making this adjustment.

Adjustment procedure:

Order	Page	Address	Data	Procedure
1				Turn the main power OFF then to ON.
2				Shoot a white pattern with the standard picture frame.
3	6	00	01	After setting the data, press the PAUSE button.
4	6	11		Confirm that data is 00.
5	6	01	11	After setting the data, press the PAUSE button.
6	6	01	0D	After setting the data, press the PAUSE button. (Executes the auto white balance reference data input.)
7	6	11		If data is 01, this is the end of data read.

Processing after Adjustments:

Order	Page	Address	Data	Procedure
1	6	01	00	After setting the data, press the PAUSE button.
2				Execute “Auto white balance adjustment”.
3	6	00	00	After setting the data, press the PAUSE button. (End)

Related Adjustments:

Auto white balance adjustment

17. Auto white balance adjustment

Purpose: Adjust for correct auto white balance.

Adjustment error: Poor color reproduction.

Subject	White pattern standard picture frame
Filter	Color temperature correction filter C14
Measurement Point Measuring Instrument	EVF or DDS display on monitor TV
Adjustment Page	F
Adjustment Address	38 39
Specification Value	R ratio $2A80 \pm 40h$ B ratio $5E80 \pm 80h$

Note 1: Make this adjustment after “Auto white balance reference data input” is completed.

Note 2: Confirm that the “Camera-shaking correction” and “Digital Zoom” are turned Off.
(CCD-TRV21/TRV21E)

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation 1)
2	F	02	21	After setting the data, press the PAUSE button. (Preparation 2)
3				Turn off the UNREG power supply once, then turn it on.
4	6	00	01	After setting the data, press the PAUSE button.
5	6	01	35	After setting the data, press the PAUSE button.
6	6	02	04	After setting the data, press the PAUSE button. Sets the R ratio display mode.
7	F	38		Change data using the PLAY and STOP buttons until the <u>R ratio data</u> on the DDS display becomes the specification value. R ratio data = $2000h + 10h \times D_{F5}$ (D_{F5} = Page F, Address: F5 data)
8	6	02	05	After setting the data, press the PAUSE button. Sets the B ratio display mode.
9	F	39		Change data using the PLAY and STOP buttons until the <u>B ratio data</u> on the DDS display becomes the specification value. B ratio data = $80h + 100h \times D_{F6}$ (D_{F6} = Page F, Address: F6 data)
10				Press the PAUSE button.

Processing after Adjustments:

Order	Page	Address	Data	Procedure
1	6	01	00	After setting the data, press the PAUSE button.
2	6	02	00	Releases the B ratio display mode.
3	F	02	00	After setting the data, press the PAUSE button. (End 2)
4				Turn off the UNREG power supply once, then turn it on.
5	6	00	00	After setting the data, press the PAUSE button. (End 1)

18. White balance check

Subject	White pattern standard picture frame
Filter	Color temperature correction filter C14 ND filter 1.0 and 0.3
Measurement Point	VIDEO output terminal (Terminated in 75Ω)
Measuring Instrument	Vectorscope
Specification Value	Fig. 6-1-11. A ~ C

Note : Confirm that the "Camera-shaking correction" and
"Digital Zoom" are turned Off.
(CCD-TRV21/TRV21E)

Check procedure:

Order	Page	Address	Data	Procedure	Condition
1				Check that the lens is not covered by either filter.	
2	6	01	0F	After setting the data, press the PAUSE button.	
3				Check that the white luminance point is located within the circle shown in Fig. A.	Without filter.
4	6	01	00	After setting the data, press the PAUSE button.	
5	6	01	23	After setting the data, press the PAUSE button.	
6				Put the C14 filter on the lens.	
7				Check that the white luminance point is located within the circle shown in Fig. B.	C14 filter.
8				Remove the C14 filter and put ND filter 1.3 (1.0 + 0.3) on the lens.	
9				Check that the white luminance point is located within the circle shown in Fig. C.	ND Filter 1.3

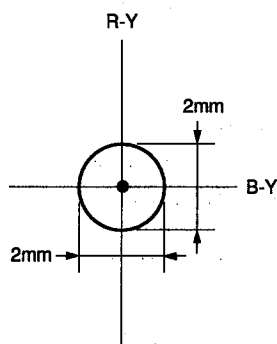


Fig. 6-1-11. A

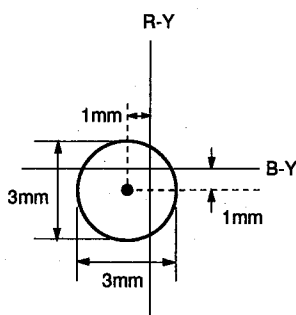


Fig. 6-1-11. B

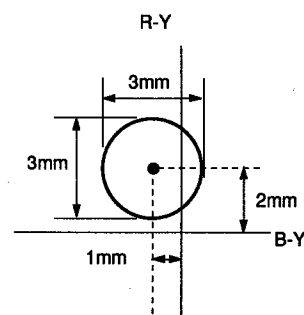


Fig. 6-1-11. C

Processing after Adjustments:

Order	Page	Address	Data	Procedure
1	6	01	00	After setting the data, press the PAUSE button.
2	6	00	00	After setting the data, press the PAUSE button.

[CCD-TRV21/TRV21E MODEL]

19. Camera-shaking correction adjustment

The "Camera-shaking correction adjustment" is necessary only when the angular speed sensor is replaced. If microprocessors or circuit is replaced or repaired, this adjustment is not necessary. Make operation check only.

Subject	
Measurement Point	VIDEO output terminal (Terminated in 75 Ω)
Measuring Instrument	Oscilloscope or TV monitor
Adjustment Page	F
Adjustment Address	42 43
Specification Value	Horizontal residual vibration $\leq 0.5\mu\text{sec}$ Vertical residual vibration $\leq 0.2\text{msec}$

Note 1: Caution when replacing parts

The two types of parts: ENC05EA and ENC05EB are supplied. Use the same type of sensor as that of the defective sensor. If different type of either ENC05EA or ENC05EB is used, picture can vibrate vertically or horizontally during camera-shake correction. After replacement, make adjustment as described.

Note 2: Caution on angular speed sensor

The angular speed sensor has high precision vibrator inside. If the sensor is dropped, balance of the vibrator is lost resulting in faulty operation. Handle the sensor carefully.

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	6	42	07	After setting the data, press the PAUSE button.
3	6	01	3F	After setting the data, press the PAUSE button.
4				Obtain the vertical data from the following equation using the value indicated on SE650 of the TZ-5 board as the sensor sensitivity value. (Result of calculation must be converted to hexadecimal value.) [Vertical data] Hex = $\frac{148d}{\text{sensor sensitivity value}} \times [\text{Hex}]$
5	F	42		Set the [Vertical data] Hex value to the page F, address 42 and press the PAUSE button.
6				Obtain the horizontal data from the following equation using the value indicated on SE651 of the TZ-5 board as the sensor sensitivity value. (Result of calculation must be converted to hexadecimal value.) [Horizontal data] Hex = $\frac{121d}{\text{sensor sensitivity value}} \times [\text{Hex}]$
7	F	43		Set the [Horizontal data] Hex value to the page F, address 43 and press the PAUSE button.
8				Confirm that "Camera-shaking correction adjustment" works correctly.
9	6	00	00	After setting the data, press the PAUSE button. (End)
10	6	42	00	After setting the data, press the PAUSE button.
11	6	01	00	After setting the data, press the PAUSE button.

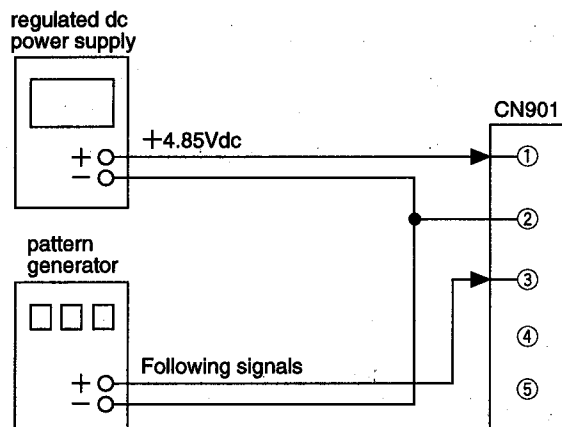
Note : Phase of the residual vibration must be in the same phase as that while no correction is applied.

20. Electronic viewfinder system adjustments (VF-102 board)

Note : About 2200V dc is applied to CRT anode and about 200 Vdc to the grid. Be careful not to touch them. If hand touches them, there is danger of electric shock.

Preparation :

1. Disconnect a flexible board from CN901 on VF-102board.
2. Connect equipments as follows.



Required signals

() : CCD-TRV11E/TRV21E

1. Monoscope signal

Output amplitude: 1.0 V p-p (75Ω terminated)
Horizontal resolution: 600 TV lines or more
Vertical resolution: 350 TV lines or more

2. Dot pattern signal

Output amplitude 1.0 V p-p (75Ω terminated)

3. Contrast signal

Output amplitude 0.5 V p-p (75Ω terminated)
fH: 15.750kHz (15.625kHz)
fV: 60Hz (50Hz)

Others: Complies with NTSC (PAL). (Refer to Fig. 6-1-12.)

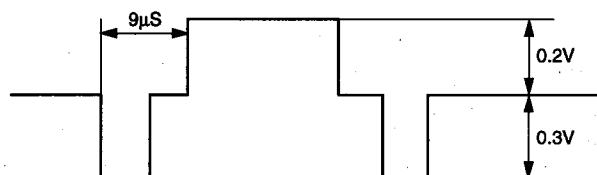


Fig. 6-1-12

20-1. Power supply voltage check

Measuring Instrument	Digital voltmeter
EVF5V	
Measurement Point	CN901 Pin ①
Specification Value	4.85 ± 0.01 Vdc

20-2. Horizontal and vertical position

Purpose: Maintains horizontal position.

Adjustment error: Horizontal position cannot be maintained.

Signal	Monoscope signal
Adjustment	
Specification Value	Overscan $7 \pm 3\%$ (horizontal) (one side) Overscan $7 \pm 5\%$ (vertical) (one side)

Adjustment procedure:

Order	Procedure
1	Confirm that the horizontal and vertical picture sizes satisfy the specification values.

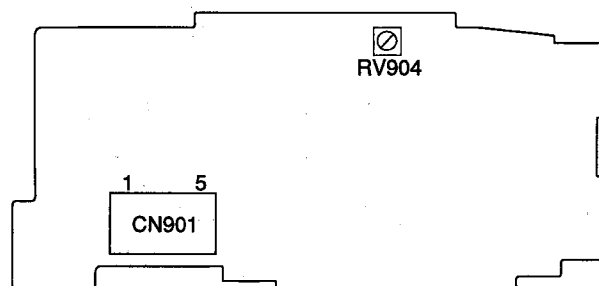
20-3. BRIGHT adjustment

Signal	Contrast signal
Adjustment	RV904
Specification Value	19 ± 4 cd/m ²

Adjustment procedure:

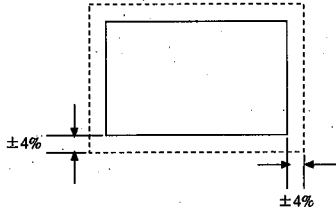
Order	Procedure
1	Brightness of the dark portion of the contrast signal satisfies the specification value.
2	Check by inputting the character generator signal that too much halation does not exist.

VF-102 BOARD (SIDE A)



20-4. Centering adjustment

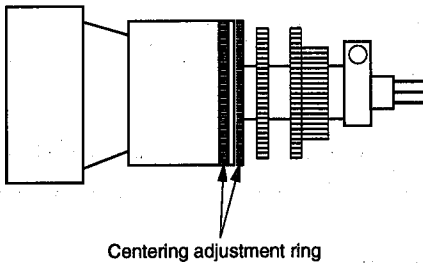
Signal	Monoscope signal
Adjustment	DY centering
Specification Value	$\pm 4\%$



Adjustment procedure:

Order	Data Procedure
1	Adjust DY centering adjustment ring so that margins at top, bottom, right and left are equal.

Note : The centering position is affected by earth magnetism. Rotate the camera 360 degrees and find the amount of centering change. Make the adjustment to the center of the change.



20-5. Focus adjustment

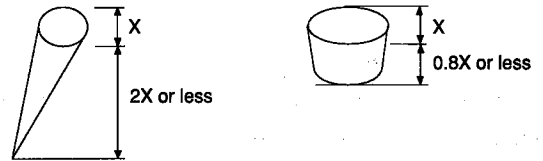
Signal	Monoscope signal
Adjustment	DY focus ring
Specification Value	Horizontal resolution is 350 lines or more.

Adjustment procedure:

Order	Procedure
1	Adjust focus ring for optimum focus. Confirm that the horizontal resolution satisfies the specification.

20-6. Diffraction adjustment

Signal	Dot pattern, Monoscope signal
Adjustment	DY diffraction adjustment ring
Specification Value	Refer to the illustration below.



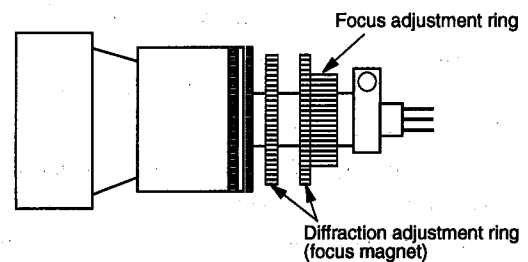
Adjustment procedure:

Order	Procedure
1	Adjust the diffraction adjustment ring so that tail of a dot must be smaller than 2 times of dot diameter, or the fan-shaped diffraction must smaller than the dot diameter.
2	If the focus and centering are affected by this adjustment, input monoscope signal and repeat focus and centering adjustments.

Related Adjustments:

Focus adjustment

Centering adjustment



21. LCD system adjustments (PD-67 board)

Note 1: The backlight (fluorescent lamp) is driven by high voltage AC power supply.

