

UNIVERSIDAD NACIONAL DE INGENIERIA

**FACULTAD DE INGENIERIA ELECTRICA Y
ELECTRONICA**



**DISEÑO E IMPLEMENTACION DE LA UNIDAD
MOVIL PARA PRODUCCION DE TELENOVELAS**

INFORME DE INGENIERIA

PARA OPTAR EL TITULO DE:

INGENIERO ELECTRONICO

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A mi esposa Clorinda
a mi hija Giovana
a mis padres Marcelo y Carmen
por el apoyo y guía que
siempre me brindaron.

SUMARIO

En 1994, la empresa Panamericana Televisión, debido a la necesidad de las grabaciones continuadas de telenovelas decide la implementación de una unidad móvil EFP que cumpla específicamente esa función.

Se empieza entonces a hacer el proyecto incluyendo costos, para luego continuar con el diseño total de la misma y finalmente hacer su instalación correspondiente.

Al término de todo el proceso, se obtuvo la unidad móvil OB-Van, que actualmente está operando satisfactoriamente y recuperando su inversión rápidamente.

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PARA PRODUCCIÓN DE TELENÓVELAS.**

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“DISEÑO E IMPLEMENTACIÓN DE LA UNIDAD MÓVIL PARA
PRODUCCIÓN DE TELENÓVELAS”

PARA OBTAR EL TÍTULO PROFESIONAL DE
INGENIERO ELECTRÓNICO

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EXTRACTO

La producción de telenovelas hoy en día exige mucho más que una imagen en televisión, la competencia con otros canales locales primero y luego con los otros países para abarcar el mercado es cada vez más fuerte.

Es por eso que las exigencias en video y audio es de calidad Broadcast. Esto implica necesariamente una inversión fuerte, que pueda cubrir los gastos primarios como son de equipos técnicos, escenografía, personal artístico de primera, gastos de producción y gastos de personal técnico entre otros.

Todo con la finalidad de primeramente recuperar la inversión, para luego lo más rápido posible obtener ganancias que permita seguir haciendo telenovelas teniendo un margen aceptable.

Es por eso que se implementó una unidad móvil funcional, que pueda operar en cualquier lugar y en el momento deseado.

El presente trabajo explica los pasos seguidos para la obtención del producto final, teniendo en cuenta no sólo aspectos técnicos sino también aspectos netamente de producción que son muy importantes en la decisión final.

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INTRODUCCIÓN

La historia de la producción y grabación de telenovelas en el Perú y específicamente en Panamericana Televisión no es nueva. Desde hace muchos años se graban este tipo de programas que han tenido buena audiencia básicamente por que en muchos casos abarca problemas de la realidad nacional.

Podemos citar por ejemplo “Simplemente María”, “Nino”, “Páginas de la Vida”, “La casa de enfrente”, “Carmín”, “Natacha”, “Gorrión”, etc. También se han hecho producciones del tipo serie como por ejemplo “Gamboa”, “Barragán”, “Casado con mi hermano”, “Fandango”, etc.

Todas estas producciones se hicieron principalmente para cubrir el mercado local y mantener un “rating” mayor que de cualquier otro programa de canales de competencia y por lo tanto un mayor ingreso económico.

Con las producciones de “Carmín” y “Gamboa” sucedió algo especial, empezó a gustar en otros mercados latinoamericanos y es así que sin haberlo previsto se empezó a exportar telenovelas.

Para hacer estas producciones contábamos principalmente de dos lugares:

a) Un estudio de la planta central en la Av. Arequipa.

Nuestra planta central posee toda la infraestructura necesaria para hacer grabaciones como de tener estudios de grabación, equipo de iluminación, escenografía, equipo técnico, como así también de contar con todo el personal necesario para realizarlas.

Pero específicamente para la grabación de telenovelas, teníamos ciertas desventajas como:

- 1.- Se usaba obligadamente uno de los dos “switcher” o centros de grabación que disponíamos, limitándonos en cierta forma a hacer sólo otra grabación más al mismo tiempo.
- 2.- Como los estudios son relativamente pequeños, no se pueden colocar todas las escenografías necesarias para la grabación de la telenovela, entonces se tenía que parar la grabación para hacer el respectivo cambio de escenografía que dicho sea de paso tenía que ser del tipo portátil para su traslado continuo.
- 3.- Cuando era el momento de grabar la telenovela, su exigencia en iluminación era tal que nuestro punto de fuerza no era capaz de soportar dos estudios de grabación con toda su capacidad de luces encendida, por lo que cuando había un programa “en vivo” obligaba a parar la grabación de la Novela con la correspondiente pérdida de tiempo (actualmente se cuenta con un grupo electrógeno de suficiente potencia para subsanar este problema)

b) Un estudio en el Coliseo Amauta.

Debido a los problemas que se nos presentaba en la grabación usando los estudios de planta central antes mencionados, se pensó en la utilización de un estudio externo. Es así como se alquiló una parte del Coliseo Amauta

donde se construyó rápidamente un estudio de televisión, con las suficientes facilidades para hacer una producción del tipo telenovela.

Este estudio contó con punto de fuerza necesario, parrillas de iluminación, las instalaciones eléctricas necesarias y además de ser suficientemente grande para la grabación.

Pero en este lugar se nos presentaba lo siguiente:

1.- No disponíamos de equipo electrónico para la grabación de la novela por lo que se desmontaba equipo de Planta Central y se instalaba provisionalmente en el Coliseo Amauta y según la necesidad del momento se movía el equipo de un lugar a otro para su utilización.

2.- El movimiento continuo y su correspondiente maltrato originaba que los equipos se malogaran con mayor frecuencia que antes, creando gastos de mantenimiento cada vez mayores.

Cuando se hizo la telenovela "Natacha" (segunda parte), se pensó ya en una novela de exportación que debería competir con los de hasta ese momento líderes como Venezuela, Mexico y Brasil.

Esta novela se grabó en el estudio Amauta, teniendo una aceptación muy buena en el mercado local y una aceptación regular en el mercado extranjero. Fue entonces que vimos la necesidad de diseñar e implementar una unidad móvil creada especialmente para este tipo de programas y que solucionara los siguientes problemas:

a) La telenovela para que sea aceptada deberá tener muchas más tomas de exteriores que antes, evitándose así las escenografías

artificiales y “falsas”, que siendo costosas no eran aceptadas por el público. Contando con la unidad móvil sería fácil transportarse de un lugar a otro, fuera del estudio para grabar las tomas.

b) Si queríamos competir deberemos poder producir novelas una a continuación de otra sin pérdida de tiempo. Quiere decir que se podría empezar una novela apenas terminada otra sin más pérdida de tiempo que el transporte de la unidad móvil a la nueva locación (para esto en la etapa de pre-producción la escenografía debería ya estar instalada).

c) Se debería aprovechar los hermosos paisajes naturales de nuestro Perú y con la unidad móvil podríamos hacer telenovelas en las provincias que quisiéramos con sólo la demora de su traslado ya sea por sus propios medios ó transportándola por avión.

d) La unidad móvil, por su equipamiento técnico podrá competir en calidad de video y audio con los otros países exportadores de telenovelas.

Es así como en 1994 se aprueba la implementación de la unidad móvil OB-Van EFP (Outside Broadcast Van for Electronics Field Production); pero en la elección de los equipos se tendría que ser muy cuidadosos ya que se deseaba una OB-Van eficiente que pudiera cumplir los requisitos anteriores pero con un costo mínimo.

El presente informe está dividida en 6 capítulos teniendo como objetivo principal plasmar la experiencia obtenida a través de los años de trabajo como Ingeniero en televisión.

En el primer capítulo, se dan las consideraciones generales que se han tomado para el diseño de la unidad móvil. En el segundo capítulo, se

expone lo correspondiente al sistema de video. En el tercer capítulo se analiza el sistema de audio. En el cuarto capítulo, se estudia las necesidades de energía e instalaciones eléctricas de la misma, considerando el uso de tensión regulada y grupo electrógeno. En el quinto capítulo, se ve lo relacionado con el sistema de comunicación e intercomunicación de la unidad móvil ya sea interno y externo con la planta central. En el sexto y último capítulo se ven algunos equipos adicionales que se usan y de los cuales se hace una referencia rápida.

En la parte final se ven las observaciones y conclusiones del presente trabajo, como así también del estudio del costo de la OB-Van.

Finalmente no quiero dejar esta oportunidad para agradecer a la Universidad Nacional de Ingeniería y a todos sus profesores que supieron darme la formación, instrucción académica y las ganas de seguir aprendiendo cada vez más en el mundo tan competitivo que existe. Quiero decir también que en cada labor que realizo diariamente trato de dar todo lo que sé, dejando en alto el nombre de la Universidad.

CAPITULO I CONSIDERACIONES GENERALES DE DISEÑO

Este trabajo tiene como uno de sus objetivos explicar como se realizó el diseño e implementación de la OB-Van para EFP (Outside Broadcas Van for Electronics Field Production) que se está usando actualmente para la grabación de telenovelas en Panamericana Televisión, explicando la relación costo por utilidad de los equipos usados, como así también sus especificaciones técnicas.

En la actualidad esta unidad móvil se encuentra en la ciudad de Arequipa haciendo la grabación de la telenovela “Canela” y próximamente terminando esta, empezará la grabación de una nueva novela en una ciudad todavía por definir.

En la implementación de la unidad móvil que se iba a usar se consideró por necesidad del tipo de producción que debería contar con el siguiente personal técnico:

- 1.- Un Ingeniero; responsable de la operatividad, funcionamiento, calibración y mantenimiento de todos los equipos que pertenecen a la móvil. Deberá tener la suficiente experiencia y conocimientos como para poder solucionar los problemas que se puedan presentar durante la grabación y en la locación que se encuentre.

El Ingeniero será el encargado de hacer el control de calidad respectivo al producto final, con la correspondiente responsabilidad del caso.

- 2.- Un director de televisión, que con criterio “artístico” y usando el “Switcher” decide la forma y duración de los encuadres de las cámaras. Para ello se encuentra siempre en comunicación con los camarógrafos y el libretista.
- 3.- Cuatro camarógrafos, encargados del manejo de las cámaras y sus accesorios, tres de los cuales harían las tomas dentro del estudio de grabación en coordinación con el director de televisión y el cuarto sería el que salga a hacer tomas externas de apoyo usando para ello el equipo portátil sin switcher, en coordinación del director de fotografía y/o director de televisión.
- 4.- Un técnico de cámaras, es el encargado de graduar los niveles de las cámaras en todo momento debido a las variaciones de luz y cada vez que sea necesario hacer los ajustes del balance de blanco y balance de negro de las cámaras (esto debido a los cambios de temperatura de color).El técnico debe ser suficientemente preparado como para interpretar correctamente los instrumentos de medición de televisión.
- 5.- Un operador de audio, que es el encargado de la mezcla final de audio como también velar por la buena calidad del mismo en todo el proceso. Este operador debe conocer bien los diferentes equipos de audio como también conocer el proceso de musicalización.
- 6.- Un auxiliar de audio, que es el ayudante del operador de audio ubicado casi siempre dentro del estudio. Es el encargado de la

ubicación y dirección de todos los micrófonos como así también del chequeo de las líneas físicas correspondientes.

7.- Un operador de videograbadoras, que se encarga de la operación de las grabadoras y/o reproductoras de video y deberá ser cuidadoso en chequear las tomas después de haberse grabado. Este operador deberá tener conocimientos en edición de televisión, ya que esta unidad móvil se usará para editar cualquier programa en caso necesario.

Basándose en este personal de trabajo se empezó a hacer la relación del equipo técnico que se necesitaba; pero había que considerar los siguientes aspectos técnicos muy importantes para la decisión final:

- a) La telenovela deberá tener una calidad Broadcast tanto en video, audio e iluminación, que permita la aceptación de la misma en los mercados extranjeros.
- b) Se deberá usar el sistema de señales de video en componente de video, que puede ser el formato Beta (luminancia Y, diferencia de color rojo R-Y, y diferencia de color azul B-Y), el formato S-VHS (luminancia Y y crominancia C) ó el formato RGB (rojo R, verde G y azul B). No se usaría más la señal de video compuesta ya que la calidad es mucho menor.
- c) El tratamiento de la señal de audio deberá en la medida de lo posible ser **digital** y en primera generación, para que al momento de hacer el proceso de musicalización o sonomontaje no se pierda calidad en los copiados.

- d) Se deberá usar en todo el proceso el código de tiempo “Time Code” SMPTE utilizado en las computadoras de edición, para que el proceso de post-producción sea exacto y rápido.
- e) Se debe utilizar cámaras de última generación que sean livianas, con una buena sensibilidad a poca iluminación y a la vez con poco ruido en el video. Estas cámaras deben ser de propósito EFP/ENG, que se pueda usar para estudios y/o exteriores.
- f) Se considerará el uso de videograbadoras Betacam o MII que tienen una calidad mucho mayor que las hasta hace poco standard U-Matic de 3/4”. Esto se verá con detenimiento en la parte de video.
- g) La intercomunicación entre el personal técnico, el de producción, y ambos debe ser fluido evitándose pérdidas de tiempo innecesarias.
- h). Los equipos deben ser fuertes para que soporten el movimiento de la unidad móvil entre locaciones y deberán ser colocados en rieles que permitan un mantenimiento preventivo y/o correctivo.
- i) Para la compra del equipo se pensará también en la posible utilización de los mismos en la planta central en caso de apoyo, quiere decir la posibilidad de sincronización en video y audio, sistema de controles remotos estándares, entrada/salida de TC, conectores BNC para video y XLR Balanceados para audio, etc.
- j) La OB-Van debe poder usarse en caso necesario, para hacer enlaces vía microondas o vía satélite con la planta central para el caso de salidas -al aire-, en vivo.

Por cuestión presupuestal esta unidad móvil se diseñó con el equipo mínimo indispensable ya que su función es básicamente la grabación de Telenovelas. El diseño varía un poco si el fin es hacer una OB-Van EFP

multipropósito que permita hacer todo tipo de transmisión, para esto se debe contar con un presupuesto mucho más grande (aproximadamente el doble), ya que se deben incluir generadores de texto, generador de efectos digitales, graficador, etc.

CAPITULO II SISTEMA DE VIDEO

Para poder entender mejor esta parte veamos en forma resumida como es la operación de la unidad móvil en un día normal de grabación.

Operativamente hablando se trata de seguir una serie de pasos establecidos:

- a) La OB-Van se instala físicamente en la locación indicada.
- b) Se alimenta de tensión de alimentación para su operación, ya sea con energía de las empresas eléctricas ó de un grupo electrógeno; teniendo cuidado de chequear el voltaje y frecuencia de entrada.
- c) Se empiezan a tender los cables de cámara usualmente de 100 mts. que van de la OB-Van hasta el estudio; lo mismo con los cables de audio para los diferentes micrófonos.

Cuando la locación es fija, estos cables deben tenderse por única vez para toda la grabación poniéndolos en sitios seguros y lejos del tránsito de las personas.

Si la locación no es fija, la tarea de tender cables se hace tantas veces como cambios de locación haya.

- d) Se retiran las cámaras guardadas en la OB-Van y se empiezan a instalar dentro del estudio junto con sus trípodes, dollys, visores, controles de lente, etc.

- e) Se instalan en el estudio equipos adicionales para el monitoreo de señal como monitores de video, parlantes, sistema de intercomunicación, etc.
- f) El operador de audio junto con su auxiliar instalan en el estudio los diferentes micrófonos que se van a usar, haciendo las pruebas respectivas para que las respuestas de éstos sean lo adecuado técnicamente hablando.
- g) Mientras tanto dentro de la OB-Van se van probando los equipos, primero su operatividad luego ajustándolos electrónicamente para que trabajen todos en fase con respecto a una referencia maestra originada de un generador de sincronismo y un generador de video. Es importante que las pruebas se hagan con el respectivo cuidado haciendo inclusive varias pruebas de grabación evitándose así posteriores problemas.
- h) Con las luces encendidas y adecuadamente dirigidas por los iluminadores, el técnico de cámaras hace los balances de blanco y de negro de cada cámara respectivamente, teniendo cuidado de poner en la misma el filtro de temperatura de color correspondiente. Esto es existe un filtro diferente para trabajar con luz natural, otro para luz artificial, etc.
- i) El Ingeniero después de hacer los ajustes correspondientes, es el que dá el visto bueno a todos los equipos e indica al personal de producción que la OB-Van se encuentra lista para operar.
- j) Todo esto hacerlo con la debida anticipación para en caso de surgir un problema solucionarlo dentro de los límites de tiempo que en televisión son usualmente muy cortos.

En la parte electrónica, que es la parte central de la Unidad Móvil tenemos que ver dos sistemas muy importantes; el sistema de video y el sistema de audio.

En la fig.1 podemos ver el diagrama de bloques del sistema.

Para la elección de los equipos de video se tuvieron en cuenta las consideraciones generales descritas anteriormente, ya que debía escogerse el formato, tipo y costo de los mismos. Para eso se tenía dos caminos para seguir:

1.- La elección de un sistema digital de grabación que puede ser cualquiera de los siguientes:

Formato D1 (4,2,2)

Formato D2 (4 fsc) (se encuentra ya en desuso)

Formato D3

Formato D5

Betacam Digital

2.- La elección de un sistema analógico de grabación como por ejemplo:

U-MATIC SP

VHS y VHS-C

S-VHS

8 mm

HI 8

MII

BETACAM SP.

En el Sistema Digital, la señal de video y audio es procesada digitalmente de una u otra forma dependiendo del formato de procesamiento de señal y del formato de entrada/salida de video; dando como resultado una calidad excelente y con una degradación imperceptible cuando se hacen copias de generación en generación (copias de copias).

En el Sistema Analógico, el procesamiento de la señal de audio y video como el formato de entrada/salida es analógico. Este procesamiento puede ser en forma de video compuesto ó de video componente, dependiendo del formato ya que cada una tiene sus propias especificaciones.

El uso de videograbadoras del formato digital era muy difícil, primero por sus altísimos costos, y segundo por la incompatibilidad que tendríamos con todos nuestros equipos de formato análogo. Es por eso que se decidió la compra de las mejores videograbadoras en sistema analógico que trabaje en sistema de video componentes que definitivamente es mucho mejor que el sistema de video compuesto.

Estas máquinas fueron el formato BETACAM-SP; formato usado y aceptado a nivel mundial (se hicieron las consultas a los posibles países compradores del producto final), que usa el sistema de componentes tipo Beta (Y, R-Y, B-Y).

Para entender la diferencia entre video componente y video compuesto veamos el diagrama simplificado de un ENCODER de una cámara de video a color 3CCD. (ver fig 2).

El propósito del Encoder es combinar las señales de Rojo (R), Verde (G), y Azul (B), que salen del procesador de video hacia una señal

compuesta de video color de acuerdo al sistema estándar empleado, en nuestro caso el NTSC.

Primero vemos que las señales de Rojo, Verde y Azul son combinadas en un circuito Matrix para obtener las señales de Luminancia (Y) y componentes de diferencia de color (R-Y, B-Y).

Las ecuaciones de la matrix para estas señales son las siguientes:

$$Y = 0.30R + 0.59G + 0.11B$$

$$R-Y = 0.70R - 0.59G - 0.11B$$

$$B-Y = -0.30R - 0.59G + 0.89B$$

Los filtros pasa bajos limitan el ancho de banda de las señales R-Y y B-Y que luego pasan a los moduladores que reciben ambos en fase y cuadratura (Diferencia de 90 grados) componentes de subcarrier (sc).

Un pedestal de 7.5 IRE (IRE es la unidad de medida en televisión teniendo de referencia que 140 IRE = 1 volt) es agregada a la señal retardada de luminancia Y y juntos con las salidas de los moduladores de las diferencias R - Y y B - Y; el resultado es la señal de video compuesto.

Es donde podemos ver la diferencia, el sistema de video componente usa la señal directamente de la salida del circuito matrix o sea Y, R-Y, B-Y, mientras que el sistema de video compuesto toma la salida final del ENCODER esto es pasando por los filtros, moduladores y retardos, con sus respectivos ruidos.

Lo mismo podemos hacer la analogía en el DECODER de la videogradora. Cuando se usa video compuesto la señal es separada en luminancia Y y crominancia C; la señal de luminancia es modulada en

frecuencia. La señal de crominancia es heterodina con una señal de frecuencia, después de esta conversión la señal de crominancia es superimpuesta con la señal Y-FM.

Cuando se compara en un monitor de buena calidad un video procesada en compuesto y otro procesado en componente, se nota ya una gran diferencia tanto en resolución como en el color y relación señal/ruido. Y cuando se hace la comparación entre copias de diferente generación la diferencia es aún mucho mayor.

La primera copia del formato Betacam es difícil de diferenciarla del original (se necesita instrumentos); pero la primera copia del formato U-Matic es reconocible fácilmente a simple vista por su degradación en la señal.

Debemos tener en cuenta que en el sistema de video, todos los equipos deberán ser del formato de video componentes para que la calidad sea la óptima.

Ahora analicemos a los demás equipos de video

2.1 Videograbadoras

Como ya se dijo se usaron videograbadoras Betacam SP. Las cuales presentan las siguientes ventajas con respecto al conocido formato U-Matic 3/4".

- a) El uso de componentes Y, R-Y y B-Y.
- b) Edición sin tener en consideración el problema del "color framing".

- c) Ausencia de subcarrier que es causa de ruido debido a su modulación en el decoder.
- d) Se evitan los problemas de color, normales en el sistema compuesto.
- e) El uso de cabezales diferentes para luminancia (2) y crominancia (2), a diferencia del U-Matic que son los mismos (2).
- f) La diferencia del equipo normal y del equipo SP (Superior Performance) se encuentra en la frecuencia de modulación de FM para la Luminancia, obteniéndose mejor respuesta en SP. Actualmente sólo se comercializa en tipo SP.
- g) Estas máquinas tienen un corrector de base de tiempo (TBC) incorporado que permite mejorar la señal. A diferencia del U-Matic que se le coloca un TBC aparte ó se le tiene que comprar la opción según el tipo de máquina.

El único fabricante de videograbadoras Betacam SP es SONY .Ahora por la ley antimonopolio existente en Estados Unidos podemos encontrar máquinas de marca BTS que en realidad son máquinas SONY con otra máscara.

El fabricante hace básicamente dos series de videograbadoras:

- 1.- La serie Broadcast BVW como por ejemplo la BVW-50, BVW-60, BVW-65, BVW-70 y BVW-75.
- 2.- La serie Industrial PVW como por ejemplo la PVW-2800, PVW-2650 y PVW-2600.

La serie BVW cuesta aproximadamente el doble de su similar en la serie PVW; pero la primera tiene una serie de ventajas sobre la segunda, de las cuales se pueden mencionar:

a) Es más robusta

b) La mayoría de las partes mecánicas son de fierro, a diferencia de la otra que tiene muchas partes de plástico.

3. Tienen sistema "confidence" tanto en el audio como en el video. Quiere decir que se puede ir chequeando en tiempo real lo que se está grabando, dando la oportunidad de encontrar fallas en la cinta de video.

4. Tienen cuatro canales de audio, dos longitudinales y dos helicoidales (AFM). Estos dos últimos con una muy buena respuesta de frecuencia. La serie PVW sólo tiene dos canales longitudinales.

5. Mayor duración de los cabezales de audio y de video, ya que están hechos de un material especial.

Debido a la cuestión presupuestal se compraron dos videograbadoras PVW-2800 que se instalaron en la móvil y una videograbadora portátil BVW-50 que se usa para hacer las tomas de apoyo en los exteriores y para tomas del video de presentación y pase de comerciales.

Las máquinas se instalaron de tal forma que se puedan usar para hacer ediciones cuando no se está en proceso de grabación.

2.2 Cámaras

Para la instalación de la OB-Van se usaron cámaras 3CCD que pudieran ser de los dos tipos ENG/EFP (“Electronics News Gattering” y/o “Electronics Field Production”). Quiere decir que pueda usarse para exteriores/noticias y para estudios de producción.

Dentro de la gran variedad de cámaras que existe en el mercado, se tuvieron en consideración final tres marcas muy conocidas:

1. SONY con su modelo DXC-537A.
2. IKEGAMI con su modelo HL-57.
3. BTS con su modelo LDK-91A y LDK-93

Las tres cumplían los requisitos deseados como son:

- a) Buena sensibilidad (F8.0 con 2000 lx), necesitando poca iluminación para captar bien las tomas.
- b) Chip sensores CCD mejorados de 2/3”, que mejoran las imperfecciones de los anteriores CCD con mayor cantidad de pixels y nuevas tecnologías para convertir la señal a pulso eléctrico.
- c) Facilidad para su mantenimiento, esto es importante ya que el servicio y reparación se dá en nuestros talleres.
- d) Livianas, que permite su uso sin trípode para tomas portátiles.
- e) Resolución de 700 líneas Horizontales, dando una resolución bastante buena.
- f) Excelente relación señal/ruido (S/N ratio >60 db)

- g) Opción de "Shutter" variable, que nos permite hacer tomas con obturación de la señal.
- h) Habilidad de sincronizarse externamente, permitiendo la aceptación de una referencia que logre poner en fase la cámara con respecto al switcher.
- i) Salida de video componentes en diferentes formatos, aparte de la salida de video compuesto.
- j). Posibilidad de selección de por lo menos tres filtros de luz, esto para usarse en interiores o exteriores con diferente tipo de iluminación.

Inclusive los proveedores nos dieron la oportunidad de ver en operación cada cámara en el campo, teniendo buenos resultados cada una de ellas.

Finalmente se decidió por las cámaras Sony DXC-537A y las consideraciones que primaron para la elección fueron:

- a) Su relación de costo por unidad.
- b) El soporte técnico del representante en el Perú.
- c) Que podíamos usar los Controladores Remotos CCU de otras cámaras que ya poseíamos (DXC-M7).

Para estas cámaras podemos usar los controladores CCU-M7 como los CCU-M5 (camera control unit) ambos de Sony, con ventajas de tener compensador de cable dependiendo de la longitud del cable (50mts, 100mts, 200mts, etc.) y también de poder seleccionar la salida de componentes en diferentes formatos (Y, R-Y, B-Y ó R, G, B ó Y, C).

Gracias a estos CCU la operatividad es sencilla, ya que cuenta con la ayuda de un menú visual en el monitor que nos permite controlar los múltiples parámetros de las cámaras en el momento deseado. Por esto es importante adiestrar adecuadamente al técnico de cámaras en el significado de cada parámetro, ya que una mala operación origina una mala señal en la salida de la cámara.

Junto a las cámaras y controladores se seleccionaron una serie de aditamentos necesarios:

2.2.1 Trípode y dolly.-

El trípode soporta la cámara cuando se trabaja en el estudio y el dolly es el aditamento que permite con un sistema de ruedas, movilizar la cámara con facilidad.

Existen de varias marcas (Sachtler, Vinten, Miller, etc.), de diferentes tamaños y materiales. Se escogieron unos que a la vez sean fuertes y livianos para soportar el constante movimiento de las mismas y poderlos movilizar rápidamente.

2.2.2 Lentes de cámara.-

El lente vá montado al frente de la cámara y es fácilmente intercambiable, las marcas más conocidas son CANON y FUJI ambos fabricantes de muy buenos lentes, tienen nuevas tecnologías que permiten superar el problema de desenfoque en tomas de gran angular y ligeras aberraciones de color en cámaras CCD.

Dependiendo en que se va a usar la cámara se escoge el tipo de lente, se eligió un lente Stándard que no sea Telefoto ni Gran Angular ya que las tomas serían a medio plano. Aquí hay que tener en cuenta de pedir el lente apropiado para la cámara debido al número de pines y tamaño de los CCD (2/3”).

2.2.3 Visor de cámara.-

Para que el camarógrafo pueda ver su propia toma necesita de visores que es un monitor pequeño que se adapta al montaje de la cámara. Se eligieron en este caso visores monocromáticos ya que no es necesario para el camarógrafo los visores a color. Se escogieron de dos tamaños según como se van a usar.

El pequeño de 1.5” se usa cuando se trabaja con cámara suelta de equipo portátil y con batería (por su tamaño y consumo de energía). El otro visor de 5” se usa en el estudio donde se trabaja con fuente de alimentación externa y no hay problema de ahorro de batería.

Estos visores deben ser de buena resolución que permita al ingeniero hacer ajustes a la cámara.

2.2.4 Cables de cámara.-

Cada fabricante de cámaras hace sus propios cables. Estos cables son de dos tipos donde hay que tener cuidado al pedirlos ya que para uno de estos cables se pedirá la adaptación especial.

La opción multicore ó multipin es la estándar que consiste en un cable grueso de 26 pines; cada pin corresponde a una señal de video, audio ó control y pueden usarse hasta de una longitud de 300 mts. sin pérdida de información, haciendo la compensación respectiva en el CCU.

La opción triaxial que consiste en un cable coaxial de tres polos; las señales de video, audio y control van moduladas en frecuencia y pueden soportar longitudes de 1000 mts. sin pérdida de información. Esta opción es tiene mayor costo debido primero al cable y segundo al hardware adicional que se tendría que instalar tanto en el CCU como en la cámara.

2.3 Switcher de video

El Switcher es el equipo operado por el director de cámaras; donde convergen todas las señales de video como cámaras, videograbadoras, TBC, debidamente en fase, que nos permite hacer una serie de efectos como por ejemplo:

- a) Disolvencias entre fuentes de video.
- b) “Wipes” que son efectos especiales.
- c) “Fading” hacia “Black Burst” ó “Background”.
- d) “Key” y “Downstream key” que son sobreimposiciones de un video sobre otro, muy usados para titulación de textos.
- e) Tomas directas o “ponche”.

La elección del switcher de video debe hacerse con sumo cuidado por lo que se consideró lo siguiente:

- a) **Comprar necesariamente el switcher en versión componentes; si se comprara en compuesto hubiéramos perdido las ventajas descritas anteriormente.**
- b) **Que acepte el formato componentes tipo Betacam de diferencias Y, R-Y, B-Y.**
- c) **Que sea pequeño y a la vez fuerte.**
- d) **Que sea de producción y no de post-producción por que su operación debe ser sencilla y rápida, con posibilidad de salidas al aire en vivo.**
- e) **Su salida debe tener la base de tiempo generada por el propio switcher y no con base de tiempo de cada fuente, que generaba muchas veces salto en el video al momento de hacer el switch.**

La elección se hizo principalmente entre dos switcher de marcas conocidas (la más famosa mundialmente es Grass Valley):

El modelo 110CV de GRASS VALLEY GROUP.

El modelo BVS-3200C de SONY

Ambos switcher cumplían las especificaciones e inclusive pude probarlos antes de la compra siendo muy comfortable su uso.

Finalmente se escogió el BVS-3200C por dos razones:

- a) **El costo**
- b) **Tenemos otro switcher igual en funcionamiento en una isla de edición (con buenos resultados) que nos facilitaría a la hora de pedir repuestos para su mantenimiento.**

2.4 Monitores de video

Los monitores de video vienen en varios tamaños, calidades, resolución y en color ó monocromático. Se escoge el tipo dependiendo su uso ya que según esto es el costo. Se tuvo en consideración lo siguiente:

- a). Un monitor monocromático de resolución aceptable para cada cámara en donde se tendrán la salida directa de cada una de ellas. Se usan en la unidad móvil sólo para ver la forma de la toma.
- b) Dos monitores a color de buena resolución para las salidas de “Programa” y “Preview” del Switcher”. Acá se vé el producto final que sale del switcher y por lo tanto vá a grabarse.
- c) Un Monitor a color de buena resolución para el técnico de cámaras, donde puede corregir con precisión los niveles de cámara y parámetros.
- d) Dos monitores a color de buena resolución uno para cada máquina para el operador de videograbadoras donde chequeará la grabación final las veces que sea necesario. Estos monitores se usan también para el control de calidad final del producto.
- e) Un televisor a color, de los que venden en el mercado local que se usa referencialmente en el caso de usar la unidad móvil para un programa “en vivo”.

2.5 Otros equipos

Para el correcto funcionamiento de la OB Van es necesario instalar una serie de equipos adicionales de video, los cuales deben cumplir ciertos requisitos.

2.5.1 Generador de sincronismo

Es el encargado de generar los pulsos y tiempos necesarios para el funcionamiento de todos los equipos de video. Es sumamente importante escoger uno de muy buena confiabilidad y tener en lo posible otro de “back-up” para poder reemplazarlo en caso necesario. Inclusive existe un sistema llamado “changeover” que hace el cambio automático de generador a la primera falla.

Generalmente junto con el generador de sincronismo viene un generador de video de barras de color que se usa para la calibración de los monitores y para hacer el “enganche de referencia” (GEN LOCK) de los demás equipos.

2.5.2 Distribuidor de video

Es el equipo donde llega la salida del programa del Switcher y tiene varias salidas dirigidas hacia los diferentes equipos como videgrabadoras, monitores, transmisor de microondas, etc.

Estos distribuidores vienen en dos versiones, en video componente (tener cuidado en el tipo de componente) y en video compuesto

dependiendo hacia donde van a alimentar estos videos. Deben ser de buena calidad para que no degraden la sefial.

2.5.3 Instrumentos de medición

Son dos instrumentos que pueden venir por separado o integrados en un solo equipo, existen en la versión portátil o en frame.

El “Waveform Monitor”o monitor de forma de onda, que permite ver las señales de luminancia ya sea sola o junto con la crominancia, como asi también permite chequear las bases de tiempo de los diferentes equipos.

El “Vectorscope”,que permite ver las señales de crominancia como así también las diferencias de fase de color de todos los equipos.

Estos instrumentos tienen una serie de opciones que son muy útiles para ajustes, chequeo y calibración de los equipos que se usan en la unidad móvil. También son muy usados para el mantenimiento preventivo y correctivo de los mismos.

De estos instrumentos existen tanto en las versiones de video componente como de video compuesto dependiendo del tipo de formato que se quiera monitorear.

2.5.4 Botonera de video

Usada por el técnico de cámaras donde hace el switch entre las diferentes fuentes, independientemente de lo que se está haciendo en el switcher. Es importante escoger una que haga el switch dentro del intervalo vertical de

las señales de video para que no se note ningún salto que pueda crear una falla irreal.

Con este equipo, los instrumentos de medición y un buen monitor de color, el técnico de cámaras puede corregir, ajustar y enfasar sus señales de video antes de que sean seleccionadas por el director de cámaras de televisión.

2.5.5 Cables de Video.-

Los cables de video deben ser coaxiales con una impedancia de 75 ohm del tipo RG-59U. Para la instalación de componentes se usó un cable especial marca CANARE, donde vienen juntos tres cables coaxiales identificados cada uno con un color respectivo. Usando este cable triple, aparte de ahorrar espacio, se evita los retardos producidos por las diferencia en longitud de los diferentes cables que ocasionan aberraciones en los efectos del switcher como “key”, “chroma key” y “downstream keyer”.

Todos estos cables pasan por una canaleta especial junto con los cables de audio y por una canaleta diferente de los cables de energía.

En la figura 3 podemos ver el diagrama de instalación del sistema de video.

Las cámaras instaladas en el estudio son conectadas a los CCU mediante sus respectivos cables de cámara.

De cada CCU salen dos salidas de video, la principal que se conecta a la botonera y el switcher y la secundaria (con opción al menú en pantalla) se conecta a su respectivo monitor B/W.

Al switcher también le llega la salida de la videograbadora Betacam con su respectivo TBC y también del generador de barras de color.

A la botonera le llegan también la salida de la videograbadora, como de la salida del programa del switcher. Esto último es para ir controlando con los instrumentos la salida final del programa.

La salida del programa del switcher es distribuida hacia: un monitor a color, una videograbadora, un transmisor de microondas y hacia la botonera de video.

La salida del previo del switcher es enviada a un monitor a color para que lo use el director de cámaras.

Adicionalmente una salida de cada videograbadora Betacam va a su monitor a color, y entre ambas existe la conexión de “dubbing” para hacer copiadados de mayor calidad.

La salida de la botonera va a un sistema de monitoreo que consiste en un monitor a color, un waveform monitor y un vectorscope. Acá el técnico de cámaras podrá variar los respectivos parámetros de las cámaras y videograbadoras usando los CCU y TBC respectivamente.

Paralelo a todo esto, el generador de sincronismo está enviando las señales de sync, blank y subcarrier que permiten operar al generador de video de barras de color.

La salida del generador de barras es enviada como señal de referencia hacia el switcher, los CCU, las videograbadoras e instrumentos de

medición, como así también se envía al switcher como video para poderla usar como señal de prueba.

También se conecta la señal de sync del generador de sincronismo hacia los diferentes monitores, esto permite ver directamente en cada monitor si la cámara permanece con la referencia.

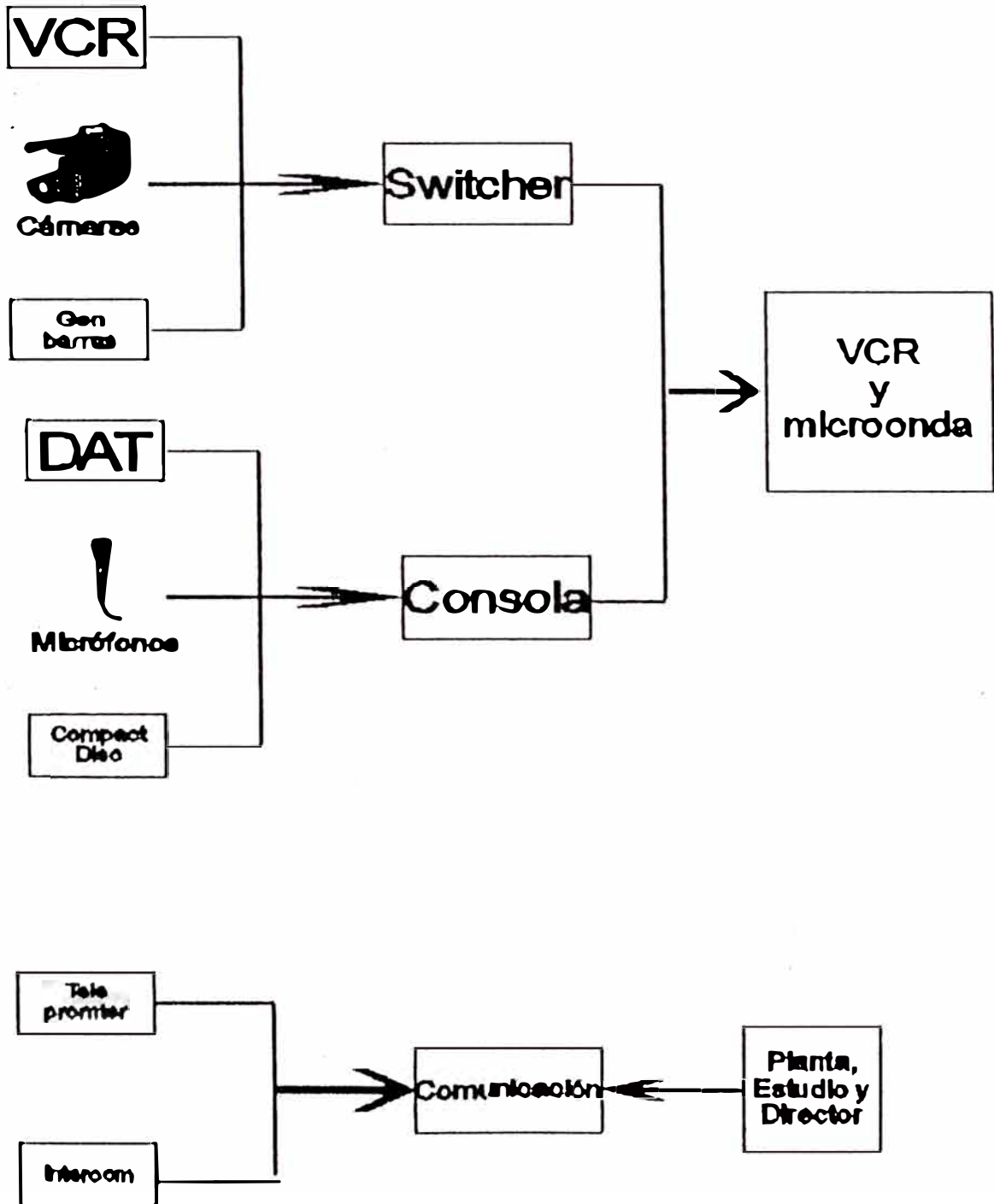


Figura 1.- Diagrama de bloques

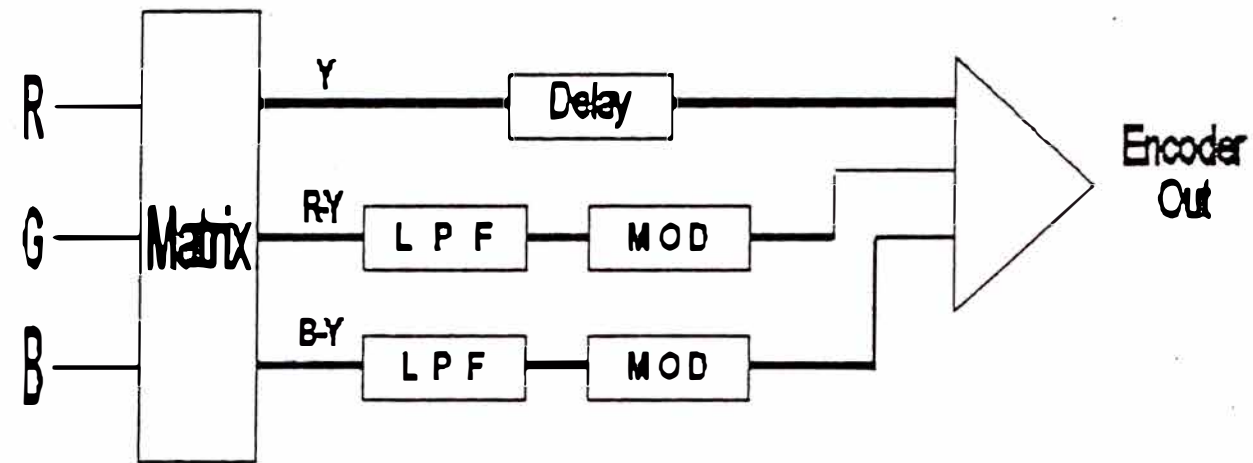
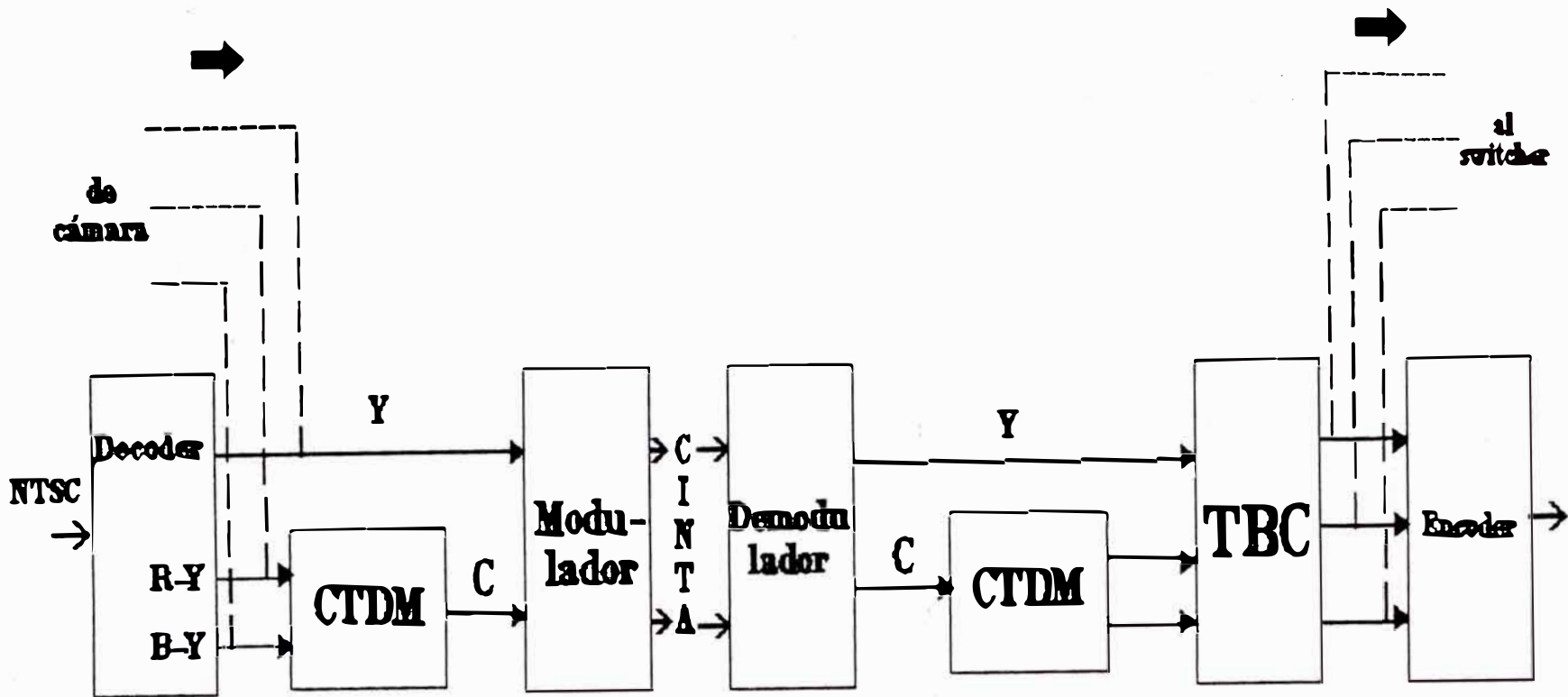


Fig 2.- Diagrama simplificado del Encoder



**Fig.- Funcionamiento de la videogradora
Betacam**

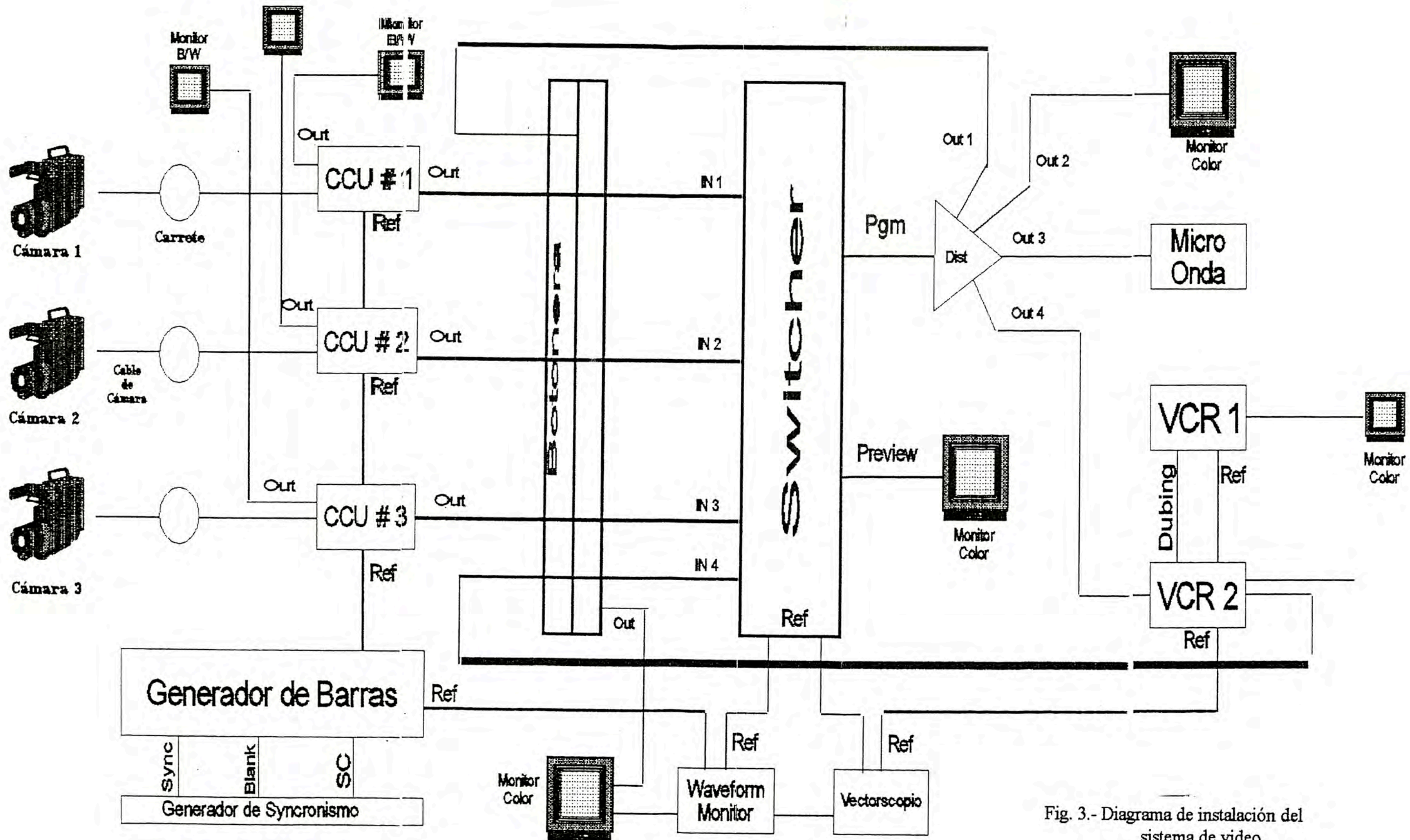


Fig. 3.- Diagrama de instalación del sistema de video.

CAPITULO III SISTEMA DE AUDIO

Cuando se graba una novela se piensa que en el futuro vá a exportarse a otros mercados donde la competencia es fuerte, para lo cual el tratamiento de la señal de audio tendrá que ser de la más alta calidad en donde todos los elementos deberán tener ciertas características técnicas.

El procesamiento de audio de la telenovela en la planta central es como sigue:

- 1.- Las tomas se editan a otro cassette por lo tanto hay pérdida de primera generación.
- 2.- La edición final es copiada a equipos digitales de 8 canales, con el respectivo código de tiempo, para hacer el proceso de musicalización.
- 3.- Se hace la musicalización o sonomontaje en sistema digital; por lo tanto no hay pérdida de generación
- 4.- El sonido final es regresado a la edición final en cassette y es lanzado al aire.

Esto significa que la única pérdida de generación es cuando se edita (antiguamente se perdían 4 generaciones). Por lo que es importante tratar el audio en la OB-Van con el mayor cuidado.

Hay que considerar que el producto final debe tener dos bandas de audio.

Audio 1 = mezcla (locución + ambiente + efectos musicales + música)

Audio 2 = mezcla (ambiente + efectos musicales + música)

Esto se hace por que si el programa se exporta a un país donde no se habla español; el comprador podrá usar el audio2 y mezclarlo con un doblaje hecho en su propio idioma para colocarlo en reemplazo del audio1 y por lo tanto emitirlo “al aire”.

Ahora veamos los equipos de audio usados en la OB-Van.

3.1 Micrófonos

Los micrófonos son el corazón del audio en la telenovela, la mayoría son diálogos de los actores; pero según el libreto de la novela, las tomas pueden ser en primer plano, en medio plano ó plano general y a la vez pueden ser fijas ó con mucho movimiento.

Para atender todas estas situaciones, se planteó la necesidad de contar con tres tipos de micrófono:

3.1.1 Micrófono de condensador.-

Este micrófono produce una alta calidad de audio; su respuesta típica de frecuencia es de 20Hz a 18Khz, son de alta sensibilidad y necesitan de una fuente de poder adicional para alimentar a su preamplificador.

Este tipo de micrófono utiliza una pequeña y delgada membrana metálica y flexible colocada cerca de una placa de metal y ambas a un potencial de polarización (48 VDC). Cuando capta un audio, la presión sonora altera el

espacio entre las placas y por lo tanto su capacidad; por lo tanto la variación de corriente originada por este cambio de capacidad constituye la señal de audio.

Estos micrófonos pueden ser del tipo:

- a) “SHOTGUN”, o comunmente llamados “BOOM” que son de un tamaño relativamente grande, colocados a una distancia de aproximadamente 1.5 mts de los actores y como son directivos (cardioides e hipercardioides) se necesita que el auxiliar de audio esté constantemente dirigiendolos a la fuente sonora.
- b) “LAVALIER”, que es un micrófono pequeño que fácilmente puede ser escondido del campo visual de la cámara. Generalmente vienen en la versión de inalámbricos donde en un mismo “frame”, van el pre-amplificador con el transmisor.

3.1.2 Micrófono electret.-

Es un micrófono de alta calidad y muy pequeño, es relativamente un micrófono de condensador que incorpora un diafragma de film plástico con una permanente carga electrostática; con esto se elimina la necesidad de un voltaje de polarización.

Como usa un pequeño pre-amplificador dentro de su compartimiento hay espacio para colocar una batería de alimentación

3.1.3 Micrófono dinámico.-

Este micrófono es menos sensible que el de condensador, generalmente su patrón de directividad es omnidireccional y se usa cuando se quiere

captar audios no críticos como por ejemplo audio de ambiente, de partidos de fútbol, de sonido de naturaleza, etc. Este tipo de micrófono funciona cuando la presión sonora hace vibrar un diafragma que tiene una pequeña bobina que cuando se mueve crea un campo magnético que genera una corriente de audio. La respuesta de frecuencia típica es de 40 Hz a 16KHz.

3.2.Consola de audio.

El elemento donde convergen las señales de audio y manejado por el operador de audio es la consola. El operador debe:

- a) Seleccionar y controlar las salidas de las diferentes fuentes de señal como microfónos, compact disc, videograbadoras, etc.
- b) Mantener el indicador de nivel dentro de los límites permitidos ajustando las ganancias de los diferentes canales.
- c) Chequear la calidad del audio en parlantes y audífonos de muy alta calidad.
- d) Ir monitoreando las fuentes que no estan On-Line o sea en modo “preview” para que puedan salir a programa en forma correcta.

La consola de audio debe ser pequeña para grabación y no para musicalización, con por lo menos dos salidas de auxiliares para poder chequear en preview y enviarle al estudio otra señal diferente a la del programa. Las entradas de la misma deben ser del tipo balanceadas (dos vivos y un blindaje) que permite una protección de interferencias externas.

En equipos de audio Broadcast trabajamos usualmente a una impedancia de 600 ohm y con un nivel de 0 VU (Que puede ser según el caso de +4dbm ó +8dbm).

La consola debe ser fácil de manejar permitiendo al operador básicamente el control de los niveles y en la medida de lo posible evitar cualquier equalización o variación, ya que este audio todavía pasaría a un proceso de sonomontaje.

La instalación inicial en la OB-Van es de trabajar en audio monoaural; pero en caso de necesidad haciendo pequeñas variaciones se podría trabajar en audio estéreo.

La consola debe tener la posibilidad de enviar fuente "Phantom" de 48 volts que alimente a lo micrófonos boom o shotgun.

3.3 Compact disc y minidisc

Este equipo CD se usa cuando el director de televisión crea conveniente agregar pequeños efectos y/o música necesarias para la toma. En la medida de lo posible este trabajo se debe dejar para la parte de musicalización en la respectiva sala de sonomontaje de planta central.

El CD debe ser fuerte para que soporte el trajín del movimiento físico de la móvil y de calidad Broadcast, es preferible que acepte también entradas de control MIDI para un caso de control por computadora.

El minidisc graba segmentos de audio para poderlos repetir constantemente y en cualquier momento, su grabación es digital y la búsqueda es bastante rápida. Se usa cuando se requiere de aplausos, risas, sonidos de timbre, etc.

3.4 Amplificador, parlantes y audífonos

Deben ser de buena calidad y respuesta de frecuencia de 20 Hz. a 20 KHz. ya que en estos equipos el operador de audio verificará la salida final de su consola y la posible presencia de ruidos extraños.

El amplificador debe ser estéreo y su potencia debe ser tal que pueda dar tanto a la móvil como al estudio el nivel suficiente de trabajo. Debe tener sistema de protección en caso de desconectarse por accidente un parlante.

El audífono debe ser de diseño cerrado, confortable para el uso prolongado y además de impedancia acorde a la consola.

Los parlantes deben aceptar una potencia acorde al amplificador, de buena calidad con el sistema de "cross over" para la separación de frecuencia. El que se coloque dentro de la OB debe ser pequeño para evitar interferencias en el video.

3.5 Grabadora de audio

En este caso se usa la misma grabadora de video Betacam SP. Esta videograbadora viene en dos versiones (dependiendo del costo) en lo que respecta al audio:

a) Con dos canales de audio.-

Usadas en la serie PVW, son los canales 1 y 2, los cuales se graban en forma longitudinal en la cinta, tan igual como el sistema U-Matic. Para eso utiliza un cabezal fijo que emite un bias de grabación hacia

la cinta que está en movimiento. La respuesta de frecuencia de estos audios es de 50 Hz a 15 KHz.

b) Con cuatro canales de audio.-

Usadas en la serie BVW, que aparte de usar los canales 1 y 2 descritos anteriormente, tiene dos canales 3 y 4 llamados AFM. Para la grabación de los audios AFM la videograbadora utiliza dos cabezales ubicados físicamente en el tambor de video (“upper drum”) junto con los cabezales de luminancia y crominancia, que se encuentra en constante movimiento. Estos audios se graban en la cinta en forma transversal igual que el video; aquí existen dos movimientos: el de la cinta y el de los cabezales de audio.

La respuesta de frecuencia de estos audios es de 20 Hz a 20 KHz.

Cuando se quieren utilizar los audios AFM hay que tener en cuenta que la grabación de estos sólo es posible hacerlo en el modo ASSEMBLY, esto es junto con el video y pulsos de control y no en el modo de inserto de audios.

En el futuro se piensa colocar para grabar audio una grabadora digital pero que acepte código de tiempo para evitar pérdidas de generación ya que el proceso de sonomontaje sería directo.

3.6 Distribuidor de audio

La salida de programa de la consola pasa por un distribuidor que puede repartir la señal a varios lugares como grabadoras, microondas, amplificadores, etc. Este distribuidor, puede variar el nivel de salida en un

gran rango, por eso es necesario chequear su calibración antes de empezar la grabación.

Los distribuidores tienen una impedancia de entrada variable de 600 ohm ó 10 Kohm; y una impedancia de salida de 600 ohm para cada salida.

3.7 Cables y conectores .-

Se usaron cables estándar de audio marca Belden, con una impedancia de 600 ohm del tipo balanceado con dos polos vivos y uno de shield, también se usaron los rollos de cable múltiple balanceado para la conexión con el estudio.

Los conectores fueron todos del tipo XLR metálicos, de tres polos y todos unidos a los cables a través de soldadura.

3.8 Equipos adicionales.-

Los siguientes equipos también se instalaron en la OB-Van haciendo la salvedad de que se usaran en caso de necesidad, con mucho cuidado y la aprobación explícita del Ingeniero responsable.

3.8.1 Gate o compuerta

El Gate es un equipo que permite pasar la señal de audio a partir de un cierto nivel de voltaje. Este nivel es regulable con un control de Threshold variable. Gracias a este equipo se pueden eliminar algunos ruidos indeseables como por ejemplo el ruido del grupo electrógeno, el ruido de una fábrica, de algún motor, etc.

El operador de audio debe tener mucho cuidado al usar el equipo por que puede cortar audios que si son deseados en la grabación como el audio de ambiente o naturaleza.

3.8.2 Compresor / limitador

Hay momentos que debido al libreto, el actor debe hablar bajo en un momento e inmediatamente después gritar, por lo que el control en la consola es difícil; para eso se usa el compresor/limitador que comprime los sonidos altos y los limita a un nivel regulable.

Este equipo tiene varios controles como el nivel de compresión, valor de limitación, velocidad de compresión, etc. por lo que el operador de audio debe tener mucho cuidado y preparación para usar el equipo ya que puede fácilmente degradar la señal de audio que es lo que no se desea.

En la figura 4 se puede ver el conexionado del sistema de audio dentro de la OB-Van.

Cada micrófono ingresa a entradas diferentes de la consola de audio, con la posibilidad que a uno de ellos pase primero por un gate o compuerta.

Adicionalmente ingresan a las entradas balanceadas de la consola, las otras fuentes de audio como la videograbadora Betacam, el compact disc, el DAT y el mini disc.

La salida de programa de la consola pasa por un distribuidor, que reparte la señal hacia la videograbadora, el transmisor de microondas, el compresor / limitador y el amplificador con su respectivo parlante para el chequeo correspondiente.

Adicionalmente la salida de auxiliar 1 de la consola es usada dentro de la OB-Van para chequear los audios en modo interno.

La salida de auxiliar 2 es enviada al estudio, que con su correspondiente amplificación es usada por el personal de producción.

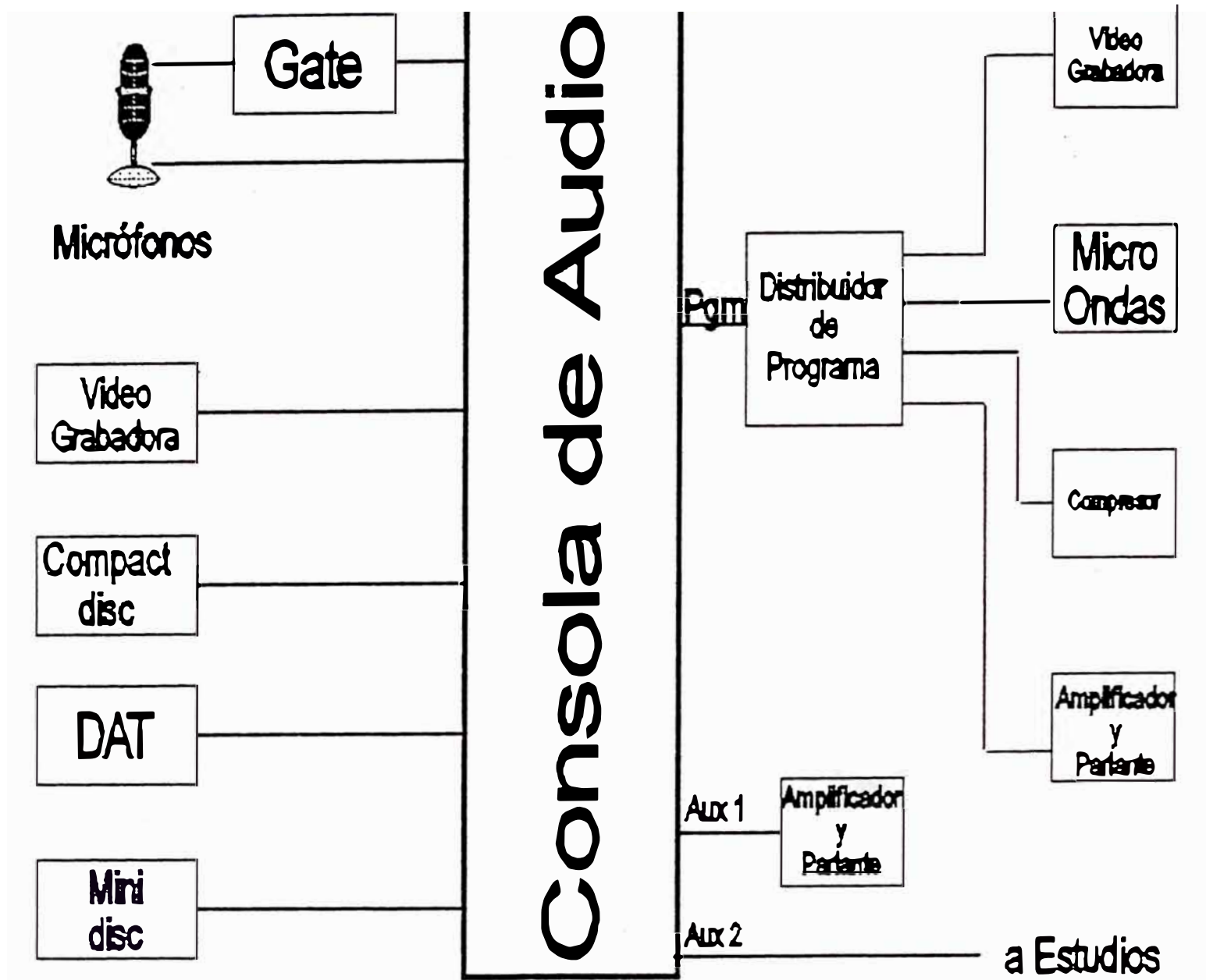


Fig. 4.- Diagrama de conexión del sistema de audio

CAPITULO IV SISTEMA DE FUERZA

Por experiencia puedo decir que la instalación eléctrica es importante en la OB-Van (Outside Broadcast Vehicle); ha habido ocasiones que se han presentado ruidos, interferencias, problemas en enlace de microondas, etc. que se descubrió que eran por problema de tierra o de energía; así que una mala instalación ó diseño podría originar situaciones desagradables como:

- a) Que se malogre un equipo; lo que implicaría gastos en la reparación, pérdida de tiempo mientras se repara y/o cambia el equipo (usualmente en Televisión se trabaja en contra del tiempo por lo que estas demoras son inadmisibles).
- b) Que el equipo funcione mal; apareciendo pequeños “hum” en video ó ruidos de fondo en el audio. Estas fallas no son aceptadas en el control de calidad.
- c) Que aparezcan interferencias a nivel general como ruidos en el video y/o audio muchas veces muy difícil de solucionar.
- d) Que la seguridad del personal que trabaje en la OB-Van no sea la adecuada pudiendo ocasionar algún percance.
- e) Que el sistema de dimmer de luces genere ruidos en el video y/o audio.
- f) Que exista muchas variaciones y/o transitorios de voltaje.

Por esto es que la instalación del sistema de fuerza debe ser cuidadosamente chequeada y probada en planta antes de su operación.

Ahora veamos brevemente el sistema que se ha dividido en tres partes: Alimentación, Sistema de Tierra y Grupo Electrónico.

4.1 Alimentación

Los equipos electrónicos de la OB-Van usa tensiones de alimentación de 110 volt y 220 volt., para esto se han colocado una serie de barras de AC y supresores de transitorios donde estos equipos puedan conectarse.

La Unidad Móvil trabaja en monofásico por dos motivos:

- a) La potencia consumida es relativamente baja.
- b) La facilidad que tendría para conectarse a cualquier punto de fuerza.

El sistema está conectado tal como lo muestra la figura 5.

Con una llave de transferencia se selecciona la energía ya sea de las empresas eléctricas o del grupo eléctrico; esta tensión de 220 volts de línea llega a una llave de cuchilla que sería la llave general, luego se divide a otras dos llaves. Una de ellas va a alimentar a toda los circuitos electrónicos y la otra al aire acondicionado junto con el Kit de luces portátil de la unidad móvil.

De la llave que alimenta a la parte electrónica vá a un estabilizador de tensión 220v/220v que debe ser de buena calidad ya que en provincias tenemos muchas fluctuaciones de voltaje.

Del estabilizador, se divide en dos rutas: la primera alimenta a una barra general de 220volt y la segunda ingresa directamente a un transformador de voltaje para que de ahí alimente a la barra general de 110volt. No se usa autotransformador de voltaje por seguridad y por que es más susceptible a las interferencias.

De estas dos barras generales de 220volt y 110 volt se alimentan a una serie de pequeñas barras de AC debidamente identificadas que se encuentran empernadas a los racks metálicos. Acá se tiene el cuidado de poner conectores de AC diferentes para 220 volt (Twist lock) y para 110 (Hubell), para evitar equivocaciones.

Las canaletas metálicas por donde van a pasar los cables de AC serán diferentes a las que se estan usando para los cables de video y de audio.

4.2 Sistema de tierra

La palabra “grounding” en video, describe la técnica y hardware que conecta los equipos de video con sus cables hacia un punto de referencia conectado a tierra. Con esto podemos minimizar ruidos en las entradas de audio y video en cualquier condición de operación e interconexión.

Aunque la OB-Van es pequeña, se debe conectar el sistema de tierra para lograr:

- a) Mayor seguridad del personal operativo.
- b) Mayor protección a los equipos.
- c) Reducción de los transitorios de voltaje.
- d) Mejorar el funcionamiento del sistema de dimmer de luces.
- e) Proteger a la OB-Van de cualquier interferencia electromagnética

f) Obtener la mejor calidad de audio.

Para esto todos los racks metálicos donde van instalados los equipos son unidos físicamente por pernos con tuerca, pintándolos luego con pintura antioxidante para evitar la corrosión

Todas las barras de AC sean de 220v ó 110 v deben tener conectados el punto central de tierra y juntos a la vez con los racks metálicos.

Todos los equipos electrónicos Broadcast vienen con toma de tierra en su tomacorriente por lo que se deben usar sus cables de AC originales de tres polos.

Si la mayor parte de la grabación se van a hacer en una locación fija (estudios), se deberá diseñar e instalar uno o varios pozos de tierra según sea el caso, que cumplan con las condiciones técnicas necesarias (la impedancia $z < 5 \text{ ohm}$) para una configuración estrella 208volt/120volt.

Cuando la OB-Van se utilice en una locación momentánea, se tomará el punto de tierra del lugar si es que existiese o en caso contrario usar alguna cañería metálica, pozo u otro punto aparente.

4.3 Grupo electrógeno

Es necesario considerar la utilización de un grupo electrógeno monofásico con toma de tierra para cuando se desee hacer una grabación en lugares donde no haya energía. Este grupo debe tener control sobre el voltaje y la frecuencia de la salida y nos dá una forma de onda senoidal ideal.

Para esto hay que considerar dos casos:

a) Las tomas sólo necesitan luz natural.-

En este caso se debe contar con un grupo electrógeno pequeño (10 Kw) para alimentar sólo la parte electrónica, el aire acondicionado, y un pequeño Kit de luces portátiles y HMI (“luz de día”).

b) Las tomas necesitan luz artificial.-

En este caso se considera llevar un grupo electrógeno de mayor potencia dependiendo de la cantidad de luces que se vaya a usar. Si el lugar posee tensión pero de baja potencia; es preferible usar esta energía para la parte electrónica y el grupo electrógeno para la iluminación, evitándonos así cualquier ruido producido por los Dimmer y Triacs.

Hay que tener en consideración que los grupos electrógenos son ruidosos dependiendo del tamaño y potencia. Este ruido es fácilmente captado por los micrófonos de condensador sumamente sensibles; para eso es necesario que el grupo sea aislado acústicamente, preparándole localmente su caja acústica o en todo caso comprándole de su propio fabricante.

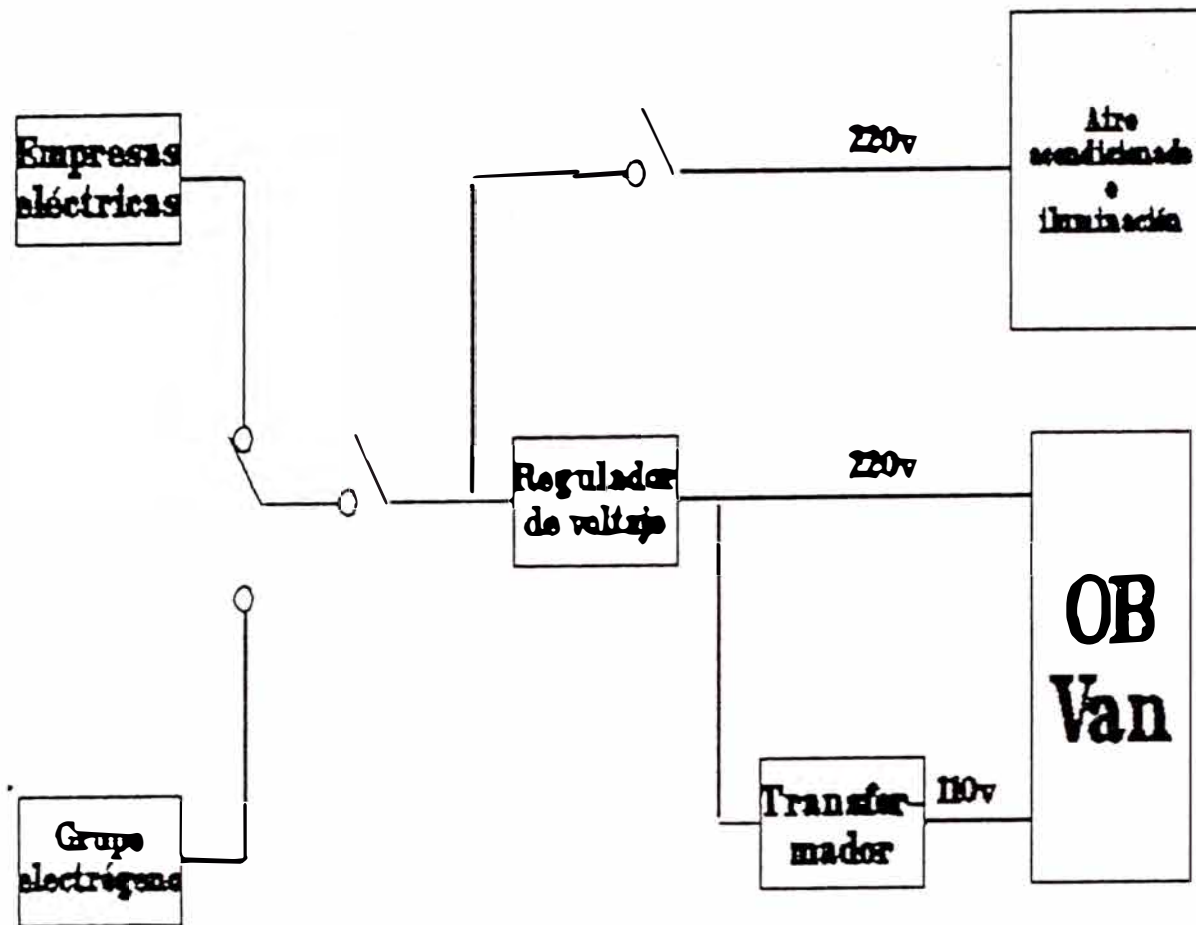


Fig. 5.- Diagrama del sistema de energía dentro de la unidad móvil

CAPITULO V SISTEMA DE COMUNICACION

Teniendo un adecuado sistema de comunicación e intercomunicación ya sea en la unidad móvil, estudios, locaciones, planta central y todos a la vez, podremos realizar las grabaciones en coordinación y evitando pérdidas de tiempo, como así también evitar errores en la salida del programa cuando el enlace es en directo. Ha habido muchos casos que por mala comunicación no aparezca video en la imagen o aparezca una toma mal hecha, lo mismo con el audio que se han escuchado conversaciones ajenas o audios de prueba, que al final dañan la imagen de la empresa.

En el sistema de la OB-Van debemos considerar los siguientes puntos: Intercomunicación, Teleprompter, Sistema de Radiocomunicación y enlace de Microondas.

5.1 Intercomunicación

Dentro de la unidad móvil se instala un sistema de intercomunicación que nos permite comunicarnos en ambas direcciones y al mismo tiempo entre el director de cámaras, el técnico de cámaras, los coordinadores de producción, iluminadores y auxiliar de audio que se encuentran en el estudio. Ver figura 6.

Para esto cada persona o grupo de personas, tiene asignado un canal de comunicación que permita desde la unidad central ubicada en la móvil seleccionar entre quienes se establece la comunicación. Este sistema es bastante flexible permitiendo una intercomunicación de todos contra todos o también de uno contra todos. El voltaje a las unidades remotas es dada desde la unidad central.

Actualmente en el mercado existen sistemas totalmente inalámbricos que permiten a las diferentes personas movilizarse dentro del estudio sin estorbar a nadie con los cables, y con gran rapidez. Las marcas más conocidas son "Telex", "Clear-Com" y "RTS". Nosotros en la unidad móvil usamos finalmente un sistema alámbrico marca "Clear-Com" por compatibilidad con todo nuestro sistema de planta central y por que lo teníamos en stock.

Adicionalmente a este sistema de intercomunicación, se le instala al director de cámaras un micrófono dinámico conectado a la consola de audio para que éste pueda dar indicaciones generales a todos los actores y personal de estudio. El operador de audio sabrá enrutar el micrófono por una salida auxiliar sin afectar al programa, usando para ello un amplificador con su respectivo parlante.

Además, los controles de las cámaras (CCU) proveen de un sistema de intercomunicación de 4 hilos entre el director y los camarógrafos, permitiendo a estos últimos recibir indicaciones sobre la forma de su toma en pleno proceso de grabación. Ver figura 7.

Existe también en cada cámara el llamado "Tally" conectado entre ésta y el switcher, encendiéndose una luz cada vez que la cámara ha sido

seleccionada por el director. Así el actor sabe con cual de las cámaras está siendo enfocado.

5.2 Teleprompter

En televisión se llama teleprompter al sistema de ayuda que se les dá a los actores y/o locutores para que no se olviden de su libreto.

Estos pueden ser de dos tipos:

5.2.1 Teleprompter óptico.-

Este sistema se basa en un mecanismo montado en el trípode de la cámara que consiste en

- a) Un monitor de televisión que tenga el barrido horizontal invertido.
- b) Un espejo especialmente pulido que permita por un lado el paso de la luz y por el otro que la reflecte.
- c) Un soporte para ambos.
- d) Un procesador de textos con salida de video, que puede ser una lap-top.

El espejo se instala entre la cámara y el locutor tal que la primera pueda ver al segundo sin problemas y del otro lado, el locutor vea reflejado en el espejo los textos que se estan colocando en el monitor con el correspondiente procesador de textos.

Este sistema se usa principalmente en programas noticiosos y conferencias, en donde por la cantidad y rapidez de las noticias, el locutor continuamente está leyéndolas “en su cámara”.

5.2.2 Teleprompter de audio.-

Este sistema es mucho más útil en la grabación de telenovelas y en obras de teatro donde existe mucho movimiento, consiste en lo siguiente :

- a) Un pequeño transmisor de audio, en donde se le coloca un micrófono que no necesita ser de buena calidad.
- b) Pequeños receptores que se colocan a cada artista (usualmente en la cintura).
- c) Audífonos miniatura colocados dentro de los oídos de cada artista.

El “telepromptista” es el encargado de recitar constantemente los libretos en el transmisor; esta señal es recibida en todos los receptores que a la vez es retransmitida por medio de una antena circular (colocada “invisiblemente” en el cuello del actor) hacia los audífonos inalámbricos miniatura de tal forma que no se vean a través de el enfoque de la cámara.

Como los pequeños audífonos son del color de la piel, es fácil hacer tomas de primer plano sin problemas.

En la OB-Van usamos el sistema de marca COMTEK.

5.3 Sistema de radio y microondas

Independientemente de los sistemas anteriores, en la unidad móvil se instala un equipo de radiocomunicación de 80 watts que nos permite comunicarnos con la planta central y con los “walkie talkies” que usamos para coordinación en la móvil y cerca de ella. Es bastante útil cuando se quiere hacer enlaces de microonda ya sea de uno o varios saltos.