Therefore, be careful not to touch the back light holder with hand or you will receive an electric shock.

Note 2: When replacing the LCD unit, be careful not to damage the LCD unit with static electricity.

Note 3: Set the BRIGHT knob to the center click position.

[Adjustment connector]

Most measurement points of the LCD adjustment are concentrated at the CN301 of the PD-67 board. Connect the measuring equipment to CN301 via the measuring pin tool. The following table shows the pin numbers and signal names of CN301.

Pin No.	Signal Name	Pin No.	Signal Name
1	VR	2	VG
3	VB	4	HDB
5	GND	6	SRT
7	SYNC	8	N.C.
9	-7.5V		

- Multi CPC Parts code: J-6082-311-A
- Alignment tape
NTSC (CCD-TRV11/TRV21) :
WR5-4NL (8-967-995-51)
PAL (CCD-TRV11E/TRV21E) :
WR5-4CL (8-967-995-56)

[Video input signal for adjustment]

If the signal column specifies the "Color bar signal with the chroma and burst signals turned OFF", input the color bar signal whose chroma and burst signals are turned OFF. Confirm that the signal level at SD-21 board CN102 pin ⑦ has 1.00Vp-p before starting adjustment.

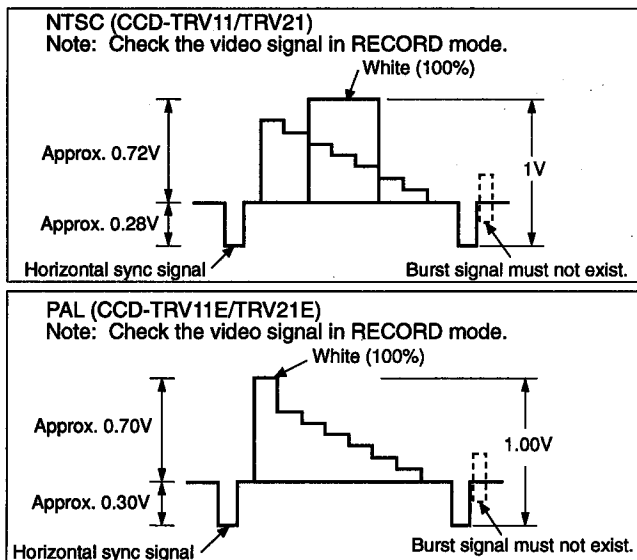


Fig. 6-1-13 Color bar signal with chroma and burst signals switched OFF.

[Power supply voltage adjustment]

Adjust the power supply voltage to be input to the battery terminal so that the voltage across PD-67 board CN303 pins ⑩ (LCD UNREG) and pins ⑪ or ⑫ (UNREG GND) is 6.5 ± 0.1 Vdc.

Power supply voltage check (PD-67, SD-21 boards)

Subject	Any subject
Measuring equipment	Digital voltmeter
DAC 3.1V check	
Measurement point	CN102 Pin ⑤ (SD-21)
Specification	3.1 ± 0.1 Vdc (GND : CN102 Pin ⑥)
LCD 4.9V check	
Measurement point	CN303 Pin ⑥ (PD-67)
Specification	4.85 ± 0.05 Vdc (GND : CN303 Pin ⑦)
LCD UNREG check	
Measurement point	CN303 Pin ⑩ (PD-67)
Specification	6.5 ± 0.1 Vdc (GND : CN303 Pin ⑪ or ⑫)

21-1. EVR initial data input

Mode	Stop
Signal	Any signal
Adjustment page	F

Note : Do not rewrite the EE PROM data except when it is necessary such as replacement of SD-21 board IC101.

Adjustment procedure:

() : CCD-TRV11E/TRV21E

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	D8 D9 DA DB DC DD DE DF E0 E1 E2 E3	BA(00) B5(60) 70(6A) 85 80 65(7A) 8A(C0) AA 74 74 90 70	After setting the data, press the PAUSE button.
3	6	00	00	After setting the data, press the PAUSE button. (End)

21-2. -7.5V adjustment

Mode	Record
Signal	Color bar signal with the chroma and burst signal switched OFF.
Measurement point	PD-67 board CN301 pin ⑨ (-7.5V)
Measuring equipment	Digital voltmeter
Adjustment page	F
Adjustment address	E3
Specification	$A = -7.5 \pm 0.1 \text{Vdc}$

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	E3		Change data using the PLAY and STOP buttons so that the voltage goes to the specification value.
3				Press the PAUSE button.
4	6	00	00	After setting the data, press the PAUSE button. (End)

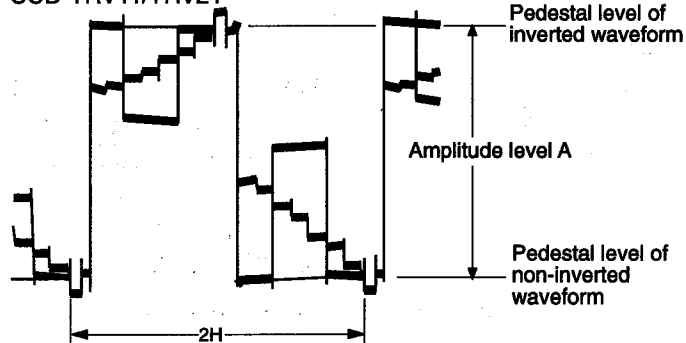
21-3. BRIGHT adjustment

Purpose: Adjusts video signal level to drive the LCD panel.

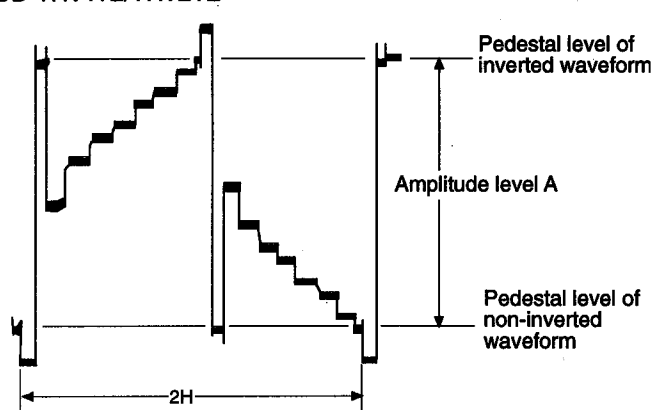
Adjustment Error: Picture on LCD will be white saturated or black compressed.

Mode	Record
Signal	Color bar signal with the chroma and burst signal switched OFF.
Measurement point	PD-67 board CN301 pin ② (VG)
Measuring equipment	Oscilloscope [External trigger: IC302 pin ⑪ (FRP)]
Adjustment page	F
Adjustment address	D8
Specification	$A = 3.20 \pm 0.05 \text{V}$

CCD-TRV11/TRV21



CCD-TRV11E/TRV21E



Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	D8		Change data using the PLAY and STOP buttons until the VG signal amplitude (A) has the specification value.
3				Press the PAUSE button.
4	6	00	00	After setting the data, press the PAUSE button. (End)

Note: The adjustment data must be within the range from 41 to BF.

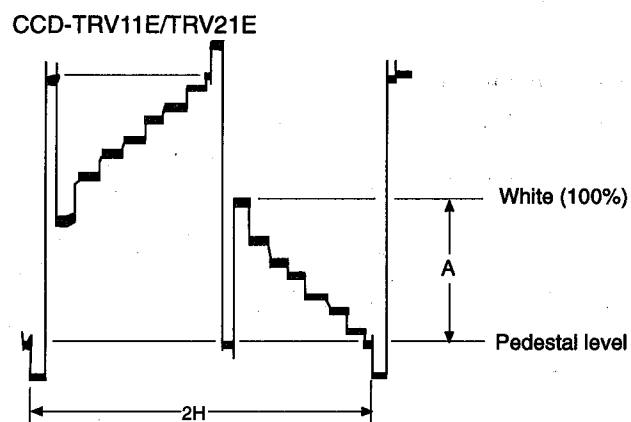
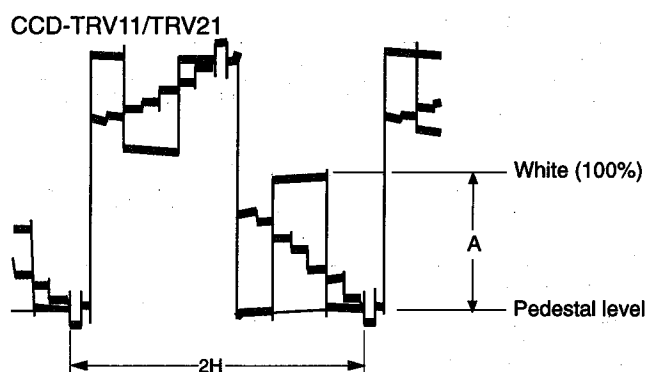
Related Adjustment: CONTRAST adjustment

21-4. CONTRAST adjustment

Purpose: Adjusts contrast of LCD picture

Adjustment Error: Details of black will be lost, or white saturated/black compressed picture.

Mode	Record
Signal	Color bar signal with chroma and burst signals switched OFF.
Measurement point	PD-67 board CN301 pin ② (VG)
Measuring equipment	Oscilloscope [External trigger: IC302 pin ⑪ (FRP)]
Adjustment page	F
Adjustment address	DD
Specification	$A=3.10\pm0.05V$



Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	DD		Change data using the PLAY and STOP buttons until the amplitude (A) has the specification value.
3				Press the PAUSE button.
4	6	00	00	After setting the data, press the PAUSE button. (End)

Note: After this adjustment, check BRIGHT of viewfinder.

If it is incorrect, adjust it again.

Related Adjustment: BRIGHT adjustment

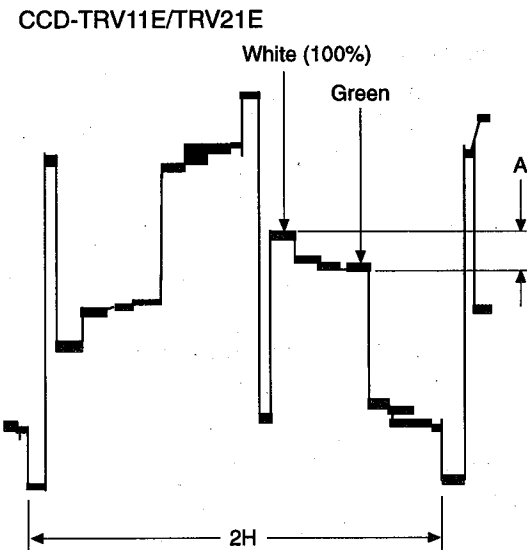
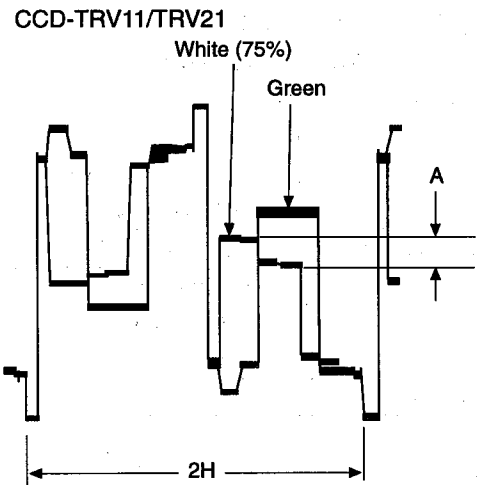
21-5. COLOR adjustment

Purpose: Adjusts color for standard level.

Adjustment Error: Color will be too much or too small.

() : CCD-TRV11E/TRV21E

Mode	Record
Signal	Color bar signal (with chroma and burst signals)
Measurement point	PD-67 board CN301 pin ② (VG)
Measuring equipment	Oscilloscope [External trigger: IC302 pin ⑪ (FRP)]
Adjustment page	F
Adjustment address	D9
Specification	A=0.00±0.05V (−0.50±0.05V)



Adjustment procedure:

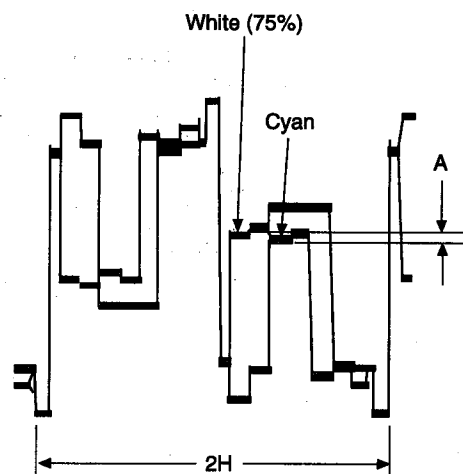
Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	D9		Change data using the PLAY and STOP buttons until the amplitude (A) has the specified value.
3				Press the PAUSE button.
4	6	00	00	After setting the data, press the PAUSE button. (End)

21-6. HUE adjustment (CCD-TRV11/TRV21)

Purpose: Adjust for standard hue.

Adjustment Error: Unnatural hue.

Mode	Record
Signal	Color bar signal (with chroma and burst signals)
Measurement point	PD-67 board CN301 pin ② (VG)
Measuring equipment	Oscilloscope [External trigger: IC302 pin ⑪ (FRP)]
Adjustment page	F
Adjustment address	DA
Specification	A=0.00±0.05V



Adjustment procedure:

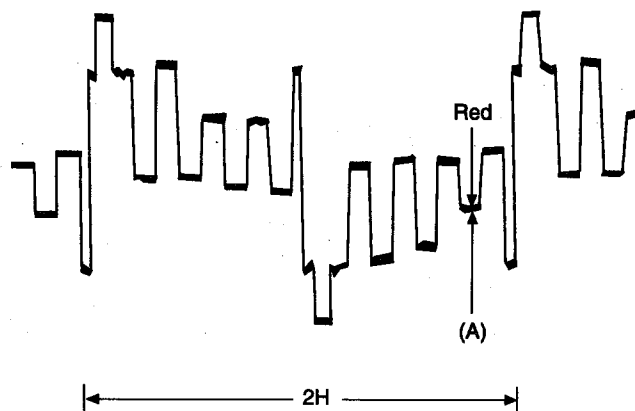
Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	DA		Change data using the PLAY and STOP buttons until the amplitude (A) has the specified value.
3				Press the PAUSE button.
4	6	00	00	After setting the data, press the PAUSE button. (End)

21-7. BURST CLEANING adjustment (CCD-TRV11E/TRV21E)

Purpose: Adjust for standard hue.