La antena del equipo debe ser bien conectada para evitar interferencias en el audio y video en el momento de transmitir. La frecuencia del equipo es la misma que nuestra central y es pedida al Ministerio de Transportes y Comunicaciones.

Este equipo, junto con un teléfono celular se usan mucho para coordinación cuando queremos usar la OB-Van para hacer enlaces a planta central, ya sea "en vivo" o no.

En el techo del camión se coloca una plataforma que sirva de soporte de un equipo transmisor de microondas que se pudiera colocar con el fin de hacer enlaces a planta central, esta plataforma también sirve para colocar una cámara con su trípode en caso de necesidad.

Este microonda debe ser del tipo portátil con un canal de video y dos canales de audio. La frecuencia de trabajo por normas, están en la bandas de 2 Ghz ó 7 Ghz.

Debido a la cantidad de canales de televisión que están usando enlaces de microondas en estas frecuencias, es preferible no usarlas a menos que sea un enlace "en vivo".

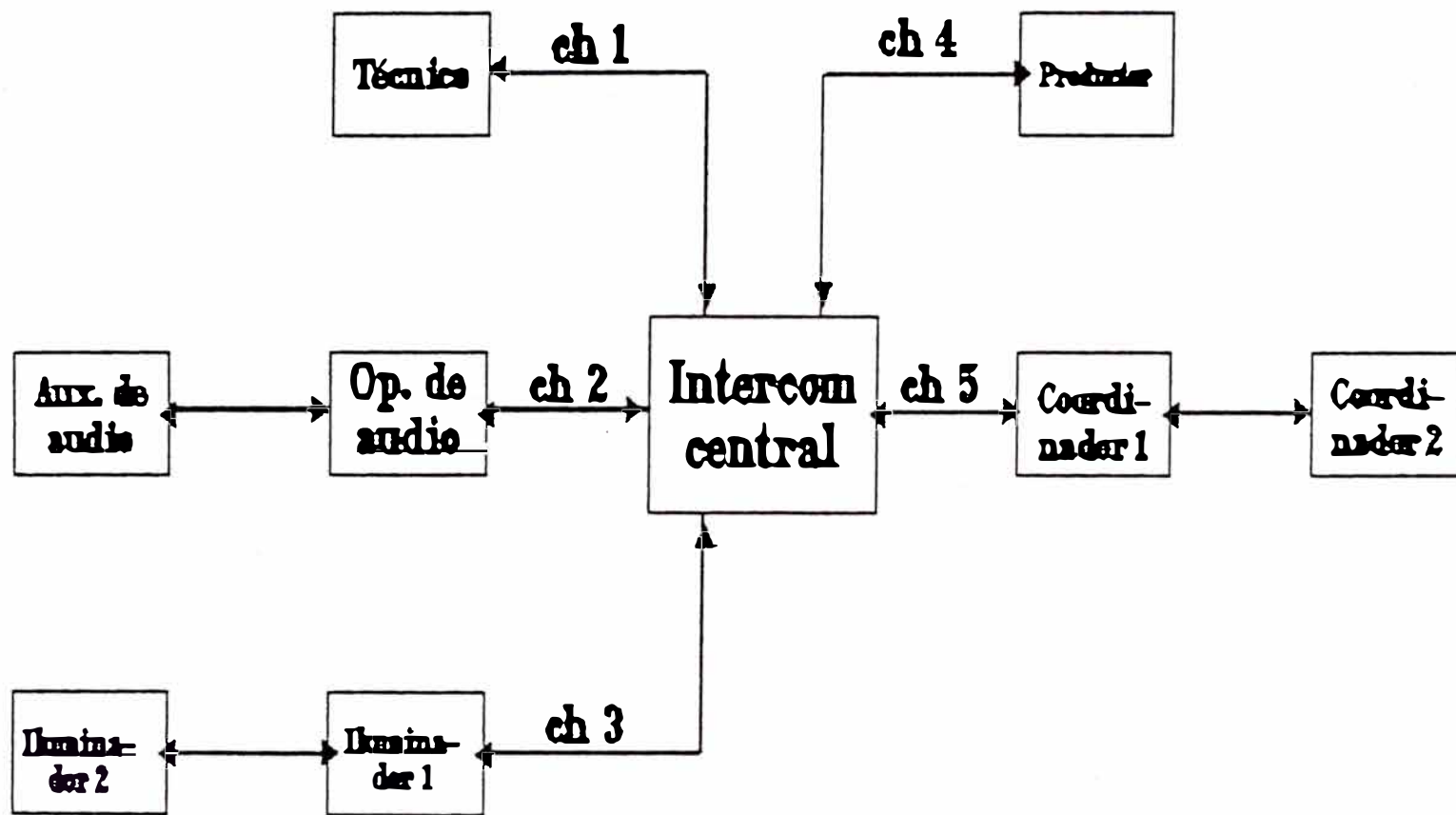


Figura 6.- Diagrama del sistema de intercom

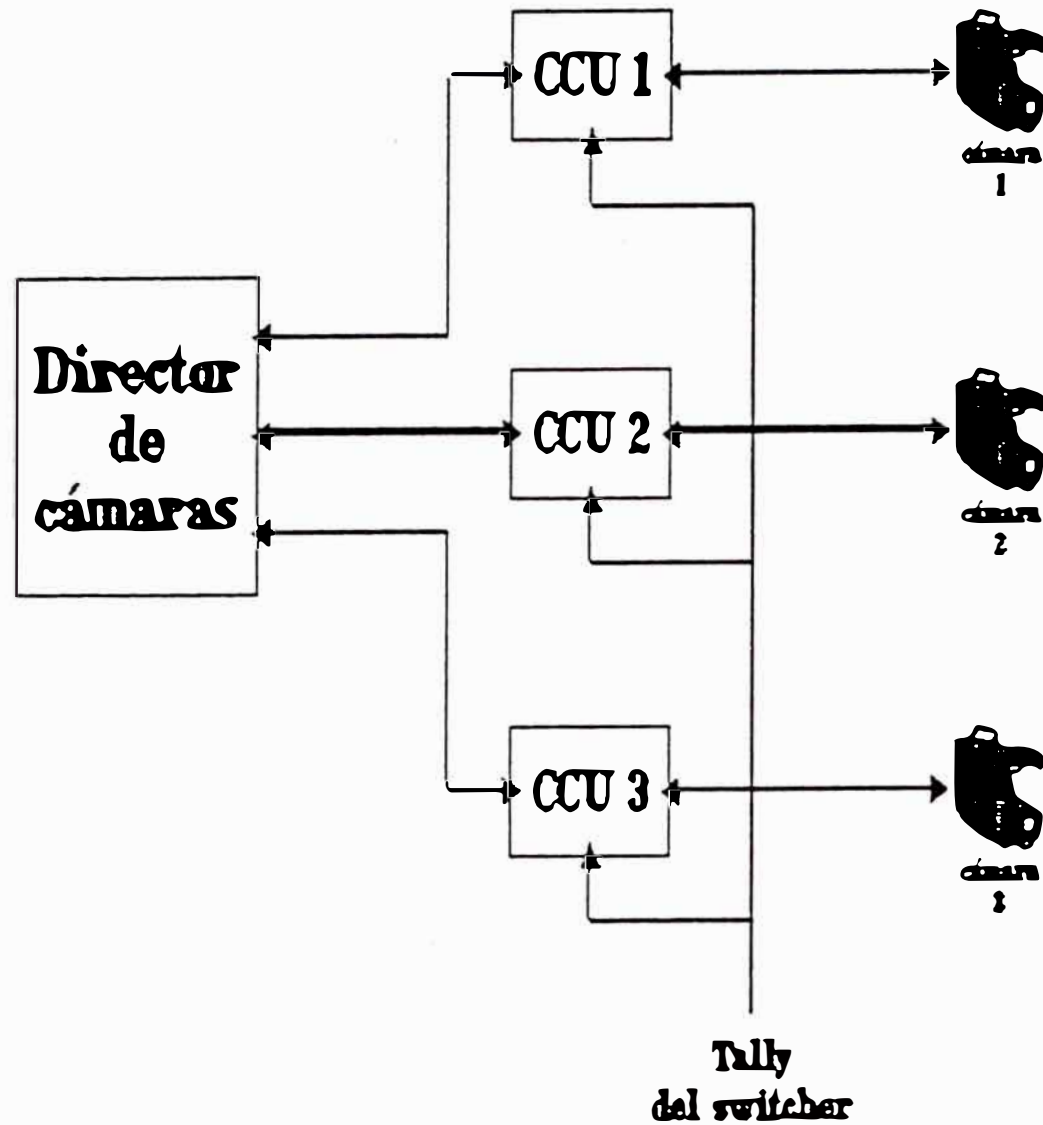


Fig. 7.- Diagrama del sistema de intercom de cámaras incluyendo el Tally

CAPITULO VI EQUIPOS ADICIONALES

Existen una serie de equipos que no entran en los rubros anteriores, pero que es necesario considerar en la unidad móvil como son los racks, el equipo de iluminación y el vehículo donde instalan los equipos.

6.1 Racks

Llamamos racks a los soportes donde van a ir puestos los diferentes equipos de audio y video, debidamente atornillados.

Esto equipos vienen con un ancho estándar de 19 pulgadas, por lo que los racks deben cumplir con la norma de la Electronic Industries Association (EIA) llamada “EIA Standard RS-310-C” de 1978.

Esta norma también indica la distancia entre las perforaciones que no son simétricas. Como generalmente se manda hacer los racks localmente, se deberá indicar con precisión todas las medidas correspondientes del estándar.

Para facilidad en el mantenimiento tanto preventivo como correctivo; los equipos se montan en los racks en unos rieles llamados “mounting rail”, que es un mecanismo que permite al equipo moverse horizontalmente como si entrara y saliera de un cajón. Estos rieles usualmente se le piden al

fabricante junto con el equipo. Con estos rieles, el equipo puede montarse y desmontarse con facilidad.

6.2 Equipo de iluminación

Si la OB-Van va a trabajar en Estudio o sea en una locación fija, la iluminación se colocará en parrillas especialmente instaladas con un punto de fuerza y sistema de distribución diseñadas para el caso.

Este informe no pretende hacer el diseño completo del sistema de iluminación sino ver el caso de grabaciones fuera de la locación con un equipo de luces portátil.

Los fabricantes como “Colortran” venden juego de luces portátil que no usan una consola de control (Dimmer) como el “Pro-Kit IV” en el que vienen entre otras cosas 2 lámparas de 650 watts, 2 lámparas de 800 watts, pedestales, partalámparas, etc.

Estas luces dan luz tipo estudio de 3200 grados Kelvin, pero sin en la grabación necesitamos luz tipo “natural”, se debe usar luminarias tipo HMI que dan de 5600 grados Kelvin.

Dependiendodel tipo y la cantidad de iluminación que se necesite para la toma; se deberá conseguir (alquilar) el grupo electrógeno apropiado.

6.3 Vehículo

Por motivo presupuestal no se compró un camión nuevo sino que se usó uno pequeño que tenemos marca Mitsubishi, con una longitud total de 5.83

mts., capacidad de 4 Tns. Previamente le hicieron reparaciones completas en el taller mecánico.

A este camión se le mandó hacer un furgón, que va sobre la parte libre con unas dimensiones de 4.70mts X 2.10mts X 1.90mts, con una puerta lateral y una puerta posterior.

Al vehículo se le dividió en tres secciones:

a) Sección media

Donde se colocaron los cuatro racks y el equipo electrónico; en esta sección se habilitó dos mesitas para la colocación del control del switcher y de la consola de audio. Esta sección es la más grande y donde está ubicado el personal.

b) Sección posterior

Ubicada entre los racks y la puerta posterior, con suficiente espacio para colocar las luces, trípodes y cables de cámara. En esta sección el Ingeniero puede hacer/chequear las instalaciones.

c) Sección frontal

Un pequeño espacio donde se colocó un estante con llave, para guardar pequeñas cosas como micrófonos, audífonos, walkie, talkies, etc.

Encima de esta sección y la cabina del chofer se colocó el aire acondicionado.

Este aire acondicionado debe mantener la temperatura de la unidad móvil entre 20 y 25 grados centígrados, para eso consultando con las compañías especializadas y dándole los datos de área de trabajo, número de personas

en la móvil, potencia de los equipos, etc. nos dieron como referencia un equipo de 15,000 BTU.

A la unidad móvil se le fabricó un panel de conexión externamente en la parte lateral que permita conectar los cables de video, audio, energía, comunicación y de cámaras, logrando con esto dos cosas: primero, seguridad para los cables y conectores que ya no se maltratarían y segundo, rapidez en el momento de poner en operatividad la unidad móvil.

Se le debe dotar al vehículo de suficiente seguridad (llaves, candados, puertas, extinguidor), evitando así hurtos y accidentes.

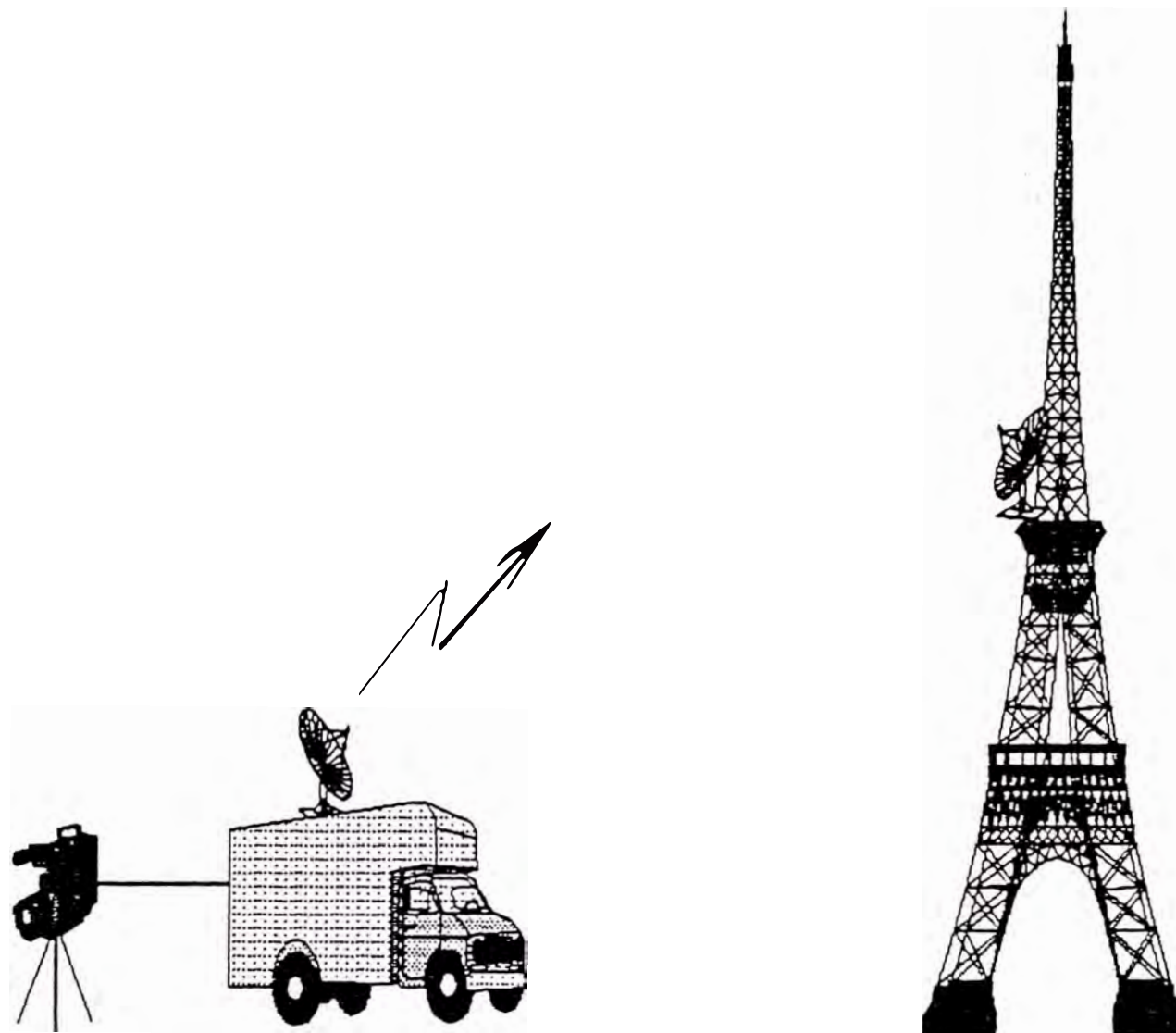


Fig. 8.- Uso de la OB-Van para hacer enlaces microondas ó vía satélite

CONCLUSIONES

- 1.- Se logró diseñar e implementar la unidad móvil para la producción de telenovelas que cumpliera con los requisitos previstos.
- 2.- Esta unidad móvil puede usarse en caso necesario para hacer ediciones, en los momentos que no se está grabando, ya que posee dos videograbadoras y switcher.
- 3.- También por su flexibilidad puede usarse para transmisiones de programas “en vivo” ya sea de EFP (Electronics Field Production) ó para noticias ENG (Electronics News Gattering), haciendo el correspondiente enlace de microondas.
 - 4.- Se ha tenido cuidado de escoger el equipo adecuado buscando la mejor relación calidad vs costo, para que la OB-Van funcione adecuadamente
- 5.- La móvil puede usarse en planta central como centro de grabación, de apoyo a los otros switchers.
- 6.- La OB-Van se encuentra operando actualmente con resultados satisfactorios.
- 7.- Por la forma de conexión estructurada, puede agregarse más equipos con facilidad para llegar a ser una OB-Van multipropósito.
- 8.- En la tabla 1, podemos ver el costo de los equipos de la unidad móvil. Todos estos precios están en dólares americanos, a este costo se tiene que

agregar los gastos de transporte, seguro, aduana e impuestos que en total es cercano al 50 %.

No se ha considerado el costo del camión en donde se instalaron los equipos ya que lo teníamos en propiedad; pero en caso de valorización se considera en 35,000 dolares.

9.- Se obtuvo con un presupuesto bajo, una OB-Van totalmente operativa.

10.- Espero que el presente trabajo ayude al futuro profesional en televisión; ya que se ha utilizado la experiencia obtenida a través de los años de trabajo.

Costo de equipos en la OB-Van

Item	Descripción	Marca	Modelo	PU	Cant	Total
1	Aire acondicionado	DAIKIN	R45LVHQ	5,500	1	5,500
2	Amplificador	CROWN	D-150A-2	879	1	879
3	Audífono	BEYERDYNAMIC	DT-48	479	1	479
4	Botonera	GRASS VALLEY	TEN-XL	2,950	1	2,950
5	Cámara color y accesorios	SONY	DXC-537A	20,000	4	80,000
6	Compact disc	TASCAM	CD-401 MKII	1,000	1	1,000
7	Compresor de audio	DBX	160XT	850	1	850
8	Consola de audio	JVC	MI-2000U	3,600	1	3,600
9	Distribuidor de audio	GRASS VALLEY	8550T1	990	1	990
10	Distribuidor de video	GRASS VALLEY	8500T1	850	1	850
11	Equipo de radio	MOTOROLA	T83JJA39	2,500	1	2,500
12	Estabilizador de voltaje	CELECTRON	220/220	1,000	1	1,000
13	Generador de barras	GRASS VALLEY	9510-TSG	895	1	895
14	Generador de sincronismo	GRASS VALLEY	9510A	2,695	1	2,695
15	Intercom headset	CLEAR-COM	KB-115	150	3	450
16	Intercom master	CLEAR-COM	SB-20	1,500	1	1,500

Tabla 1

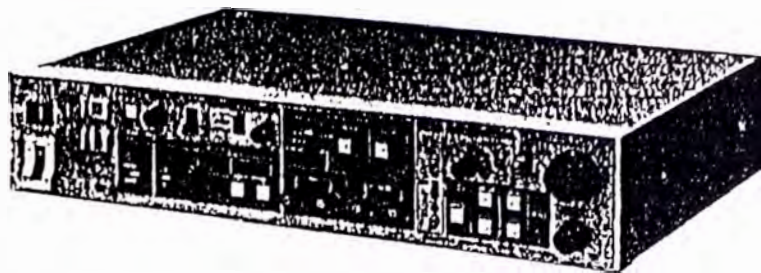
Item	Descripción	Marca	Modelo	PU	Cant	Total
17	Kit de luces	COLORTRAN	PRO-KIT IV	1,470	1	1,470
18	Micrófono inalámbrico	BEYERDYNAMIC	MCE 50.11	500	2	1,000
19	Micrófono shotgun	BEYERDYNAMIC	MCE 86S.02	650	2	1,300
20	Monitor video B/W	SONY	PVM-91	450	3	1,350
21	Monitor video color	PANASONIC	BT-H 1350Y	1,430	3	4,290
22	Monitor video color	PANASONIC	CT-1331Y	610	1	610
23	Parlante	JBL	4602B	750	2	1,500
24	Racks de metal	S/M		250	4	1,000
25	Switcher de video	SONY	BVS-3200C	10,000	1	10,000
26	Teleprompter	COMTEK	PR-72B	215	4	860
27	Televisor color	SONY	KV-2043	600	1	600
28	Transformador	S/M	220/110	400	1	400
29	Videgrabadora Betacam	SONY	BVW-50	13,200	1	13,200
30	Videgrabadora Betacam	SONY	PVW-2800	15,200	2	30,400
31	Walkie talkie	MOTOROLA	GP-300	700	2	1,400
32	Waveform/Vectorscope	VIDEOTEK	TVM-621	3,900	1	3,900
					Total	179,418

APENDICE

CCU-M5

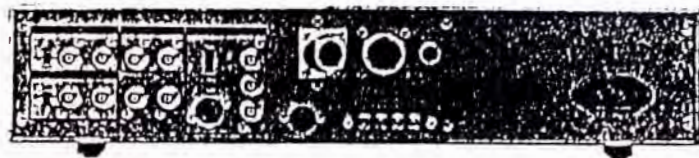
Camera control unit for DXC-M7/537/327A/327/25/3000A/930 series

Directly interfaces with both Z-type (26-pin) and Q-type (14-pin) camera systems • Also interfaces with DXC-930 via CCTZ/CCZ-A or CCTQ/CCQ-AM combination
Remote control operation with maximum cable lengths of 100m for Z-type and 100m for Q-type cable • VBS, R/G/B, Y/R-Y/B-Y, Y/C output • Built-in AC power unit • 19-inch rack mountable and 2-units high



Specifications

Power requirements:	AC 85V to 138V, 50/60Hz
Power consumption:	54W
Inputs/Outputs:	VBS OUT (x2): BNC-type, 1.0Vp-p, sync negative, 75Ω
	R/G/B OUT: BNC-type, 0.714Vp-p, 75Ω
	Y/R-Y/B-Y OUT: BNC-type Y: 1.0Vp-p, sync negative, 75Ω R-Y/B-Y: 0.7Vp-p (75% color bars)
	Y/C OUT: Y/C connector (4-pin), [Y] 1.0Vp-p, sync negative, 75Ω [C] 0.286Vp-p, 75Ω
	SYNC OUT: BNC-type, 4.0Vp-p, 75Ω, negative
	GENLOCK IN: BNC-type, VBS (1.0Vp-p) or BB (0.45Vp-p), loop-through
	RET VIDEO IN: BNC-type, VBS, 1.0Vp-p, loop-through
	CAMERA: Sony Q-type, 14-pin Sony Z-type, 26-pin
	TALLY/INTERCOM: DIN 4-pin or screw terminals
Control:	Gain select Output mode select Status display Shutter speed select Iris (auto/manual) White balance (auto/manual/preset) Black balance (auto/manual/preset) R/B gain Master pedestal R/B pedestal Gamma (DXC-930) Knee point (auto/manual/preset) Detail level Sub-carrier phase Horizontal phase Tally/Intercom
Operating temperature:	5 to 40°C (41 to 104°F)
Dimensions:	Approx. 424(W)x103(H)x321(D)mm (16 1/2 x 4 1/8 x 12 1/8 inches)
Weight:	5.9kg (13 lb)
Supplied accessories:	AC power cord Rack mount brackets
Optional cables:	
(CCU-M5 ↔ DXC-M7/537/327A series)	CCZ-A2 (2m) CCZ-A5 (5m) CCZ-A10 (10m) CCZ-A25 (25m) CCZ-A50 (50m) CCZ-A100 (100m)
(CCU-M5 ↔ DXC-327/325/3000A series)	CCO-10AM (10m) CCO-25AM (25m) CCO-50AM (50m) CCO-100AM (100m)
(CCU-M5 ↔ DXC-930)	CCTZ-3RGB (3m) or CCTZ-3YC (3m) & CCZ-A Cable CCTQ-3RGB (3m) & CCO-AM Cable



3 Camera accessories

CCU-M7

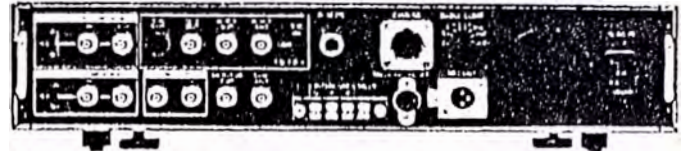
Camera control unit for DXC-M7/537/327A/930 series

•Full remote control of DXC-M7 series color video camera with maximum cable length of 300m
•Remote control of DXC-537/327A/930 series color video camera with maximum cable length of 300m
•Scene File memory for up to four shooting conditions
•VBS, R/G/B, Y/R-Y/B-Y, Y/C outputs
•XLR connector for MIC output
•Built-in AC power supply
•19-inch rack mountable and 2-units high



Specifications

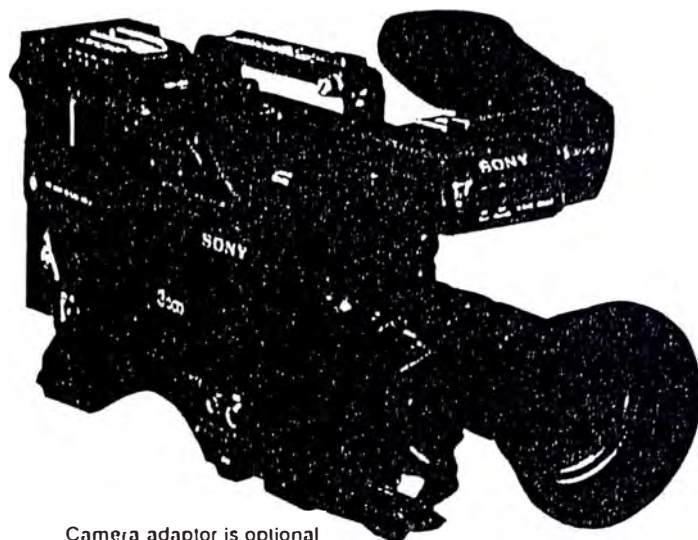
Power requirements: AC 85 to 138V, 50/60Hz
Power consumption: 62W
Inputs/outputs: VBS OUT (x2);
BNC-type, 1.0Vp-p, sync negative, 75Ω
R/G/B OUT;
BNC-type, 0.714Vp-p, 75Ω
Y/R-Y/B-Y OUT;
BNC-type,
Y: 1.0Vp-p, sync negative, 75Ω
R-Y/B-Y: 0.7Vp-p (75% color bars)
Y/C OUT;
Y/C connector (4-pin), 1.0Vp-p, 75Ω
SYNC OUT;
BNC-type, 4.0Vp-p, 75Ω, negative
GENLOCK IN;
BNC-type, VBS (1.0Vp-p) or
BB (0.286Vp-p), loop through
RET VIDEO IN;
BNC-type, VBS, 1.0Vp-p, loop-through
CAMERA;
Sony Z-type, 26-pin
TALLY/INTERCOM,
DIN 4-pin or screw terminals
MIC OUT;
XLR-type, 3-pin, -20dB
Control
Gain select
Output mode select
Status display ON/OFF
Shutter speed select
Iris (auto/manual)
White balance (auto/manual/preset)
R/B gain
Black balance (auto/manual/preset)
Master pedestal
R/B pedestal
Gamma (manual/preset)
Master gamma
R/B gamma
Knee point (auto/manual/preset)
Detail level
Sub-carrier phase
Horizontal phase
Scene File operation
Tally/Intercom
Operating temperature: -10 to 45°C (14 to 113°F)
Dimensions: Approx. 424(W) x 103(H) x 387(D)mm
(16 3/4 x 4 1/8 x 15 1/4 inches)
Weight: 8.5 kg (18 lb 12 oz)
Supplied accessories: AC power cord
Rack mount metals
Optional cables:
(CCU-M7 ↔ DXC-M7/537/327A-series)
CCZ-A2 (2m)
CCZ-A5 (5m)
CCZ-A10 (10m)
CCZ-A25 (25m)
CCZ-A50 (50m)
CCZ-A100 (100m)
(CCU-M7 ↔ DXC-930)
CCTZ-3RGB (3m) or
CCTZ-3YC (3m) with
CCZ-A cable



DXC-537 series

3-chip CCD color video camera

- Excellent picture quality provided by use of three Sony 2/3-Inch IT Hyper HAD (Hole Accumulated Diode) sensors
- 700 TV lines of horizontal luminance resolution thanks to the high density CCD chips (420,000 total picture elements/380,000 effective picture elements) and Sony's original spatial offset technology
- The HAD sensor structure in combination with advanced electronic circuitry allows an excellent S/N ratio of 62dB
- The Hyper HAD sensor's wide photo sensing sites and OCL (On-Chip-Lens) layer result in an extremely high sensitivity of F8.0
- Smear almost negligible due to the HAD sensor structure and OCL layer of the Hyper HAD sensor
- Variable Speed Electronic Shutter improves dynamic resolution when shooting moving objects
- Innovative Clear Scan function for shooting computer displays without horizontal bands appearing across display screen
- 2-line image enhancer for crisp images
- Modular design allows choice of combo, stand-alone or multi-camera use
- Can be coupled directly with the PVV-1A for high quality component acquisition or with the EVV-9000 for handy operation
- Can be combined with the BVV-5 via the CA-511 Camera Adaptor
- Can be combined with S-VHS recorders from Panasonic or JVC via the CA-512 or CA-513 camera adaptor
- When combined with CA-537, 26-pin connector on camera adaptor provides signal output in Y/R-Y/B-Y, VBS, Y/C and RGB forms for connection with various equipment
- Triax DXF-501 quick start viewfinder needs no preheat time and adopts a new diopter mechanism for easier diopter adjustment
- Compact size, lightweight and low power consumption
- Convenient built-in microphone
- Safety Zone and Center Marker indications in viewfinder
- Built-in character generator can generate letters and numbers for titles and dates
- 5 step auto iris override (+1F stop/+0.5F stop/PreseV-0.5F stop/-1.0F stop)
- Convenient gain-up function (0/+9/+18dB)
- Zebra video level indication
- Two memory white balance system
- RM-M7G remote connector on camera head for remote control in any configuration
- Extended system versatility with optional CA-325A/325B Camera Adaptors, RM-M7G Remote Control Unit, and CCU-M7/M5

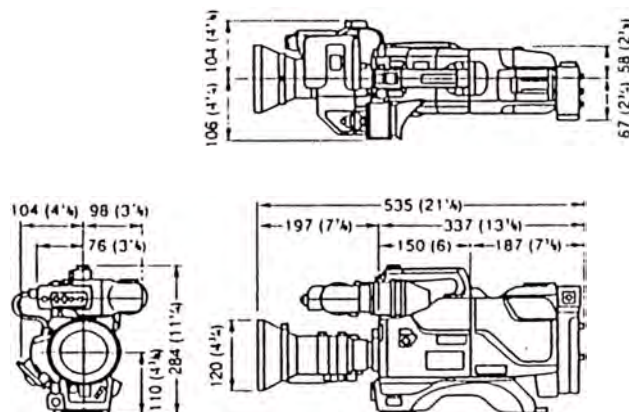


Camera adaptor is optional

Composition	Model	DXC-537K	DXC-537L	DXC-537H
Color video camera head		○	○	○
Zoom lens VCL-916BY		○	Option	Option
Viewfinder DXF-501		○	○	Option
Tripod adaptor VCT-14		○	○	Option
Carrying case LC-421		○	○	Option
Camera cable CCZO-A2		○	○	Option

(○) Supplied

Dimensions



Unit: mm (inch)

Specifications

Image device:	2/3-inch Interline-Transfer CCD (x3). 818 x 513(H/V) total picture elements 768 x 493(H/V) effective picture elements
Electronic viewfinder:	1.5-inch monochrome (except DXC-537H)
Lens:	F1.8-9.5 to 152mm zoom lens with auto iris/macro mechanism (DXC-537K)
Lens mount:	Bayonet-mount
Signal system:	EIA standards, NTSC color system
Horizontal Resolution:	700 TV line
Minimum illumination:	13 lx with F1.8, +18dB
Sensitivity:	F8.0 at 2000 lx
Sync system:	Internal or external selectable
S/N ratio:	62dB
Power requirements:	DC 12V
Power consumption:	9.5W (without VF/CA-537)
Operating temperature:	-10 to 45°C (14 to 113°F)
Weight:	2.2kg (4 lb 14 oz, for camera head only) 3.5kg (7 lb 11 oz, with CA-537)

INPUT/OUTPUT	
VTR/CCU/CMA:	Sony Z-type, 26-pin
VIDEO OUT:	BNC-type
GENLOCK:	BNC-type
MIC IN:	XLR-type, 3-pin
LENS:	12-pin
REMOTE:	1φ-pin
VF:	DIN 8-pin
DC IN:	XLR-type, 4-pin
EARPHONE:	Mini jack
INTERCOM:	Mini intercom jack

Product configuration

DXC-537K



DXC-537L



DXC-537H

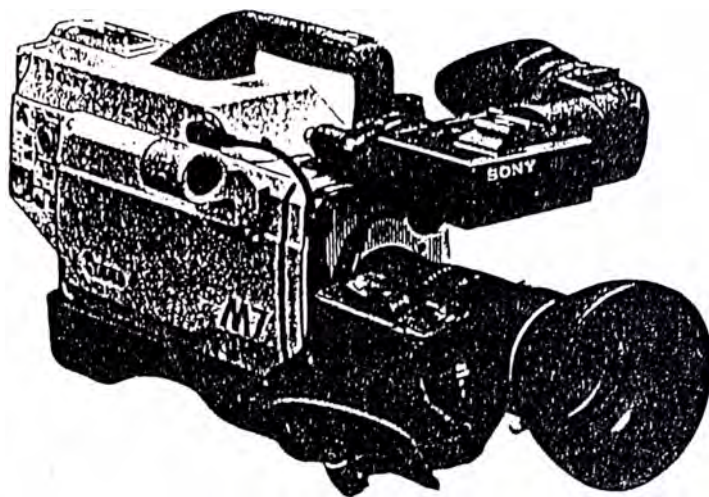


1 Color video cameras

DXC-M7 series

3-chip CCD color video camera

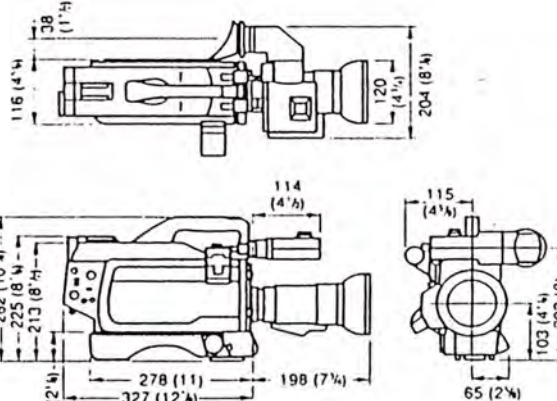
- Excellent picture quality provided by use of three Sony 2/3-inch IT Hyper HAD (Hole Accumulated Diode) sensors
- 700 TV lines of horizontal luminance resolution thanks to the high density CCD chips (420,000 total picture elements/380,000 effective picture elements) and Sony's original spatial offset technology
- The HAD sensor structure in combination with advanced electronic circuitry allows an excellent S/N ratio of 62dB
- The Hyper HAD sensor's wide photo sensing sites and OCL (On-Chip-Lens) layer result in an extremely high sensitivity of F8.0
- Smear almost negligible due to the HAD sensor structure and OCL layer of the Hyper HAD sensor
- Variable Speed Electronic Shutter improves dynamic resolution when shooting moving objects
- DCC (Dynamic Contrast Control) circuit can reproduce 600% dynamic range
- Automatic white balancing and A/B white balance memories for each optical filter positions
- Auto iris reference level can be controlled by five steps (+1F stop/+0.5F stop/PreseV-0.5F stop/-1F stop)
- Each the master gamma and the R/B gamma can be controlled independently on the camera head
- Detail level of the 2-line image enhancer can be delicately controlled for both the horizontal and the vertical lines
- Pedestal level can be controlled on the camera head
- Convenient gain-up switch (0/+9/+18dB)
- Interfaces with the Betacam and the U-matic portable VTRs via Sony Z-type 26-pin connector
- The DXF-M7 multi-position viewfinder provides the most comfortable viewing position (DXC-M7K/M7 only)
- Built-in SMPTE color bars generator and RS-170A sync generator
- Zebra video level indication
- Phantom power supply for an external microphone
- Magnesium diecast body and shielding on the body to avoid radio frequency interference
- Extended system versatility with optional CCU-M7 Camera Control Unit, RM-M7G Remote Control Unit and CA-M7 Studio Adaptor



Composition	Model	DXC-M7K	DXC-M7	DXC-M7H
Color video camera head		○	○	○
Zoom lens VCL-915BYA		○	Option	Option
1.5-inch viewfinder DXF-M7		○	○	Option
Microphone holder CAC-1		○	○	Option
Tripod adaptor VCT-14		○	○	Option
Camera connecting cable CCZO-A2		○	○	Option
Carrying case LC-M7G		○	○	Option

○: Supplied

Dimensions



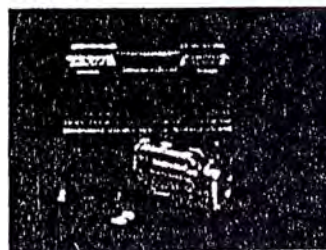
Unit: mm (inch)

Product configuration

DXC-M7K



DXC-M7



DXC-M7H



Specifications

Image device: 2/3-inch Interline-Transfer CCD (x3), 818x513(H/V) total picture elements, 768x493(H/V) effective picture elements

Electronic viewfinder: 1.5-inch monochrome (except DXC-M7H)

Lens: F1.8,9.5 to 143mm zoom lens with auto iris/macro mechanism (DXC-M7K)

Lens mount: Bayonet-mount

Signal system: EIA standards, NTSC color system

Horizontal Resolution: 700 TV line

Minimum illumination: 13 lx with F1.8, +18dB

Sensitivity: F8.0 at 2000 lx

Sync system: Internal or external selectable

S/N ratio: 62dB

Power requirements: DC 10.5 to 17V

Power consumption: 16W (for camera head only)

Operating temperature: -10 to 45°C (14 to 113°F)

Weight: 3.6kg (7 lb 15 oz.) for camera head only, 5.8kg (12 lb 13 oz.) with VF and lens)