Adjustment Error: Unnatural hue.

Mode	Record
Signal	Color bar signal (with chroma and burst signals)
Measurement point	PD-67 board CN301 pin ③ (VB)
Measuring equipment	Oscilloscope [External trigger: IC302 pin ⑪ (FRP)]
Adjustment page	F
Adjustment address	DA
Specification	Minimum amplitude of the flicker of the red position.



Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	DA		Change data using the PLAY and STOP buttons until the amplitude (A) has the specified value.
3				Press the PAUSE button.
4	6	00	00	After setting the data, press the PAUSE button. (End)

21-8. V. COM adjustment

Purpose: Adjusts for correct voltage of the DC bias voltage of the common electrode signal of the LCD panel.

Adjustment Error: Details of the LCD picture will be lost.
Flicker occurs easily. Vertical stripes will appear.

Mode	Playback PAUSE
Signal	Alignment tape: color bar for operation check segment (WR5-4CL/4NL)
Measurement point	To be confirmed on LCD display
Measuring equipment	
Adjustment page	F
Adjustment address	DF

Adjustment procedure:

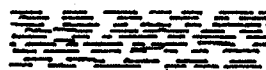
Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2				Establish the PB PAUSE state using operation keys of the camera.
3	F	DF		Change data using the PLAY and STOP buttons of the adjustment remote commander and observe the noise bar portion. Find the noise bar showing noise similar to head clogging. Keep pressing the PLAY button until black dots can be seen clearly. This data is D_A . Then keep pressing the STOP button until black dots can be seen clearly. This data is D_B .
4				Convert the D_A and D_B to the decimal value which are D_A' and D_B' . (Refer to Table 7-5-2.) [Conversion Table between hexadecimal and decimal values]. Then calculate D_C' using the equation $D_C' = (D_A' + D_B') \div 2$
5	F	DF		Set data to D_C and press the PAUSE button.
6	6	00	00	After setting the data, press the PAUSE button. (End)

Note: This adjustment must be executed after the BRIGHT and CONTRAST adjustments are completed.

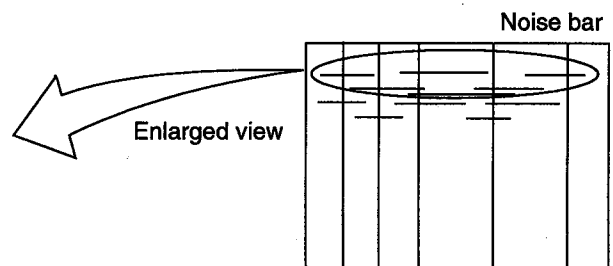
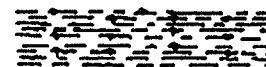
Keep pressing the PLAY button.



Find the noise bar showing noise similar to head clogging.



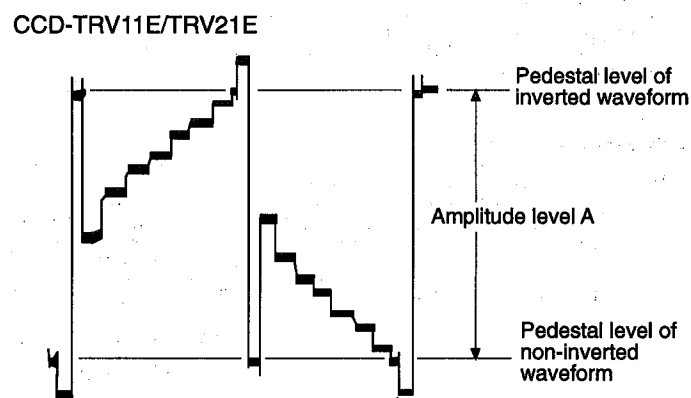
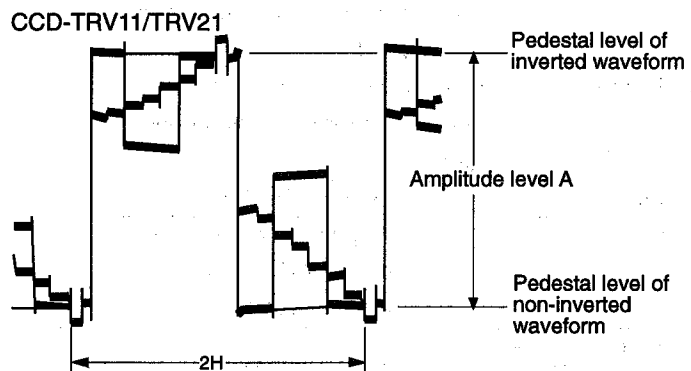
Keep pressing the STOP button.



21-9. White balance preset adjustment (1)

Purpose: Make the preliminary adjust before the white balance final adjustment

Mode	Record
Signal	Color bar signal with chroma and burst signals switched OFF
Measurement point	CH1: PD-67 board CN301 pin ② (VG) CH2: PD-67 board CN301 pin ① (VR)
Measuring equipment	Oscilloscope [External trigger: IC302 pin ⑪ (FRP)]
Adjustment page	F
Adjustment address	DB
Specification	Difference of amplitude between the VR and VG signals= $0\pm0.1V$



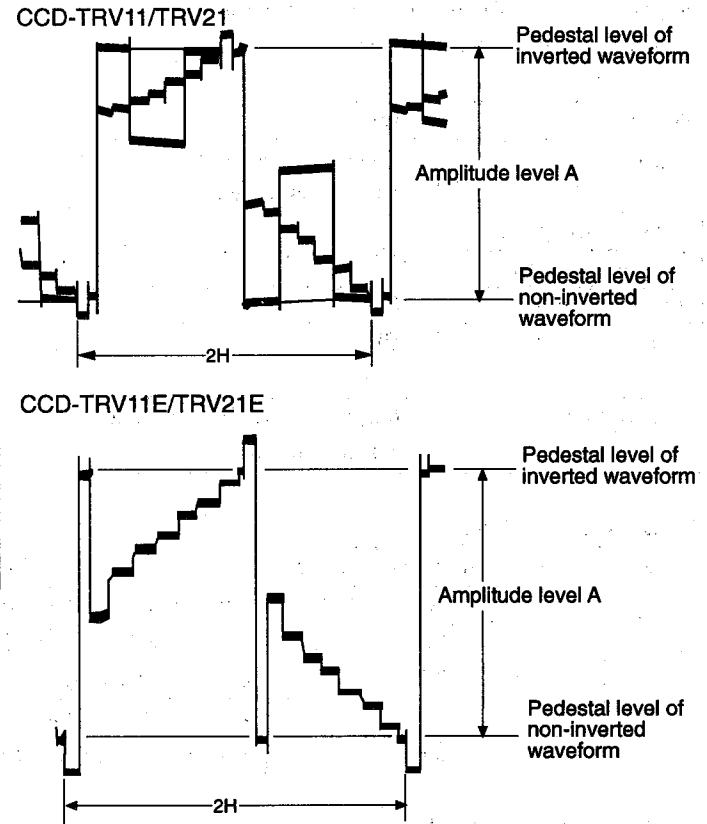
Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	DB		Change the B3 data using the PLAY and STOP buttons until the VR and VG signals have the same amplitude.
3				Press the PAUSE button.
4	6	00	00	After setting the data, press the PAUSE button. (End)

21-10. White balance preset adjustment (2)

Purpose: Make the preliminary adjust before the white balance final adjustment

Mode	Record
Signal	Color bar signal with chroma and burst signals switched OFF
Measurement point	CH1: PD-67 board CN301 pin ② (VG) CH2: PD-67 board CN301 pin ③ (VB)
Measuring equipment	Oscilloscope [External trigger: IC302 pin ⑪ (FRP)]
Adjustment page	F
Adjustment address	DC
Specification	Difference of amplitude between the VB and VG signals= $0\pm0.1V$



Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	00	After setting the data, press the PAUSE button. (Preparation)
2	F	DC		Change the B4 data using the PLAY and STOP buttons until the VR and VG signals have the same amplitude.
3				Press the PAUSE button.
4	6	00	00	After setting the data, press the PAUSE button. (End)

21-11. White balance adjustment

Purpose: Adjust for correct white balance.

Adjustment Error: Color reproduction on LCD display will be poor.

Mode	Record
Signal	Color bar signal with chroma and burst signals switched OFF
Measurement point	To be confirmed on LCD display
Measuring equipment	
Adjustment page	F
Adjustment address	DB DC
Specification	Image on the LCD display must not have any color.

Note1: Start adjustment within 30 ± 5 seconds after the back-light turns ON.

Note2: During adjustment, the LCD protection film must be peeled off.

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	DB DC		Change the DB and DC data using the PLAY and STOP buttons until the image on the LCD display has no color.
3				Press the PAUSE button.
4	6	00	00	After setting the data, press the PAUSE button. (End)

21-12. VCO adjustment

Purpose: Sets the VCO free-run frequency.

Adjustment Error: Incorrect picture on EVF

(): CCD-TRV11E/TRV21E

Mode	Stop
Signal	No signal
Measurement point	CN301 pin ④ (HDB)
Measuring equipment	Frequency counter
Adjustment page	F
Adjustment address	DE
Specification	$f=15734 \pm 30\text{Hz}$ ($15625 \pm 30\text{Hz}$)

Adjustment procedure:

Order	Page	Address	Data	Procedure
1				Press the DATA SCREEN button of the remote commander to disappear the display.
2	6	00	01	After setting the data, press the PAUSE button. (Preparation)
3	F	DE		Change data using the PLAY and STOP buttons until the oscillating frequency satisfies the specification.
4				Press the PAUSE button.
5	6	00	00	After setting the data, press the PAUSE button. (End)

21-13. Horizontal display position adjustment

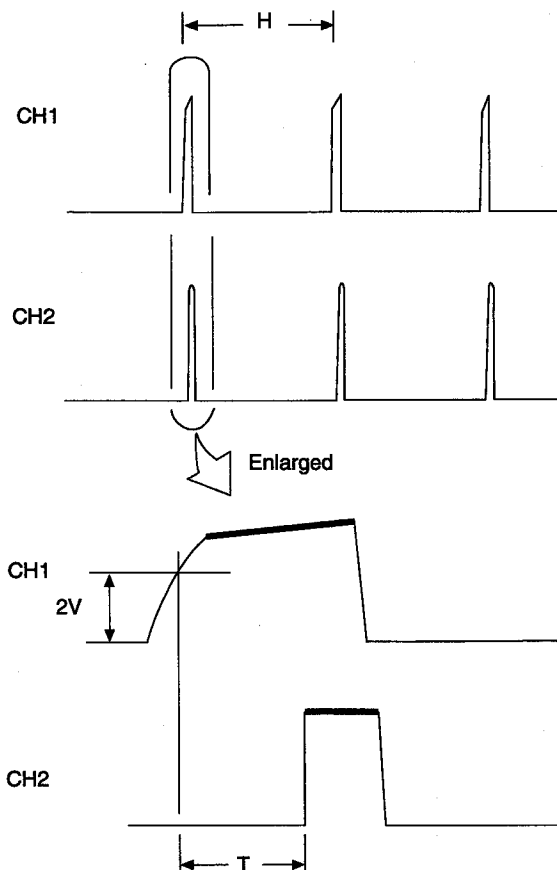
Purpose: Adjusts the horizontal position of picture on LCD display.

Adjustment Error: Picture position will be shifted left or right.

(): CCD-TRV11E/TRV21E

Mode	Record
Signal	Color bar signal
Measurement point	CH1: PD-67 board CN301 pin ⑦ (SYNC) CH2: PD-67 board CN301 pin ⑥ (SRT)
Measuring equipment	Oscilloscope
Adjustment page	F
Adjustment address	E2
Specification	$T=1.2\pm0.1\mu\text{sec}$ ($0.5\pm0.1\mu\text{sec}$)

Note: Set the LCD so that it is directed toward the lens.
(The waveform is different depending upon direction.)

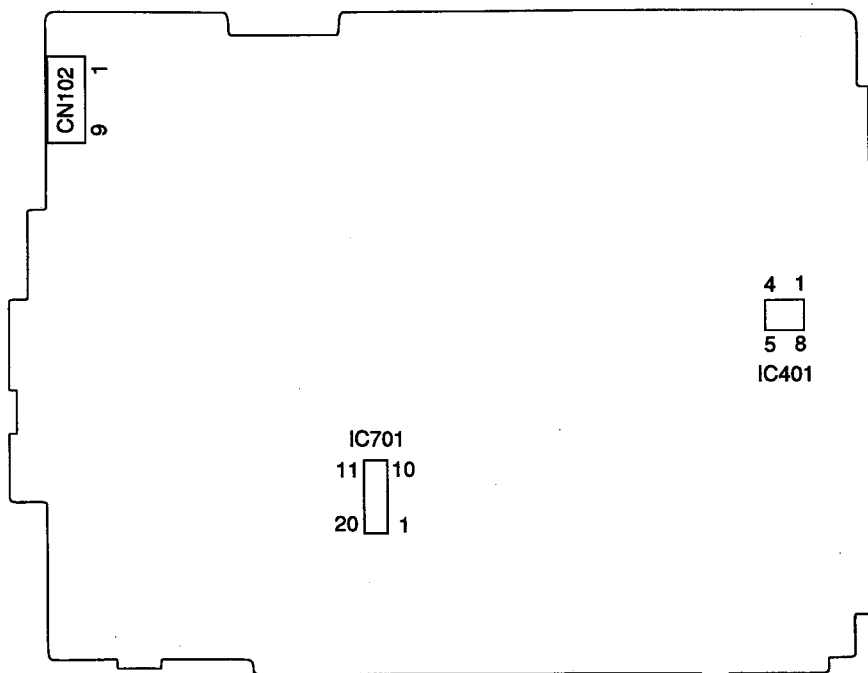


Adjustment procedure:

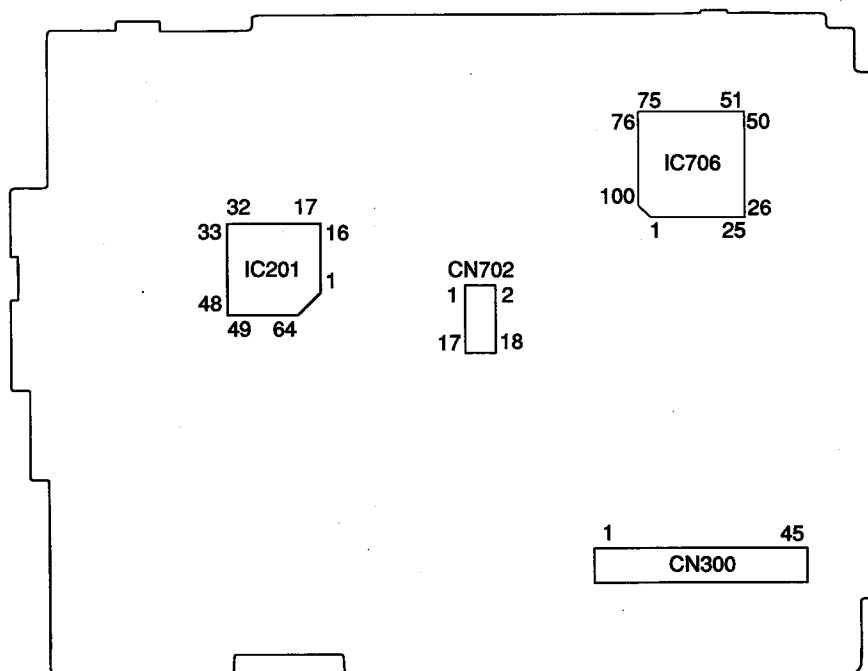
Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	E2		Change data using the PLAY and STOP button until the delay time "T" satisfies the specification.
3				After setting the data, press the PAUSE button.
4	6	00	00	After setting the data, press the PAUSE button. (End)

ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

VC-167 BOARD (SIDE A)



VC-167 BOARD (SIDE B)



6-2. MECHANISM SECTION ADJUSTMENTS

Refer to the separate "8 mm Video Mechanism Section Adjustment Manual VI B Mechanism" for adjustment, check procedure and mechanical parts replacement.

2-1. HOW TO OPERATE THE MECHANISM AFTER THE CASSETTE COMPARTMENT IS REMOVED

1. How to load a cassette tape:

- 1) Refer to "1. Disassembly" and turn the main power on with the cabinet and camera section removed. (It enables to operate the mechanical deck.)
- 2) Connect the adjustment remote commander and set the NORM - ADJUST (HOLD) switch to ADJUST (ON) position.
- 3) Check that the main power is being supplied.
- 4) Select page: 6, address: 00, set data :01 and press the PAUSE button.
- 5) Select page: F, address: 02, set data: 01 and press the PAUSE button.
- 6) Turn off the power supply once, then turn it on.
- 7) Set the NORM - ADJUST (HOLD) switch to NORM (OFF) position. (The adjustment remote commander can be disconnected hereafter.)

- 8) Press the push-switch-1 knob in the direction of arrow which sets the machine into loading mode.

★ PB, FF/REW and CUE/REV operations are possible.

- 9) After completing all steps of above operation, be sure to perform "4. Processing after operation".

2. How to establish RECORD mode:

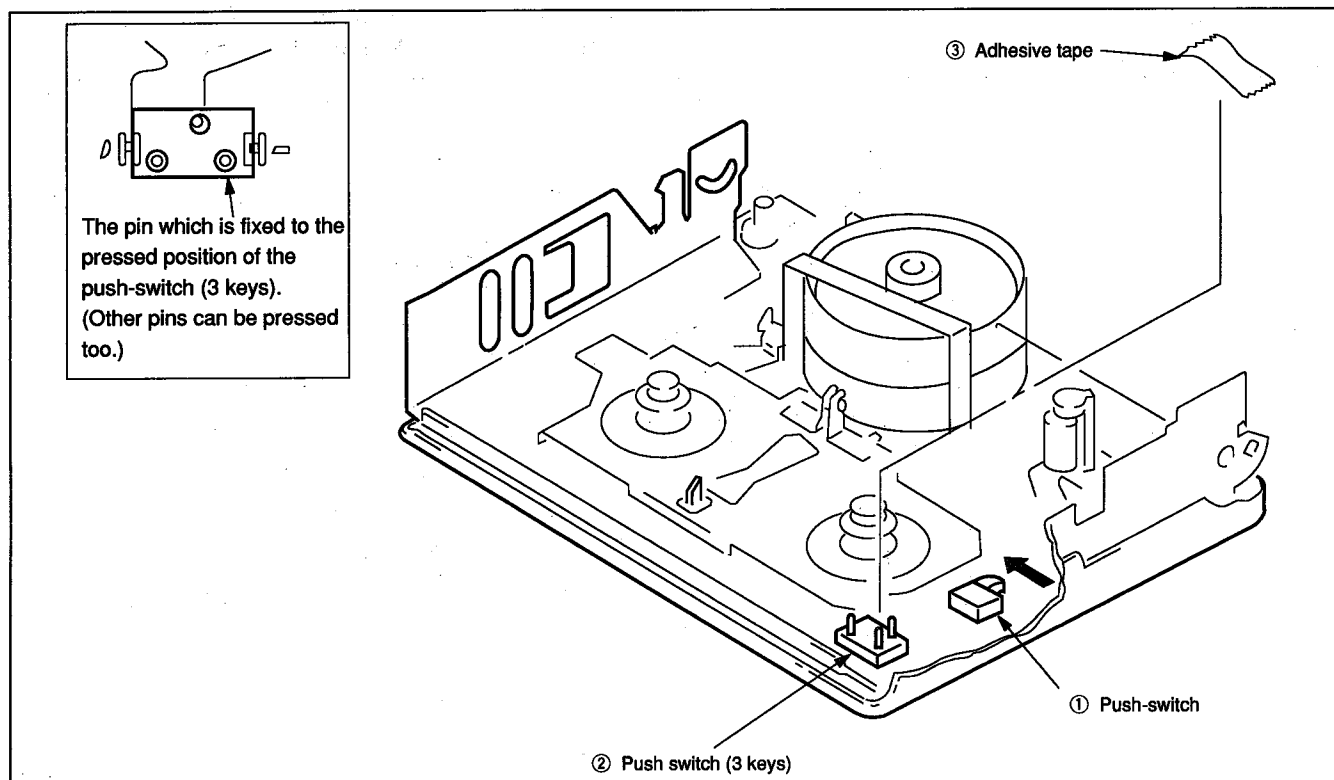
- 1) Press pin of the push-switch 2 (ON state) and keep the ON state by fixing with adhesive tape.
- 2) Turn the main power switch ON (select VTR or CAMERA position of camera).
- 3) Set the RECORD switch to ON.
(When the test mode is selected, the rotation detection of the S and T reel tables is muted, and the top end sensor is disable which allow to run the tape.)

3. How to eject a cassette tape:

- 1) Press the EJECT switch to ON.

4. Processing after operation

- 1) Connect the adjustment remote commander and set the NORM - ADJUST (HOLD) switch to ADJUST (ON) position.
- 2) Select page 6, address: 00, set data: 01 and press the PAUSE button.
- 3) Select page: F, address: 02, set data: 00 and press the PAUSE button.
- 4) Remove the power supply to the machine.



2-2. TAPE PATH ADJUSTMENT

Purpose: Adjusts the head linearity.

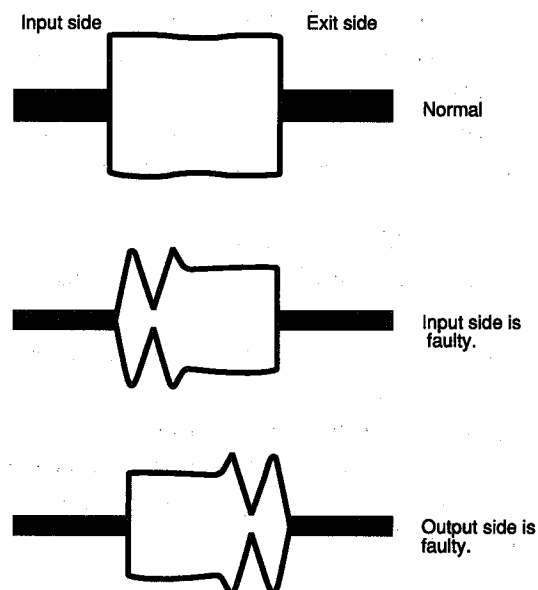
Adjustment Error: Noise appears on top and bottom of display when playing back the tape recorded by other machines.

1. Preparations for adjustments

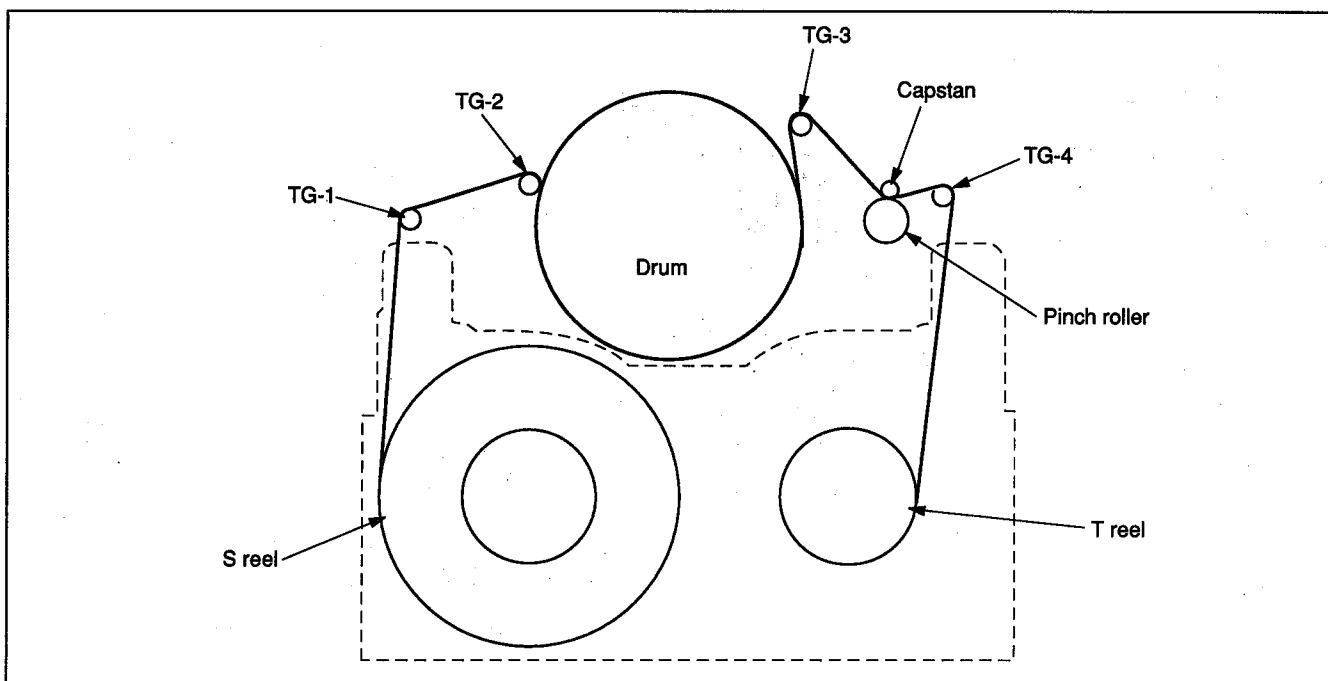
- 1) Clean the tape running surface (tape guide, drum, capstan, pinch roller).
- 2) Connect the adjustment remote commander to the LANK terminal (CF-42 board J480).
- 3) Set the NORM - ADJUST (HOLD) switch to ADJUST (ON) position.
- 4) Check that the main power is being supplied.
- 5) Select page: 6, address: 00, set data :01 and press the PAUSE button.
- 6) Select page: F, address: 02, set data: 03 and press the PAUSE button.
- 7) Turn off the power supply once, then turn it on.
- 8) Connect an oscilloscope.
CH1: VC-167 board CN102 pin ①.
External trigger: VC-167 board CN102 pin ③.
- 9) Playback the tracking alignment tape (WR5-1CP/1NP).*
- 10) Check to see that RF waveform is flat at input and exit sides on oscilloscope.
If it not flat. Tape Path Adjustment" of the 8 mm Video Mechanism Section Adjustment Manual VII **B Mechanism**.
- 11) After completing the adjustment, perform "2-1-4. Processing after operation".

VC-167 board CN102

1	PB RF
2	REC 2
3	GND
4	EMPH IN
5	CAM Y IN
6	DEEMPH OUT
7	BPF ADJ
8	RF SWP
9	CAP FG



* WR5-1NP : NTSC (CCD-TRV11/TRV21)
WR5-1CP : PAL (CCD-TRV11E/TRV21E)



6-3. VIDEO SECTION ADJUSTMENT

When performing adjustments, refer to the layout diagrams for adjustment related parts beginning from page 6-74.

Perform the video section adjustment in the sequence as described.

[Adjustment sequence]

- 1) Servo system adjustment
 - 1.SYNC LEVEL/BURST LEVEL adjustment.
 - 2.Switching position adjustment
 - 3.Capstan FG offset adjustment
- 2) Playback frequency response characteristics adjustment
- 3) DEMD OUT adjustment
- 4) YD OUT LEVEL adjustment
- 5) Chroma level check
- 6) PB Y level adjustment
- 7) FE OSC check
- 8) Emphasis input level adjustment
- 9) Y FM deviation adjustment
- 10) Y FM carrier frequency adjustment
- 11) Chroma emphasis fo adjustment
- 12) REC Y level adjustment
- 13) REC L level adjustment
- 14) REC C level adjustment

3-1. PREPARATIONS BEFORE ADJUSTMENT

The following measuring equipment are used for video section adjustment.