INPUT/OUTPUT

VTR/CCU: Sony Z-type, 26-pin

VIDEO OUT: BNC-type

GENLOCK: BNC-type

MIC IN: XLR-type, 3-pin

LENS: 12-pin

REMOTE: 10-pin

VF: DIN 8-pin

DC IN: XLR-type, 4-pin

EARPHONE: Mini jack

INTERCOM: Mini intercom jack

LDK 9SR Full-Size CCD Studio Camera

• Top-of-the-line, full-size CCD studio camera • Applicable for any live or recorded TV broadcast or series production • FT-5SR Series CCD sensors deliver high pixel density • 700 TV lines resolution • 62dB+ S/N • Cameras may be linked via BTS's System 9000 camera control system • Remote control interface features RS-232 or RS-422 serial interface for camera robotics and station automation systems • Assignable operator control panel allows camera assignment via a panel-top switch; rotary controls for iris, master black, black and gains, gamma, etc.; extensive remote knob slope and point; remote white clip; and diagnostic information point • Master control panel enables multiple cameras to be operated from a single control point, including direct monitoring access • Ceramic white shading, an intelligent file data base using iris and focus length feedback, corrects white shading artifacts • Patented additive notch filter in base station encoder produces significant color reduction • 8-position removable effects filter cassette • Effects filter changes easy

LDK 910SR CCD Convertible Studio Camera

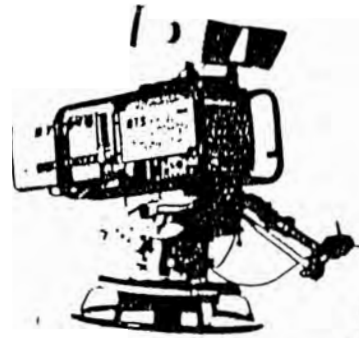
• Provides outstanding versatility as either an in-studio or a location production camera system • Features FT-5SR Series CCD sensor, delivering high pixel density • 700+ TV lines of resolution • High S/N ratio • Compact, rugged and reliable • Automatic black shading and black balance for consistent picture quality • Unique pivot-in-knee circuit adapts both the knee point and compression ratio to the highlight content of the picture for film-like picture quality • In the field, individual cameras may be used with a VTR and a local remote control panel (LCP). LCPs permits precise control of master black and individual red and blue painting for perfect film performance • Uses wide-band RGB triax cabling for superior remote control nearly 1 1/2 miles from its base station

Series 9000 Remote Control System

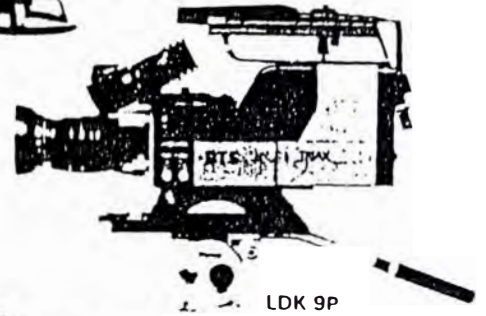
• Flexible remote control system designed exclusively for BTS LDK CCD cameras • From simple 1-camera setup to complete multi-camera operations, Series 9000 provides maximum control and flexibility for unparalleled artistic freedom in any situation • Enables video operators to manage the parameters of up to 8 cameras simultaneously or individually, or apply the parameters of 1 camera to all cameras • System consists of a Base Station, Master Control Panel (MCP) and either joystick or rotary-controlled Operational Control Panels (OCPs) • Permits individual camera control from create camera OCPs, or all cameras from a single MCP • MCP plays include operational, maintenance and diagnostic setup information • Connection between an MCP and the control system is a simple 2-wire bus for fast and flexible OCP assignments without rewiring the system • Individual camera parameters may be stored on a removable RAM card and recalled through the MCP based on the Open Systems Interconnection (OSI) concept • All system components are integrated via a high-speed data loop

LDK 9P Frame Transfer CCD Portable/EFP Studio Camera System

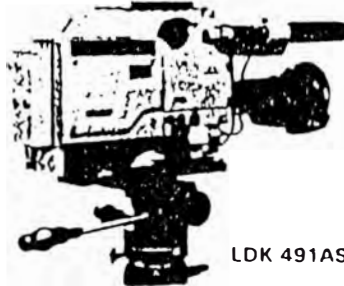
Matches the LDK 9SR in capabilities, yet is a lightweight (14 lbs.) EFP system • 3 FT-5SR high-resolution CCD sensors • 700 TV lines resolution • 2000 lux at f/5.6 • 62dB S/N • Complete RGB triax capabilities • Full compatibility with LDK 9 studio cameras • Unique personal scene file card for perfect setups • Soft skin detail • Optional 4:2:2 digital serial video output • Switchable 4:3 standard and wide-screen 16:9 letterbox format • In EFP mode, can use Betacam SP and MII on-board VTRs • Comprised of a camera and triax base station



LDK 9SR



LDK 9P



LDK 491ASR

LDK 93SR Multipurpose Portable CCD Camera System






• For both studio and field production • Can be set up as a studio camera or ENG/EFP camcorder operating under triax or multicord operation and/or local or remote operation • Interfaces with System 9000 camera control system • FT-5SR Series CCD sensors deliver high pixel density • 700+ TV lines resolution • 62dB+ S/N • Needs no warm-up, maintenance or technical setup • For ENG shooting, 4 color balance memories provide instant access to presets for lighting changes and 2 operator-controlled presets • Camera settings may be performed on the camera or via a remote operational control panel • Can use either a Betacam SP or MII on-board VTR • 4-position electric filter wheel • Letter box 16:9 • Cleanscan






LDK 491ASR CCD Camcorder

• Lightweight (15 lbs.) Betacam SP camcorder • Camera/VTR combination • FT-5SR Series CCD sensors • High pixel density • 700+ TV lines resolution • 62dB+ S/N • Greatest sensitivity at full-open iris • Cleanscan • Ergonomically designed body and camera controls including a 4-position wheel that adjusts to all lighting conditions and an X-Y adjustable viewfinder with diopter • Integrated Betacam SP recorder features built-in time code generator, sophisticated diagnostics with LCD warnings and readouts, and mixed or individual channel monitoring • Uses metal or oxide 30-minute tape cassettes • Exposure controls provide clear pictures for freeze frame or slow motion play • Optional remote control panel provides control of iris, master black, color painting, colorbar selector, gain switch and auto white/black balance




Lenses

LENSES FOR DXC-537/M7, EVW-537 series, DXC-537/PVV-1A camcorder (Bayonet mount type, 12-pin connector)

					
Image format	J8 x 6.8BI-B	J14a x 8.5BI-B	VCL-915BYA	J15 x 9.5BI-B	J18 x 8.5BI-B
Mount	1/2-inch	1/2-inch	1/2-inch	1/2-inch	1/2-inch
Focal length	6 to 48mm	8.5 to 119mm	9.5 to 143mm	9.5 to 143mm	8.5 to 153mm
Zoom ratio	8X	14X	15X	15X	18X
Zoom control	Manual & motorized	Manual & motorized	Manual & motorized	Manual & motorized	Manual & motorized
Iris control	Auto & manual	Auto & manual	Auto & manual	Auto & manual	Auto & manual
Maximum aperture ratio	1.7	1.7	1.8	1.8	1.7
Minimum object distance	0.3m	0.8m	0.95m	0.95m	0.9m
Zoom extender	2.0X	2.0X	—	2.0X	2.0X
Macro	—	○	○	○	○
Filter size	105mmφ	82mmφ	82mmφ	82mmφ	105mmφ
Weight	1.7 kg (3 lb 12 oz)	1.28 kg (2 lb 13 oz)	1.5 kg (3 lb 5 oz)	1.6 kg (3 lb 8 oz)	1.57 kg (3 lb 7 oz)
Dimensions	233mm(L) (9 1/8 inches)	192.6mm(L) (7 1/4 inches)	168mm(L) (6 1/4 inches)	186mm(L) (7 3/8 inches)	214mm(L) (8 1/2 inches)
Note	By Canon	By Canon	By Canon	By Canon	By Canon

					
Image format	A8.5 x 5.5BEVM-28	A14 x 8.5BEVM-28	VCL-916BY	A16 x 9.5BERM-28B	A18 x 8.5BEVM-28
Mount	1/2-inch	1/2-inch	1/2-inch	1/2-inch	1/2-inch
Focal length	8.5 to 47mm	8.5 to 119mm	9.5 to 152mm	9.5 to 152mm	8.5 to 153mm
Zoom ratio	8.5X	14X	16X	16X	18X
Zoom control	Manual & motorized	Manual & motorized	Manual & motorized	Manual & motorized	Manual & motorized
Iris control	Auto & manual	Auto & manual	Auto & manual	Auto & manual	Auto & manual
Maximum aperture ratio	1.7	1.7	1.8	1.7	1.7
Minimum object distance	0.3m	0.65m	0.95m	0.95m	0.75m
Zoom extender	1.7X	2.0X	—	2.0X	2.0X
Macro	○	○	○	○	○
Filter size	95mmφ	77mmφ	77mmφ	77mmφ	95mmφ
Weight	1.72 kg (3 lb 12 oz)	1.28 kg (2 lb 13 oz)	1.4 kg (3 lb 1 oz)	1.43 kg (3 lb 2 oz)	1.49 kg (3 lb 6 oz)
Dimensions	216.5mm(L) (8 1/2 inches)	189mm(L) (7 1/2 inches)	160mm(L) (6 1/4 inches)	178.5mm(L) (7 1/8 inches)	200.5mm(L) (8 inches)
Note	By Fujinon	By Fujinon	By Fujinon	By Fujinon	By Fujinon

1/2-inch LENSES FOR DXC-327/327A/325, EVW-327/327A/325/300 series, DXC-327A/PVV-1A camcorder (1/2-inch Bayonet mount type, Hot-shoe connector)

			
Image format	VCL-810BX	VCL-712BX	VCL-713BX
Mount	1/2-inch	1/2-inch	1/2-inch
Focal length	8 to 80mm	7.5 to 90mm	7.5 to 97.5mm
Zoom ratio	10X	12X	13X
Zooming control	Manual & motorized	Manual & motorized	Manual & motorized
Iris control	Auto & manual	Auto & manual	Auto & manual
Maximum aperture ratio	1.4	1.4	1.4
Minimum object distance	1.1m	1.1m	1.0m
Zoom extender	—	—	—
Filter size	62mmφ	72mmφ	72mmφ
Weight	920 g (2 lb)	1.2 kg (2 lb 10 oz)	910 g (2 lb)
Dimensions	127mm(L) (5 1/8 inches)	154mm(L) (6 1/8 inches)	147.5mm(L) (5 7/8 inches)
Hot-shoe connector	Hot-shoe type	Hot-shoe type	Hot-shoe type
Note	By Canon	By Fujinon	By Canon

*82mm Filter is also usable by fitting it in the lens hood.

T-332S (by Daiwa)

Tripod/dolly

- Suitable for the DXC-1800/1820/1821H/325/327/327A series
- Bowl leveling for extra steady adjustment of camera balance and angle
- Light weight twin tubular tripod with the built-in triangle

Minimum/Maximum height:

660mm/1360mm
(26 inches/53 3/4 inches)

Load capacity: 6.5 kg (14 lb 5 oz)

Weight: 4.1 kg (9 lb 1 oz)

Supplied accessories:

Dolly. Carrying bag. Panning rod



VSF-2000D (by Heiwa)

Tripod/dolly

- Suitable for DXC-M7/537/M3A/3000A/325/327/327A, EVW series, DXC-537/PVV-1A, DXC-327A/PVV-1A camcorders
- For studio use
- Equipped with two panning rods

Minimum/Maximum height:

700mm/1400mm
(27 1/4 inches/55 1/4 inches)
(without dolly)

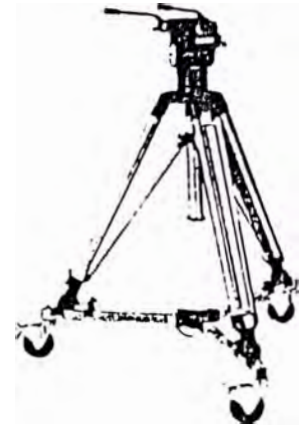
Load capacity: 15 kg (33 lb 1 oz)

Weight: 10.5 kg (22 lb 2 oz) with dolly

VSF-L-20 (by Heiwa)

Carrying case for VSF-2000D

Weight: 3.5 kg (7 lb 11 oz)



LIBEC 70SD (by Heiwa)

Tripod/dolly/carrying bag/spreader

- Suitable for DXC-M7/537/M3A/3000A/327/327A/325, EVW series, DXC-537/PVV-1A, DXC-327A/PVV-1A camcorders
- Recommended for field use
- Equipped with two extendable panning rods

Minimum/Maximum height:

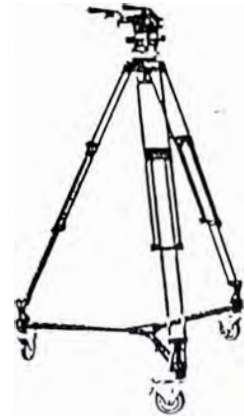
820mm/1595mm
(32 3/8 inches/62 7/8 inches)
(without dolly)

Load capacity: 15 kg (33 lb 1 oz)

Weight: 11.2 kg (24 lb 5 oz)

Supplied accessories:

Dolly. Carrying bag.
Panning rods, Spreader



3 Camera accessories

DXF-50

High resolution 5-inch electronic viewfinder for DXC-M7/537/M3A/3000A/3000IR/325/327/327A series (monochrome)

- Tally facility
- “+” mark appears on the screen with CENTER MARK switch
- Also connectable to DXC-1800/1820/1821H/6000/M3/3000 series

Picture tube: 5-inch monochrome, 70° deflection

Video signal: EIA standard

Scanning system:

2:1 interlace
525 lines

Horizontal resolution:

600 lines (center)

Connectors: DIN 8-pin connector

Power requirements:

Supplied from a camera

Power consumption:

10W

Operating temperature:

-10 to 50°C (14 to 122°F)

Dimensions: Approx.

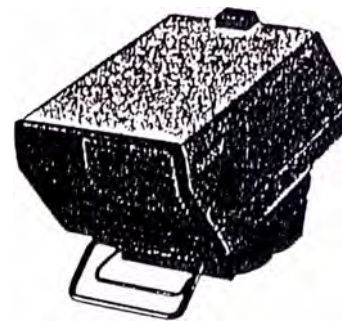
144.5(W) x 167(H) x 290(D)mm
(5⁷/₁₆ x 6⁷/₁₆ x 11¹/₂ inches)
including projecting parts and controls

Weight:

Approx. 3.1 kg (6 lb 14 oz)
with stand and hood

Supplied accessories:

Stand (1), Screws (4)



DC-520

Battery adaptor for PVV-1A, DXC-325/327/327A/537, EVW-325/327/327A/537 series

- For attaching two NP-1A/1B battery packs to the PVV-1A, DXC-325/327/327A/537, EVW-325/327/327A/537 series

Dimensions: Approx

100(W) x 195(H) x 44(D)mm
(4 x 7¹/₄ x 1¹/₂ inches)

Weight:

Approx. 230 g (8 oz)



DC-8

Battery adaptor for DXC-M3A/3000A/3000/3000IR/M7 series

- For attaching the two NP-1A/1B battery pack to the DXC-M3A/3000A/3000/3000IR/M7 series
- Supplied with the DXC-M3AK/M3A

Dimensions: Approx.

91.2(W) x 207.5(H) x 91.8(D)mm
(3¹/₈ x 8¹/₄ x 3¹/₈ inches)

Weight:

Approx. 580 g (1 lb 4 oz)



DR-100

Intercommunication headset

- Used in the DXC-M7/537/M3/M3A/3000A/3000/3000IR/325/327/327A series, DXC-1820/1821 series, CCU-M3 series, CCU-M5 series, CCU-M7 series, CCU-1820 series, and SEG-2000A/2550A series

- With mini type 4-pole plug

Weight: 105 g (3.7 oz)



Combi Pedestal

Studio and field operation • Compact, modular set-up • Long-time wheel alignment of casters based on overload protection at each wheel and after half a cycle of the steering wheel, all casters are aligned again • Double-wheeled casters with plained treads • Center column is supported with a low pressure pneumatic system. A hand pump which is attached to the pedestal can be used to make readjustments where on location • Primary filling is made with a manual compressor • Make use of the pedestal's "on air" height adjustments without attaching the dolly • On slippery or delicate surfaces clip-on rubber feet for the pedestal are taking effect • 3-leveled support construction • Safety catch prevents the center column from reising. Transport-clips at the center column prevent the tripod from unfolding while being carried • Precisely steerable dolly can be changed from a 1-wheel to a 3-wheel steering mode (crab and swirl) • Big steering wheel and telescopic transmission • Cable guards (height is adjustable) • Overload protection within each wheel guard ensures that the casters continue to run parallel • Transport and operating lock for the dolly arms • Folding design for pedestal and dolly to be transported, no tools required; built-in handles • Twin wheels with a 4" diameter. Option: 6" • Maximum load: 55kg • Weight: 21kg

118 Combi Pedestal	13,380.00
118 Combi Pedestal/154 Dolly with twin wheels of 154mm diameter	14,380.00
114 Pedestal CII Identical to Combi except a steerable dolly	7,385.00
122 Varlo Pedestal 1-90 Quick fix	14,850.00
101 Varlo Pedestal 2-75 Quick fix	17,495.00

OB 2 Tripod/OB Dolly

Developed especially for outside broadcasting • Can be extended to 8" diameter. As a special feature Sachtler offers an extender for the OB dolly. This extender, on the 1 side increases the size of the supporting base and on the other side it takes the weight off the wheels

100 OB 2 tripod	3,895.00
160 OB dolly	2,740.00
102 OB elevation column	3,295.00
100 OB 1 tripod	2,195.00
188 XL 2 tripod	2,995.00
180 XL dolly	2,195.00

Video 80 II Fluid Head

OB/Studio applications • Leakproof, zero-friction fluid head • Fluid damping modules control very precisely camera/lens combinations weighing up to approx. 80kg • Damping modules guarantee grades of drag which can be reproduced exactly at all temperatures at which cameras can still be operated • Seven settings of drag for the horizontal and vertical position • Locks for the horizontal and vertical direction are working independent of the damping and counterbalancing system. They bring the camera to a stop, wherever desired, without transmitting vibrations • Maximum load: approx. 198 lbs. • Drag can be completely turned off, if 1 has to make sudden movements with the camera • Grades of drag: horizontally and vertically 7 each and 0 • V-shaped wedge plate is used to mount the camera to the sliding balance plate • Tilt angle: ± 60°

3088 Video 80 II	10,585.00
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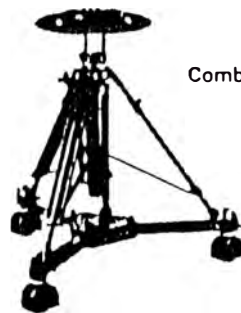
Video 30 II EFP Fluid Head

Heavy-duty 7 position dynamic counterbalancing system • 2 EFP pan arms • 150mm bell • 40kg capacity • 9kg • For studio and field production using small studio or O.B. cameras

3000 Video 30 II	8,975.00
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Video 25 II ENG/EFP Fluid Head

A medium sized ENG/EFP fluid head optimized for on location shooting combining the stability and pan and tilt comfort previously offered only by significantly larger and heavier camera support systems • Bel-



Combi Pedestal



Video 80 II



OB 2 Tripod



Video 25 II



Video 20 III

ancing momentum adjustable in 7 steps • Positive operational pan and tilt lock • Safety lock • 150mm bell, Mitchell intermediate tripod interface • 25kg capacity • 6.5kg

2500 Video 25 II	7,385.00
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Video 17 III/ 18 III/20 III ENG/EFP Fluid Heads

Powerful counterbalancing spring • Positive operational pan and tilt lock • Safety lock • 100mm ball • Medium sized ENG/EFP fluid heads for the ultimate in mobility • Lightweight but stable enough to accept ENG camera with EFP accessories

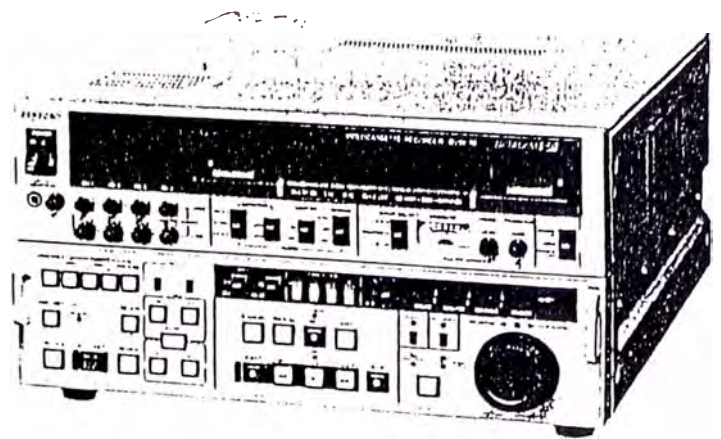
1700L	Video 17 III 3 step on/off drag control for pan + tilt	4,175.00
1800L	Video 18 III 7 step on/off drag control for pan + tilt	4,295.00
1800P	Video 18 Plus, 4" (100mm)	4,560.00
1800S	Video 18 Sensor, 4" (100mm)	4,770.00
2000L	Video 20 III 7 step on/off drag control for pan + tilt	6,095.00
2000P	Video 20 Plus, 4" (100mm)	6,395.00
2000S	Video 20 Sensor, 4" (100mm)	6,595.00

BVW-70 (NTSC)/70P (PAL)/70S (SECAM)



Betacam SP Studio Recorder/Player

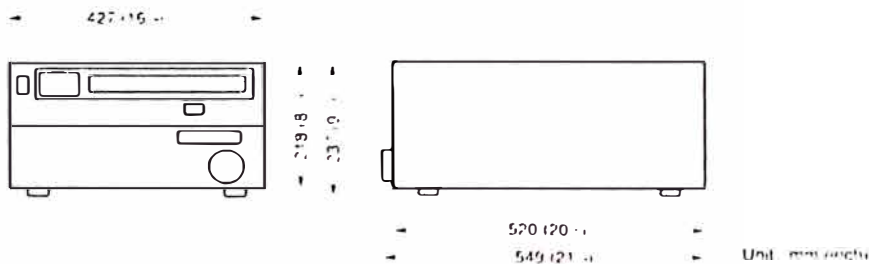
- More than 90 (NTSC)/100 (PAL) minutes of recording/playback time using the L-cassette
- Two AFM audio channels in addition to two longitudinal audio channels with the Dolby C-Type NR (Noise Reduction) system
- Dynamic Motion Control edit memory function
- High speed picture search provides recognizable color pictures at up to 5 times the normal speed in forward and reverse (24 times in monochrome)
- RS-422A 9-pin remote control interface
- 36-pin parallel remote control interface
- Audio/video confidence playback
- Built-in comprehensive two-machine editing
- Built-in sophisticated TBC with 32 line correction window and advanced, high quality, digital dropout compensator
- Built-in LTC/VITC/User Bits generator and reader
- SC-H indicator for composite input and output
- Built-in character generator provides "Burnt-in" time code output
- Built-in capstan override allows playback tape speed to be varied $\pm 16\%$ in 2% steps via the search dial
- Initial setup offers operational flexibility via the search dial
- Built-in self-diagnostics
- BNC component signal inputs and outputs
- 19-inch rack mountable



Supplied accessories

- AC power cord (1)
- 12-pin dubbing cable VDC-C5 (5m) (1)
- 9-pin remote control cable RCC-5G (5m) (1)
- Extension board (3)
- Operation and maintenance manual (1)

Dimensions



Specifications

	BVW-70	BVW-70P	
General	Weight	Approx. 30 kg (66 lb 2 oz)	
	Power requirements	AC 90 to 265V, 48 to 64Hz	
	Power consumption	240W	
	Operating temperature	+5°C to +40°C (+41°F to +104°F)	
	Storage temperature	-20°C to +60°C (-4°F to +140°F)	
	Humidity	Less than 80% (relative humidity)	
	Tape speed	NTSC: 11.86cm/s, PAL: 10.15cm/s	
	Recording/playback time	More than 90 (NTSC)/100 (PAL) min with BCT-90MLA More than 30 (NTSC)/35 (PAL) min with BCT-30MA	
	Fast forward/rewind time	Less than 180 s with BCT-90MLA	
	Search speed SHUTTLE	STILL, 1/30, 1/10, 1/5, 1/2, 1, 2, 5, and 24 times normal speed, forward and reverse	
	JOG	Frame by frame, forward and reverse	
	Lock up time	Less than 0.6 s from standby mode	

	Metal particle Tape		Oxide Tape		
	Metal Particle Tape	Oxide Tape	Metal Particle Tape	Oxide Tape	
Video	Bandwidth	30Hz to 4.5MHz ± 0.5 dB	30Hz to 4.1MHz ± 0.5 dB	25Hz to 5.5MHz ± 0.5 dB (relative to 0.5MHz)	25Hz to 4.0MHz ± 0.5 dB (relative to 0.5MHz)
	Luminance (50% modulation)	30Hz to 4.5MHz ± 0.5 dB	30Hz to 4.1MHz ± 0.5 dB	25Hz to 5.5MHz ± 0.5 dB (relative to 0.5MHz)	25Hz to 4.0MHz ± 0.5 dB (relative to 0.5MHz)
	Color difference (50% modulation)	30Hz to 1.5MHz ± 1.5 dB	30Hz to 1.5MHz ± 1.5 dB	25Hz to 2.0MHz ± 1.5 dB (relative to 0.5MHz)	25Hz to 1.5MHz ± 1.5 dB (relative to 0.5MHz)
	S/N ratio	More than 51dB (Component IN/OUT) More than 49dB (Composite IN/OUT)	More than 48dB (Component IN/OUT)	More than 48dB (Unweighted) (ISC Trap off, 10kHz to 5MHz)	More than 46dB (Unweighted) (ISC Trap off, 10kHz to 5MHz)
	Luminance	More than 53dB More than 53dB	More than 50dB More than 50dB	—	—
	Chrominance AM	—	—	—	—
	PM	—	—	—	—
	Color difference (Unweighted)	—	—	More than 48dB	More than 45dB
	Distortion	—	—	—	—
	Differential gain	Less than 2%	Less than 3%	—	—
Differential phase	Less than 2°	Less than 3°	—	—	
K-factor (2T pulse)	Less than 2%	Less than 3%	—	—	
Y-C delay	Less than 20ns	Less than 20ns	Less than 20ns	Less than 20ns	
L-F linearity	Less than 3%	Less than 4%	—	—	
Pulse shape distortion (K-pulse)	—	—	Less than 1.5%	Less than 3%	
Luminance (2T)	—	—	Less than 1.5%	Less than 3%	
Color difference (8T)	—	—	Less than 1.5%	Less than 3%	

Audio	Longitudinal	50Hz to 15kHz ± 3 dB (at 10dB below reference level)	50Hz to 15kHz ± 3 dB (at 10dB below reference level)	50Hz to 15kHz ± 3 dB (20dB below peak level (1))	50Hz to 15kHz ± 3 dB (20dB below peak level (1))
	Frequency response	50Hz to 15kHz ± 3 dB (at 10dB below reference level)	50Hz to 15kHz ± 3 dB (at 10dB below reference level)	50Hz to 15kHz ± 3 dB (20dB below peak level (1))	50Hz to 15kHz ± 3 dB (20dB below peak level (1))
	S/N ratio	72dB (at 3% distortion level)	50dB (Dolby NR off) (at 3% distortion level)	More than 68dB (at peak level (1)) (Weighted CCIR 468-3)	More than 62dB (at peak level (1)) (Weighted CCIR 468-3)
	Distortion (K-3) (at 1kHz) at peak level (1) (at operational level (+4dBm))	Less than 1%	Less than 2%	—	—
	Distortion (K-3) (at 1kHz) at peak level (2) (at operational level (+4dBm))	Less than 3%	Less than 3%	—	—
	Distortion (K-3) (at 1kHz) at peak level (2) (at operational level (+4dBm))	Less than 1%	Less than 1%	—	—
	Crosstalk (at 1kHz)	Less than -65dB	—	Less than -71dB	Less than -60dB
	Stereo phase (at 15kHz)	Less than 20°	—	± 20	± 45
	Erase ratio (at 1kHz)	—	—	More than 65dB	More than 65dB
	Depth of erasure (for recorders only) (at 1kHz)	—	—	—	—
	REC mode	More than 70dB	More than 70dB	—	—
	INSERT mode	More than 65dB	More than 65dB	—	—
	Wow and flutter	Less than 0.1% rms	Less than 0.1% rms	Less than 0.1% (DIN45507)	Less than 0.1% (DIN45507)
	AFM	—	—	—	—
	Frequency response	20Hz to 20kHz ± 0.5 dB	—	20Hz to 20kHz ± 0.5 dB (20dB below peak level (2))	—
	Dynamic range	More than 85dB	—	—	—
	S/N ratio (at peak level (2)) (Weighted CCIR 468-3)	—	—	More than 72dB	—
Distortion (K-3) (at 1kHz) at peak level (2) (at operational level (+4dBm))	Less than 0.5%	—	—	—	
Distortion (K-3) (at 1kHz) at peak level (2) (at operational level (+4dBm))	—	—	Less than 3%	—	
Distortion (K-3) (at 1kHz) at peak level (2) (at operational level (+4dBm))	—	—	Less than 0.5%	—	
Stereo phase (at 20kHz)	Less than 10°	—	± 10	—	
Crosstalk	Less than -70dB (DIN45507)	—	Less than -70dB (at 100Hz to 12.5kHz)	—	
Wow and flutter (DIN45507)	—	—	Less than 0.01%	—	

*Peak level (1) = +8dB above operational level

*Peak level (2) = +19dB above operational level

*All audio specifications were measured with Dolby on

3VW-50 (NTSC)/50P (PAL)

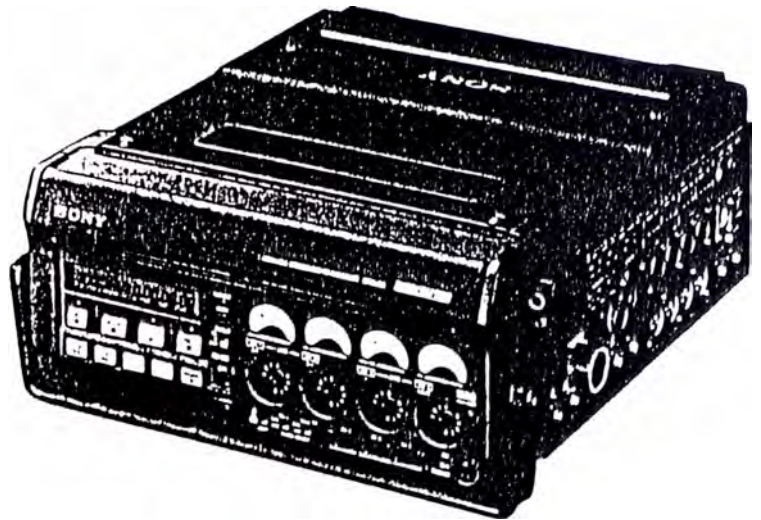
BETACAM SP

Betacam SP Portable Recorder/Player

Accept both L-size and S-size cassette • Low power consumption—19W in Save Rec Mode • Continuous operation for up to 180 minutes on one BP-90A or up to 70 minutes on two NP-1B's is possible • Compact and lightweight (Approx. 8.5 kg/18 lb 12 oz, including a 3P-90A battery and an S-size videocassette) • Longer record/playback time

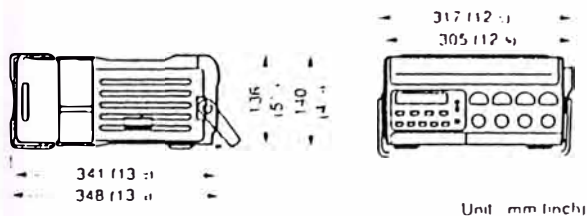
- More than 90 (NTSC)/100 (PAL) minutes with the L-size cassette
- More than 30 (NTSC)/35 (PAL) minutes with the S-size cassette

• Front loading system • Audio/Video confidence playback • Built-in TBC allows broadcast quality pictures to be transmitted with no additional TBC • Interface for an external TBC is also provided for user convenience • Player VTR capability via the RS-422A 9-pin serial interface for field editing • Built-in LTC/VITC/User Bits generator and reader with external genlock capability • Four independent audio meters, record level controls, playback level controls and XLR input/output connectors • Frame accurate back space editing • Recognizable picture can be monitored at full range of the speed in SEARCH mode (± 5 times normal speed, color) and FAST FORWARD/REWIND mode (± 16 times normal speed, monochrome) • Built-in character generator • Built-in external microphone power supply (+48V, CH-1/2/3/4) • Large LCD display • Simple remote control from an optional BVR-3 Remote Controller • Audio and video phono type output connectors allow handy monitoring on a TV receiver



Supplied accessories: Soft carrying case (1)
Operation and maintenance manual (1)

Dimensions



Specifications

		BVW-50		BVW-50P	
General	Weight	Approx. 6.6 kg (14 lb 9 oz)			
	Power requirements	DC 12 V			
	Power consumption	Save Rec Modn. 19W, PB/EE Rec Modn. 29W			
	Operating temperature	0 C to +40 C (+32 F to +104 F)			
	Storage temperature	-20 C to +60 C (-4 F to +140 F)			
	Humidity	25% to 85% (relative humidity)			
	Tape speed	11.86cm/s		10.15cm/s	
	Recording/playback time	More than 90 min (with BCT-90MLA) More than 30 min (with BCT-90MLA)		More than 100 min (with BCT-30MA) More than 35 min (with BCT-30MA)	
	Fast forward/rewind time	Less than 7 min (with BCT-90MLA) Less than 2 min (with BCT-30MA)		Less than 7 min (with BCT-90MLA) Less than 2.5 min (with BCT-30MA)	
	Fast forward/rewind speed	Max. ± 16 times normal speed (with monochrome picture)			
Search speed	Max. ± 5 times normal speed with color picture				
Continuous operating time	Approx. 180 min (with BP-90A and BVV-5/5P)				
Video		Metal Particle Tape	Oxide Tape	Metal Particle Tape	Oxide Tape
	Bandwidth				
	Luminance (50% modulation)	30Hz to 4.5MHz ± 1 dB	30Hz to 4.1MHz ± 1 dB	25Hz to 5.5MHz ± 1 dB	25Hz to 4.0MHz ± 1 dB
	Color difference (50% modulation)	30Hz to 1.5MHz ± 1 dB	30Hz to 1.5MHz ± 1 dB	25Hz to 1.5MHz ± 1 dB	25Hz to 1.5MHz ± 1 dB
	S.N ratio				
	Luminance	More than 51dB (Component IN/OUT) More than 49dB (Composite IN/OUT)	More than 48dB (Component IN/OUT)	More than 48dB	More than 46dB
	Chrominance AM	More than 53dB	More than 50dB	—	—
	PM	More than 53dB	More than 50dB	—	—
	Color difference	—	—	More than 48dB	More than 45dB
	Distortion				
Differential gain	Less than 2%	Less than 3%	—	—	
Differential phase	Less than 2	Less than 3	—	—	
K-factor (2T pulse)	Less than 2%	Less than 3%	—	—	
Y-C delay	Less than 20ns	Less than 20ns	Less than 20ns	Less than 20ns	
Pulse shape distortion (K-pulse 2T)	—	—	Less than 2%	Less than 3%	
Audio	Longitudinal				
	Frequency response	40Hz to 15kHz ± 1 dB	40Hz to 15kHz ± 3 0dB	40Hz to 15kHz ± 1 dB (20dB below peak level (1)*)	40Hz to 15kHz ± 3 0dB (20dB below peak level (1)*)
	S.N ratio	More than 72dB (at 3% distortion level)	More than 50dB (Dolby NR off) (at 3% distortion level)	More than 62dB (at peak level (1)*) (Weighted CCIR 468 J)	More than 58dB (Dolby NR on) (at peak level (1)*) (Weighted CCIR 468 J)
	Distortion THD (at 1kHz reference level)	Less than 1.5%	Less than 2%	—	—
	Distortion THD (at 1kHz at peak level (1)*) (at operational level (1)*)	—	—	Less than 3% Less than 1.5%	Less than 3% Less than 2%
	Crosstalk (at 1kHz)	Less than -55dB	Less than -55dB	Less than -55dB	Less than -55dB
	Depth of erasure (at 1kHz)	More than 65dB	More than 65dB	—	—
	Erase ratio (at 1kHz)	—	—	More than 65dB	More than 65dB
	Wow and flutter	Less than 0.15% rms	Less than 0.15% rms	Less than 0.15% rms (DIN45507)	Less than 0.15% rms (DIN45507)
	AFM				
Frequency response	20Hz to 20kHz ± 1 dB	—	20Hz to 20kHz ± 1 dB (20dB below peak level (2)*)	— (20dB below peak level (2)*)	
Dynamic range	More than 80dB	—	—	—	
S.N ratio (at peak level (2)*) (Weighted CCIR 468 J)	—	—	More than 68dB	—	
Distortion THD (at 1kHz reference level)	Less than 0.5%	—	—	—	
Distortion (at 1kHz) at peak level (2)*) at operational level (+4dBm)	—	—	Less than 3% Less than 0.6%	—	
Crosstalk (at 1kHz)	Less than -65dB	—	Less than -65dB	—	

*Peak level (1) = +8dB above operational level

*Peak level (2) = +19dB above operational level

*All audio specifications in metal mode were measured with Dolby on.

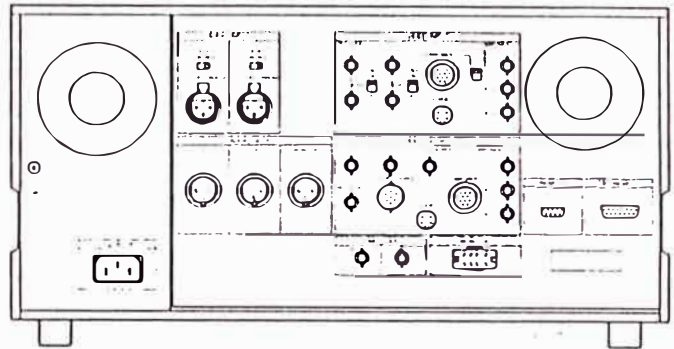
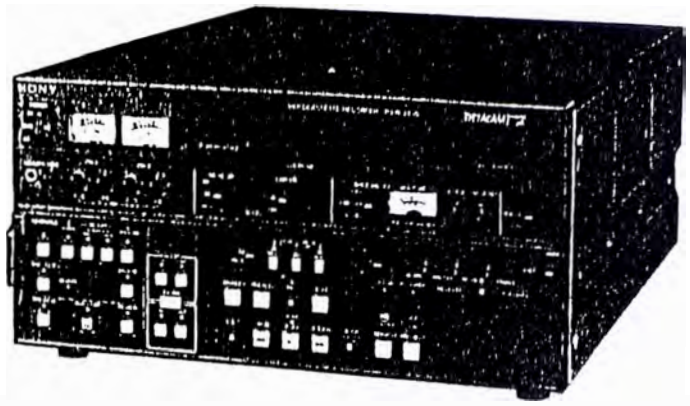
-1 Betacam SP 2000 PRO VTRs

VW-2800

Recorder/player

Superior picture quality, Inherent in the Betacam SP format • More than 90 minutes of recording/playback time using L-size Metal (for both recording and playback) or oxide (for playback only) cassettes • High speed picture search provides recognizable color pictures at up to 10 times normal speed in forward and reverse (24 times in monochrome) • Two longitudinal audio channels with Dolby C-type NR (Noise Reduction) system • Direct RS-422A 9-pin interface with other RS-422A equipped video machines (ex. Betacam/Betacam SP VTRs, BVU series U-matics) • Built-in comprehensive editing facilities Dynamic Motion Control with memory provides slow-motion editing capability (when used with a player VTR equipped with DT function) • Built-in Time Base Corrector with advanced high quality digital dropout compensator • VTR remote control from an optional BVR-50 • Built-in LTC/VITC/User Bits generator and reader • Built-in character generator • Enhanced serviceability with built-in self-diagnostics • User friendly dial menu operation • Y/R-Y/B-Y component signal inputs and outputs via BNC or 12-pin Betacam DUB connectors • S-video (Y/C separate) input/output connectors • 7-pin U-matic DUB output capability (option) • Compact and lightweight (5 unit high, 9-inch rack mountable, approx. 25 kg/55 lb 2 oz) • Low power consumption (150W)

BETACAM SP
2000 PRO



- Supplied accessories: AC power cord (1)
Remote control cable RCC-5G (9-pin) (1)
PSW 4 x 16 screws for rack mounting (4)
Operation manual (1)
- Optional accessories: TBC remote controller BVR-50
Component color corrector BVX-10
Control panel extension kit BKW-2010
U-matic DUB out kit BKW-2020
Control panel case BK-803
12-pin dubbing cable VDC-C5 (5m)
S-video cable SYC-2/5 (2m/5m)
Remote control cable RCC-5G-10G-30G (5m/10m/30m)
Rack mount kit RMM-110

Specifications

- General**
Type: Recorder/Player
- Video recording system:** Rotary 4 head helical scan
Luminance: FM recording
Chrominance: FM recording (CTDM recording)
- Video signal system:** EIA monochrome/NTSC color
- Operating temperature:** 5 to 40°C (41 to 104°F)
- Storage temperature:** -20 to 60°C (-4 to 140°F)
- Power requirements:** AC 90 to 132V, 48 to 160Hz
- Power consumption:** 150W
- Dimensions:** 427(W) x 237(H) x 549(D)mm
(16 7/8 x 9 3/8 x 21 1/4 inches)
- Humidity:** Less than 80% (relative humidity)
- Weight:** Approx. 25 kg (55 lb 2 oz)
- Tape speed:** 11.86cm/s
- REC/Playback time:** More than 90 min with BCT-90MLA/SBT-90ML
More than 30 min with BCT-30MA/SBT-30M
- Fast Forward/Rewind time:** Less than 3 min with BCT-90MLA/SBT-90ML
- Search speed:**
SHUTTLE: 19 steps, still to 24 times normal speed, forward and reverse
JOG: Frame by frame, forward and reverse

	Metal Particle Tape	Oxide Tape
Video performance		
Bandwidth		
Luminance (50% modulation)	30Hz to 4.5MHz ±3dB	30Hz to 4.0MHz ±2dB
Color difference (50% modulation)	30Hz to 1.5MHz ±3dB	30Hz to 1.5MHz ±3dB
S/N ratio		
Luminance (COMPONENT IN OUT)	More than 51dB	More than 48dB
Chrominance	More than 53dB	More than 50dB
AM	More than 53dB	More than 50dB
PIA	More than 53dB	More than 50dB

Differential gain	Less than 3%	Less than 3%
Differential phase	Less than 3°	Less than 3°
K factor (2T pulse)	Less than 2%	Less than 3%
Y/C delay	Less than 20 ns	Less than 20 ns
Audio performance		
Frequency response (20dB below peak level)	50Hz to 15kHz ±1dB	50Hz to 15kHz ±3.0dB
S/N ratio (at 3% distortion level)	More than 72dB	More than 50dB (Dolby NR OFF)
Distortion THD (at 3% distortion level)	Less than 1.0%	Less than 2.0%
Wow and flutter	Less than 0.1% rms	Less than 0.1% rms

Signal Inputs

- REF VIDEO IN (BNC): 1.0Vp-p, 75Ω
- VIDEO IN (BNC): Composite video, 1.0Vp-p, 75Ω, sync negative
- COMPONENT IN 1 (12-pin male):
Luminance: 1.0Vp-p, 75Ω, sync negative
Color difference: R-Y: 0.7Vp-p, 75Ω
B-Y: 0.7Vp-p, 75Ω
- COMPONENT IN 2 (BNC x 3):
Luminance: 1.0Vp-p, 75Ω, sync negative
Color difference: R-Y: 0.7Vp-p, 75Ω
B-Y: 0.7Vp-p, 75Ω
- S-VIDEO IN:
Y: 1.0Vp-p, 75Ω
C: 0.286Vp-p (burst), 75Ω
- AUDIO IN CH-1/2 (XLR 3-pin female):
LOW: -60dBs, 3kΩ, balanced
HIGH: +4dBs, 600Ω/10kΩ selectable, balanced
- TIME CODE IN (BNC): 0.5V to 18Vp-p, 10kΩ

Signal Outputs

- VIDEO OUT 1 (BNC): Composite video, 1.0Vp-p, 75Ω, sync negative
- VIDEO OUT 2 (BNC): Composite video, 1.0Vp-p, 75Ω, sync negative
- VIDEO OUT 3: Composite video, 1.0Vp-p, 75Ω, sync negative with or without character insertion
- COMPONENT OUT 1 (12-pin male):
Luminance: 1.0Vp-p, 75Ω, sync negative
Color difference: R-Y: 0.7Vp-p, 75Ω, B-Y: 0.7Vp-p, 75Ω
- COMPONENT OUT 2 (BNC x 3):
Luminance: 1.0Vp-p, 75Ω, sync negative
Color difference: R-Y: 0.7Vp-p, 75Ω, B-Y: 0.7Vp-p, 75Ω
- AUDIO LINE OUT (XLR 3-pin male):
CH-1/2: +4dBs, 600Ω, balanced
- AUDIO MONITOR OUT (XLR 3-pin male):
CH-1/2: +4dBs, 600Ω, balanced
- U-matic DUB OUT (with an optional BKW-2030):
Y: 1.7Vp-p, 51Ω, C: 0.9Vp-p, 51Ω
- S-VIDEO OUT:
Y: 1.0Vp-p, 75Ω, C: 0.286Vp-p (burst), 75Ω
- TIME CODE OUT (BNC): 1.2Vp-p, 75Ω

PVW-2650

Player with DT

BETACAM SP
2000 PRO

- Superior picture quality, Inherent in the Betacam SP format
- Dynamic Tracking (DT) provides broadcast quality noiseless playback within -1 to +3 times normal playback speed
- More than 90 minutes of playback time using L-size Metal or Oxide cassettes
- High speed picture search provides recognizable color pictures at up to 10 times normal speed in forward and reverse (24 times in monochrome)
- Two longitudinal audio channels with Dolby C-type NR (Noise Reduction) system
- RS-422A 9-pin interface with other RS-422A equipped Sony machines (ex. Betacam/Betacam SP VTRs, BVU series U-matics)
- Built-in Time Base Corrector with advanced high quality digital dropout compensator
- TBC remote control from an optional BVR-50
- Built-in LTC/VITC/User Bits generator
- Built-in character generator
- Enhanced serviceability with built-in self diagnostics
- User friendly dial menu operation
- Y/R-Y/B-Y component signal outputs via BNC or 12-pin Betacam DUB connectors
- S-video (Y/C separate) output connectors
- 7-pin U-matic DUB output capability (option)
- Compact and lightweight (5 unit high, 19-inch rack mountable, approx. 25 kg/55 lb 2 oz)
- Low power consumption (130 W)

Supplied accessories: AC power cord (1)
Remote control cable RCC-5G (9 pin) (1)
PSW 4 x 16 screws for rack mounting (1)
Operation manual (1)

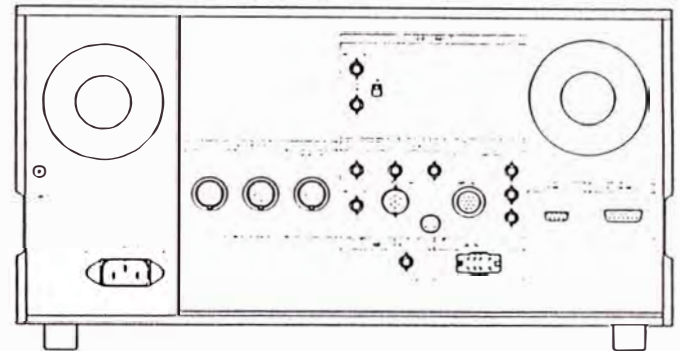
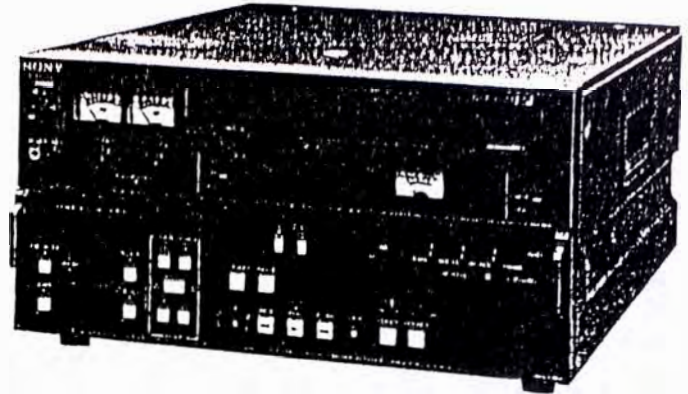
Optional accessories: TBC remote controller BVR-50
Component color corrector BVX-10
Control panel extension kit BKW-2010
U-matic DUB out kit BKW-2020
Control panel case BK-803
12-pin dubbing cable VDC-C5 (5m)
Remote control cable RCC-5G 10G 30G (5m/10m/30m)
S-video cable SYC-2.5 (2m/5m)
Rack mount kit RMM-110

Specifications

General

Type: Player with DT
Video playback system: Rotary 4 head helical scan
Luminance: FM recording
Chrominance: FM recording (CTDM recording)
Video signal system: EIA monochrome/NTSC color
Operating temperature: 5 to 40 C (41 to 104 F)
Storage temperature: -20 to 60 C (-4 to 104 F)
Power requirements: AC 90 to 132V, 48 to 64Hz
Power consumption: 130W
Humidity: Less than 80% (relative humidity)
Weight: Approx. 25 kg (55 lb 2 oz)
Tape speed: 11.86cm/s
Playback time: More than 90 min with BCT-90MLA
More than 30 min with BCT-30MA
Fast Forward/Rewind time: Less than 3 min with BCT-90MLA
Search speed:
SHUTTLE 19 steps, still to 24 times normal speed, forward and reverse
JOG Frame by frame, forward and reverse
Dynamic Tracking Range: -1 to +3 times normal speed

	Metal Particle Tape	Oxide Tape
Video performance		
Bandwidth:		
Luminance (50% modulation)	30Hz to 4.5MHz ±1dB	30Hz to 4.0MHz ±1dB
Color difference (50% modulation)	30Hz to 1.5MHz ±1dB	30Hz to 1.5MHz ±1dB
S/N ratio:		
Luminance (Component IN/OUT)	More than 51dB	More than 48dB
Chrominance		
AM	More than 53dB	More than 50dB
PM	More than 53dB	More than 50dB
Differential gain	Less than 3%	Less than 3%
Differential phase	Less than 3°	Less than 3°
K-factor (2T pulse)	Less than 2%	Less than 3%
Y/C delay	Less than 20 ns	Less than 20 ns



Audio performance		
Frequency response	50Hz to 15kHz ±1dB	50Hz to 15kHz ±3.0dB
S/N ratio (at 3% distortion level)	More than 72dB	More than 50dB (Dolby NR OFF)
Distortion THD (at 1kHz reference level)	Less than 1.0%	Less than 2.0%
Wow and flutter	Less than 0.1% rms	Less than 0.1% rms

Signal Inputs

REF VIDEO IN (BNC): 1.0Vp-p, 75Ω

Signal outputs

VIDEO OUT 1 (BNC): Composite video, 1.0Vp-p, 75Ω, sync negative
VIDEO OUT 2 (BNC): Composite video, 1.0Vp-p, 75Ω, sync negative
VIDEO OUT 3 (BNC): Composite video, 1.0Vp-p, 75Ω, sync negative with or without character insertion

COMPONENT OUT 1 (12-pin male):

Luminance 1.0Vp-p, 75Ω, sync negative
Color difference R-Y: 0.7Vp-p, 75Ω, B-Y: 0.7Vp-p, 75Ω

COMPONENT OUT 2 (BNC x 3):

Luminance 1.0Vp-p, 75Ω, sync negative
Color difference R-Y: 0.7Vp-p, 75Ω, B-Y: 0.7Vp-p, 75Ω

AUDIOLINE OUT (XLR 3-pin male) CH-1/2:

+4dBs, 600Ω, balanced

AUDIO MONITOR OUT (XLR 3-pin male) CH-1/2:

+4dBs, 600Ω, balanced

U-matic DUB OUT (with an optional BKW-2020):

Y: 1.7Vp-p, 75Ω, C: 0.9Vp-p, 75Ω

S-VIDEO OUT:

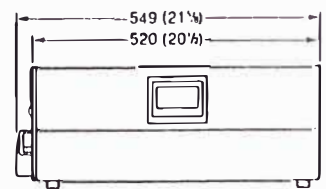
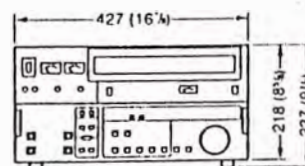
Y: 1.0Vp-p, 75Ω, C: 0.286Vp-p (burst), 75Ω

TIME CODE OUT (BNC):

1.2Vp-p, 75Ω

* The specifications of "video/audio performance oxide tape" were measured by playing back material on a standard PVW VTR that had been recorded on a standard BVW series Betacam SP VTR.

Dimensions



Unit: mm (inch)

BETACAM CAMERA/ RECORDERS/PLAYERS

Broadcast Television Systems

BETACAM SP2000 PRO

PDK-537A Camera

• Designed for maximum system flexibility, allowing it to be used in camcorder, stand-alone and studio configurations • Can be docked with the PBC-1A dockable recorder • With the CA-511 adaptor, the BCB-5 recorder can be attached to the camera • With the CA-537 adaptor, it provides signals in component, Y/C and composite for stand-alone and studio use • 62dB S/N ratio • 700 TV lines resolution • f/8.0 at 2000 lux sensitivity • Smear reduction • Low lag

PBC-1A Dockable Recorder

• Portable Betacam SP recorder, generally linked with the PDK-537A 2000 PRO camera head • Permits up to 30 minutes of recording on an S-cassette (metal oxide only) • Built-in time code generator/reader • Slowfinder playback • Frame-accurate back space editing • 2-channel audio inputs with longitudinal track recording

PBC-2600 Editing Player

• Full playback Betacam SP recording format • Permits playback of all Betacam SP tapes, both metal particle and oxide • Built-in time base corrector and time code reader • 24X picture search in forward and reverse • RS-422 remote interface • Y/C and component (R, R-Y, B-Y) outputs • Composite video signal output • S-Video signal output

PBC-2650 Editing Player With Dynamic Tracking

• Incorporates all the features of the PBC-2600, with added increased dynamic tracking (playback from -1 to +3 times normal speed)

PBC-2800 Recorder/Player

• Accepts metal particle tape for recording • Offers 2-way playback compatibility with all Betacam SP formats with both metal particle and oxide tape • Full editing control facilities • Built-in time base corrector • Built-in time code reader • Plays back Betacam SP or traditional Betacam cassettes (records on metal particle tape only) • 24X picture search in forward and reverse • RS-422 remote interface • Y/C and component (R-Y, B-Y) outputs • Composite video signal output • S-Video signal output

BETACAM SP

BCB-5-N Camera Recorder/Field Recorder

• Can be operated as part of a BTS camcorder system or a stand-alone unit (with optional VTR adaptor) • Allows recording and playback of oxide and metal tape • 30-minute record/playback capability • Viewer playback • 4 audio channels: 2 FM and 2 longitudinal

BCB-22-N Office Player

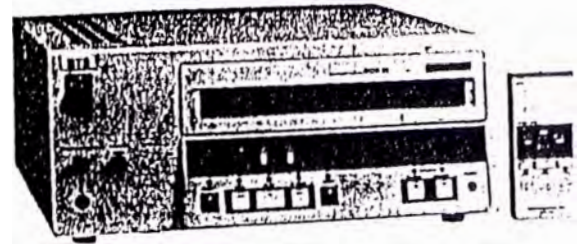
• An economical playback system for Betacam and Betacam SP video tapes • Accepts both metal particle and oxide tape cartridges in large and small sizes • 4-channel audio: 2 FM and 2 longitudinal • Video/audio outputs and built-in RF modulator (CH 3 or 4 selectable)

BCB-50-N Portable Field Recorder/Player

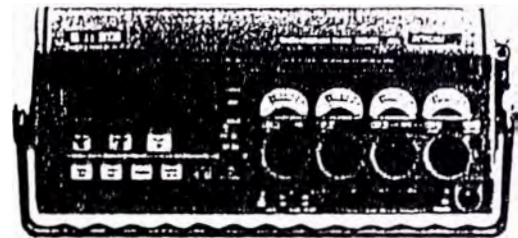
• With the use of metal particle tape, the BCB-50 conforms completely to the Betacam SP recording standard with its wide luminance bandwidth, improved S/N ratio and other key elements • When using oxide tape, conventional Betacam standards are attained • Accepts both 90-minute L and 30-minute S-cassettes • With optional batteries, can operate up to 90 minutes (1 BP-90A battery), or up to 200 minutes (2 P-1B batteries) • 4 audio channels: 2 FM and 2 longitudinal

BCB-65-N Studio Player With Dynamic Tracking

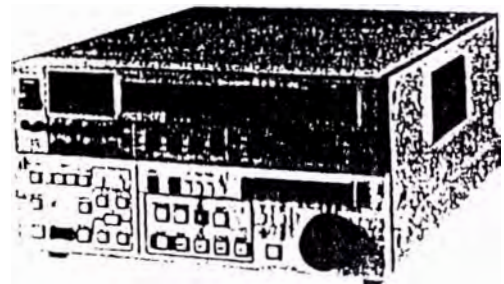
• Studio playback unit featuring noiseless, broadcast-quality dynamic tracking playback from -1 to +2 times normal speed • Built-in TBC • Accepts both 90-minute L and 30-minute S-cassettes • 4 audio channels: 2 FM and 2 longitudinal • High-speed picture search: 24X normal speed forward and reverse



BCB-22-N



BCB-50-N



BCB-75-N

BCB-70-N Studio Player/Recorder/Editor

• Complete production and post-production VTR for all applications • Built-in TBC • Built-in time code generator/reader with on-board preset switch • Accepts both 90-minute L and 30-minute S-cassettes • 4 audio channels: 2 FM and 2 longitudinal • High-speed picture search: 24X normal speed forward and reverse

BCB-75-N Studio Player/Recorder/Editor

• Complete production and post-production VTR for all recording, playback and editing applications • Noiseless broadcast-quality dynamic tracking playback from -1 to +2 times normal speed • Built-in TBC • Built-in time code generator/reader with on-board preset switch • 4 audio channels: 2 FM and 2 longitudinal • High-speed picture search: 24X normal speed forward and reverse

BCB-D75 Recorder/Player

• Standard Betacam SP recorder/player with analog component video and 4 audio channels; however, through its built-in serial integral input/output, it provides a way of handling Betacam material in a component digital system featuring D-1 VTRs, graphics and paint systems • Increased dynamic tracking playback from -1 to +3 times normal speed and 54-step search dial • Built-in TBC with Y/C-add processing circuitry to ensure maximum vertical stability in DT mode • Built-in time code generator/reader with on-board preset switch • Accepts both 90-minute L and 30-minute S-cassettes

1 Analog Production Switcher

plus multi-level M/E system • 8 video inputs, plus black and background • Program and preset buses • Linear and luminance keying • Look-ahead preview system that always shows the effect • 3 independently GPI-programmable auto transition systems • 10 wipe patterns with modifiers • 3 independent matte generators, for key fill, background and pattern borders • 10 E-19 effects memory system registers available from the control panel • Clean feed video output • Independent frame rate fade-to-black • Pulseprocessor re-inserts blanking from blackburst on program output • DSK includes linear and luminance keying • A high performance compact switcher at a small price • Offers power and performance for small studio and off-line applications • Integrates seamlessly with GVG DPM-700 digital effects system

Model 110 provides "big" switcher performance at a compact size. Like its larger counterparts, the Model 110 provides high performance and unparalleled production power. Model 110 features a 3-bus multilevel M/E system that gives you unparalleled flexibility and picture quality.

Model 110 is designed to integrate with other GVG products such as the DPM-700 digital effects and VPE Series edit systems, without adding a high price. The ideal choice for small production studios or edit suites, the Model 110 is available in both composite and component versions.

Options

3/Component Chroma Keyer

Provides capability to key from either RGB or Y, R-Y, B-Y inputs.

Chroma Key Bypass

Reverts the chroma key video signal path into a second external video signal path.

Linear Borderline® Key Edge Generator for the DSK

Shows all keyers to be enhanced with edging effects. Includes border, drop shadow and outline.

RS-232/422 Serial Interface

Flexible control from an editor or external computer

Pulse Regenerator

Provides drive pulses for the switcher from a composite video source such as blackburst.

110CV Component Video Switcher

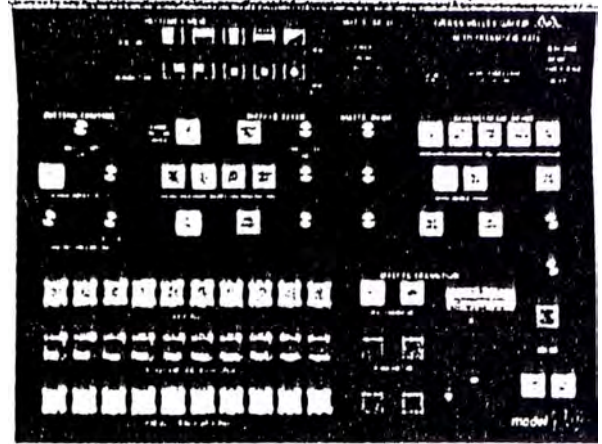
The Model 110CV has all the features of the Model 110 (composite) and uses the same control panel, plus it adds that extra quality that component video is known for:

Standard input and output transcoders can be user-set to allow operation with the following video formats: Beta/Beta SP, SMPTE/ITU, MII or RGB • Standard pulse regenerator • Standard chroma keyer can key from any of the 8 primary inputs via the key bus • Standard RS-232/422 serial interface for control by an editor or external computer • Terminating primary video inputs • Standard tender module simplifies adjustments and troubleshooting • Optional: Linear Borderline key edge generator for the DSK

The switcher is fully compatible with Betacam or MII series machines. Each input is jumper-selectable between component color difference and RGB inputs. Outputs are provided in both RGB and component formats, as well as luminance (Y) channel monitoring for all buses.

Specifications

Number of Primary Video Inputs: 8 plus black and background
 Number of External Key Inputs: 1 • Outputs: Program, preview, key, clean feed • Control Panel Dimensions: 5.2"H x 17.0"W x 3.75"D • Electronics Frame Dimensions: 5.25"H x 17.0"W x 3.5"D • Power Requirements: Power: 100W, max (Model 110); 20W, max (Model 110CV); Voltage: 85-260, selectable; 50/60Hz



Composite Systems

110-N	Model 110 system, NTSC	\$ 10,995.00
110-02S	Model 110 2m cable (separate)	150.00
110-03N	Model 110 frame and service manual only NTSC	8,250.00
110-04	Model 110 control panel and operator's handbook	3,500.00
110-05	Model 110 cable fab kit (with system)	500.00
110-05S	Model 110 cable fab kit (separate)	600.00
110-10S	Model 110 10m cable (separate)	200.00
110-15	Model 110 module extender set	700.00
110-19	Model 110 control panel rackmount adaptor	100.00
110-30	Model 110 30m cable (with system)	200.00
110-30S	Model 110 30m cable (separate)	300.00
110-33	Model 110 RGB chroma keyer	850.00
110-34	Model 110 chroma key bypass board	54.00
110-40	Model 110 NTSC linear Borderline	1,500.00
110-41	Model 110 NTSC pulse regenerator	1,000.00
110-50	Model 110 serial interface adaptor	1,500.00
110-100	Model 110 100m cable (with system)	600.00
110-100S	Model 110m cable (separate)	700.00

Component Systems

110CV-525C	110CV basic system 525/60 line system (for all formats except M1)	\$ 18,950.00
110CV-3-525C	525/60 system frame and maintenance manual, no control panel	15,950.00
110CV-02S	Model 110CV 2m cable (separate)	150.00
110CV-04	Model 110CV control panel and operator's handbook	3,500.00
110CV-05	Model 110CV cable fab kit (with system)	500.00
110CV-05S	Model 110CV cable fab kit (separate)	600.00
110CV-10S	Model 110CV 10m cable (separate)	200.00
110CV-19	Model 110CV control panel mount adaptor	100.00
110CV-30	Model 110CV 30m cable (with system)	200.00
110CV-30S	Model 110CV 30m cable (separate)	300.00
110CV-40	Model 110CV-525/60 linear Borderline	1,500.00
110CV-100	Model 110CV 100m cable (with system)	600.00
110CV-100S	Model 110CV 100m cable (separate)	700.00

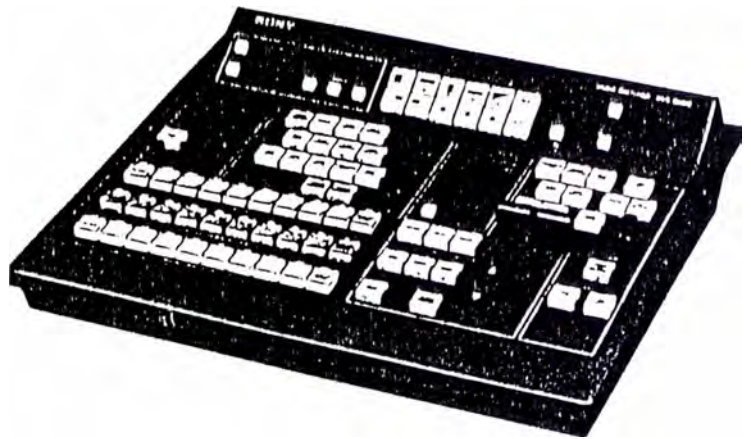
For additional specifications and ordering information please inquire.

Prices and Specifications Subject to Change Without Notice.

BVS-3200 (NTSC)/3200P (PAL)/3200C (NTSC)/3200CP (PAL)

Composite/Component Video Switcher

- Choice of composite or component version:
BVS-3200/3200P Composite Video Switcher
 - Accepts composite video signals
- BVS-3200C/3200CP Component Video Switcher
 - Accepts composite or a combination of RGB, Y/R-Y/B-Y component signals
- 12-pin Component Video Connector Inputs/Outputs for Betacam VTRs are provided
- Ten Primary inputs (including color black and color background) •One M/E and two KEY Busses/Processors (assignable) •KEY OVER function •Two common EXT KEY sources and FILLS available for both KEYERS •One EXT KEY source and FILL available for DSK •Ten basic and eight matrix wipe patterns with modifiers •Fully adjustable internal BOX MASK and EXT MASK inputs
- Four COLOR MATTE GENERATORS for BACKGROUND, EFF/BORDER (KEY 1 and KEY 2), and DSK •CHROMAKEYER (RGB or Y/R-Y/B-Y selectable)
- DSK with BORDER, DROP SHADOW, OUTLINE-2H/4H selectable •FADE to BLACK (FTB) function •Auto Transition for M/E, DSK, and FTB •RS-422A editor interface •Communication of E-File and initial panel information with BVE-2000/9100 •DFS-500/500P interface
- Four Black Burst Outputs •GPI Input port for M/E, DSK, FTB, and SELECT •Four (BVS-3200C/3200CP)/two (BVS-3200/3200P) PGM Outputs and one PVW Output



- Supplied accessories: AC power cord
Control panel cable (5m)
Extension board
- Optional accessories: SWC-2530D Control panel cable (30m)
RMM-3000 Rack mount kit

Specifications

- Power requirements: AC 100V to 240V $\pm 10\%$, 50/60Hz $\pm 10\%$
Power consumption: BVS-3200/3200P: 140W
BVS-3200C/3200CP: 180W
- Operating temperature: 0 C to 40 C (32 F to 104 F)
Storage temperature: -20 C to 60 C (-4 F to 140 F)
- Dimensions
- Control panel: Approx. 424(W) x 111(H) x 440(D)mm
(16 $\frac{1}{2}$ x 3 $\frac{1}{4}$ x 17 $\frac{1}{8}$ inches)
- Processor unit:
- BVS-3200:
Approx. 424(W) x 132(H) x 350(D)mm
(16 $\frac{1}{2}$ x 5 $\frac{1}{8}$ x 13 $\frac{3}{8}$ inches)
- BVS-3200P:
Approx. 424(W) x 132(H) x 397(D)mm
(16 $\frac{1}{2}$ x 5 $\frac{1}{8}$ x 15 $\frac{3}{8}$ inches)
- BVS-3200C/3200CP:
Approx. 424(W) x 176(H) x 450(D)mm
(16 $\frac{1}{2}$ x 7 x 17 $\frac{3}{8}$ inches)
- Weight:
- Control panel: Approx. 4.4 kg (9 lb 11 oz)
Processor unit:
- BVS-3200/3200P:
Approx. 13 kg (28 lb 11 oz)
BVS-3200C/3200CP:
Approx. 18 kg (39 lb 11 oz)

8500 Series Audio/Video Distribution Amplifiers

8500 Series models feature differential inputs with 6 outputs. Circuit-building blocks such as input amplifiers, output amplifiers and voltage regulators have been reduced to individual hybrid integrated circuits which provide improved performance, better unit-to-unit consistency and ease of maintenance over conventional discrete designs.

8500 DA's include the 8501, a basic non-equalizing DA; the 8502, an equalizing DA with dual range (0'-500' and 500'-1000') variable equalization; the 8503, an equalizing DA with precision stepped equalization (100', 200', ...1000') plus vernier trim (0'-125'); the 8504, a delay DA capable of up to 300ns delay (up to 1.1µsec. with optional plug-ins); the 8505, a field DA which combines long cable EQ (up to 3000' of cable) and a 2-speed clamp. The line also includes the 8520, a pulse

8551 is a high performance voltage-mode audio DA. It has an active, balanced Hi-Z input (input Z > 40K ohms) and 6 active, balanced Lo-Z outputs (output Z > 50 ohms). The 8551 will accommodate signal levels to +24dBu; SNR is > 110dB.

8560 Stereo Audio Distribution System is a series of audio distribution amplifiers. Each amplifier handles 2 channels of audio, manipulated by a single gain control and a balance trim.

8560 rack unit frame of the 8560 Series houses up to 4 DAs, a meter board and power supplies. The meter board, with PPM and VU ballistics, allows monitoring of all DA inputs and outputs.

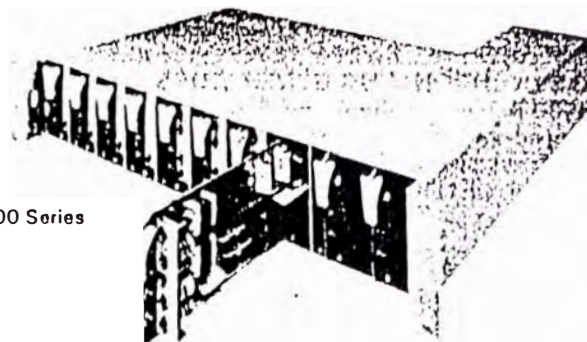
8500/8800 Video and Pulse Trays

8500T1-120	1 RU video tray with 120V PS (holds 4 DAs) . . . \$	695.00
8500T2-120	2 RU video tray with 120V PS (holds 8 DAs) . . .	845.00
8500PS-120	Backup PS for 8500T2-120	275.00
8500T2-DC48	2 RU video tray with 48VDC PS	1300.00
8500PS-DC48	Backup 48VDC power supply	750.00
8500T20-120	2 RU, 10-cell VDA tray with US line cord	845.00
8500T20R-120	2 RU, 10-cell remote tray with US line cord	945.00
8500PSV-120	Backup power supply for all 8500 T20 series trays, US cord	325.00
8500EX	Extender card	95.00

Distribution Amplifiers

Note: Video trays must be ordered separately

8500	Utility VDA (no equalization)	\$120.00
8501	VDA (no equalization)	175.00
8502	VDA with variable cable EQ (for 8281-type cables)	295.00
8502-59B	VDA with variable cable EQ (for "RG-598/U" cable)	295.00
8502-59	VDA with variable cable EQ (for "RG-59/U" cable)	295.00
8503	VDA with step/vernier EQ (for 8281-type cables)	425.00
8503-59B	VDA with step/vernier EQ (for "RG-598/U" cable)	425.00
8503-59	VDA with step/vernier EQ (for "RG-59/U" cable)	425.00
8504	Delay DA (with cable EQ for 8281-type cables)	495.00
8504-59B	Delay DA (with cable EQ for "RG-598/U" cable)	495.00
8504-59	Delay DA (with cable EQ for "RG-59/U" cable)	495.00
8504-D300	300ns delay submodule only	200.00
8504-D500	500ns delay submodule only	250.00
8504-D800	800ns delay submodule only	275.00
8505	Field VDA (with cable EQ for 8281-type cables)	565.00
8505-59	Field VDA (with cable EQ for "RG-59/U" cable)	565.00
8506	Clamp VDA (with cable EQ for 8281-type cables)	435.00
8506-59	Clamp VDA (for cable EQ for "RG-59/U" cable)	435.00



8500 Series

8510R	Remotely-controlled VDA (with cable EQ for 8281-type cable)	\$595.00
8511	Wideband (100MHz) VDA	465.00
8520	Pulse DA	295.00
8520-8281	Pulse DA with 8281 EQ	375.00
8520-R	Pulse DA with regenerator	365.00
8520-EQ1	8281 EQ submodule only	125.00
8520-EQ2	"RG-598/U" EQ submodule only	125.00
8520-RGEN	Pulse regen. submodule only	100.00

Audio Distribution Equipment

8551	Audio DA	\$265.00
8552R	Remotely-controlled Audio DA	395.00
8553	Audio tone generator	295.00
8550T1-120	1 RU audio tray with 120V PS (holds 4 DAs)	725.00
8550T2-120	2 RU audio tray with 120V PS (holds 8 DAs)	895.00
8550PS-120	Backup PS for 8550T2-120 or 8550T1-120	385.00

Stereo Audio Distribution Equipment

8561	Stereo audio distribution amp	\$495.00
8561-MFS	8561 with multi-function submodule installed	845.00
8561-PCS	Stereo ADA with phase adjustable channel switch	695.00
8561SM-MFS	Multi-function submodule	350.00
8561SM-PCS	Phase adjustable, channel switch submodule	200.00
8561-RCK	Remote control kit for multi-function submodule equipped 8561s	95.00
8562	Stereo audio metering module	785.00
8560T2-120	2 RU (4 cell) tray with 120V PS	995.00
8550PS-120	Backup PS for 8550T2-120	385.00
8560EX	Module extender	150.00

8800 High-Density Distribution Amplifiers

A family of 10 cell trays housing 8 output DAs offers the ultimate in utility, quality and lowest price per cell. There is full compatibility between GVG's 8500 Series and the new 8800 Series. The 8500T20 2 RU trays offer 10 cells and 6 outputs, while the 8800T20 2 RU trays offer 10 cells with 8 outputs. Both provide 90-250VAC, 50/60Hz, auto-ranging power supplies for worldwide service.

The 8800 and 8801 DAs offer 6 or 8 outputs when used in the 8500 or 8800 trays, respectively. They both feature loopthrough inputs and the 8801 includes AC-DC coupling and delay-matching to 8501 DAs.

8800	Utility Video DA	\$120.00
8801	Video distribution amplifier	175.00
8800T20-120	2RU, 10-cell/8-out VDA tray with US line cord	895.00
8800PSV-120	Backup power supply for all 8800 T20 series trays, US cord	325.00
8500EX	Extender for 8800 VDAs	95.00

NOTE: Loss characteristics vary considerably among cables with "RG-xx" designations. EQ networks on 8500 Series VDA's are optimized for the following specific cables: "RG-598/U": Belden 8263; "RG-59U": Belden 9259; "RG-11/U": Belden 8238. Exact loss curves are available upon request.

Prices and Specifications Subject to Change Without Notice.

CV-20 Series Component Video Terminal Equipment

The CV-20 Series is a family of products providing component video system designers with signal generation and format conversion capability. Whether the need is conversion between various component formats or conversion between the composite and component world, the CV-20 Series is an economical solution.

CV-11/85 Translator

The CV-11/85 Translator is a simplified version of the CV-21. It may be used in any application where "straight through" conversion from Y, R-Y, B-Y to RGB is required, such as displaying the component output of a Betacam[®] system on an RGB monitor. The CV-11/85 is designed to mount in a standard 8500 Series video DA tray, and may be used in conjunction with 8500 Series amplifiers to provide multiple RGB feeds. Mounts in 8500 Series DA tray.

Specifications

Inputs: Y, R-Y, B-Y (75 ohms terminating); Y = 1V p-p including sync; R-Y, B-Y = $\pm 350\text{mV}$ (75% saturation) • Outputs: RGB (one each) • Frequency Response: $\pm 0.2\text{dB}$ to 6MHz • Gain Adjust: Unity $\pm 1\text{dB}$
CV-11/85 \$395.00

CV-21 Translator

The CV-21 converts Betacam MII, SMPTE or EBU-N10 standard Y, R-Y, B-Y signals to RGB. The CV-21 features full blanking processing which enables the user to delete sync on the RGB outputs, if desired, and to compensate for setup on the Y input signal. Mounts in CV-20T tray.

Specifications

Inputs: Y, R-Y, B-Y (75 ohms terminating); Y = 1V p-p including sync; R-Y, B-Y = $\pm 350\text{mV}$ (75% saturation) • Outputs: RGB (two each); Y • Frequency Response: $\pm 0.2\text{dB}$ to 6MHz • Gain Adjust: Unity $\pm 1\text{dB}$ • Setup Adjust: $\pm 15\text{IRE}$
CV-21 \$995.00

CV-22 Translator

The CV-22 converts RGB signals to Betacam MII, SMPTE or EBU-N10 standard Y, R-Y, B-Y. Full blanking processing and sync add/delete capability is provided to accommodate the large degree of variability which exists in RGB environments. Mounts in CV-20T tray.

Specifications

Inputs: RGB (75 ohms terminating) 700mV video with or without sync. Sync/color black (looping) required if input video is non-composite • Outputs: Y (three); R-Y, B-Y (two each); Y = 1V p-p including sync; R-Y, B-Y = $\pm 350\text{mV}$ (75% saturation) • Frequency Response: $\pm 0.2\text{dB}$ to 6MHz • Gain Adjust: Unity $\pm 2.5\text{dB}$ • Setup Adjust: 0 to +10IRE
CV-22 \$995.00

CV-23 Color Bar Generator

The CV-23 is a component color bar generator which generates full-field color bars in both RGB and Y, R-Y, B-Y formats. It requires composite sync or color black as a timing reference and is capable of operating in either 525/60 or 625/50 systems. Mounts in CV-20T tray.