3-1-1. Equipment required

- 1) Monitor TV
- 2) Oscilloscope, dual trace, 30 MHz bandwidth or more with delay mode function.
(Use 10:1 probe unless otherwise specified.)
- 3) Frequency counter
- 4) Digital voltmeter
- 5) Audio generator
- 6) Audio level meter
- 7) Audio distortion meter
- 8) Audio attenuator
- 9) Regulated power supply
- 10) Alignment tape

NTSC (CCD-TRV11/TRV21)

- For tracking adjustment (WR5-1NP)
Parts code: 8-967-995-02
- For normal mode video frequency response adjustment (WR5-6N)
Parts code: 8-967-995-12
- For confirmation of normal mode operation
for SP (WR5-5NSP)
Parts code: 8-967-995-42
or (WR5-4NSP)
Parts code: 8-967-995-41
for LP (WR5-4NL)
Parts code: 8-967-995-51

PAL (CCD-TRV11E/TRV21E)

- For tracking adjustment (WR5-1CP)
Parts code: 8-967-995-07
- For normal mode video frequency response adjustment (WR5-6C)
Parts code: 8-967-995-17
- For confirmation of normal mode operation
for SP (WR5-5CSP)
Parts code: 8-967-995-47
or (WR5-4CSP)
Parts code: 8-967-995-46
for LP (WR5-4CL)
Parts code: 8-967-995-56

3-1-2. Precautions on adjustment

The EVF (electronic viewfinder) is not necessary for video section adjustment.

Remove the following connector to remove the EVF.

1. CF-42 board CN481 (pin-8)

After completing all adjustments, release the adjustment mode by either of the following two methods.

- 1) Remove the lithium battery. (In this case, data time and menu setting by users are erased. Input these data again.)
- 2) Return the data of the address: 00 on page:6 to 00. If the page: 2 data is changed, return the data to the original value.

3-1-3. Adjustment connector (VC-167 Board CN102)

Some video section adjustment points are concentrated to the VC-167 board CN102. Connect the measuring equipment via the tool (Multi CPC: J-6082-311-A).

Pin No.	Signal Name
1	PB RF
2	REC 2
3	GND
4	EMPH IN
5	CAM Y IN
6	DEEMPH OUT
7	BPF ADJ
8	RF SWP
9	CAP FG

3-1-4. Equipment connection

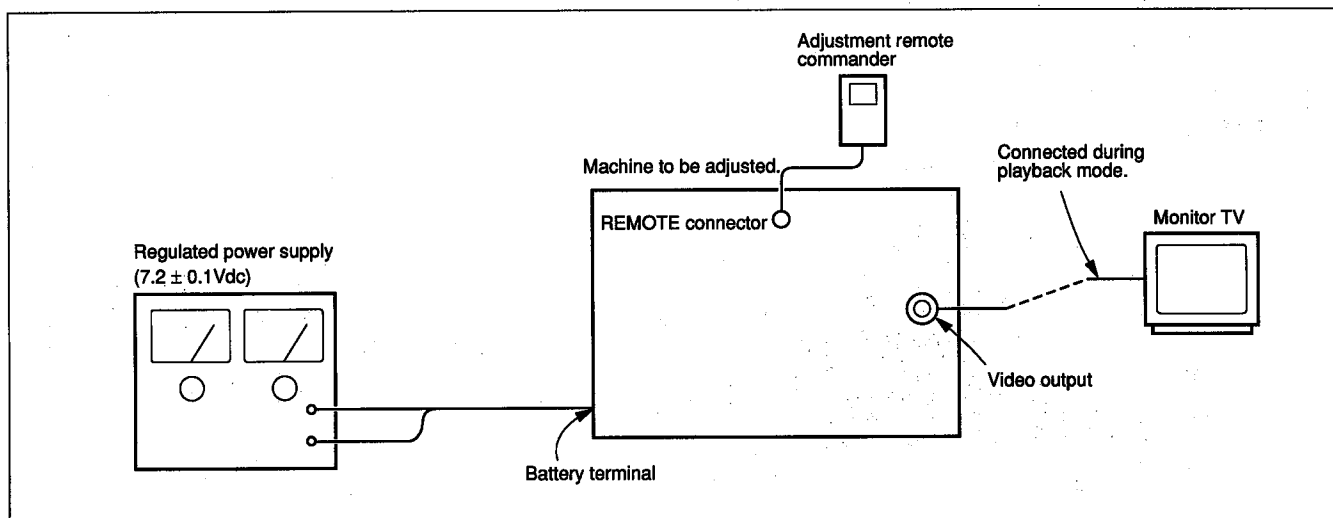


Fig.6-3-1.

3-1-5. Alignment tape

The following table shows the alignment tapes available.

Use the tape specified in the signal column for each adjustment.

If tape type is not specified in the adjustments which use the "Operation Check" tape, use any type of tape for the checking purpose.

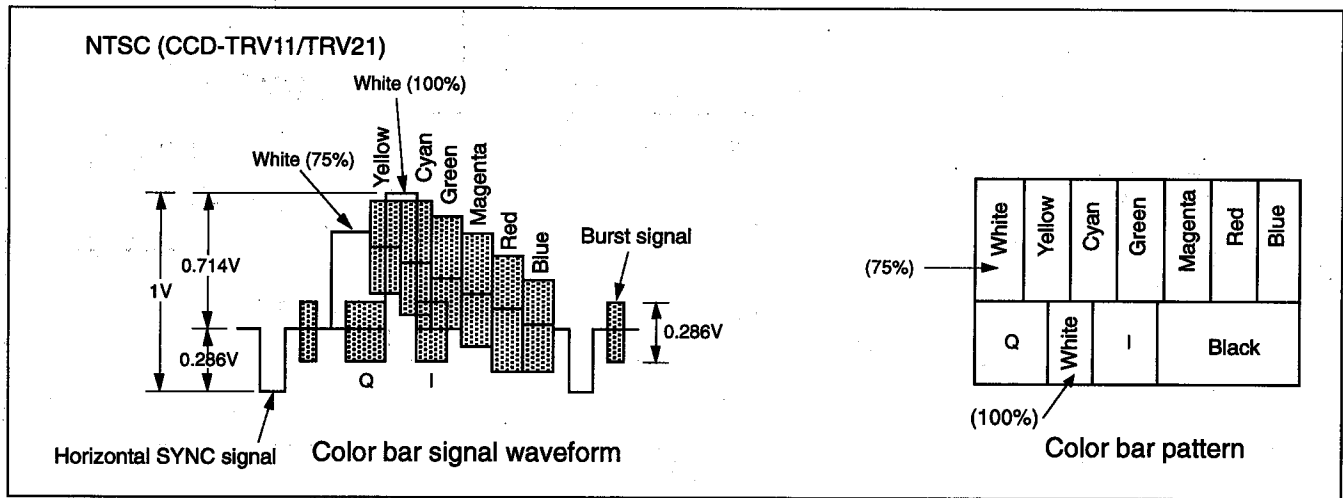
Name	Record Mode	Tape Type	Tape Speed	Use
Tracking WR5-1CP/1NP	Normal	MP	SP	Tape path adjustment Switching position adjustment
Video frequency response adjustment WR5-6C/6N	Normal	MP	SP	Frequency response adjustment
Operation check (SP mode) WR5-5CSP/5NSP	Normal	MP	SP	Operation check
Operation check WR5-4CL/4NL	Normal	MP	LP	

Note : Tape type

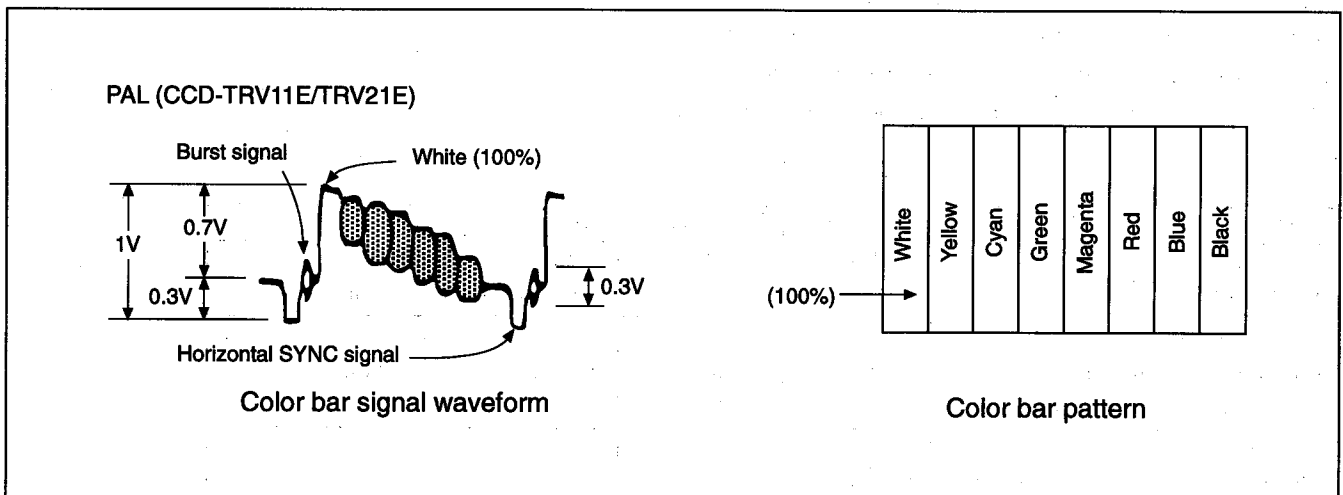
MP — Metal particle tape

The color bar signal which is recorded in the alignment tape.

Note : Measured at video input/output connector (across 75 Ω termination).



Color bar signal of NTSC alignment tape



Color bar signal of PAL alignment tape

3-1-6. Output level and impedance

Video output Pin jack
Output signal: 1 V p-p, 75 Ω unbalanced,
sync negative

Audio output Pin jack
Input level: -7.5 dBs (across 47 k Ω load)
Output impedance: 2.2 k Ω or less

3-2. ADJUSTMENT POINTS WHEN MAJOR PARTS ARE REPLACED

1. When drum is replaced:

“Tape Path Position Adjustment” of mechanical section adjustment

“PB RF frequency response characteristics adjustment” of the video section adjustment

“Switching position adjustment” of the servo section adjustment

3-3. POWER SUPPLY SYSTEM ADJUSTMENT

1. Power supply voltage check (VC-167 board)

Mode	Camera record
Subject	Any subject
Measuring Equipment	Digital voltmeter
MT5V check	
Measuring Point	CN300 pin ³⁶
Specification Value	$5.0 \pm 0.15\text{Vdc}$
DIG 3V check	
Measuring Point	CN300 pin ³⁰
Specification Value	$3.16 \pm 0.1\text{Vdc}$
AU 3 V check	
Measuring Point	CN501 pin ⁵
Specification Value	$3.18 \pm 0.1\text{Vdc}$
EVF 5V check (camera mode)	
Measuring Point	CN300 pin ⁴¹
Specification Value	$4.85 \pm 0.15\text{Vdc}$
EVF15 V check	
Measuring Point	CN300 pin ⁴⁰
Specification Value	$14.95 \pm 0.4\text{Vdc}$

2. VTR & CAM mode ON

Mode	Stop
Signal	Any signal
Adjustment Page	F
Adjustment Address	02

Adjustment procedure:

Order	Page	Address	Data	Procedure
1				Set the remote commander (RM-95) to HOLD (adjustment position), and turn on the UNREG power supply.
2	6	00	01	After setting the data, press the PAUSE button.
3	F	02	03	After setting the data, press the PAUSE button.
4				Turn off the UNREG power supply once, then turn it on.

How to cancel the VTR & CAM mode ON.

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button.
2	F	02	00	After setting the data, press the PAUSE button.
3				Turn off the UNREG power supply once, then turn it on.

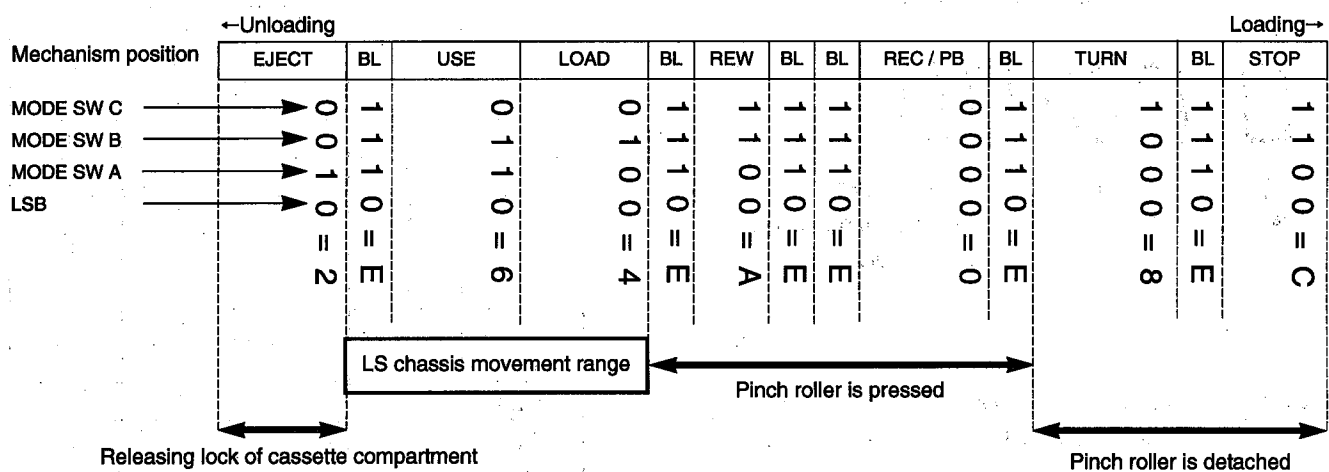
3. EMG code (Emergency code)

The emergency codes are stored in the addresses: E4, E8 and EC corresponding to the type of errors occurred. Types of error code are shown in the following table.

Code	Error Status
00	No error
10	Loading motor error during loading
11	Loading motor error during unloading
20	T reel error during unloading
21	S reel error during unloading
22	T reel error in normal mode
23	S reel error in normal mode
30	FG error during capstan startup
31	FG error during capstan normal speed
40	FG error during drum startup
41	PG error during drum startup
42	FG error during normal rotation of drum
43	Not used
44	Phase error during normal rotation of drum

4. MSW code

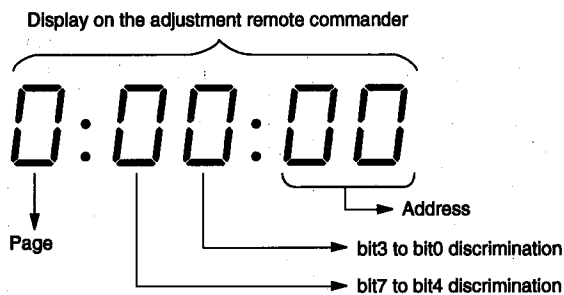
- The lower digit data of the page F: address: E6, EA and EE indicate the MSW code (mode switch code) when an error occurs.
- The upper digit data of the page F: address: E6, EA and EE indicate the MSW code (mode switch code) of mode transition (mode SW code before mode transition) when an error occurs.
- The lower digit data of the page F: address: E7, EB and EF indicate the MSW code (mode switch code) of transition target (code to which the machine is going to enter) when an error occurs.



Mechanism	MSW	Detail of Content
Position	Code	
EJECT	2	The position where the cassette compartment lock is released. The end position in the unthread-end direction. The mechanism does not move any more in the direction of unloading direction.
BL	E	Blank code. The code which separates a code from another code. The machine does not stop at the code while it is operating.
USE	6	EJECT completed position. If a cassette is ejected, it stops at this position. If mechanism moves in the loading direction, the TG1 guide and the TG9 guide start moving.
LOAD	4	The code during loading and unloading. This code is output while the LS chassis is moving.
REW	A	REW position. The position to activate the REW and FR/REV.
RP	0	PB, REC, CUE REV and PAUSE position. The pinch roller is pressed and the tension regulator is turned ON.
TURN	8	The position which is used to move the swing gear from S to T or from T to S. Normal STOP position.
STOP	C	The pinch roller is detached, tension regulator is turned OFF, and both reels are braked. Mechanism does not move any more in the loading direction.

5. Bit value discrimination

Bit values must be discriminated using the display data of the adjustment remote commander for the following items. Use the table below to discriminate if the bit value is "1" or "0".



(Example) If the remote commander display is "8E", bit value from bit 7 to bit 4 can be discriminated from the column ①, and those from bit 3 to bit 0 from column ②.

Display on the Adjustment Remote Commander	Bit value			
	bit3 or bit7	bit2 or bit6	bit1 or bit5	bit0 or bit4
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
A(F)	1	0	1	0
B(b)	1	0	1	1
C(L)	1	1	0	0
D(d)	1	1	0	1
E(E)	1	1	1	0
F(F)	1	1	1	1

6. Initializing the emergency code area

(Caution) Perform the initializing operation only when the past emergency codes can be deleted.

Operating procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	6	11	00	After setting the data, press the PAUSE button.
3	6	01	4D	After setting the data, press the PAUSE button.
4	6	11	01	After setting the data, press the PAUSE button.
5	F	E4~EF	00	After setting the data, press the PAUSE button.
6	6	01	00	After setting the data, press the PAUSE button.
7	6	00	00	After setting the data, press the PAUSE button. (End)

7. LED check

Data	Operation
00	Normal
10	Tally LED lights.

Operating procedure:

Order	Page	Address	Date	Procedure
1				Turn CAM POWER ON.
2				Check LED.
3	2	00	00	After setting the data, press the PAUSE button.
4	2	A0	10	Tally LED light.

8. Key input check



Bit	Key Switch	Switch Condition
0	Date (+)	"1" =OFF "0" =ON
1	Time	
2	Cassette eject	
3	Video power supply	
4	CC DOWN	
5	Start/Stop	
6	Camera power supply	

Operating procedure:

Order	Page	Address	Data	Procedure
1	2	00	3F	After setting the data, press the PAUSE button.
2	2	01		ON/OFF of each key switch can be known by discriminating the bit value of each display data.

9. Key input check (A/D port)

• CF-42 board

Display data Address	00~20	21~60	61~A0	A1~E0	E1~FF
2E (KEY AD0: IC303 ㉔)	• STOP (S307)	• REW (S305)	• FF (S306)	• PAUSE (S304)	No key input
2F (KEY AD1: IC303 ㉕)	• PB (S303)	• EDIT SEARCH (-) (S302)	• EDIT SEARCH (+) (S301)		No key input
30 (KEY AD2: IC303 ㉖)	COUNTER RESET (CF-42 board S482)	TITLE (CF-42 board S301)	DISPLAY (CF-42 board S302)	END SEARCH (CF-42 board S303)	No key input
31 (S/S MODE SW: IC303 ㉗)	START/STOP MODE (CF-42 BOARD : S485)				
	5 SEC				
32 (PROGRAM AE: IC303 ㉘)	PROGRAM AE (CF-42 BOARD : S489)				
		AE SPORTS	AE HIGH-SPEED SHUTTER	AE TWILIGHT	AE AUTO

Operating procedure:

Order	Page	Address	Data	Procedure
1	2	00	01	After setting the data, press the PAUSE button.
2	2	2E-32		Pushed key switch can be known by discriminating the data of each address.

Operating procedure:

Order	Page	Address	Data	Procedure
1	2	00	01	After setting the data, press the PAUSE button.
2	2	2E~32		From the display data of each address, it can be known which key is being pressed.

10.Individual operation of drum, capstan and loading motor

Data	Operation
00	Normal
02	Drum rotation in normal direction
06	Capstan rotation in normal direction
08	Capstan rotation in reverse direction
0A	Loading motor rotation in normal direction
0C	Loading motor rotation in reverse direction
01	All motors stop.
03	
05	
07	
09	
0B	
0D	
0F	

Operating procedure:

Order	Page	Address	Data	Procedure
1	7	00	02	After setting the data, press the PAUSE button.
2	7	0E	01	Individual operation of motors is approved.
3	7	11		Motor can be operated individually by setting the above described data.
4				Turn the main power (7.2 V) OFF.

3-4. SERVO SYSTEM ADJUSTMENTS

1. SYNC level and BURST level adjustments

Purpose: Adjust the sync and burst level of the camera output to the specified values.

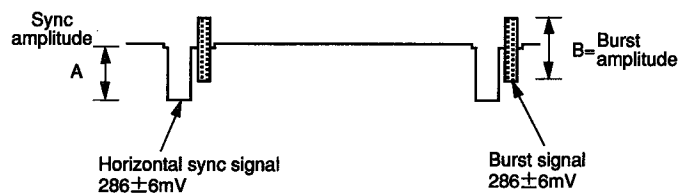
Adjustment error: The playback machine can lose lock of the servo systems if the sync level is too low.
The playback color will become too thick if the burst level is low.

() : CCD-TRV11E/TRV21E

Mode	Camera record
Subject	Color bar chart: standard picture frame
Measurement point	VIDEO output terminal (terminated in 75Ω)
Measuring equipment	Oscilloscope
Adjustment page	F
Adjustment address	28 (SYNC LEVEL) 29 (BURST LEVEL)
Specifications	A = 286 ± 6 mV (300 ± 6 mV) (SYNC LEVEL) B = 286 ± 6 mV (300 ± 6 mV) (BURST LEVEL)

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	6	01	03	After setting the data, press the PAUSE button.
3	F	28		Change the data using the PLAY and STOP buttons until the SYNC LEVEL (A) satisfies the specification.
4				Press the PAUSE button.
5	F	29		Change the data using the PLAY and STOP buttons until the BURST LEVEL (B) satisfies the specification.
6				Press the PAUSE button.
7	6	01	00	After setting the data, press the PAUSE button.
8	6	00	00	After setting the data, press the PAUSE button. (End)



2. Switching position adjustment

Purpose: Removes vertical mechanical error of head assembling.

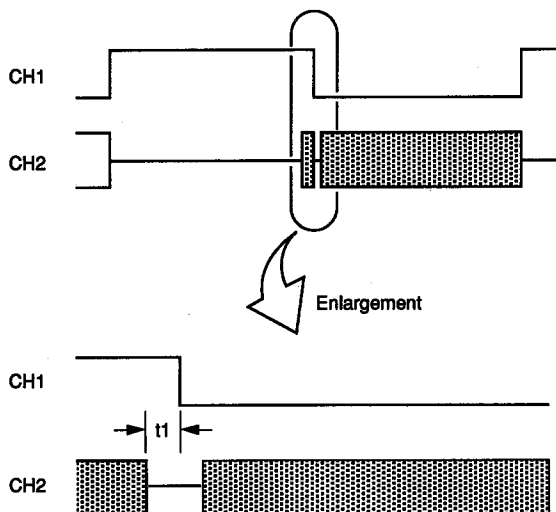
Adjustment error: Skew picture.

Mode	Playback
Signal	Alignment tape : For adjustment tracking (WR5-1CP/1NP)*
Measurement Point	CH1 : ⑧ of CN102 (RF SWP) CH2 : ① of CN102 (PB RF)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	0A 0B
Specification Value	$t_1 = 0 \pm 10 \mu \text{ sec}$

* WR5-1NP : NTSC (CCD-TRV11/TRV21)
WR5-1CP : PAL (CCD-TRV11E/TRV21E)

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	0B	80	Initial setting.
3	F	0B		Change the data with the PLAY and STOP buttons, and minimize t_1 .
4				Press the PAUSE button.
5	F	0A		Change the data with the PLAY and STOP buttons, and minimize t_1 .
6				Press the PAUSE button.
7				Check that t_1 satisfies the specified value. If not, repeat steps 3 to 6 in order.
8	6	00	00	After setting the data, press the PAUSE button. (End)

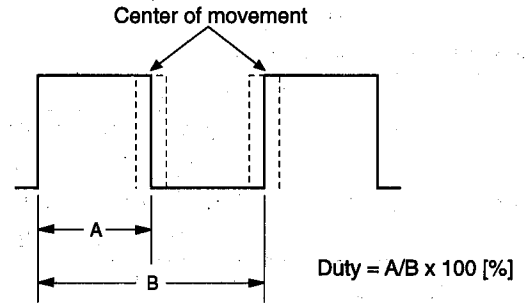


3. Capstan FG offset adjustment

Purpose: Adjusts duty ratio of capstan FG signal

Adjustment error: Jitter can increase.

Mode	CAM-REC (SP)
Signal	Any signal
Measurement Point	CN102 pin⑨
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	12
Specification Value	Duty = $50 \pm 1.5\%$



Adjustment procedure:

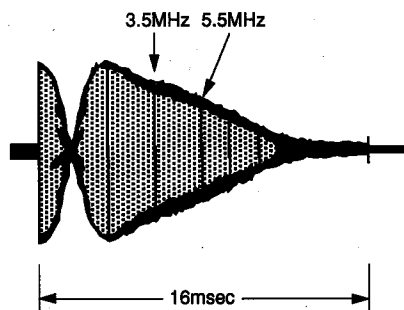
Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	12	80	After setting the data, press the PAUSE button.
3	F	12		Change data using PLAY and STOP buttons so that the duty ratio A/B satisfies the specification.
4				Press the PAUSE button.
5	6	00	00	After setting the data, press the PAUSE button. (End)

3-5. PLAYBACK FREQUENCY RESPONSE CHARACTERISTICS ADJUSTMENT

Purpose: Remove variation of picture quality between heads due to difference of characteristics.

Adjustment error: Flicker or over-modulation of playback picture.

Mode	Playback
Signal	Alignment tape: Normal mode frequency response characteristics adjustment (WR5-6C/6N)*
Measurement Point	Check connector (CH1: CN102 pin① (PB RF))
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	22 23
Specification Value	3.5 MHz level : 5.5 MHz level = 4 : (3.0 ± 0.2)



* WR5-6N : NTSC (CCD-TRV11/TRV21)
WR5-6C : PAL (CCD-TRV11E/TRV21E)

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	22		Change data using PLAY and STOP buttons to adjust the level ration between 3.5 MHz level and 5.5 MHz level of the PB RF waveform of channel "1a" satisfies the specification. Press the PAUSE button. Playback mode.
3	F	23		Adjust the channel "2a" in the same way (address 23). Press the PAUSE button. Playback mode.
4	6	00	00	After setting the data, press the PAUSE button. (End)

3-6. DEMD OUT LEVEL ADJUSTMENT

Purpose: The playback video level is kept to constant level.

Adjustment error: The playback picture can be brighter or darker than normal picture.

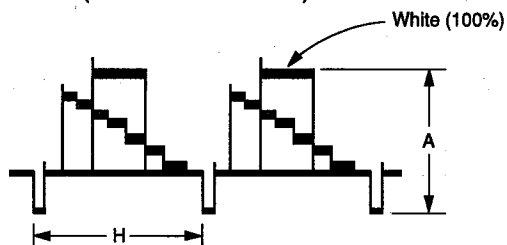
Mode	Playback
Signal	Alignment tape : Normal mode (WR5-5CSP/5NSP)*
Measurement Point	IC201 pin②⑩ or CN102 pin⑥
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	1D
Specification Value	$A=0.50\pm0.01V_{p-p}$

* WR5-5NSP : NTSC (CCD-TRV11/TRV21)
WR5-5CSP : PAL (CCD-TRV11E/TRV21E)

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	1D		Change data using PLAY and STOP buttons so that the Y signal level (A) satisfies the specification.
3				Press the PAUSE button.
4	6	00	00	After setting the data, press the PAUSE button. (End)

NTSC (CCD-TRV11/TRV21)



PAL (CCD-TRV11E/TRV21E)

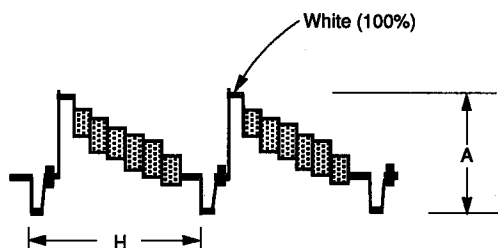


Fig. 6-3-1

3-7. YD OUT LEVEL ADJUSTMENT

Purpose: Minimizes the residual chroma component of Y comb filter output signal.