Specifications

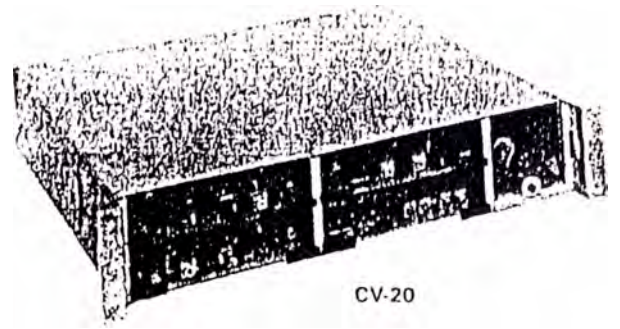
Output Signal: Full field color bars switch selectable to 75% or 100% saturation • Outputs: One set each RGB and Y, R-Y, B-Y • Reference Input: Composite sync or color black • Timing Adjust: Output timing may be adjusted to $\pm 2\mu\text{s}$ with respect to the input timing reference
CV-23 \$1295.00

CV-24N NTSC Decoder

The CV-24N is a variable-Q notch filter design. Front panel controls are provided for input level, setup adjust, chroma phase and chroma gain. The output matrix may be strapped to provide RGB, Betacam MII, SMPTE or YIQ outputs. Mounts in CV-20T tray.

Specifications

Input: NTSC video (75 ohms terminating), 1V p-p nominal, adjustable $\pm 3\text{dB}$ • Outputs: Two sets, strappable to any one of the following: RGB (700mV video/300mV sync); SMPTE-standard Y, R-Y, B-Y; Betacam; or YIQ • Luminance Bandwidth: DC to 6MHz $\pm 0.2\text{dB}$ with 3.58MHz notched out to approximately -30dB • S/N Ratio: $> 60\text{dB}$ (16MHz bandwidth) • Propagation Delay: Approximately 850ns
CV-24N \$1695.00



CV-20

CV-25N NTSC Encoder

The CV-25N produces high quality NTSC video (2 outputs) from composite or non-composite RGB. The CV-25N has a unique, onboard pulse regenerator which derives blanking from input sync, eliminating the need for separate blanking input, sync timing on the output may also be adjusted. An alignment test generator is also included. Mounts in CV-20T tray.

Specifications

Inputs: Number and Type: One each R, G, B video (internally terminated), sync, subcarrier (looping) • Levels: 700mV RGB video with or without sync, with $\pm 1\text{dB}$ gain trim; 4V p-p sync $\pm 6\text{dB}$; 2V p-p SC, $\pm 6\text{dB}$; 2V p-p SC, $\pm 6\text{dB}$ CMRR (RGB inputs); $> 40\text{dB}$ at 60Hz • Outputs: (75 ohm source terminated) Number and Type: Two each NTSC composite video; Level: 1V p-p nominal (714mV video, 286mV sync and burst) • Frequency Response: $\pm 0.2\text{dB}$ to 5MHz (luminance) • Black/White Balance: $< 0.5\text{IRE}$ residual subcarrier • I/Q Quadrature: $> 0.5^\circ$ of subcarrier • Electrical Length: 810ns $\pm 40\text{ns}$ (RGB in NTSC out) • Adjustments: (Card Edge) H Phase, Fine Chroma Phase, Test Mode Enable, Green Tie Enable, I Black Balance, Q Black Balance, Setup • Mounting: Fits in CV-20T tray • Power: Provided by CV-20PS power supply
CV-25N \$1495.00

CV-95N Sync Pulse Generator

The CV-95N has been designed to provide a source of reference timing pulses for analog component islands. Designed on a module that fits into the CV-20T tray, it genlocks to color black. Used in conjunction with CV products, it provides a cost-effective method of system integration.

Specifications

Inputs: Composite color black high-impedance loopthrough • Outputs: Two composite sync, two composite blanking, two color black, two subcarrier (selectable for either GVG encoded subcarrier or standard 2V p-p subcarrier), two common pulse outputs—select either CFID (VI), VD, HD, CS, or BF • Controls (Front Panel): Coarse phase, medium phase, line phase, vernier phase • Controls (On Board): Vertical phase: 2H advance, 1H delay; Vertical blanking width: 16.5-21 lines; Horizontal blanking width: 10.3 μs to 11.3 μs ; Selectable pulse output: GVG encoded subcarrier or standard subcarrier indicators for reference present and color lock • Performance When Locked to Master SPG: Sync time base error: $< 2\text{ns}$; Subcarrier filter: $< 0.25^\circ$ of 3.58MHz; SC phase stability: $< 2^\circ$ of 3.58MHz; Electrical length: 810ns, $\pm 40\text{ns}$
CV-95N \$1395.00

CV-20T Tray

The CV-20T tray is a 2RU tray which will accept up to four CV-20 Series modules in any mix. It comes with one power supply; a second (backup) supply and module extender are available as options.

CV-20T \$895.00
CV-20PS Backup power supply for CV-20T tray \$265.00
CV-20EXT Module extender for CV-20T series modules \$110.00

*Betacam is a trademark of Sony Corporation.

Magni Monitor — Compact Monitoring System

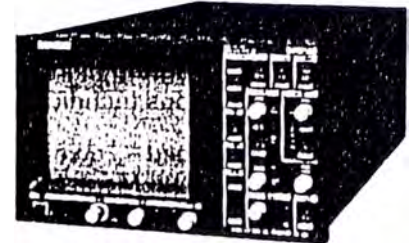
Base Unit: 3 monitoring inputs; Remote Unit: menus and straight-forward controls for streamlined operation; Display Unit: compact LCD screen • Waveform monitor and vectorscope • NTSC, PAL, component • Automatic standard detection feature • View waveforms on standard picture monitors, eliminates specialized CRTs • Adjustable waveform/graticule colors • Adjustable intensity • SC/H phase and color frame limit warnings (vectorscope mode) • Component amplitude/timing warnings (waveform monitor mode) • Remote unit is only 2" deep—fits in production panels, racks, front panels

M-W/V Base unit includes the power supply and remote unit. M-400 has front panel control.

M-W/V	Basic waveform/vector version (NTSC/PAL/CAV)	\$1795.00
M-400	Combination waveform/vector with built-in S-Video, front panel controls and 2 S-Video loopthrough inputs	1795.00
M-Rack	A special full width rackmount (< 2" depth) to mount monitor remote	120.00
M-R	Extra remote unit	250.00
M-400-R	Remote unit for MM-400	250.00



MM 400

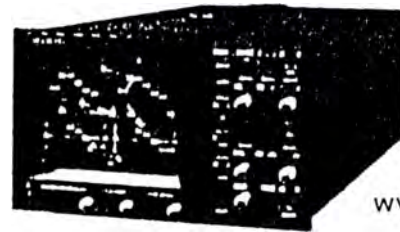


WFM560

WFM560 Component/Composite Waveform Monitor

6 inputs for: 2 complete component signal sets, 6 composite signals, a combination of component and composite • Multi-standard capability for NTSC, PAL, SECAM, 525-line and 625-line component • Component vectorscope function • Component format switching for SMPTE/EBU, Betacam, M-II, GBR • Extensive memory settings for front panel setups • Time, voltage and settime cursors with readouts • Invalid signal and Video Overdrive™ indicators • Overlay modes for signal comparison

WFM560	6-channel NTSC/PAL/SECAM/CAV waveform monitor, CAV vectorscope	\$4950.00
WFM560S	6-channel NTSC/PAL/SECAM/CAV waveform monitor with staircase	4950.00
RM500	Remote panel	550.00

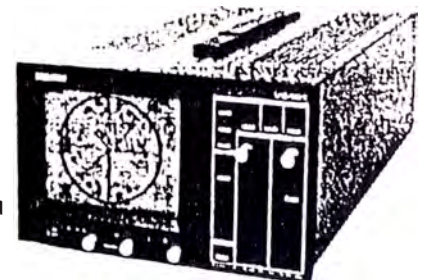


NV560/WV561

NV560/WV561 Combination Waveform Monitor/Vectorscope for Component/Composite Use

6 inputs for: 2 complete component signal sets, 6 composite signals, a combination of component and composite • WV560: NTSC and 525-line component standards, including Y/C; WV561: NTSC, PAL, 525-line and 625-line component standards, including Y/C • SC/H phase measurement and color frame indicator • Built-in differential phase and gain measurements • Simultaneous waveform/vector display mode • Time and voltage cursors with on-screen readouts

WV560	6-channel NTSC/CAV waveform monitor/vectorscope with SC/H and color framing	\$6250.00
WV561	6-channel NTSC/PAL/CAV waveform monitor/vectorscope with SC/H and color framing	6550.00
RM500	Remote panel	550.00



VS561

• Adjustable color and intensity for waveform, vector and graticules • Internal processing and 10-bit resolution maintain accuracy of conventional "CRT" based monitors • Multi-standard (NTSC, PAL), multi-format (composite, S-Video, component) capable **WVM-710**. \$3995.00

VS561 Component/Composite Vectorscope

6 inputs for: 2 complete component signal sets, 6 composite signals, a combination of component and composite • NTSC, PAL, 525-line and 625-line component standards • Simultaneous component and composite vector displays • Amplitude/phase measurement cursors • Graticule and mode readouts • VITS display and R-Y output for differential phase and gain measurements (with WFM560) • Calibrated stereo audio display • SC/H phase measurement and color frame indicator

VS561	6-channel PAL/NTSC/CAV vectorscope with SC/H and color framing	\$4950.00
RM500	Remote panel	550.00

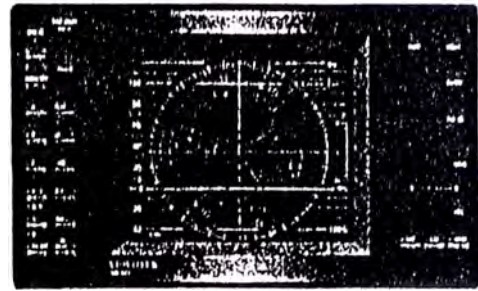
WVM-710 Waveform Monitor/Vectorscope

• Full function, rasterizing waveform monitor and vectorscope for display on picture monitor screens • Real time auto-measurement screen shows video signal parameters graphically and numerically • View waveform/vector full screen, or 1/4-size keyed over or mixed into picture • Video signal parameter status can be keyed over bottom of picture display—perfect for monitoring in production, editing and graphics • Safe title area can be mixed into picture

Prices and Specifications Subject to Change Without Notice.

TV-621 Combination Waveform Monitor/Vectorscope

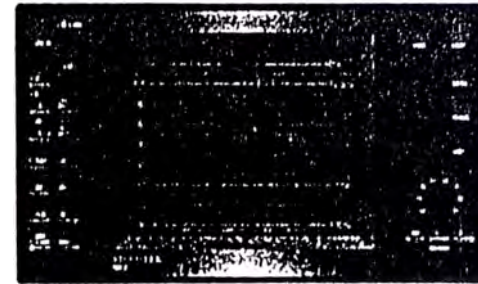
The VM-621 is a full featured half-rack width combination waveform monitor/vectorscope which produces a variety of unique displays. One, two or three video signals may be observed individually or in any combination of three inputs. Waveforms can be displayed in either simultaneous parade modes or overlaid for comparison of timing and amplitude characteristics. Any one input may be displayed with simultaneous low pass and chroma filters. Vector displays can also be overlaid for simultaneous observation and comparison of the phase and amplitude of up to three signals. Four user defined memories permit rapid recall of frequently used modes. Diagnostic testing of the front panel controls and LEDs are built in. An R-Y mode displays the demodulated chrominance with horizontal sweep. A graticule scale is provided to aid in measuring differential phase. This display can be viewed simultaneously in the parade mode with one or two additional filter waveforms. The TV-621 is available with an optional AC/DC power supply (ADC-1), allowing an external DC power source or battery to be input via a 4-pin X1 connector for portable field use \$3828.00



TVM-621

V4-61 Vectorscope

The VSM-61 is designed for convenience and ease of operation in providing the vector display of video signals at an economical price. Market proven traditional features are combined with ergonomically designed controls. Proven, reliable circuit design permits accurate measurement of differential gain and differential phase of color television signals. Selection of inputs (A, B or subcarrier A) and references (A, B or external subcarrier) are easily accomplished via tactile membrane control switches. Rapid A/B comparisons may be made by directly switching between the A and B inputs. Requiring only three rack units (5.25") and one half-rack width, the VSM-61 vectorscope may be mounted in the optional DRC-1 double rackmount case along with a TSM-61 or TSM-61 waveform monitor for complete signal monitoring \$2132.00



TSM-61

V-61 Waveform Monitor With Line Select

Designed for convenience and ease of operation, the TSM-61 is an excellent value in waveform monitors. Market proven traditional features combined with ergonomically designed controls. Proven, reliable circuit design permits a variety of measurement parameters. Selection of filter response (flat, IRE, chroma or differential gain) and time base sweep (1H, 2H, 2V, 1H mag, 2H mag, 2V mag) are easily accomplished via tactile membrane control switches. Rapid A/B comparisons may be made by directly switching between A and B inputs. Line Select permits the observation of lines 14 through 21, field 1 or field 2. An auto bright-up circuit increases the intensity of the selected lines for observation of VITS, VIRS or closed caption signals being displayed. Additionally, auto focus assures a clear, well defined image of the line selected, without readjustment. Requiring only three rack units of vertical rack space (5.25") and one half-rack width, the TSM-61 waveform monitor may be mounted in the optional DRC-1 double rackmount case along with a VSM-61 vectorscope for complete signal monitoring \$2132.00

TSM-51 Waveform Monitor

The TSM-51 offers the most commonly used waveform monitor functions at an economical price. Market proven traditional features are combined with ergonomically designed controls. Proven reliable circuit design permits a variety of measurement parameters. Selection of filter response (flat, IRE or chroma) and time base sweep (2H, 2V, 2H mag, 2V mag) are easily accomplished via tactile membrane control switches. Rapid A/B comparisons may be made by directly switching between the A and B inputs. Requiring only three rack units of vertical rack space (5.25") and one half-rack width, the TSM-51 waveform monitor may be mounted in the optional DRC-1 double rackmount case along with a VSM-61 vectorscope for complete signal monitoring \$1729.00

TVM-675 Component Analog/Composite Combination Waveform Monitor/Vectorscope Audio Monitor

The TVM-675 is a full-featured half-rack-width combination waveform monitor/vectorscope, audio monitor engineered to observe either composite or component analog signals. Stereo audio phase and levels may be monitored via the audio display. The audio may be displayed alone or in any combination with waveform and/or vector. One, two or three composite video signals may be observed individually or in any combination of three inputs. Waveforms can be displayed in either parade modes or overlaid for comparison of timing and amplitude characteristics. All three composite inputs may be displayed simultaneously with Flat, Low Pass and Chroma filters. Vector displays can also be overlaid for simultaneous observation and comparison of the phase and amplitude of up to three composite signals. The TVM-675 can display component analog video signals from Beta, SMPTE, EBU or MII standards of 75% and 100% equivalent saturations. Component vectors may be displayed by themselves or in combination with the waveform display. Four user-defined memories permit rapid recall of frequently used modes. Diagnostic testing of the front panel controls and LEDs is built in. An R-Y (V axis PAL) mode displays the demodulated chrominance with horizontal sweep. A graticule scale is provided to aid in measuring differential phase. This display may be viewed simultaneously in the parade mode with one or two additional filter waveforms. The TVM-675 is ideal for multi-format analog video and stereo audio monitoring \$4228.00

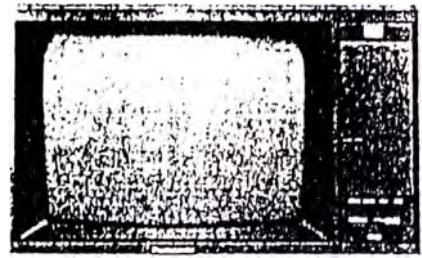
Options

- SSC-1 Single standard case \$ 60.00
- PTC-1 Portable case with handle and sunshield 155.00
- DRC-1 Double rackmount case 220.00
- BLK-1 Blank panel for DRC-1 45.00
- DAT-3 Half rack tray for DRC-1 to mount 2 PVS-6 or PVS-6A, stand-alone distribution amplifiers or VSG-21 color sync and test signal generator. 135.00

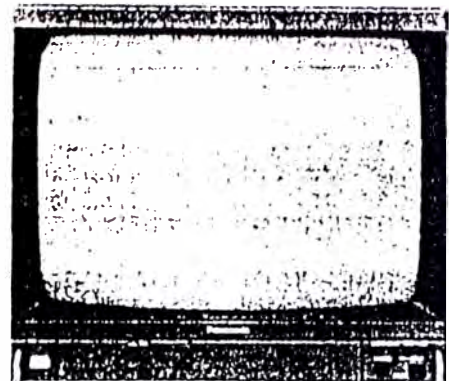
BT-M1310Y/BT-D1920Y High-Grade Stereo Video Color Video Monitors

Common features:

VHS compatible • More than 560 lines of horizontal resolution • Versatile in/out connectors, including line 1/2 ext sync/RGB, all with automatic termination; also 8-pin VCR in/out • Line 1/2/VCR/RGB selectable component (Y, R-Y, B-Y) input available as option • Versatile front panel controls: Preset picture on/off; line 1 split; setup switch; RGB cutoff; fast/slow time constant; pulse cross; normal/underscan; blue signal only; color/auto/mono mode; comb/trap filter; degauss • Separate H/V size controls; H and V centering controls; V-hold control • Commercial UL listing; 3-prong AC power cord • Rack-mountable • Front panel tally lamp • Rugged metal cabinet construction



BT-M1310Y



BT-D1920Y

BT-M1310Y 13" Diagonal High-Grade Stereo Video Color Video Monitor

Includes common features plus:

0.39 dot pitch medium-grade CRT \$2000.00

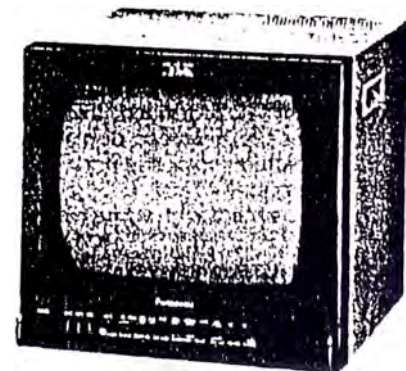
BT-D1920Y 19" Diagonal High-Grade Stereo Video Color Video Monitor

Includes common features plus:

0.55mm dot pitch data-grade CRT • Gray face screen transparency, 70% • More than 90fL brightness and 40:1 contrast • 5fL preset contrast \$2265.00

BT-H1350Y 13" Diagonal Color Video Monitor

SMPTE Type C phosphor • 0.31mm dot pitch • 750 lines horizontal resolution • Line 1, Line 2, RGB input External sync in/out • Front mounted 1.5W speaker Selectable color temperature (9300K or 6500K) Blue-only, underscan, pulse cross • Multi-standard PAL, SECAM, NTSC 3.58, NTSC 4.43) • MII and S-HS compatible • Rack-mountable with optional rack-mount \$1430.00



BT-H1350Y

Accessories for BT-M1310Y/D1920Y/H1350Y

- RA-131
Rack-mount brackets, 1 pair (BT-H1350Y) . . . \$130.00
- RA-M100
Component (Y/R-Y/B-Y) adaptor 110.00
- BT-100YC
S-Video/BNC conversion adaptor, 2 pieces 75.00
- AG-C70AE
S-Video (Y/C) cable (10') 20.00
- AG-C71AE
S-Video (Y/C) cable (16.6') 25.00

Prices and Specifications Subject to Change Without Notice.

COLOR VIDEO MONITORS

CT-2583Y 25" Diagonal Color Video Monitor

• 90° tint-face screen • 450 lines horizontal resolution • Either S-Video (4-pin Y/C) or line (BNC) Input/output • Audio Input/output (RCA) • Automatic 75 ohm termination • Auto on • On-screen display for adjustment of sharpness, brightness, color, tint, channel selection • Built-in comb filter

CT-2583Y \$640.00

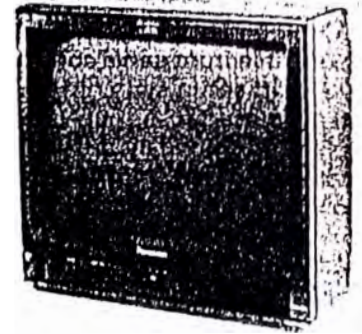


CT-2583Y

CT-2010Y 20" Diagonal Color Video Monitor

• Square corner screen • 450 lines horizontal resolution • Video/audio (line 1/line 2) • Video input/output: BNC • Automatic 75 ohm termination • S-Video input/output (4-pin) • VCR terminal: 8-pin • Monitor out terminals • Phono input/output • 1.5W speaker, front panel • Comb filter • Direct compatibility with S-VHS • Input source is switch selectable from the front panel • Quick-on CRT uses no current when unit is off • Auto degaussing • Front panel controls for color, tint, brightness, contrast, sharpness, volume hold • Headphone jack

CT-2010Y \$755.00

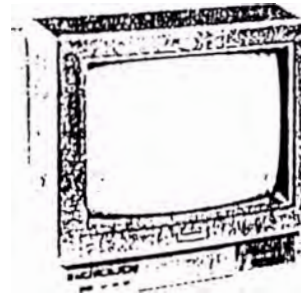


CT-2010Y

CT-2083Y 20" Diagonal Color Video Monitor

• Flat square screen • 450 lines horizontal resolution • Video input/output: BNC • Automatic 75 ohm termination • S-Video in/out (4-pin) • Audio input/output (RCA) • 1.5W amplifier • 2.5" speaker, front panel • Auto on • Line 1/2/3/S-Video, switchable • Built-in comb filter • On-screen display for adjustment of sharpness, brightness, picture, color and tint

CT-2083Y \$455.00

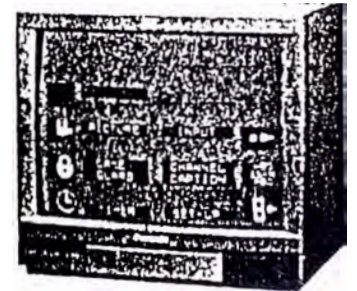


CT-1331Y

CT-1331Y 13" Diagonal Color Video Monitor

• Tint face screen • 420 lines horizontal resolution • Video/audio (line 1/line 2) • Video input/output BNC • Automatic 75 ohm termination • S-Video in/out: 4-pin; VCR terminal: 8-pin; monitor out terminals • Phono input/output • 1.5W amplifier • Speaker, front panel • Comb filter • Direct compatibility with S-VHS • Input source is switch selectable from the front panel • Front panel controls also include color, tint, brightness, contrast, sharpness, volume and vertical hold, headphone jack

CT-1331Y \$605.00



CT-2084VY

CT-1383Y/1383YW 13" Diagonal Color Video Monitors

• 90° deflection screen • 420 lines horizontal resolution • Video input/output: BNC • Automatic 75 ohm termination • S-Video in/out (4-pin) • Audio input/output (RCA) • 1.5W amplifier • 2.5" speaker, front panel • Auto on • Line 1/2/3/S-Video, switchable • Built-in comb filter • Headphone jack • On-screen display for adjustment of sharpness, brightness, picture, color and tint

CT-1383Y \$360.00

CT-1383YW Same as above except with white cabinet . . \$390.00

COLOR VIDEO MONITOR/RECEIVERS

CT-1384VY 13" Diagonal Color Video Monitor/Receiver

• 90° deflection screen • 420 lines horizontal resolution • Easicon™ on-screen menu • Selectable line 1/2/3/S-Video/RF • Wireless infrared remote control • 181-channel cable compatible tuner • Programmable channel scan • On-screen display for adjustment of sharpness, brightness, color, tint and channel selection • Auto power on/off • Built-in closed caption decoder • 1.5W audio amp • 2.5" speaker • 1/8" mini-plug headphone jack

CT-1384VY \$410.00

CT-2084VY 20" Diagonal Color Video Monitor/Receiver

• 90° deflection flat square screen • 450 lines horizontal resolution • Easicon on-screen menu • Selectable 1/2/3/S-Video/RF • 20-function wireless infrared remote control • 181-channel cable compatible tuner • Programmable channel scan • Auto power on/off • Built-in closed caption decoder • 1.5W audio amp • 2.5" speaker

CT-2084VY \$515.00

CT-2584VY 25" Diagonal Color Video Monitor/Receiver

• 100° deflection tint-face screen • 450 lines horizontal resolution • Easicon on-screen menu • Selectable S-Video or Line/RF • Wireless infrared remote control • On-screen display for adjustment of sharpness, brightness, color, tint and channel selection • 181-channel cable compatible tuner • Programmable channel scan • Auto power on/off • Built-in closed caption decoder • 1.5W audio amp • Two 2.5" speakers

CT-2584VY \$740.00

Accessories

ET-100YC S-Video/BNC conversion adaptor, 2 pieces (all models) \$75.00
 AG-C70AE S-Video (Y/C) cable, 10' (all models) 20.00
 AG-C71AE S-Video (Y/C) cable, 16' (all models) 25.00

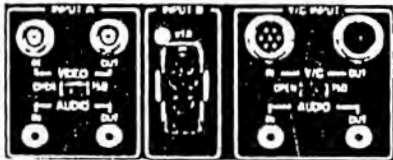
Monitores de video a color

TM-1400SU

14"

TM-900SU

9"



CARACTERÍSTICAS

- Resolución horizontal superior a 450 líneas
- CRT de 14"V (diagonalmente medido), FS (cuadrado) con paso de rayas de 0,499 mm.
- Entrada Y/C para S-VHS.
- Juegos de entradas de video compuestas (BNC/8 patas).
- Entrada de audio (RCA) con altavoz integrado.
- Funciones múltiples profesionales.
 - 1) Subdivisión
 - 2) Cruzamiento de impulsos
 - 3) Interruptor selector AFC
 - 4) ON/OFF a color
 - 5) Comprobación de azul
- Montable en un estante EIA con el uso del adaptador de montaje opcional.

CARACTERÍSTICAS

- Resolución horizontal superior a 310 líneas
- CRT de 14"V (diagonalmente medido) con paso de puntos de 0,47 mm.
- 7 patas para para S-VHS (Conexión en puente posible).
- 2 Juegos de entradas de video compuestas (A/B).
- Funciones múltiples profesionales.
 - 1) Subdivisión
 - 2) Cruzamiento de impulsos
 - 3) ON/OFF de color
 - 4) Comprobación de azul
 - 5) Sincronización INT/EXT
- CA/CC seleccionable (CC12V, 4 patas XLR).
- Capacidad de audio con altavoz integrado.
- Pueden montarse dos unidades colateralmente en un estante EIA haciendo uso del adaptador de montaje opcional RK-9U.

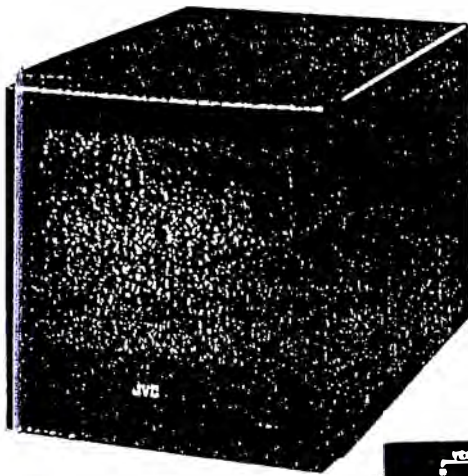
ESPECIFICACIONES

DELO	TM-1400SU	TM-900SU
Modelo	Monitor de video a color	—
Formato de color	BTSC	—
Tamaño visual	14" (tamaño visual/diagonalmente medido) FS, data grade, pistolas en línea, paso de puntos 0.499 mm	9" (tamaño visual/diagonalmente medido) FS, data grade, pistolas en línea, paso de puntos 0.47 mm
Alimentación requerida	CA 120 V 60 Hz	—
Consumo	1.05A (1A) 60 W (promedio)	CA 0.64 A/CC 3.0 A
Potencia de audio	0.75 W	1.0 W
Altavoz	4.5 cm redondo x 1	8 cm redondo x 1
Entrada de video compuesta	A BNC x 2 (1 para salida conectada en puente) 1.0 Vp-p, 75 ohmios, interruptor de terminación provisto B VTR-8 patas x 1 1.0 Vp-p, 75 ohmios	BNC x 2 (1 para salida conectada en puente) 1.0Vp-p, 75 ohmios, interruptor de terminación provisto
Entrada de video separada	7 patas x 2 (1 para salida conectada en puente) Y 1.0 Vp-p, 75 ohmios, positivos C 0.286 Vp-p, 75 ohmios	7 patas x 2 (1 para salida conectada en puente) Y 1.0 Vp-p, 75 ohmios, positivos C 0.286 Vp-p, 75 ohmios
Entrada de audio	A RCA x 2 (1 para salida conectada en puente) 390 mV rms (-6 dB) alta impedancia B 8 patas x 1,775 mV rms (0 dB)	RCA x 1 (1 para salida conectada en puente) 390 mV rms (-6 dB) alta impedancia
Dimensiones	360 (anchura) x 314.3 (alto) x 393.3 (fondo) mm	223 (anchura) x 227 (alto) x 328 (fondo) mm
Peso	16 kg	9 kg

Monitores de video a color

TM-9U (A)

9"



CARACTERÍSTICAS

9"V (diagonalmente medido) con un paso de rayas-puntos de 0,47 mm.

Dos unidades TM-9U pueden montarse en un estante EIA-19" normal.

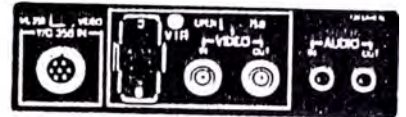
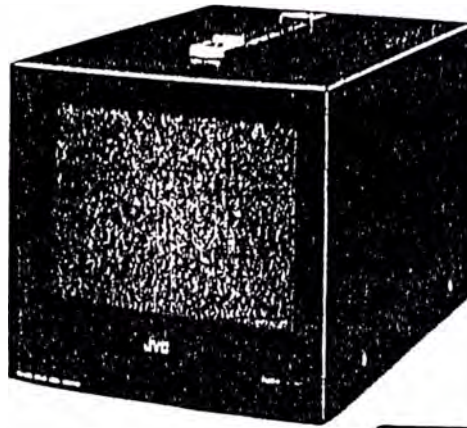
Allavoz de audio Integrado

Diseño elegante y compacto con dimensiones reducidas.

Adopción de un gabinete metálico para reducir interferencias.

TM-91SU

9"



CARACTERÍSTICAS

■ Imágenes de alta calidad y diseñado para los sistemas S-VHS.

■ Pueden montarse dos unidades TM-91U en un estante EIA normal (adaptador opcional).

■ CRT de 9"V (diagonalmente medido) con paso de puntos de 0,47 mm.

■ Terminales de entrada de video:

1) Compuesta (conexión en puente posible)

2) Señales de video independientes Y/C: 7 patas.

3) Terminal de entrada de audio: RCA (conexión en puente posible).

■ Allavoz de audio Integrado.

ESPECIFICACIONES

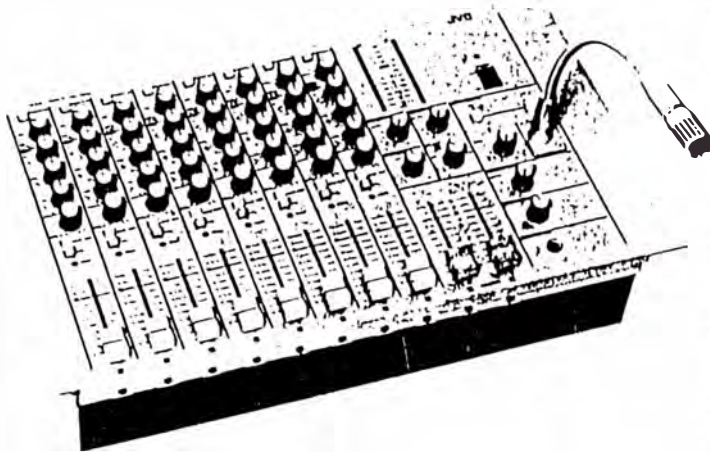
Tipo	Monitor a color
Sistema de color	NTSC
Alimentación requerida	CA 120V, 60Hz
Consumo	47W (Máx), 36W (promedio)
Dimensiones de CRT	9" (tamaño visual, diagonalmente medido), FS CRT
Salida de audio	1W
Allavoz	8cm redondo x 1
Terminal INPUT A	Video (BNC) 1.0 Vp-p, 75 ohmios Audio (RCA) 390mV rms (-6dB), alta impedancia, conexión de salida en puente posible
Dimensiones externas	223 (ancho) x 343 (fondo) x 227 (alto)mm
Peso	9,9 kg

ESPECIFICACIONES

Tipo	Monitor a color
Sistema de color	NTSC
CRT	9" (tamaño visual, diagonalmente medido), pistola-CRT en línea, paso de rayas-puntos de 0,47mm
Alimentación requerida	CA 120V, 60Hz
Consumo	0,63A (Máx), 37W (promedio)
Resolución horizontal	Superior a 300 LINEAS
Terminales de entrada	Video BNC/1 Vp-p, 75 ohmios, conexión de salida en puente posible
Externa:	Audio RCA: 390mV rms (-6dB), alta impedancia, conexión de salida en puente posible Y/C 358: 7 patas
Salida de audio:	1W
Allavoz:	8cm redondo x 1
Dimensiones externas:	223 (ancho) x 236 (fondo) x 343 (alto)mm
Peso:	8,5kg

Mezcladores profesionales de audio

MI-2000U



Micrófono opcional

CARACTERÍSTICAS

- Entradas de micrófono balanceada aislada con transformadores
- Entradas de línea con conectores XLR para facilitar la conexión de equipos con salida balanceada
- Entrada para micrófono de otercom desde el conector del panel posterior
- Oscilador incorporado para facilitar la comprobación de los circuitos
- Salidas auxiliares de señal para proceso de Eco.
- Fuente de alimentación fantasma para conectar directamente micrófonos de condensador
- Función de escucha previa para facilitar la comprobación de las señales
- Montaje directo en rack EIA
- Convertidor opcional de c.a./c.c. para aplicaciones de mezcla ENG
- Entrada para monitorización externa, para facilitar la edición de vídeo

ESPECIFICACIONES

LÍNEAS DE ENTRADA

- Canal 1, canal 4 conmutables micró/línea
Micro -70/ 60/ 50/ 40/ 20 dB balanceados, XLR 3-31
Línea -10 dB, 10 kohm balanceados, XLR 3-31
- Canal 5, canal 6 conmutables micró/línea
Micro -70/ 60/ 50/ 40/ 20 dB balanceados, XLR 3-31
Línea -10 dB, 10 kohm, no balanceados, RCA
- Canal 7, canal 8 conmutables micró/línea
Micro -70/ 60/ 50/ 40/ 20 dB balanceados, XLR 3-31
Phono -54 dB, 50 kohm, no balanceados, RCA (ecualizador RIAA incorporado)

Entrada monitor 2 líneas, -10 dB, 10 kohm no balanceados, RCA

Micrófono de orden -60 dB, 600 ohm, balanceados, XLR 3-31

LÍNEAS DE SALIDA

- PROGRAMA A 2 líneas, 0 dB, impedancia de carga 600 ohm balanceados, XLR 3-32
- PROGRAMA B 2 líneas, 0 dB, impedancia de carga 10 kohm, no balanceados, RCA
- SALIDA REC 2 líneas, 0 dB, impedancia de carga 10 kohm, no balanceados, RCA
- SALIDA AUX 1 línea, 0 dB, impedancia de carga 10 kohm, no balanceados, RCA
- RETORNO ESTUDIO 2 líneas, 0 dB, impedancia de carga 10 kohm, no balanceados, RCA
- MONITOR SALA 2 líneas, 0 dB, impedancia de carga 10 kohm, no balanceados, RCA
- AUDICULARES 1 línea (estéreo), 8 g máx, 100 mW (para estéreo)

RESPUESTA EN FRECUENCIA

MICRO 20 Hz a 20 kHz ± 0 dB/ ± 2 dB

LÍNEA 20 Hz a 20 kHz ± 0 dB/ ± 1 dB

Distorsión armónica total

Micro inferior a 0,1% (1 kHz) 3% a 20 kHz (salida ± 20 dB)

Línea inferior a 0,1% (20 Hz a 20 kHz) (salida ± 20 dB)

Ruido de entrada equivalente inferior a -129 dB (medida 150 Hz, 100 Hz, 1000 Hz, 10000 Hz)

Distorsión de modulación inferior a -70 dB (medida por las 0,1 Hz, 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz)

Distorsión de modulación inferior a -70 dB (1 kHz) entre canales, entre canales de un par de canales

Distorsión de modulación inferior a -70 dB

Salida máxima ± 20 dB

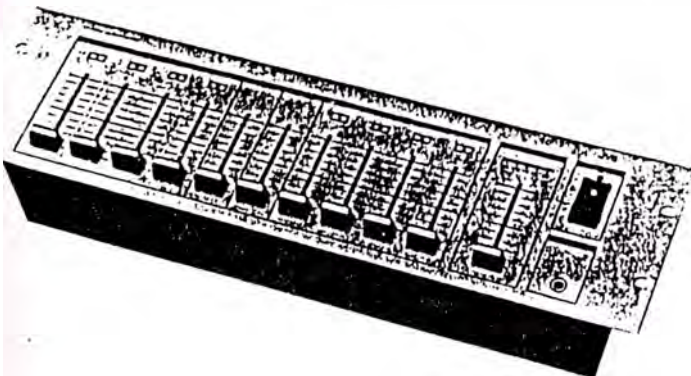
Fuente de alimentación 120 Vca (MI-2000U) o 12 Vcc

Consumo 5 W (c.a.), 2,2 A (c.c.)

Dimensiones: 482 (anchura) x 132 (altura) x 91 (fondo) mm

Peso 7,2 kg

MI-1200U



CARACTERÍSTICAS

- Mezclador de audio de 10 canales instalable en rack
- Grandes atenuadores deslizantes
- Indicador de nivel con 5 LEDs
- Conectores de micrófono tipo XLR de 3 patas
- Compatible con fuentes de alimentación de c.a. y c.c. de 12 V
- Idóneo para uso en sistemas de voz, en combinación con el generador de efectos especiales

ESPECIFICACIONES

Señales de entrada

- Micrófono: 1, -64 dB, 600 ohm balanceados, por transformador (XLR 3-31) (pata 2 = fase positiva para MI-1200U)
- Phono: 1, -54 dB, 50 kohm, no balanceados (RCA x 2) (sistema de mezcla derecha/izquierda)
- Magnetofono: x 1, -10 dB, 50 kohm, no balanceados (RCA x 2) (sistema de mezcla derecha/izquierda)
- Auxiliar: 4, -10 dB, 50 kohm, no balanceados (RCA)

Respuesta en frecuencia: 50 a 15000 Hz, ± 0 /-1,5 dB (a 1 kHz)

Relación señal-ruido: superior a 60 dB (a 1 kHz)

Ruido residual: inferior a -70 dB

Distorsión: inferior a 10% (a 1 kHz, nivel de salida normal)

Indicadores de nivel: 5 LEDs (-15/-10/-3/0/+3 dB)

Temperatura de servicio: 0 a 40 °C

Fuente de alimentación: 120 Vca (MI-1200U) o 12 Vcc

Consumo: 5 W (c.a.), 2,2 A (c.c.)

Dimensiones:

Montaje en rack: unidades de panel 4U en rack estándar EIA de 19

pulgadas

Dimensiones de la unidad: 482 (anchura) x 132 (altura) x 91 (fondo) mm

Todos los números de modelos, especificaciones y precios son susceptibles de modificación sin previo aviso

Mezclador de audio de 10 canales/Unidad de autofundido

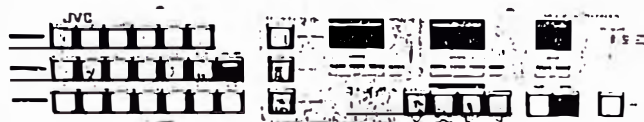
M-3000U



CARACTERÍSTICAS

- 8 canales monoaurales y un canal estéreo
- VCA (amplificador controlado por tensión), controlado por el M-300U
- Posibilidad de montaje en rack EIA
- Ecualizador de 3 bandas para cada canal (graves, medios y agudos)
- Control de fin de entrada (canales 1 a 8)
- Fader deslizante de 100 mm ultrasuave

MI-F30U



CARACTERÍSTICAS

- Flexibilidad de Interconexión (RS-422, RS-232C y tres GPI)
- Cuatro formas de transición distintas con velocidad variable de hasta 999 cuadros ()
- Memoria para cien eventos
- Posibilidad de montaje en rack EIA

ESPECIFICACIONES

<p>Fin de entrada</p> <p>Canales 1-8 monoaural, conmutable A/B</p> <p>Modo A -60/-40/+4 dB, superior a 5 kohm balanceada (XLR-3-31)</p> <p>Modo B, canales 1-4 -4 dB, superior a 5 kohm balanceada (XLR-3-31)</p> <p>Canales 5-8 -20 dB, superior a 10 ohm, no balanceada (RCA)</p> <p>Ecualizador graves, 100 Hz \pm 15 dB, curva aplanaada</p> <p>Medios 150 Hz - 7 kHz \pm 15 dB, curva en cresta</p> <p>Agudos 10 kHz \pm 15 dB, curva aplanaada</p> <p>Canal 9, estéreo, conmutable línea/phonon</p> <p>Modo A -20/+4 dB, 10 kohm, no balanceada (RCA)</p> <p>Modo B -54 dB, 1 kHz, superior a 50 kohm, no balanceada (RCA)</p> <p>Canal (1-2) +4 dB, 10 kohm, balanceados (XLR-3-31) o no balanceados (RCA)</p> <p>Canal externo (L, R) +4 dB, 10 kohm balanceados (XLR-3-31)</p> <p>Canal de orden -70 dB, 600 ohm balanceados (XLR-3-31)</p>
<p>Salidas de salida</p> <p>Modo A (L, R) +4 dB, 600 ohm balanceados (XLR-3-32)</p> <p>Modo B, 10 kohm, no balanceados (RCA)</p> <p>Canal (1, 2) +4 dB, 10 kohm, no balanceados (RCA)</p> <p>Modo (L, R) +4 dB, 10 kohm, no balanceados (RCA)</p> <p>Salidas (L, R) 16 - 600 ohm, máx. 100 mW a 16 ohm (pata phono estéreo)</p> <p>Modo auxiliar programa (L, R) +4 dB, 10 kohm (9 patas, d-sub)</p> <p>Modo monitor (L, R) +4 dB, 10 kohm (9 patas, d-sub)</p> <p>Modo ecualizador 10 kohm (9 patas, d-sub)</p>
<p>Respuesta en frecuencia 20 Hz - 20 kHz \pm0/-2 dB</p>
<p>Distorsión armónica total, inferior a 0.08 % (20 Hz - 20 kHz a -20 dB de ganancia)</p>
<p>Impedancia de entrada equivalente, inferior a -128 dB (IHF, curva A ponderada)</p>
<p>Nivel residual, inferior a -90 dB (IHF, curva A ponderada)</p> <p>inferior a -75 dB (IHF, curva A ponderada)</p>
<p>Ruido, inferior a -70 dB (1 kHz)</p>
<p>Frecuencia de corte 400 Hz, 7 kHz (onda sinusoidal)</p>
<p>Fuente de alimentación 120 Vca, 50/60 Hz, 220/240 Vca, 50/60 Hz</p>
<p>Dimensiones 482 x 115 x 399 mm</p>

ESPECIFICACIONES

<p>Punto de cruce, matriz de 3 buses (over, program, preset)</p>
<p>Control de canal, 2 canales acoplados (1/2, 3/4, 5/6, 7/8, 9L, 9R)</p>
<p>Velocidades de transición (1 - 999 cuadros (over, preset))</p>
<p>4 formas de transición</p> <p>corle en V, fundido cruzado, corte fundido, fundido corte</p> <p style="text-align: center;"><input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/></p>
<p>Memoria de eventos, 100 eventos (punto de cruce, forma de transición, velocidad de transición)</p>
<p>Interface serie, RS-422C o RS-232C</p>
<p>GPI, 3 modos (over transition, preset transition, preset cut)</p>
<p>Fuente de alimentación, 120 Vca, 50/60 Hz, 220/240 Vca, 50/60 Hz</p>
<p>Dimensiones, 482 (anchura) x 88 (altura) x 180 (fondo) mm</p>

PROFESSIONAL BROADCAST AND INTERCOM HEADSETS

DT 108* Dynamic Headset

Dynamic single-muff headset with built-in dynamic boom mic (200 ohm) • Designed for live remote broadcasting, studio, film and TV, 2-way communication • Standard headset for most intercom systems

- DT 108. \$ 289.00
- DT 109* Same as the DT 108 in a dual-muff configuration. 349.00
- DT 109.4 Same as the DT 109 with built-in balanced preamp 409.00
- DT 109.5 Same as the DT 109 but with balanced mic 200/400 ohms 369.00

DT 108.4 Dynamic Headset

Same as DT 108 but supplied with built-in amplifier for carbon-level mic inputs found on many ENG cameras • 200 or 300 ohm balanced mic line • Available in 400, 600, 2000 or 3000 ohm headphone impedance • Straight, non-detachable, open ended cable

- DT 108.4 \$ 399.00

*Note: DT 108 and DT 109 are available in the following impedances: 8, 50, 100, 200, 400, 800 and 2000 ohms.

DT 190 Sports Headset Microphone

• Dual earcup headset microphone • Designed for on-the-air applications where isolation from ambient noise and the highest levels of speech intelligibility are required • Adjustable microphone boom permits quick adjustment when worn by user • Available in mono, dual mono or stereo

- DT 190. \$ 399.00
- DT 180 Single-muff version of DT 190 379.00

BROADCAST/STUDIO MONITORING HEADPHONES

DT 48* Dynamic Headphone

• Closed design • For professional applications • Considered the standard headphone for use in live recording, film monitoring, broadcasting and ENG work • 16Hz-20kHz • Supplied with 3m straight (K), non-detachable cable terminated in 1/4" connector

- DT 48 \$ 479.00

*Note: Specify straight (K) or coiled (WK) cable, stereo or mono wiring and impedance.

Stereo: 8, 25 and 200 ohms; Mono: 16, 50 and 400 ohms

DT 100 Circumaural Studio Headphone

• Closed design • Comfortable for extended use • 10' cable with 1/4" stereo connector supplied • Used in audio recording and monitoring applications • 30Hz-20kHz

- DT 100. \$ 239.00

DT 102 Dynamic Single-Cup Headphone

• Dynamic, single-muff communication headphone • Designed for monitoring broadcast, TV, theater and discos • 30Hz-20kHz

- DT 102. \$ 179.00



DT 108



DT 109



DT 190



DT 150

DT 150 Circumaural Stereo Headphone

• Combines rugged, field serviceable construction of DT 100 with digital performance transducers • 5Hz-35kHz frequency response • Use for studio or on-location applications • Replaceable ear cushions and headband pad • Detachable cord

- DT 150. \$ 269.00

Stereo: 8, 50, 100, 200, 400, 600, 800 and 2000 ohms

Mono: 16, 100, 200, 400, 800, 1200, 1600 and 4000 ohms

DT 505 Mini Earphone Monitor

• Dynamic mini earphone supplied with ear loop (OB 506) and straight, open ended cable • Mono only • Optional ST 505 'steto-clip' available for binaural listening • Available in 50 ohm impedance

- DT 505 \$ 49.00

Cables

- K 100.07 Straight 10' (3m) cable with 1/4" phone jack wired in stereo. \$ 36.00
- WK 100.07 Coiled 10' (3m) cable with 1/4" phone jack wired in stereo. 45.00
- K 109.0 Straight 5' (1.5m) cable open ended for DT 108/109 35.00
- K 109.00 Straight 10' (3m) cable for DT 108/109 39.00
- WK 109.00 Coiled 10' (3m) cable open ended for DT 108/109 45.00

Compact Mini Microphones

- MCE 5.9 • Miniature omnidirectional condenser mic • Bare end for use with any wireless transmitter • 20-20,000Hz • Battery/phantom power \$259.00
 - MCE 5.11 • XLR version of MCE 5.9 with power supply unit and pre-amp • 48V battery \$549.00
 - MCE 5.15 • Phantom power only version \$479.00
 - MCE 5.16 • Same as MCE 5.15 with connector to S170P \$359.00
 - MCE 10.9 • Miniature hypercardioid condenser mic for any wireless transmitter • 40-20,000Hz • Battery/phantom power \$399.00
 - MCE 10.11 • Same as MCE 10.9 but with pre-amp power supply \$659.00
 - MCE 10.16 • Same as MCE 10.9 but with connector for S170P \$499.00
 - MCE 50.11* • Miniature omnidirectional condenser mic • XLR version with power supply and pre-amp • 25-18,000Hz • Battery/phantom power \$499.00
 - MCE 50.15* • Same as MCE 50.11 with XLR pre-amp for phantom powering \$399.00
 - MCE 50.16* • Same as MCE 50.15 with connector for S170P \$299.00
- * MCE 50s also available in flesh tone versions with prefix MCE 51.
- MCE 52.15 • Omni-instrumental miniature condenser with gooseneck/clip • 35-20,000Hz \$399.00
 - MCE 52.16 • With Lemo connector for TS170 \$299.00
 - MCE 53.15 • Omni-instrumental miniature condenser mic with long gooseneck/clip • 35-20,000Hz \$429.00
 - MCE 53.16 • With Lemo connector for TS170 \$299.00



Shotgun Microphones

- MCE 86.01 • Short shotgun condenser microphone • Hypercardioid/figure polar pattern • 50Hz-18kHz • Can be phantom powered, generally 12-48V • Camera or fishpole/boom shockmount \$499.00
- MCE 86.02 • Same as MCE 86.01 with EA19/25 suspension and KVM mic clamp \$549.00
- MCE 86S.01 • Same as MCE 86.01 with phantom/battery power and 86 \$599.00
- MCE 86S.02 • Same as MCE 86.02 with phantom/battery power and EA19/25 \$649.00
- MCE 87S • Battery only version of MCE 86.01 with EA 19/25 and KVM mic clamp \$599.00
- MCE 87VS • Phantom only version with mini jack connectors \$459.00

- MEM 86 • Low profile shotgun with remote pre-amp, clamp and stand \$599.00
- MC 736PV • Condenser, cardioid-lobe 'short shotgun' microphone • 12dB attenuation pad • Bass roll-off switch • High S/N ratio and high sound pressure level capability • Requires 12-48V phantom power • 40-20,000Hz \$1499.00
- MC 737PV • Ultra-directional condenser, 'long shotgun' microphone • 12dB attenuation pad • Bass roll-off switch • High S/N ratio and high sound pressure level capability • 12-48V phantom power • 40-20,000Hz \$1649.00

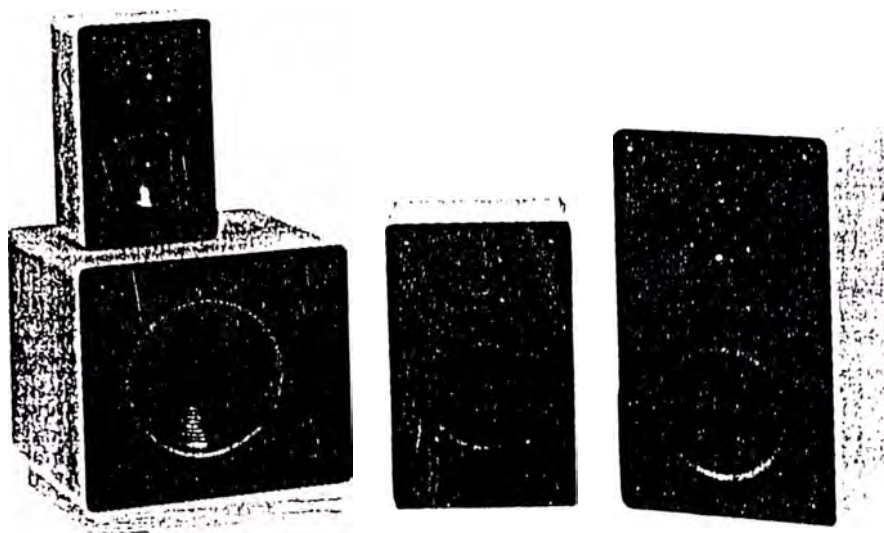
Gooseneck Mounted Microphones

Type	Model	Diameter	Length	Base Termination	Switch	Pre-Amp	Voltage	Article #	Polar Pattern*	Price
Dynamic	HM 180	3/8"	12"	3/8" thread	No	-	-	(418.471)	H	\$349.00
	HM 420	3/8"	12"	3/8" thread	No	-	-	(249.440)	H	339.00
	HM 420	3/8"	12"	Male XLR	No	-	-	(404.926)	H	349.00
	HM 422	3/8"	8"	3/8" thread	No	-	-	(403.466)	S	199.00
	HM 422	3/8"	14"	3/8" thread	No	-	-	(403.466)	S	209.00
	HM 424	3/8"	12"	3/8" thread	No	-	-	(428.108)	H	199.00
	HM 424	3/8"	12"	Male XLR	No	-	-	(433.659)	H	209.00
	HM 424	9/16"	12"	3/8" thread	Yes	-	-	(423.300)	H	219.00
	HM 480	3/8"	20"	3/8" thread	No	-	-	(415.715)	H	499.00
	Condenser	SHM 20	3/8"	6"	3/8" thread	No	Yes	12-48V	(408.875)	H
SHM 20		3/8"	8"	3/8" thread	No	Yes	12-48V	(408.833)	H	409.00
SHM 20		3/8"	8"	3/8" thread	No	No	12-48V	(404.500)	H	179.00
SHM 20		3/8"	12"	3/8" thread	No	Yes	12-48V	(407.720)	H	429.00
SHM 20 solid		3/8"	12"	3/8" thread	No	Yes	12-48V	(407.739)	H	449.00
SHM 20		3/8"	12"	Male XLR	No	Yes	12-48V	(418.782)	H	389.00
SHM 20 white		3/8"	12"	Male XLR	No	Yes	12-48V	(433.284)	H	389.00
SHM 20		3/8"	12"	Male XLR	Yes	Yes	12-48V	(408.162)	H	399.00
SHM 20 white		3/8"	12"	Male XLR	Yes	Yes	12-48V	(433.292)	H	399.00
SHM 20		3/8"	20"	3/8" thread	No	Yes	12-48V	(403.747)	H	479.00
SHM 20 white		3/8"	20"	Male XLR	Yes	Yes	12-48V	(409.170)	H	449.00
SHM 21 LED		3/8"	8"	3/8" thread	No	No	12-48V	(422.606)	H	249.00
SHM 21 LED		3/8"	18"	3/8" thread	No	No	12-48V	(435.171)	H	259.00
SHM 21 LED		3/8"	18"	3/8" thread	No	No	12-48V	(428.558)	H	259.00
STM 20		3/8"	12"	Shockmounted	Yes	Yes	12-48V	(407.755)	H	479.00
STM 20 solid		3/8"	18"	Shockmounted	Yes	Yes	12-48V	(418.579)	H	629.00

* H = Hypercardioid S = Supercardioid

- MTS 320 Tabletop base for gooseneck \$149.00
- MTS 330 Large tabletop base for gooseneck \$169.00

Prices and Specifications Subject to Change Without Notice.



- CD loudspeakers are the result of years of research, development and refining
- The bass drivers employ polypropylene cones for smooth, quick response and large magnets and voice coils for high efficiency and power handling
- Midrange frequencies are reproduced by the woofers in models 6.2 and 8.2 and by a 3" textile dome in model 10.3
- High frequencies are reproduced by a 1" dome for accurate transient response with ferro-fluid for high power capability
- Crossover networks are optimized for each driver using superior components
- Bass reflex alignment is computer designed according to Thiele – small parameters to ensure proper loading of the drivers
- The subwoofer is designed to extend the low frequency response of models 6.2 or 8.2
- All models are available in clear or black oak veneer

6.2 CD Studio Monitor

The 6.2 CD features a 6.5" magnesium cast frame bass driver with a mineral filled poly cone and a butyl rubber surround. The high frequency driver is a 1" polymer dome with ferro-fluid. The dividing network utilizes high grade components with a crossover frequency of 2800Hz. The cabinets are available in clear or black oak veneer. Careful match of drivers, crossover and enclosure tuning result in a compact, high quality monitor speaker. Power: 100W; Frequency Range: 50Hz-24,000Hz; Sensitivity: 90dB SPL 1W/1M; Dimensions: 15"H x 9"W x 8"D

6.2 CD pair \$395.00

8.2 CD Studio Monitor

The 8.2 CD is a larger monitor for use where size is not a concern. The 8" bass driver is constructed with a magnesium cast frame, mineral filled poly cone and a butyl

rubber surround. The high frequency driver is a 1" silk textile dome with ferro-fluid. Optimum port tuning allows rich, deep bass while matched drivers crossed over at 2500Hz result in accurate transient response. Clear or black oak. Dimensions: 19"H x 12"W x 11"D; Power: 100W; Frequency Response: 41Hz-30,000kHz; Sensitivity: 91dB SPL 1W/1M

8.2 CD pair \$495.00

10.3 CD

The 10.3 CD is a 3-way system featuring a 10" bass driver with a magnesium cast frame, mineral filled poly cone and a butyl rubber surround. Midrange frequencies are handled by a 3" textile dome, while the high frequencies are reproduced by a 1" textile dome with ferro-fluid. This system, with a larger cabinet and bass driver, has been designed for greater coverage area. Clear or black oak. Dimensions: 25"H x 14.5"W x 12"D; Power: 125W; Frequency Response: 36Hz-30,000kHz; Sensitivity: 90dB SPL 1W/1M

10.3 CD pair \$695.00

1220 CD Subwoofer

The 1220 CD has been designed to extend the low frequency response of the model 6.2 CD. The 12" poly cone bass driver features a dual voice coil so that the monaural low frequencies from each channel will be reproduced by the single cone. The crossover sends frequencies below 125Hz to the woofer while frequencies above 125Hz are sent to the output terminals. The tuned port system efficiently reproduces low frequencies in a relatively small space. Clear or black oak veneer. Dimensions: 18"H x 18"W x 18"D (including base); Power: 125W; Frequency Response: 38Hz-150Hz; Sensitivity: 91dB 1W/1M

1220 CD single \$495.00

D-75 Single or Dual Channel Power Amplifier

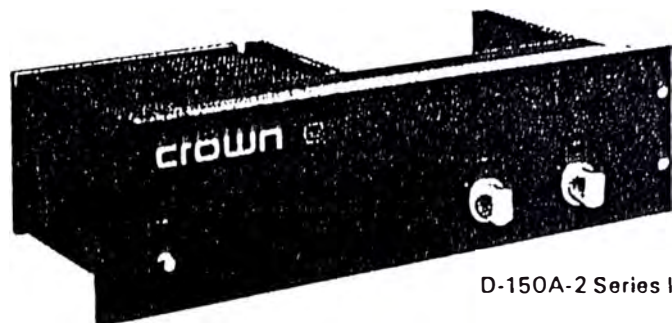
The Crown D-75 power amplifier, requiring only 1 3/4" (4.5cm) of vertical rack space, was designed to operate easily and continuously into a variance of load requirements. D-75 provides 35W per channel minimum continuous average power (both channels operating) into an 8 ohm load over a bandwidth of 20Hz-20kHz at a rated sum total harmonic distortion that is 0.05% of the fundamental output voltage. Frequency response of the unit varies no more than ±1dB from 20Hz-20kHz at 1W into 8 ohms. Features of the D-75 include active balanced inputs, Cannon XLR connectors, easily accessible mono-stereo switch, and front panel LEDs indicating overloads and signal presence. A special feature of the D-75 is the provision for isolating chassis ground from electrical ground. \$549.00



D-75

D-150A-2 Single or Dual Channel Power Amplifier

The Crown D-150A-2 is a single or dual channel power amplifier designed for precision amplification of frequencies from DC Hz to 20kHz. The design of the D-150A-2 provides extremely low harmonic and intermodulation distortion with very low noise. A switch on the rear of the unit allows stereo or mono operation with no internal wiring changes. In the mono mode, the D-150A-2 is capable of a 50V balanced line output. The unit operates on AC current from 120V to 240V. 80W continuous average power per channel into 8 ohms at .05% THD.



D-150A-2 Series II

The D-150A-2 embodies the simplest and yet most accurate distortion display available in any audio product. The IOC (Input-Output Comparator) senses any form of amplifier non-linear behavior and reports its existence through front panel LEDs. Slew-induced distortion, protection circuit activation, and clipping distortion will all be detected by the IOC circuit at levels below the rated distortion of the amplifier. Thus, the amplifier becomes a valuable tool in the hands of the user to facilitate proper amplifier-speaker-environment matching, as well as a continuous monitor of the purity of the signal reproduction through the amplifier under actual operating conditions. \$879.00



DC-300A-2 Series II

DC-300A-2 Single or Dual Channel Power Amplifier

The Crown DC-300A-2 is a single or dual channel power amplifier designed for precision amplification of frequencies from DC to 20kHz, 0Hz-20kHz. The design of the DC-300A-2 provides extremely low harmonic and intermodulation distortion with very low noise. A switch on the rear of the unit allows stereo or mono operation with no internal wiring changes. In the mono mode, the DC-300A-2 is capable of a 70V balanced line output. The unit operates on AC current from 120V to 100V. 155W continuous average power per channel into 8 ohms at .05% THD.

The DC-300A-2 contains output protection circuitry pioneered by Crown. This circuitry protects the unit completely against shorted, mismatched, or open loads and completely eliminates the need for DC fuses and mode switches to protect the amplifier. With this unique protection system, the DC-300A-2 can safely drive any speaker load, resistive or reactive, without any fear of harming the amplifier. The speakers can be paralleled with no deterioration of sound quality since changing one load impedance only affects the maximum power available, not the ability of the amplifier to produce clean sound.

The DC-300A-2 embodies the simplest and yet most accurate distortion display available in any audio product. The IOC senses any form of amplifier non-linear behavior and reports its existence through front panel LEDs. Slew-induced distortion, protection circuit activation, and clipping distortion will all be detected by the IOC circuit at levels below the rated distortion of the amplifier. Thus, the amplifier becomes a valuable tool in the hands of the user to facilitate proper amplifier-speaker-environment matching, as well as a continuous monitor of the purity of the signal reproduction through the amplifier under actual operating conditions.

The DC-300A-2 has two totally separate direct-coupled amplifier circuits employing dual integrated circuit op amp input stages and silicon transistors in succeeding stages. The DC-300A-2 exhibits essentially flat frequency and phase response down to DC and eliminates thumping from non-symmetrical wave forms. Output stages utilize Crown class AB + B circuitry in which the driver transistors carry the quiescent bias current while the output transistors serve only as boosters which sense and deliver large currents. \$1199.00

Prices and Specifications Subject to Change Without Notice.

Control® Series Monitors

Control® Micro™ 40W Single Point Source Monitor

• Frequency Range (-10dB): 100Hz to 20kHz • Power Capacity¹: 40W
 • Sensitivity (1W, 1m)²: 88dB³ • Nominal Impedance: 4 ohms • Crossover Frequency: n/a • Enclosure Material: ABS • Terminations: Spring terminal (adapted to accept dual banana jacks) • Dimensions: 6.25" H x 6" W x 5.5" D • Net Weight (Each): 3.5 lbs.

The Control Micro is ideal for limited space applications and fits nicely over the mixing console meter bridge. Comes standard with a wall mount bracket—no additional hardware or accessories are needed. each/\$90.00

Control SB-Micro™ 100W Sub-Bass System

• Frequency Range (-10dB): 38Hz to 260Hz • Power Capacity¹: 100W
 • Sensitivity (1W, 1m)²: 88dB³ • Nominal Impedance: 4 ohms • Crossover Frequency: 225Hz • Enclosure Material: Wood composite • Terminations: Spring terminal (adapted to accept dual banana jacks) • Dimensions: 7.5" H x 20" W x 11.5" D • Net Weight (Each): 13 lbs.

The perfect partner to the Control Micro, the Control SB-Micro relies on a double chamber bypass design to smoothly extend bass response to below 40Hz while acoustically filtering information above the 225Hz crossover point. each/\$210.00

Control 1™ 150W 2-Way Monitor

• Frequency Range (-10dB): 70Hz to 20kHz • Power Capacity¹: 150W
 • Sensitivity (1W, 1m)²: 90dB³ • Nominal Impedance: 4 ohms • Crossover Frequency: 6kHz • Enclosure Material: Structural foam • Terminations: Spring terminal (adapted to accept dual banana jacks) • Dimensions: 9.25" H x 6.25" W x 5.625" D • Net Weight (Each): 4 lbs.

The Control 1, an ideal reference monitor for checking radio sound suitability, is also at home in restaurants, AV presentation rooms and other locations where the speakers should be visually unobtrusive. each/\$130.00

Control 1 Plus™ 160W 2-Way Monitor

• Frequency Range (-10dB): 60Hz to 20kHz • Power Capacity¹: 160W
 • Sensitivity (1W, 1m)²: 91dB³ • Nominal Impedance: 4 ohms • Crossover Frequency: 6kHz • Enclosure Material: Structural foam • Terminations: Spring terminal (adapted to accept dual banana jacks) • Dimensions: 9.25" H x 6.25" W x 5.625" D • Net Weight (Each): 5.5 lbs.

The Control 1 Plus uses the same enclosure as the Control 1, but provides a step upward in performance, offering greater bandwidth, higher power handling and better sensitivity. each/\$165.00

Control 1AW/70 All-Weather Loudspeaker

• Frequency Range (\pm 3dB): 120Hz to 20kHz • Power Capacity¹: 150W
 • Sensitivity (1W, 1m)²: 87dB SPL • Nominal Impedance: 4 ohms • Crossover Frequency: 6kHz • Enclosure Material: UL⁹⁴ V-0 flame class rated • Dimensions: 9 1/4" H x 6 1/4" W x 5 7/8" D • Net Weight (Each): 5 lbs.

The Control 1AW/70 solves the problem of bringing monitor sound quality outdoors. Features the acclaimed acoustical performance of the Control 1 and the high-quality internal autotransformer simplifies the sound system installer's task of running multiple loudspeakers from a common power amplifier. each/\$210.00

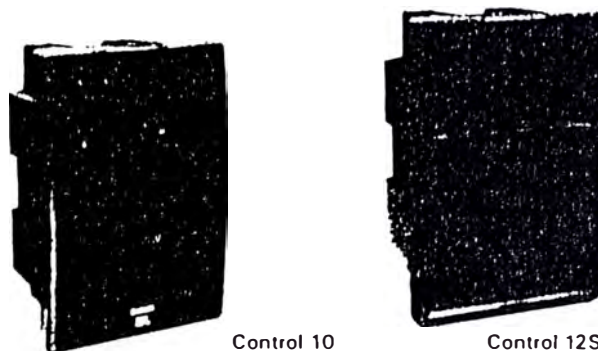
Control 5™ 175W 2-Way Monitor

• Frequency Range (-10dB): 50Hz to 20kHz • Power Capacity¹: 175W
 • Sensitivity (1W, 1m)²: 92dB³ • Nominal Impedance: 4 ohms • Crossover Frequency: 3kHz • Enclosure Material: Structural foam • Terminations: Spring terminal (adapted to accept dual banana jacks) • Dimensions: 15.25" H x 9.875" W x 9" D • Net Weight (Each): 10 lbs.

The Control 5 is a step up from the Control 1 Plus. It provides sound reproduction in fixed installations such as restaurants, AV presentation rooms, boardrooms and other locations that require inconspicuous systems. Its range and power handling also make it suitable for use as a surround system in theaters. each/\$225.00



Control 1



Control 10

Control 12SR

Control 8SR™ /70 175W Loudspeaker

• Frequency Range (-10dB): 70Hz to 16kHz • Power Capacity¹: 175W
 • Sensitivity (1W, 1m)²: 92dB SPL • Nominal Impedance: 4 ohms • Crossover Frequency: 3kHz • Enclosure Material: Polypropylene structural foam • Dimensions: 15 1/4" H x 9 7/8" W x 9" D

The Control 8SR is a high performance, compact and versatile sound loudspeaker designed for a wide variety of applications. The UV stable polypropylene enclosure and weatherized transducers make it possible for both outdoor and indoor use. Its cosmetic shape and design make it easy to fit the Control 8SR into virtually any environment. The control 8SR is available with optional Multi-tap 70.7V line distribution autotransformer for internal mounting. each/\$295.00
 Control 8SR/70 Multi-tap 70.7 line distribution autotransformer. 360.00

Control 10™ 150W 3-Way Monitor

• Frequency Range (-10dB): 35Hz to 27kHz • Power Capacity¹: 150W
 • Sensitivity (1W, 1m)²: 94dB³ • Nominal Impedance: 8 ohms • Crossover Frequency: 1.1kHz, 4.6kHz • Enclosure Material: Polystyrene • Terminations: Spring terminal (adapted to accept dual banana jacks) • Dimensions: 24" H x 17" W x 12" D • Net Weight (Each): 32 lbs.

The Control 10 is the ultimate in a versatile, go-anywhere control monitor. It offers increased range and greater sensitivity. Its 3-way design delivers full sound with exceptionally wide dynamics. each/\$635.00

Control 12SR™ 200W 2-Way Monitor

• Frequency Range (-10dB): 45Hz to 17kHz • Power Capacity¹: 200W
 • Sensitivity (1W, 1m)²: 97dB³ • Nominal Impedance: 8 ohms • Crossover Frequency: 2kHz • Enclosure Material: Polystyrene • Terminations: Spring terminal (adapted to accept dual banana jacks), XLR plus 1/4" phone jack • Dimensions: 24" H x 17" W x 12" D • Net Weight (Each): 44 lbs.

All the advantages of the Control Series are exemplified in the Control 12SR. A specially designed second-order crossover network, with a transition frequency of 2kHz, is responsible for blending the low and high frequency components. each/\$885.00

¹ Rating based on test signal of IEC filtered random noise with a peak-to-average ratio of 0dB, 2 hours duration
² Sensitivity is based on an input of 2.83V at 8 ohms or 2.0V at 4 ohms
³ Averaged from 500Hz to 2.5kHz
⁴ Averaged from 50Hz to 150Hz



TX-501/502 'CNS' Pocket Transmitters

Full broadcast quality • >115dB S/N ratio • Wide dynamic range • Choice of microphones • Sophisticated automatic level control

Utilizing 'CNS' noise reduction, the Micron range of transmitters exceeds a broadcaster's demand for full audio bandwidth at minimal distortion levels.

Rigorous testing at every stage of production ensures a high level of performance and long term reliability. Housed in lightweight stainless steel cases for durability and strength, the transmitters are capable of withstanding the heavy demands of location use.

The modulation level can be quickly and accurately optimized from the top panel of the transmitter using the set level control, peak reading LED indicators and line up tone oscillator.

- TX-501 Pocket transmitter-single battery. Supplied with antenna, microphone connector and leather pouch. VHF 30-300MHz \$ 1900.00
- TX-501U Same as above but UHF 300-600MHz 2350.00

TX-503 'CNS' Hand Held Transmitter

>115dB S/N ratio • Omni directional or cardioid • Interchangeable heads • Built in anti-popping filters • Strong lightweight stainless steel body • Dual low battery warning • Line up oscillator

The TX-503 hand held transmitter uses a unique interchangeable head assembly allowing its use as an omni-directional or cardioid pattern condenser microphone. The microphone heads use high quality AKG electret microphone elements with an integral two layer windscreen.

The power switch features an audio mute position allowing the transmitter to be powered without transmitting audio. A three position audio sensitivity switch maximizes the signal-to-noise ratio for various applications. Particular attention has been paid to the successful handling of high sound pressure levels.

An electronic anti-popping filter affords protection against overload, even at high SPL. Further front end protection is provided by a 3-position bass roll off filter which can be used to reduce wind noise or counteract close microphone effects.

- TX-503 Hand Held Transmitter, Omni directional or cardioid (please specify). VHF 30-300MHz \$ 1990.00
- TX-503U Same as above but UHF 300-600MHz 2300.00

MR-510 'CNS' Mobile Receiver

Small high quality receiver • >115dB S/N ratio • Wide dynamic range • Multifunction LED display • Compatible with all sound, film and video recorders

The MR-510 receiver is housed in a rugged diecast case and is specifically designed to withstand the rigors of location work.

A recessed multi-function LED display features an indicating system which provides reliability and accuracy unattainable with a meter. Signal strength, tuning and battery monitoring of both transmitter and receiver are available at the flip of a switch.

The balanced audio output is transformer isolated at low impedance microphone level. The front panel jack socket provides headphone monitoring and can also be used as a high level auxiliary output.

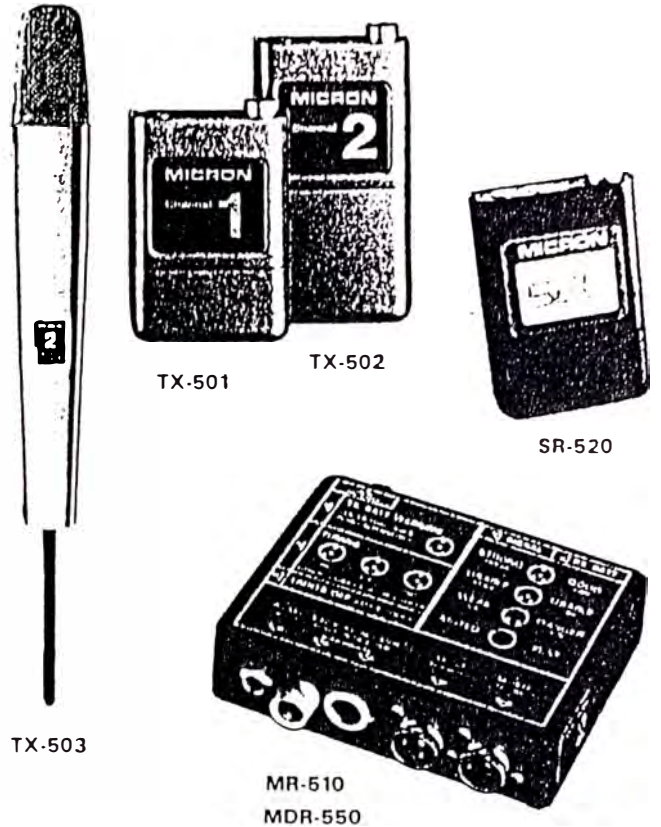
External powering can be from any 12-30VDC supply with either +ve or -ve ground.

- MR-510 'CNS' mobile receiver. Supplied with antenna, audio cable, power connector and case. VHF 30-300MHz \$ 1850.00

MDR-550 'CNS' Mobile Diversity Receiver

Small, high quality, true diversity receiver • Virtually no dropouts • Rugged & reliable • >115dB S/N ratio-Wide dynamic range • Low distortion - Wide, flat frequency response • Active Interference suppression • Multifunction LED display

The MDR-550 is a high quality, compact, true diversity mobile receiver small enough to mount on a camera, recorder, or in your pocket.



With Micron's proven 'CNS' noise suppression system, sound quality is excellent. Active interference suppression circuitry provides trouble free operation even in hostile RF environments.

A recessed multi-function two color LED display provides both transmitter and receiver monitoring of all major functions.

- MDR-550 Mobile diversity receiver. Supplied with 2 antennas, audio cable and case. VHF 30-300MHz . . . \$ 2850.00
- MDR-550U Same as above but UHF 300-600MHz 3150.00

SR-520 Miniature Receiver

120dB S/N ratio • Small, lightweight housing • Internal or external powering • Mic and variable high level outputs • Easily attaches to any camera

The Micron SR-520 receiver is specifically designed for use with all types of camera/recorder combinations.

Housed in a strong lightweight aluminum housing, the SR-520 can be easily attached to the side of cameras and recorders. Size: 3.7"x2.5"x.08". Weight: 4.4 oz.

Using the standard Micron 8 pin connector gives the user a variety of connection options. Both mic level and variable high level outputs are available simultaneously. Powering can be either from an internal 9v battery or externally from the camera supply.

A three color LED display gives easy to read information on received signal strength, tuning, transmitter battery condition & receiver battery condition.

- SR-520 Miniature mobile receiver. Supplied with antenna, connector & pouch. VHF 30-300MHz \$ 2250.00
- SR-520U Same as above but UHF 300-600MHz 2500.00

Micron Audio also manufactures a complete line of modular, multi-channel diversity receiver systems, antenna distribution systems and accessories.