Adjustment error: Chroma flicker at video out (pin jack) of VTR overall characteristics. Color variations also significant.

Mode	Playback
Signal	Alignment tape : Normal mode (WR5-5CSP/5NSP)*
Measurement Point	CN102 pin⑤
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	24
Specification Value	$A=0.50 \pm 0.01V_{p-p}$

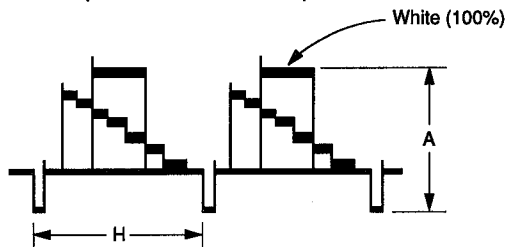
* WR5-5NSP : NTSC (CCD-TRV11/TRV21)
WR5-5CSP : PAL (CCD-TRV11E/TRV21E)

Note : Minimize the residual chroma to the smallest amplitude

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	24		Change data using PLAY and STOP buttons so that the Y signal level (A) satisfies the specification.
3				Press the PAUSE button.
4	1	00	00	After setting the data, press the PAUSE button. (End)

NTSC (CCD-TRV11/TRV21)



PAL (CCD-TRV11E/TRV21E)

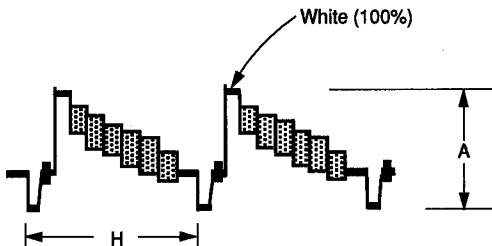


Fig. 6-3-2

Related Adjustments:

“Emphasis input level adjustment”, “PB Y level adjustment”, “Y FM carrier frequency adjustment”

3-8. PB CHROMA LEVEL CHECK

Purpose: The playback chroma level is kept to constant level.

Adjustment error: Color of playback picture can be thinner or thicker than normal picture.

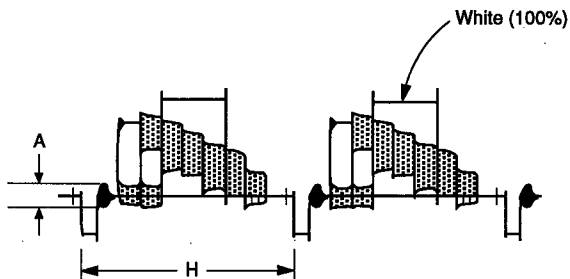
Mode	Playback
Signal	Alignment tape: color bar segment of operation check tape • Normal mode WR5-5CSP/5NSP*
Measurement Point	CN102 pin⑥
Measuring Instrument	Oscilloscope
Adjustment Page	
Adjustment Address	
Specification Value	$A=150 \pm 15 \text{mVp-p}$ (BURST LEVEL)

* WR5-5NSP : NTSC (CCD-TRV11/TRV21)
WR5-5CSP : PAL (CCD-TRV11E/TRV21E)

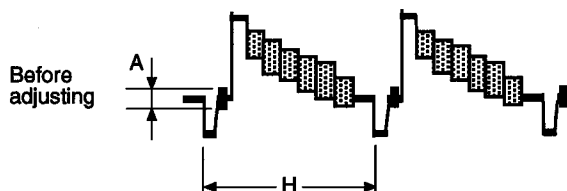
Adjustment procedure:

Order	Page	Address	Data	Procedure
1				Playback the color bar segment of the normal mode alignment tape (WR5-5CSP/5NSP)*.
2				Check that the burst signal level satisfies the specification.

NTSC (CCD-TRV11/TRV21)



PAL (CCD-TRV11E/TRV21E)



3-9. PB Y OUT LEVEL ADJUSTMENT

Purpose: Adjusts playback video level for the specification value.

Adjustment error: Playback picture can be too brighter or too darker than normal picture.

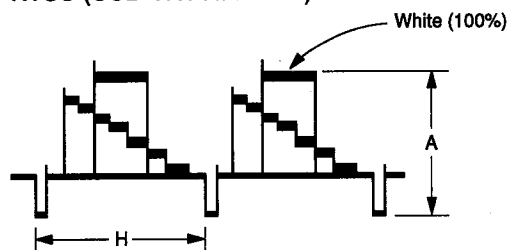
Mode	Playback
Signal	Alignment tape: color bar segment of operation check tape • Normal mode WR5-5CSP/5NSP*
Measurement Point	VIDEO output terminal (terminated in 75Ω)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	1B
Specification Value	$A=1.00 \pm 0.05V_{p-p}$

* WR5-5NSP : NTSC (CCD-TRV11/TRV21)
WR5-5CSP : PAL (CCD-TRV11E/TRV21E)

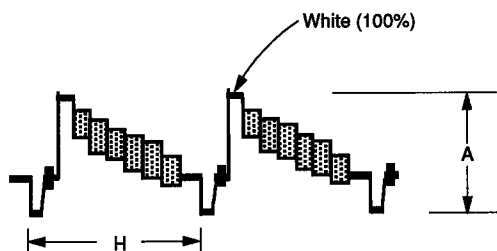
Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2				Playback the color bar segment of the normal alignment tape (WR5-5CSP/5NSP)*
3	F	1B		Change data using PLAY and STOP buttons so that the playback signal level (A) satisfies the specification.
4				Press the PAUSE button.
5	6	00	00	After setting the data, press the PAUSE button. (End)

NTSC (CCD-TRV11/TRV21)



PAL (CCD-TRV11E/TRV21E)



3-10. FE OSC CHECK

Purpose: Check the oscillating frequency and level of the flying erase (FE) signal.

Adjustment error: If REC-PAUSE recording is repeated, un-erased area is left in the junctions between the editings which results in increase of noise or previous picture can be seen.

Mode	CAM-REC
Signal	Any signal
Measurement Point	CN101 pin ⑪
Measuring Instrument	Oscilloscope and frequency counter
Adjustment Page	
Adjustment Address	
Specification Value	A=7.0Vp-p or more (MP mode) f=7.2±0.5MHz (MP mode)

Adjustment procedure:

Order	Page	Address	Data	Procedure
1				Insert a normal MP type tape.
2				Make a recording.
3				Check that the FE signal level satisfies the specification.
4				Check that the FE signal frequency satisfies the specification.



$f=7.2\pm0.5\text{MHz}$

3-11. EMPHASIS INPUT LEVEL ADJUSTMENT

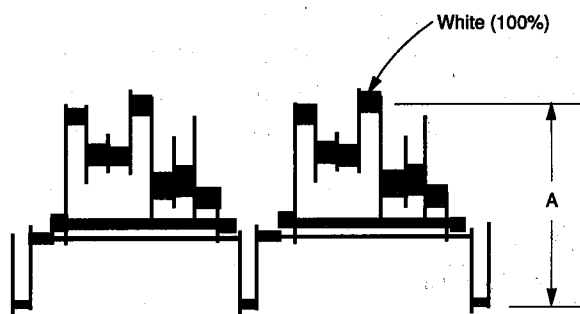
Purpose: Adjusts the record emphasis characteristics to the specification value.

Adjustment error: Luminance signal smear, blurred picture, too much emphasized edge of overall video characteristics.

Mode	CAM-REC
Signal	Color bar chart
Measurement Point	<ul style="list-style-type: none"> • CN102 PIN④ • VIDEO output terminal (terminated in 75Ω)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	1A
Specification Value	$A = (V_o \times 0.96 \times 500) \text{ mV}_{p-p} \pm 2\%$

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	6	01	47	After setting the data, press the PAUSE button.
3				Measure amplitude of the VIDEO OUT. The measured value is "Vo"[V].
4	F	1A		Change data using PLAY and STOP buttons so that the Y signal level at CN102 pin④ (A) satisfies the specification.
5				Press the PAUSE button.
6	6	01	00	After setting the data, press the PAUSE button.
7	6	00	00	After setting the data, press the PAUSE button. (End)

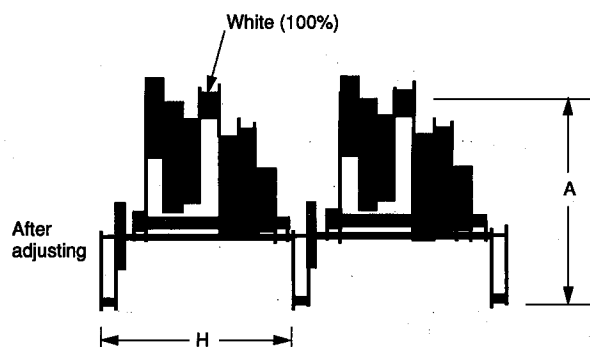


3-12. Y FM DEVIATION ADJUSTMENT

Purpose: Adjusts the FM signal to be recorded on tape to the 8 mm format. (Adjusts the frequency deviation of normal mode Y FM signal.)

Adjustment error: Too bright or too dark overall picture.
Overmodulation picture. (If deviation is too wide, or too narrow.)

Mode	CAM-REC and playback
Signal	Color bar chart
Measurement Point	<ul style="list-style-type: none"> • CN102 pin② • VIDEO output terminal (terminated in 75Ω)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	17
Specification Value	$A = (V_o \times 0.96) V_{p-p} \pm 2\%$



Related Adjustments:

“Normal mode Y FM deviation adjustment”

Note : The “Emphasis input level adjustment”, “PB Y level adjustment”, must have already been completed.

Adjustment procedure:

Order	Page	Address	Data	Procedure
1				Insert a normal MP type tape.
2	6	00	01	After setting the data, press the PAUSE button. (Preparation)
3	6	01	47	After setting the data, press the PAUSE button.
4				Shoot and record the color bar chart. The video out level at that setup is “Vo”.
5				Playback the recorded signal.
6				Compare the playback signal level (A) with the specification value. If the specification value is satisfied, the adjustment is complete.
7	F	17		If the specification value is not satisfied, change data using PLAY and STOP buttons. • If the playback signal level is bigger than the specification value, decrease the data. • If the playback signal level is smaller than the specification value, increase the data.
8				Press the PAUSE button.
9				Return to step 4.
10	6	01	00	After setting the data, press the PAUSE button.
11	6	00	00	After setting the data, press the PAUSE button. (End)

3-13. Y FM CARRIER FREQUENCY ADJUSTMENT

Purpose: Adjusts the FM signal to be recorded on tape to the 8 mm format. (Adjusts the carrier frequency of normal mode Y FM signal.)

Adjustment error: (If frequency is low) Overall picture will be blurred signal. (If frequency is high) Overall picture will have black streaking noise. S/N will be deteriorated.

Mode	CAM-REC
Signal	Any signal
Measurement Point	IC201 pin④
Measuring Instrument	Frequency counter, Oscilloscope
Adjustment Page	F
Adjustment Address	19
Specification Value	$4.20 \pm 0.01\text{MHz}$

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	6	01	43	After setting the data, press the PAUSE button.
3	F	19		Change data using PLAY and STOP buttons so that the Y signal level (A) satisfies the specification. (Record mode)
4				Press the PAUSE button.
5	6	01	00	After setting the data, press the PAUSE button.
6	6	00	00	After setting the data, press the PAUSE button. (End)



3-14. CHROMA EMPHASIS fo ADJUSTMENT

Purpose: Adjust fo of the chroma emphasis to the specified frequency range.

Adjustment error: The bust and chroma level becomes too big during playback.

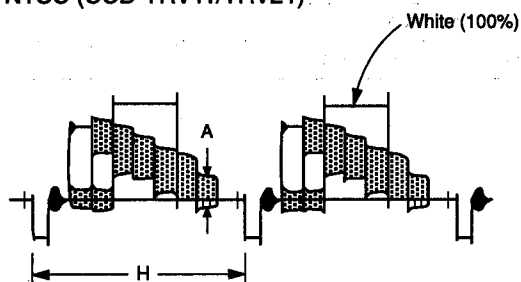
Mode	Playback
Signal	Color bar signal (WR5-5CSP/5NSP)*
Measurement Point	IC201 pin ②
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	1E
Specification Value	Minimizes the chroma component (A in the following diagram)

* WR5-5NSP : NTSC (CCD-TRV11/TRV21)
WR5-5CSP : PAL (CCD-TRV11E/TRV21E)

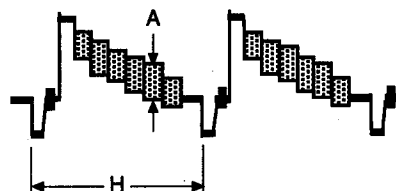
Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	1E		Change data so that the chroma component (A) is minimized.
3				Press the PAUSE button.
4	6	00	00	After setting the data, press the PAUSE button. (End)

NTSC (CCD-TRV11/TRV21)



PAL (CCD-TRV11E/TRV21E)



3-15. REC Y LEVEL ADJUSTMENT

Purpose: Maintains a constant level of Y FM, chroma AFM and ATF signals when recording on tape.

Note : Use the MP type tape. If an oscilloscope has the bandwidth limiting switch, set to on position.

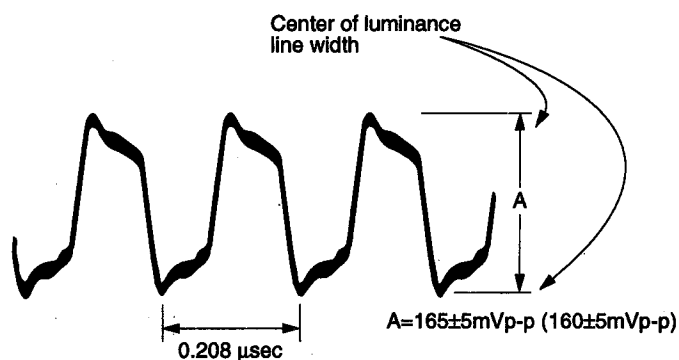
Adjustment error: (If level is low) Poor S/N of playback picture
(If level is high) Black streaking noise appears.

Connection: Connect CN102 pin⑧ (RF SWP) to GND.
() : CCD-TRV11E/TRV21E

Mode	CAM-REC (SP)
Signal	No signal
Measurement Point	CN102 pin② (check connector)
Measuring Instrument	Oscilloscope (Note)
Adjustment Page	F
Adjustment Address	1F
Specification Value	$A=165 \pm 5\text{mVp-p}$ ($160 \pm 5\text{mVp-p}$)

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2				Insert the MP tape to establish record mode.
3	6	01	43	After setting the data, press the PAUSE button.
4	F	1F		Change data using PLAY and STOP buttons so that the REC Y RF level (A) satisfies the specification.
5				Press the PAUSE button.
6	6	01	00	After setting the data, press the PAUSE button.
7	6	00	00	After setting the data, press the PAUSE button. (End)



3-16. REC L LEVEL ADJUSTMENT

Purpose: Maintains a constant level of chroma, AFM and ATF signals when recording on tape.

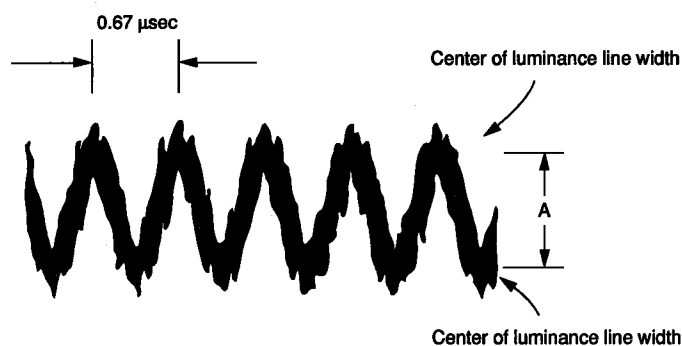
Adjustment error: If level is low, audio distortion increases, ATF servo loses lock, and chroma S/N deteriorates.

If level is high, Y S/N deteriorates and white streaking noise appears.

Mode	CAM-REC (SP)
Signal	No signal
Measurement Point	CN102 pin② (check connector)
Measuring Instrument	Oscilloscope Frequency bandwidth limitation: 20 MHz OFF
Adjustment Page	F
Adjustment Address	21
Specification Value	$A=8.494 \pm 0.3\text{mV}$ (AFM Level)

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	6	01	43	After setting the data, press the PAUSE button.
3	F	21		Change data using PLAY and STOP buttons so that the AFM signal level (A) satisfies the specification.
4				Press the PAUSE button.
5	6	01	00	After setting the data, press the PAUSE button.
6	6	00	00	After setting the data, press the PAUSE button. (End)



3-17. REC C LEVEL ADJUSTMENT

Purpose: Maintains a constant chroma level when recording on tape.

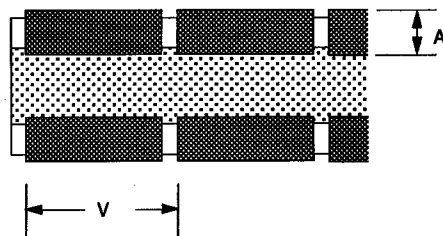
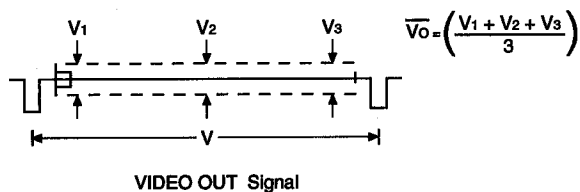
Adjustment error: If level is low, overall S/N deteriorates.
If level is high, S/N of Y signal at deep color deteriorates and white streaking noise appears.

[] : CCD-TRV11E/TRV21E

Mode	CAM-REC
Signal	White pattern (See page 6-2)
Measurement Point	<ul style="list-style-type: none"> • CN102 pin② (Check connector) • VIDEO output terminal (terminated in 75Ω)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	20
Specification Value	$A = \left(33.8 \times \frac{\overline{V_o}}{714} \right) \text{mVp-p} \pm 2\text{mVp-p}$ $\left[A = \left(28.5 \times \frac{\overline{V_o}}{700} \right) \text{mVp-p} \pm 2\text{mVp-p} \right]$

Adjustment procedure:

Order	Page	Address	Data	Procedure
1				Shoot the all white pattern to the full picture frame.
2	6	00	01	After setting the data, press the PAUSE button. (Preparation)
3	6	01	45	After setting the data, press the PAUSE button.
4				Measure the chroma output level of the VIDEO OUT connector. Obtain the average value of three points (beginning, middle, end) of a vertical period. Call the average value $\overline{V_o}$ (mV).
5	F	20		Change data using PLAY and STOP buttons so that the REC signal at CN102 pin② amplitude (A) satisfies the specification.
6				Press the PAUSE button.
7	6	01	00	After setting the data, press the PAUSE button.
8	6	00	00	After setting the data, press the PAUSE button. (End)



6-4. AUDIO SYSTEM ADJUSTMENT

- Use the alignment tape (WR5-5CSP/5NSP)* for audio system adjustment.
- Connect an audio input signal from VC-167 board CN501 as shown in Fig.6-4-1.

* WR5-5NSP : NTSC (CCD-TRV11/TRV21)
WR5-5CSP : PAL (CCD-TRV11E/TRV21E)

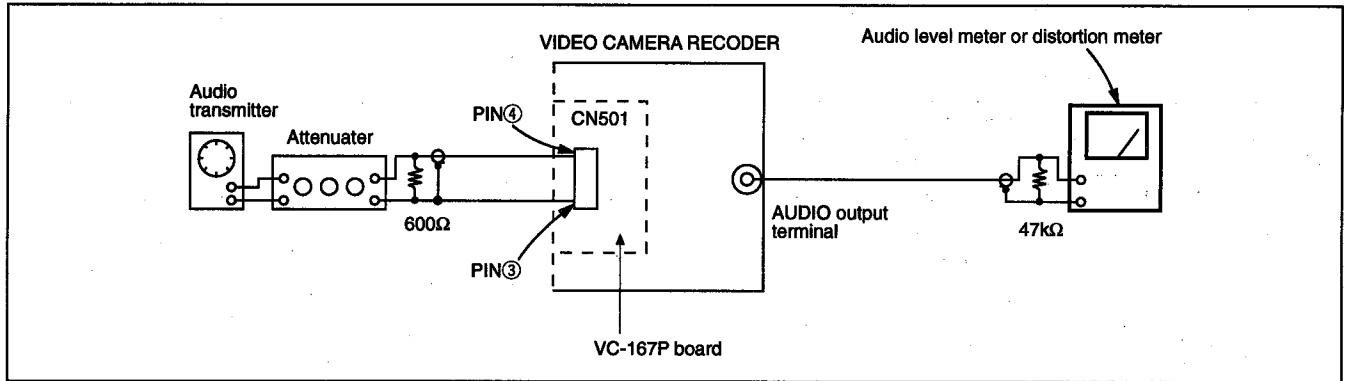


Fig.6-4-1

4-1. EE-OUTPUT LEVEL CHECK

Mode	Record
signal	CN501 PIN ④ INPUT 400 Hz, -38 dBs
	Audio input from CN501 pin④
Measurement Point	AUDIO output terminal (no load)
Measuring Instrument	Audio level meter
Specification Value	-7.5 ±2.0 dBs

Check procedure

Order	Procedure
1	Check that 400 Hz signal level satisfies the specification.

4-2. 1.5MHz DEVIATION ADJUSTMENT

Purpose: 1.5MHz deviation adjustment. Error in this adjustment value means loss of tape inter change ability.

Mode	Playback
Signal	Alignment tape : For checking operations (WR5-5CSP/5NSP)*
Measurement	AUDIO output terminal.
Measuring Instrument	Oscilloscope, level meter
Adjustment Page	F
Adjustment Address	13
Specified Value	$-7.5 \pm 0.5\text{dBs}$

* WR5-5NSP : NTSC (CCD-TRV11/TRV21)
WR5-5CSP : PAL (CCD-TRV11E/TRV21E)

Adjustment method:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	13		Change the data with the PLAY and STOP buttons, and adjust the 400Hz signal level to specified value.
3				Press the PAUSE button.
4	6	00	00	After setting the data, press the PAUSE button. (End)

4-3. BPF fo ADJUSTMENT

Purpose: Optimizes fo of BPF inside IC.

Adjustment error: Incorrect discrimination of monaural/stereo and increase of noise at high output of audio volume are resulted.

Mode	Playback
Signal	Alignment tape: (WR5-5CSP/5NSP)*
Measurement Point	AUDIO output terminal
Measuring Instrument	Distortion meter
Adjustment Page	F
Adjustment Address	15
Specification Value	Distortion : 1% or less.

* WR5-5NSP : NTSC (CCD-TRV11/TRV21)
WR5-5CSP : PAL (CCD-TRV11E/TRV21E)

Adjustment procedure:

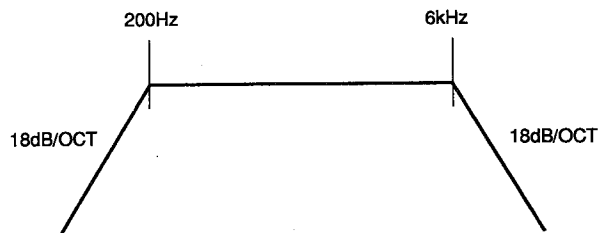
Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2				Playback the 400 Hz segment of the WR5-5CSP/5NSP* alignment tape.
3	F	15		Change data using PLAY and STOP buttons so that distortion factor is minimized.
4				Press the PAUSE button.
5	6	00	00	After setting the data, press the PAUSE button. (End)

4-4. OVERALL SIGNAL LEVEL AND DISTORTION CHECK

Purpose: Checks distortion level.

Mode	CAM-REC and playback
Signal	400 Hz, -38 dBs
Measurement Point	AUDIO output terminal
Measuring Instrument	Audio level meter and distortion meter
Specification Value	Level: -7.5 ± 2.0 dBs Distortion 0.8% or less (Note)

Note: The value when band-pass filter of 200 Hz to 6 kHz is used.



Check procedure:

Order	Procedure
1	Input 400 Hz, -38 dBs signal to, CN501 pin ④.
2	Record the signal. (CAM-REC)
3	Remove the input signal and playback the recorded segment.
4	Confirm that 400 Hz signal level at audio output terminal is -7.5 ± 2 dBs and distortion is 0.8% or less. (Note)

4-5. OVERALL NOISE LEVEL CHECK

Purpose: Checks noise level.

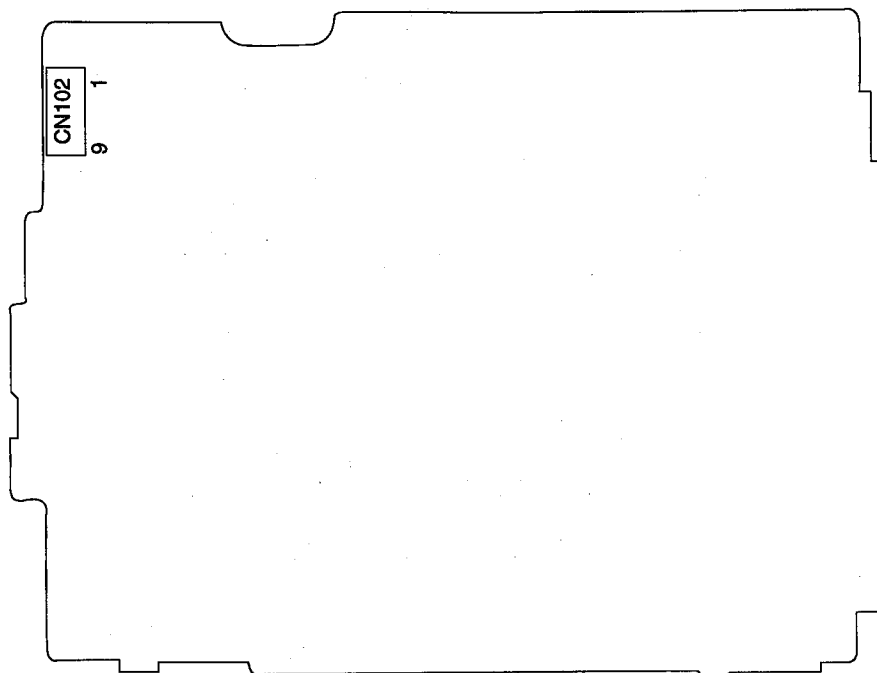
Mode	CAM-REC and playback
Signal	No signal: VC-167 board CN501 (Note)
Measurement Point	AUDIO output terminal
Measuring Instrument	Audio level meter (using IHF-A curve weighting filter)
Specification Value	-65 dBs or less

Note: Before making short circuit between CN501 pins ③ and ④, remove the flexible board from CN501

Check procedure:

Order	Procedure
1	Insert a shorting to pin ③ and pin ④ as CN501.
2	Make recording.
3	Remove the shorting plug.
4	Playback the recorded segment.
5	Confirm that the noise level at audio input terminal is -65 dBs or less.

**ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS
VC-167 BOARD (SIDE A)**



VC-167 BOARD (SIDE B)