**DIGITAL RECORDING SERIES RF
CONDENSER MICROPHONES**
MKH 20 P48U3 Omnidirectional Microphone

• Low distortion • Transformerless • Flat frequency response • High frequency switch (6dB boost at 10kHz) • Switchable 10dB pad to prevent overmodulation • Handles 142dB/SPL • High output level • Ideal for concert, midside (M-S) acoustic strings, brass and wind instrument recording • 20-20,000Hz frequency response • 48V phantom powering • Matte black finish • 22 oz. shipping weight • Supplied accessories: MZQ40 stand adaptor; MZW41 windscreen \$1250.00



MKH 20



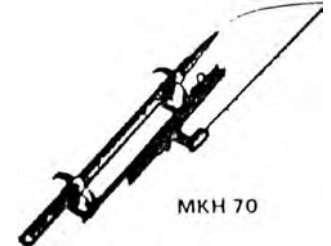
MKH 40

MKH 30 P48U3 Bi-Directional (Figure Eight) Microphone

• Symmetrical bi-directional characteristic • Low distortion • Transformerless • Flat frequency response • Switchable bass attenuation (4dB at 100Hz) • Switchable 10dB pad, handles 142dB/SPL • High output level • Primarily used for live strings, up-close dialogue, mid-side (M-S) and Blumlien stereo (X-Y) recording • 40-20,000Hz frequency response • 48V phantom powering • Matte black finish • 24 oz. shipping weight • Supplied accessories: MZQ40 stand adaptor, MZW41 windscreen. \$1350.00



MKH 60



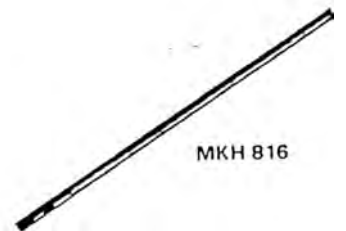
MKH 70

MKH 40 P48U3 Cardioid Microphone

• Low distortion • Transformerless • High output level • Transparent response • Switchable bass attenuation (4dB at 50Hz) • Pre-attenuation of 10dB to prevent overmodulation • Recommended for digital sampling, over dubbing vocals, percussive sound, acoustic guitars, piano, brass and string instruments • 40-20,000Hz frequency response • 48V phantom powering • Matte black finish • 22 oz. shipping weight • Supplied accessories: MZQ40 stand adaptor, MZW41 windscreen. \$1250.00



MKH 416



MKH 816

MKH 50 P48U3 Supercardioid Microphone

• Narrower pickup pattern than cardioid • Low distortion • Transformerless • High output level • Switchable bass attenuation (4dB at 50Hz) and 10dB pad • Off-axis attenuation for better isolation makes it ideal for multi-track recording, live performances, stage overheads and chrestra pickup • 40-20,000Hz frequency response • 48V phantom powering • Matte black finish • 23 oz. shipping weight • Supplied accessories: MZQ40 stand adaptor, MZW41 windscreen \$1250.00

MKH 60 P48U3 Supercardioid/Lobe
(Short Shotgun) Microphone

• Short interference tube RF condenser • Lightweight metal alloy • Transformerless • Symmetrical capsule design • Smooth off-axis frequency response • Switchable low cut filter (5dB at 100Hz) • High frequency boost (5dB at 10kHz) and 10dB attenuation • Handles extremely high SPL (135dB) • Ideal for broadcasting, film, video, sports recording, interviewing in noisy environments and excellent for studio voiceovers • 50-20,000Hz frequency response • 48V phantom powering • Matte black finish • 23 oz. shipping weight. \$1395.00

MKH 70 P48U3 Supercardioid/Lobe
(Shotgun) Microphone

• Low distortion • Transformerless • Low noise • Switchable presence (+5dB at 10kHz) • Low cut filter (-5dB at 50Hz) • 10dB pre-attenuation • Handles 132dB/SPL with high sensitivity and output level • Ideal for video/film studios, theatre, sporting events and nature recordings • 50-20,000Hz frequency response • 48V phantom powering • Matte black finish • 28 oz. shipping weight. \$1695.00

MKH 80 P48U3 Multi-Pattern Condenser Microphone

• Highly immune to humidity • Exceptionally low inherent noise • Symmetrical push-pull capsule design incorporates optimum resistive loading, virtually eliminating intermodulation distortion • Dual membrane converter reproduces bass previously heard only in large diaphragm microphones • 5 switchable polar patterns (omnidirectional, wide cardioid, cardioid, supercardioid and figure-eight) • Attenuation, treble boost, bass cut switches and an integrated LED which indicates the optimum direction of reception to facilitate exact orientation of the microphone. \$2950.00

**INDUSTRY STANDARD RF
CONDENSER MICROPHONES**
MKH 416 P48U3 Supercardioid/Lobe
(Short Shotgun) Microphone

• Transformerless, RF condenser designed as a combination of pressure gradient and interference tube microphones • Very good feedback rejection, low proximity effect, 128dB/SPL • Rugged and resistant to climate conditions • Ideal for boom, fishpole and camera mountings • A long distance microphone for recording and video/film studios • Podium or lecture microphone • Excellent for interviewing by reporters • 40-20,000Hz frequency response • 48V phantom powering • Matte black finish • 18 oz. shipping weight \$1250.00
MKH 416 TU3 Same as MKH 416 P48U3, but designed to use audio wire (A-B) powering and handles 124dB/SPL; 12V A-B powering 1250.00

MKH 816 P48U3 Ultra-Directional/Lobe
(Shotgun) Microphone

• Narrow-beam pattern, transformerless RF condenser microphone • Handles 124dB/SPL and has high output voltage • Perfect for crowded news conferences, movie sets, TV stages, sporting events and nature recordings • 40-20,000Hz frequency response • 48V phantom powering • Matte black finish • 46 oz. shipping weight
MKH 816 P48U3. \$1450.00
MKH 816 TU3 Same as MKH 816 P48U3, but designed to use audio wire (A-B) powering and handles 118dB/SPL; 12V A-B powering 1450.00

Prices and Specifications Subject to Change Without Notice.

125

* PHONE (305) 599-2112 *



* FAX (305) 599-1133 *

K Modular Electret Microphone System

The rugged system has separate capsules and powering modules that can be combined to produce a wide variety of microphones. A single module plus a few capsules can provide the user with a flexibility that would otherwise require investing in a number of individual microphones. It converts quickly from one type of microphone to another by simply threading together various system components. All capsules use back-electret technology for uncompromised quality. Output of all powering modules is balanced, low impedance (200 ohms) and terminates in standard 3-pin XLR connector.

K6 Powering Module

• Universal powering module for the system • Powered by a single 1.5V AA battery with a life of 150 hours, or phantom power (12-48V) • On/off switch with LED indicator, bass rolloff switch (flat, -11dB) • Use with M52, ME64, ME65, ME66, ME67, MKE2-60, MKE40-60, MKE102-60 • Black finish • Length 6 1/4"

K6 \$255.00

K6P Powering Module

• Same as K6 powering module except phantom power only with no on/off switch or battery compartment

K6P \$255.00

MICROPHONE CAPSULES
M52 Omnidirectional

• Very broad and smooth frequency response without proximity effect • Good for interviews or discussions • Low handling noise • Integrated windscreen reduces pop and wind noise dramatically • Use with K6 or K6P • Frequency range: 20-20kHz \pm 2.5dB • Black finish • Length ME62 3 5/8", ME62/K6 7 3/8"

M52 \$159.00

M52/K6 414.00

ME64 Cardioid

• Tight directional pattern insures isolation from surrounding noise and provides high gain before feedback • Use with K6 or K6P • Frequency range: 50-20kHz \pm 3dB • Black finish • Length ME64 4 1/4", ME64/K6 7 1/4"

ME64 \$190.00

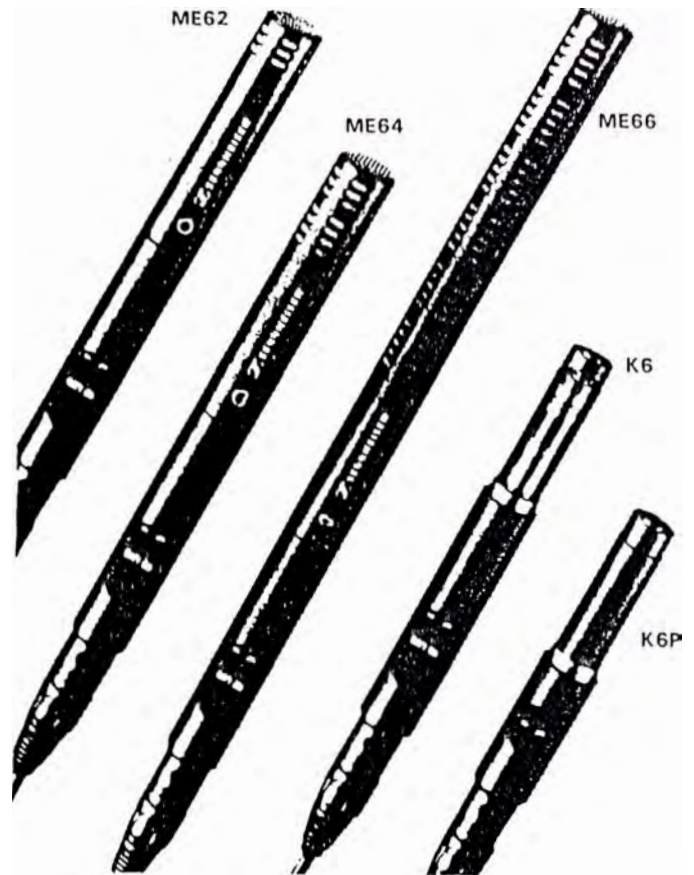
ME64/K6 445.00

ME66 Short Shotgun

• Combination of supercardioid at low frequencies and shotgun above 2000Hz • Excellent mic for on-camera or review for ENG/EFP use • Will increase gain before feedback by using as a podium mic in sound reinforcement • Use with K6 or K6P • Frequency range: 50-20kHz \pm 2.5dB • Black finish • Length ME66 8 3/4", ME66/K6 12 3/8"

ME66 \$269.00

ME66/K6 524.00


MKE2-60 Omnidirectional Lavalier

• Open natural sound plus extremely small size (less than 1/4" dia., approximately 7/16" long) • May also be used as a clip-on instrument mic • Very popular with broadcasters • Stranded steel cable • Frequency range: 20-20kHz \pm 3dB • Matte black

MKE2-60 \$285.00

MKE102-60 Omnidirectional Lavalier

• Natural sound with high intelligibility and transparency • Low noise and high SPL • Exchangeable capsule allows different cables to be used with straight or right-angle connectors • Stranded steel cable • Frequency range: 40-20kHz \pm 3dB

MKE102-60 \$275.00

MKE40-60 Cardioid Lavalier

• For applications where isolation from ambient noise is needed and/or increased gain before feedback • Well-suited as instrument clip-on microphone, where advantages of isolation and proximity effect are desired • Swivel mount for easy positioning • Stranded steel cable • Frequency range: 40-20kHz • Matte black finish

MKE40-60 \$330.00

Prices and Specifications Subject to Change Without Notice.

MD 409-U-3 Cardioid Microphone

• Especially well suited for close proximity miking of high sound pressure levels • An excellent drummer's microphone • Maintains acoustic separation of individual sound sources due to its cardioid pattern • Large transducer membrane ensures accurate transmission of powerful sound sources without distortion or coloration • 50-15,000Hz frequency range • Matte black body and gold plated basket \$295.00

MD 421-U Cardioid Microphone

• Handles high sound pressure levels and durable • Favorite of musicians, broadcasters, recording studios and sound contractors • 5-position bass rolloff switch provides equalization control up to 1000Hz • Humbucking coil reduces interference from equipment and power cables • 30-17,000Hz frequency range • Matte black finish . . \$469.00

MD 431-U Supercardioid Microphone

• High gain before feedback • Handles high sound pressure levels • Produces a clean, open sound • Triple layer steel-mesh grille • Shock-suspended capsule • Specially contoured low frequency response • Humbucking coil • Noiseless magnetic reed on/off switch with removable actuator • 40-16,000Hz frequency range \$479.00

MD 422 Cardioid Microphone

• Rugged dynamic microphone, all-metal construction with hardened steel basket • Designed with a spring suspension for the capsule to eliminate handling noise and aid in shock absorption • 5-position bass rolloff switch to reduce proximity effect • Ideally suited for broadcasters, DJ voice-overs, studio recording and touring companies • 30-17,000Hz frequency range \$579.00

MD 441-U Supercardioid Microphone

• Separate 5-position low frequency and 2-position high frequency equalization switches • Critically damped internal shock suspension • Humbucking coil • Uses include: broadcast announce, sound reinforcement, instrumental and vocal applications • 30-20,000Hz frequency range • Matte black finish • 34 oz. shipping weight \$695.00

PRO FORCE SERIES MICROPHONES

MD 511/MD 512 Cardioid Microphones

• Dent and shatterproof glass composite construction • NdFeB magnets and featherweight membranes • Especially well-suited to miking choirs, spread-out sound sources or vocalists that do not like to stay right on top of a microphone • An "active mass" virtually eliminates handling noise and also moves the microphone's center of gravity away from its axis

MD 511 Without on/off switch \$179.00

MD 512 With on/off switch \$199.00

MD 515/MD 516 Supercardioid Microphones

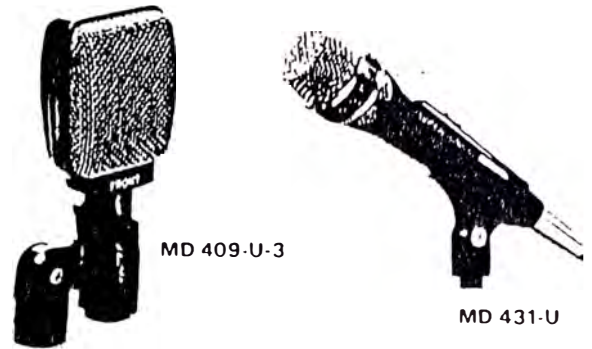
• Dent and shatterproof glass composite construction • NdFeB magnets and featherweight membranes • Hexagonal grilles for acoustic transparency • Precise supercardioid pattern for outstanding gain before feedback and the ability to handle high sound pressure levels • Recommended for musicians who move around the stage a great deal

MD 515 Without on/off switch \$229.00

MD 516 With on/off switch \$259.00

MD 518 Cardioid Microphone

• Dynamic handheld suitable for a broad range of applications including vocals, rack toms and saxophone miking • All-metal basket and lightweight nickel body ensure mechanical durability • Smooth cardioid pickup and frequency response characteristics make this roadable microphone an excellent choice for artists wanting more performance from their microphone • 50-16,000Hz frequency range • Matte black finish \$269.00



MD 409-U-3

MD 431-U



MD 422



MD 441-U



MD 518



BF 1051

BF 1051 VHF Handheld Wireless Microphone System

• Designed specifically for the working musician • Each transmitter/receiver system has 2 switchable frequencies, ensuring interference-free operation • HiDynPlus noise reduction system results in extremely low noise • Antenna integrated into the BF 1051's internal electronics • Voltage stabilizer guarantees that the transmitter's performance remains constant throughout the life of the battery • Receiver employs the true diversity technique, where a logic switch continually monitors the field strength captured by 2 independent receiver sections, choosing the one with the strongest signal • Comes complete with antennas, squelch control, channel selection and LED status and level indicators \$1749.00

L SERIES WIRELESS MICROPHONE SYSTEMS

L Single Antenna Receiver

metal construction • Completely RF shielded design keeps noise to minimum • Sensitive, interference-free operation • Double-tuned RF stages with high-gain, MOSFETS for reducing noise • Removable, flexible, insulated, 1-piece 1/4-wave antenna • Mount the antenna normally, with the WA440 rackmount kit or upgrade to the optional 1/2-wave high-gain antenna • Rackmountable

L MARCAD® Diversity Receiver

intelligent" circuitry monitors both RF signals • Increase in RF gain, improved reception and exceptional freedom from dropouts • MARCAD circuitry blends both signals for the best RF S/N performance • Rackmountable • 2 detachable 1/4-wave whip antennas • Status indicators. Green "power on" LED. 2 yellow "RF" LEDs indicate signal presence and blending of 2 signals by MARCAD circuitry. "Normal" and "peak" LED indicators show audio level • 2 volume-controlled outputs: 1/4" phone and 3-pin XLR

L Transmitter

The L2 is a handheld microphone with a built-in transmitter. It features superb frequency response, extended dynamic range, an LED battery status indicator, rugged case and heavy-duty grille with built-in pre-filter • The L Series Transmitter is available in 2 versions; the popular L2/58 and L2/87, based on the SM87 concert-quality condenser lavalier mic • Durable construction • Interchangeable heads. You can use either the SM87 or SM58 head with the same L2 transmitter. Gold-plated wiper contacts • Internal loop antenna, reliable, efficient, individually tuned • Not affected by hand position • 14-20 continuous hours of performance from a standard 9V alkaline battery • Full 50mW output assures long-range operation and stable performance • Doubled RF output stages, "Mirror Image" companding and a low-distortion modulated oscillator • This continuous-on LED saves battery life by reminding the user to power down for storage • Concealed lio gain switch. Provides 15dB adjustment

L1 Body-Pack Transmitter

Extended battery life (14 to 20 hours) and surface-mount construction • "Mirror Image" companding circuitry • Universal input connector • Removable belt clip • Permanently attached battery door • LED status indicator. Low-current green LED provides continuous indication of power-on status and battery condition • Noiseless microphone muting switch. Allows user to leave transmitter power on to prevent unwanted signal pickup by the receiver, while muting the source • Wide range gain adjustment. 40dB gain adjustment range allows the L11 to handle anything from a low-output, low-impedance microphone to a high-level, high-impedance guitar pickup • 50mW RF output provides the strongest signal permitted by the FCC, radiated by the L11's efficient 1/4-wave antenna

L SERIES COMPLETE DIVERSITY SYSTEMS

Body Pack Systems

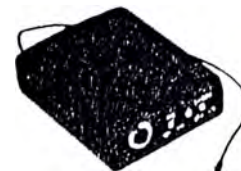
	Consist of: (1) L11 body-pack transmitter, (1) L4 MARCAD diversity receiver, (1) condenser microphone
1114	Less microphone; includes WA300 instrument cable \$535.00
1114/83	Includes WL83A professional omnidirectional lavalier microphone 605.00
1114/84	Includes WL84A professional unidirectional lavalier microphone 645.00
1114/93	Includes WL93 micro-lavalier omnidirectional microphone 605.00
1114/16	Includes WCM16 headworn microphone 770.00
1114/98	Includes WM98 miniature instrument microphone 730.00



L4



L3



L11

Handheld Systems

LS24/58	Consists of: (1) L2/58 handheld transmitter with SM58 microphone, (1) L4 MARCAD diversity receiver, (1) swivel adaptor \$690.00
LS24/87	Consists of: (1) L2/87 handheld transmitter with SM87 microphone, (1) L4 MARCAD diversity receiver, (1) swivel adaptor 750.00

L SERIES SINGLE ANTENNA SYSTEMS

Body-Pack Systems

	Consist of: (1) L11 body-pack transmitter, (1) L3 single antenna receiver, (1) condenser microphone
LS113/83	Includes WL83A omnidirectional lavalier microphone \$465.00
LS113/84	Includes WL84A professional unidirectional lavalier microphone 505.00
LS113/93	Includes WL93 micro-lavalier omnidirectional microphone 465.00

Handheld Systems

LS23/58	Consists of: (1) L2/58 handheld transmitter with SM58 microphone, (1) L3 single antenna receiver, (1) swivel adaptor \$550.00
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L SERIES COMPONENTS

L11	Body-pack transmitter \$185.00
L2/58	Handheld transmitter with SM58 microphone 355.00
L2/87	Handheld transmitter with SM87 microphone 415.00
L3	Single antenna receiver 195.00
L4	MARCAD diversity receiver 335.00
WCM16	Headworn condenser microphone 250.00
WL83A	Professional omnidirectional lavalier microphone 85.00
WL84A	Professional unidirectional lavalier microphone 125.00
WL93	Professional micro-lavalier omnidirectional microphone (black) 85.00
WL93T	Professional micro-lavalier omnidirectional microphone (tan) 85.00
WM98	Miniature instrument microphone 170.00

D-301 Compact Disc Player

Balanced XLR and unbalanced RCA audio outputs • Hard-wired 10-key remote control • 20-program memory • Single-play function Link function • Center-drawer design • Standard 19" rackmountable • Ideal for use in studio, radio and disco environments . . . \$649.00

D-401MKII Compact Disc Player

Designed for the professional recording production studio or broadcast environment • Rackmountable • Fader start • Auto cue • Pitch control • Single play • Digital out • 20-selection calendar • 4-mode time counter • 4-mode repeat • Index search • Auto space • Both XLR balanced and RCA unbalanced outputs \$999.00

D-601 Compact Disc Player/ RC-601 Multi-Player Control Unit

Auto Cue starts play on the first frame of a program • End Check function allows user-definable monitoring of a program's end and is ideal for planning cross-fades • Integral, frame-accurate jog wheel for fast, repeatable searching • Front-panel variable pitch and 12-position LED readout • Audio output is via both balanced XLR jacks and unbalanced RCA jacks • XLR digital output • With the addition of the RC-601, users will find the 3 locate points especially useful for spotting effects • Numeric keypad allows direct locating to any track, index or time reference location • For on-air broadcast use, all but the basic transport functions can be disabled when desired • The CD-601/RC-601 also features an RS-232 port for external computer control, off-line monitoring, cue return and display of elapsed time, track remain time, still remain time or total disc time

D-601 \$1649.00
RC-601 849.00

D-701 Compact Disc Player/ RC-701 Multi-Player Control Unit

The CD-701 CD Player/RC-701 Control Unit combination features an auto cue function, event play and link play • By doing away with rise time, the RAM buffer enables continuous looping between any 2 points • The CD-701 features a unique clamping system which uses a rigid free disc clamping device to ensure precise disc rotation and faultless tracking • The CD-701 features oversampling digital filters, 16-bit D/A converters and an internally switchable monitor-mode line output • RC-701 Control Unit controls up to 4 CD player units and features ±6% pitch control with frame-accurate search using an easy-to-handle dial or numeric keys

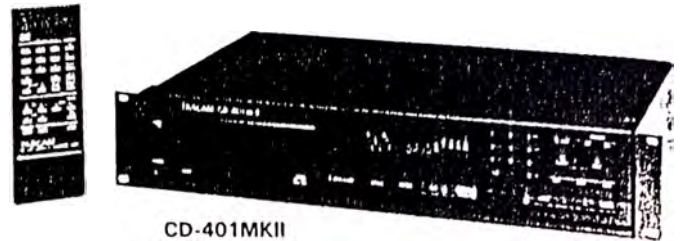
D-701 Compact disc player \$2499.00
RC-701 Multi-player control unit 1349.00
RC-7 Remote control unit 200.00

DA-30 Digital Audio Recorder

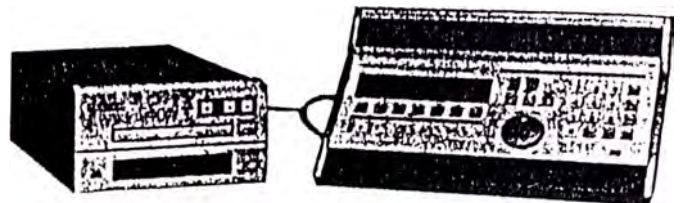
Analogue to digital converters use Delta-Sigma modulation and 64-times oversampling • S/N ratio in excess of 94dB • AES/EBU digital I/O • Full-function programmable remote control • Start ID positioning • Headroom margin display • +4dBm balanced inputs and outputs plus -10dBV unbalanced inputs and outputs • Ability to interact with other professional digital equipment via the AES/EBU interface • 48kHz, 44.1kHz and 32kHz sampling frequencies \$1499.00

DA-60 Digital Audio Recorder

4 heads for off-tape "confidence" monitoring • RAM buffer for instant start • Accurate dial search capability • Auto cue • Auto punch in/out with rehearsal capability • Gapless punch in/out • 12% pitch control on playback • 2 locate points • Absolute time, start end and program numbers which can be recorded independently in the sub-code area • User-selectable copy protection • Cue and review at 1X, 3X or 9X play speed • AES/EBU and SP/DIF digital I/O • Word clock I/O • 37-pin parallel port for external-transport control \$5999.00
SY-D6 Synchronizer board. With the SY-D6 the DA-60 will offer a SMPTE/EBU reader/generator; chase SMPTE time code with offset capability; lock to video sync; and offer a 9-pin serial port for direct editor control \$649.00

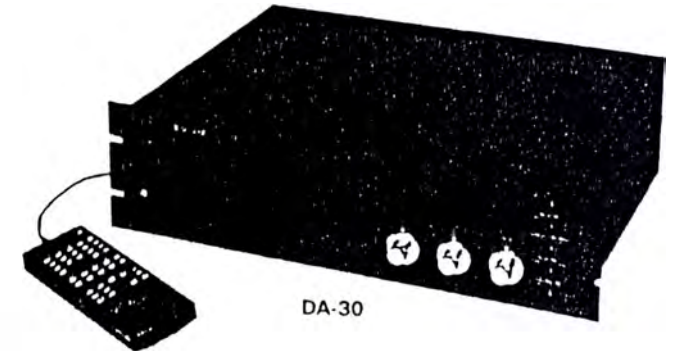


CD-401MKII

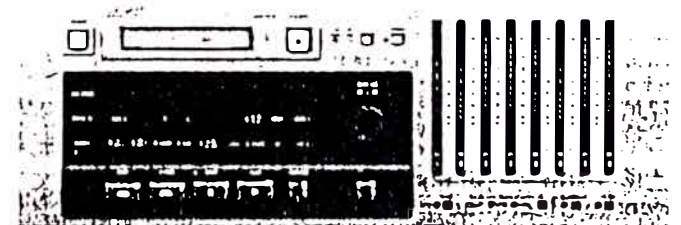


CD-701

RC-701



DA-30



DA-88

DA-88 8-Track Digital Audio Recorder

Utilizes a rugged compact 8mm cassette transport that records on Hi8 tape • Capability of recording up to 100 minutes on a standard 120 tape, allowing the audio for an entire CD project, feature film or video project to fit on 1 tape • Records at both 44.1kHz or 48kHz with a variable pitch of 6% at each sampling rate • Up to 16 DA-88 units may be locked together by connecting a simple 15-pin D-sub connector between each unit, giving you a total of 128 audio tracks • Word sync I/O utilizes 2 BNC connectors and digital I/O uses a 25-pin D-sub connector for easy copying of tracks from 1 machine to another • The digital I/O port supports both external AES/EBU and S/DIF II digital interfaces • 8-digit LED time display shows absolute time in hours, minutes, seconds and frames. The display will also show memo times, pitch change, SMPTE T/C and SMPTE offset

DA-88 \$4499.00
RC-B48 Remote controller for the DA-88, can directly control up to 6 units (48 total tracks) \$1499.00

Main Stations

A Main Station is a combination intercom station and system power supply.

- CS-222 Portable Main Station 2-channel headset station. Remote mic kill. Mic/line program input with IFB/interrupt. Stage announce. A+B "Link" switch. Separate channel Listen level controls and Call buttons. Power supply features special "auto-restore" overload/sort circuit protection. Applications include: theater, concerts, sports (coach-to-spotter), rental firms. Supports up to 30 headset stations or 10 speaker stations. \$695.00
- PS-101 Rackmount kit for CS-222 and PS-22. 2RU (3.5" H) \$55.00
- PS-222 Rackmount Main Station 2-channel speaker and headset station. Remote mic kill. Mic/line program input with IFB/interrupt. Stage announce. A+B "Link" switch. Separate channel Listen level controls and Call buttons. Applications include: fixed installations, theater directors and stage managers, video trucks and facilities, sports arenas. 2RU (3.5" H). Supports up to 30 headset stations or 10 speaker stations \$820.00
- IS-222-GM Same as above w/gooseneck mic \$970.00
- MS-400A Main Station 4-channel rackmount headset/speaker operation, 2A power supply, mic/line program input, SA (stage/studio announce) output, user selectable program interrupt (IFB) and ISO function (3.5" H) \$1228.00
- MS-400A-GM Same as above w/gooseneck mic \$1378.00
- MS-412A Main Station 4-channel, same specs as MS-400A but no speaker (has ext. speaker jack). Has switch matrix to assign each of 12 stations (or 12 groups) to any of the 4 channels or a disconnected off line. Applications include: video production/theatre with constant repatching needs \$1891.00
- MS-412A-GM Same as above w/gooseneck mic \$2041.00

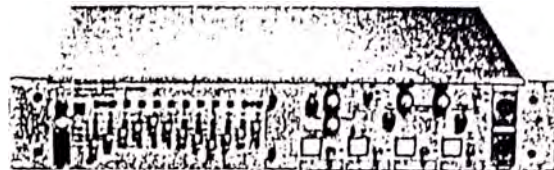
IS-812 Master Station

- LCD display simplifies station programming • Up to 12 party-line intercom channels • Stores 4 complete programming configuration 'setups' • Individual front panel channel 'listen' volume trim controls • 4 programmable 'preset' buttons • Program signal assignable to all channels • Can operate up to 8 external IFB channels • Automatic headset detection • Dual action electronic latching 'light touch' control buttons • Variable button illumination
- IS-812-8 8-channel master station \$3395.00
 - IS-812-12 12-channel master station \$3695.00
 - FB-40 4-channel IFB/ISO option \$495.00
 - FB-80 8-channel IFB/ISO option \$835.00
 - SO-16 16-channel ISO only option \$155.00
 - IO229 4-channel expansion card \$495.00
 - CP-56 Elco connector option \$155.00
 - CP-30 Tuchel connector option \$250.00
 - P-1200 MS-812 interconnect panel. \$1850.00

Rackmount Remote Stations

A remote station does not contain a power supply. It obtains DC power from a system power supply or main station.

- MR-102A Headset Station 2-channel (A or B selectable) headset station mounts in console or standard 2-gang electrical box (headset operation only). \$198.00
- MR-104A Same as above except 4-channel selectable \$284.00
- RM-120A Remote Station Single Space Rackmount Speaker station, two-channels (monitor A, B, or both). Dynamic/carbon headsets; Stage Announce; selectable talk/listen/program functions. Applications include: video/theatre production. \$577.00
- RM-120A-GM Same as above w/gooseneck mic \$727.00
- RM-400A Remote Station 4-channel headset/speaker station, rackmount mic/line level program input, SA (stage/studio announce) output, user selectable program interrupt (IFB) and ISO function (3.5" H) \$995.00



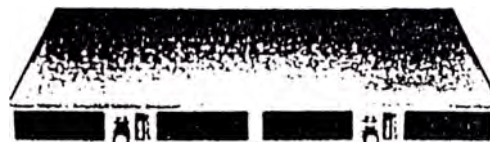
SB-412A



MS-812



RM-120A



1021M

- RM-400A-GM Same as above w/gooseneck mic. \$1145.00
- KB-111A Speaker Station 2-channel select speaker station, uses handset or push-to-talk mic. Mount in 6" x 8" electrical box or portable enclosure. Applications include: theatre/security \$283.00
- KB-112 Speaker Station Speaker station with push-to-talk mic; talk/listen can be controlled remotely. All functions selectable. Applications include: dressing rooms/paging/security. \$299.00

Enclosures for KB-111A and KB-112 Speaker Stations

- P-Box Portable wedge shaped enclosure, metal and wood construction, for KB-111A (single channel only) and KB-112 . . . \$141.00
- M-Box Portable rectangular shaped enclosure, metal construction, for KB-111A (single channel only) and KB-112 \$117.00

1021M Amplified Monitor Speaker

- Magnetically shielded • Bi-amplified • 18W • 2-way speaker system with output levels of 95dB SPL • Only one rack space high
- Full-range, high fidelity sound • Exceptional bass response
- Discrete 2-channel monitoring • Completely self-contained and self-powered • Electronically balanced or unbalanced, line-level XLR inputs • Bar-type LED peak level meters • Stereo/mono switch

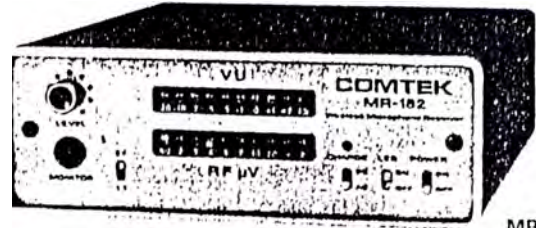
Monitor Applications

- Stereo/2-channel program audio • Video/audio tape machines
- "Off air" receivers • Patch bay signals • Wireless mic receivers
- Cue/on audio console outputs
- 1021M \$625.00

DISTRIBUTOR

BJ

M-182 Wireless Microphone Receiver
Field and studio use • For use with M-182 handheld or M-72 Type C wireless mic transmitters • Comes with FWA-182 antenna and power cord • Includes choice of C-15 carrying case or RMK 182-1 rackmounting kit • Carrier frequency: 169-216MHz • F.C.C. Part 15 • Helical resonator for optimum front-end RF selectivity • Switchable for companded/non-companded transmitters • DC-isolated audio outputs for use with high-impedance mic inputs • Headphone output can serve as high quality audio output • LED peak-level monitoring for audio status • Frequency response: 40Hz-15kHz ± 2dB • 95dB S/N • Operates up to 1800' with M-182 transmitter
M-182 \$760.00
Option 1 Internal NiCad battery pack 70.00



MR-182 -

M-82C Miniature Wireless Microphone Receiver for Video Camera Use

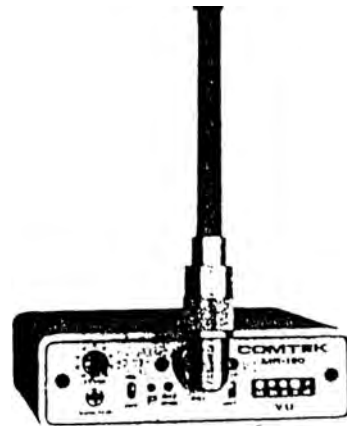
Use with M-182 handheld or M-72 Type C wireless mic transmitters • Includes CC-18 XLRA output cable, FWA-82 loaded whip antenna, NP-1 bracket at camera mounting plate, P-1 belt clip carrying pouch and 9V battery (10 hours of continuous operation) • Carrier frequency: 169-216MHz • F.C.C. Part 15 • 4-pole, active R.F. preselector incorporates dual gate FET semiconductors • 100dB S/N • Operating range up to 300' when used with Comtek lavalier or handheld transmitters • 50-15,000Hz frequency response • Flexible base loaded whip antenna • Audio output is line balanced through a 3.5mm stereo output jack or unbalanced with a 1/4" mono jack (this level will also drive a low impedance headphone for monitoring receiver output)
M-82C \$300.00



MRC-82C

M-180 Miniature Wireless Microphone Receiver With Internal Audio Mixer

Self-powered for field and studio use • Audio mixer function allows up to two M-180s to operate simultaneously with true audiomixer function • For use with M-182 handheld or M-72 Type C wireless mic transmitters • Carrier frequency: 169-216MHz • Up to 1500' operating range • Frequency response: 40Hz-15,000Hz • F.C.C. Part 15 • 95dB S/N • Nylon flex base loaded whip antenna • Includes C-15 carrying case and AA batteries compact enough to be conveniently portable, but has features found in larger, more expensive receivers • Helical resonator • Independent audio output amplifiers for each audio function • Ultra high speed squelch circuit eliminates "off" switching noise • DC-isolated audio output for use with self-powered mic input • Internal battery charger for use with NiCad batteries • 50-hour battery life with 4 AA alkaline batteries
M-180 \$700.00



MR-180 -

PR-72b Miniature personal receiver for assistive listening applications. Operates with earphone or neck-loop transducer (not included). For use with M-72 type L or M-72 type BS transmitter. Option 1 standard. Carrier frequency 60-88MHz, 169-216MHz. Includes P-1 belt-clip carrying pouch and 9V battery \$215.00

Options for PR-72b Personal Receiver

- Option 0 PR-72b receiver without plug-in crystal selector for single channel operation. N/C
- Option 1 Plug-in frequency selector (standard on all models) N/C
- Option 2 Microphone input for auditory/speech training applications. Will self-power electret microphones. Not available with PR-72b options 3, 4 or 5. \$59.00
- Option 3 Switch for 2-channel operation. Not available with PR-72b options 2, 4 or 5. 40.00
- Option 4 Manual on/off power switch. Not available with PR-72b options 2, 3 or 5. 17.50
- Option 5 Extremely rugged volume control. Recommended for general public use. Not available with PR-72b options 2, 3 or 4. 17.50

Crystals

- Receiver plug-in channel selector for PR-72b receiver (standard frequency) \$15.00
- Custom frequency crystal 25.00



PR-72b -

Prices and Specifications Subject to Change Without Notice.

SERIES 800

802 Master Station

A sophisticated microprocessor-assisted Intercommunications control station • Capable of providing 22 independent signal paths operating in up to 6 separate modes • Offers an array of features including intercom, squawk, IFB/SA, station-isolate and signaling • Combination of hardware and software programmability allows the user to conveniently structure an individualized operating format • Features a sensible front panel layout, unique momentary/latching action buttons, individual channel listen level controls, and stereo headset source assignment • Utilizes a powerful Z80 type microprocessor to control the election and operation of multiple functions and capabilities • Refined firmware package offers immense capabilities via the standard PROM • Can operate independently and may be employed as a single unit or used in multiples • Programmable signaling circuitry (call lights) may be incorporated as an option • A memory circuit holds the flashing call signal for a predetermined time or until answered • Each individual channel can operate in either a 2- or 4-wire balanced line mode • Completely self-contained, requiring no external electronics • Adaptability, non-volatile user memory and presets are perfect for industrial applications such as high level security operations, oil production communications, large scale research teams, aerospace command centers and airport control towers • All front panel switches have dual level illumination and large easy-to-read interchangeable legends • The switches also feature a unique momentary/latching action; the microprocessor continually senses the position of each switch and determines whether to make a temporary or permanent latch • Compatible with dynamic and carbon microphone headsets as well as "plantronics" type mini headsets • Front panel mounted gooseneck microphone may be used in conjunction with the loudspeaker for headset-free operation

802 Master station/communications control center \$5395.00
862 System interconnect for 802 I/O to other equipment . . . 1750.00

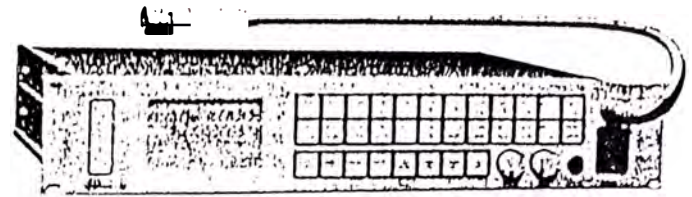
Options

802-A1	Option base	\$ 350.00
802-B3	Talk, channels 7-12	495.00
802-C2	4-wire receive, channels 1-6	315.00
802-C3	4-wire receive, channels 7-12	315.00
802-D2	Call signal, channels 1-6	315.00
802-D3	Call signal, channels 7-12	315.00
802-E1	Chime signal	100.00
802-F1	Squawk/dedicated address, 6 channels	575.00
802-F5	Squawk/dedicated address, additional 4 channels	560.00
802-G1	IFB/4001 emulate	275.00
802-G5	IFB/4002 emulate	275.00
802-H1	ISO/VCP6A emulate	185.00
802-H5	ISO/VCP 12A emulate	185.00
802-J1	E&M signaling	750.00
802-K1	Handset interface	675.00
802-FS	Master station field spare parts kit	1350.00
802-DS	Master station depot spare parts kit	1600.00
EPROMS	Master station updated software	250.00

Notes: Option A1 is required for options D, E, F, G, H; Option E1 requires options D2 or D3; Option F5 requires option F1.

848A Programmable Matrix Intercom Station

• Main component of a "distributed summing bus" matrix intercom system • In a point-to-point system arrangement, each station can talk to any 1 or combination of other stations • A quantity of 2 stations can be used to create a 2x2 minimum size system, while a quantity of 24 stations make up a 24x24 maximum size system • In addition to 24 regular talk buses each station has an All Talk bus for system paging and 2 TW intercom conference-line circuits for direct connection to standard RTS system Intercoms • Programming features include electronic momentary/latching switch action, latch disable, instant mic-on, calling station tallies, received call stacking, auto-stacking answer-back, forced crosspoints, crosspoint inhibit, auto return talk, crosspoint grouping, and busy line lock out • A dedicated-line matrix intercom system can be used wherever point-to-point intercommuni-



802



848A



810

cations are required • The ability to set up and alter (in real time) each station for a group of specific "talk-to" destinations • Each talk path is dedicated to a send/receive bus • Each station is augmented with 2 TV intercom conference line circuits, which allows each station to connect to standard TW intercom system lines

848A	User station/24-channel matrix line	\$2500.00
4025A	1x4 25-pair 50-pin passive switcher	95.00
DC848	Data concentrator	1425.00

Matrix/Conference-Line Intercommunications

810 Master Station

• Compatible with other Series 800 products • All intercom lines are balanced line-level, and operate in a full-duplex mode • Interconnection to TW intercom circuits is also possible through ancillary equipment • A group of 11 pushbuttons serve as the selection switches • A momentary-action All Talk pushbutton enables each station to talk simultaneously • Can be used to create a 10 x 10 point-to-point squawk system • A station can talk to multiple stations simultaneously by depressing any combination of buttons • Depressing the All Talk button will page all stations simultaneously • The 810-AA can be used as a user station within a 10 x 10 matrix intercom system • The 810-CL can be used as a user station within a 10-channel conference line intercom system • Pushbuttons are latching action • The 810-5CTL can be used within a 5-channel conference line intercom system • Pushbuttons are latching action • Each channel has a separate talk and listen pushbutton, allowing any combination of listening and talking to selected channels

810	Master station/10-channel squawk system station	\$1850.00
810-AA	10-channel matrix system station	1925.00
810-CL	10-channel conference line station	1950.00
810-5CTL	5-channel talk/listen conference line station	1950.00
-M	20" gooseneck panel microphone	140.00
865	Central matrix/required for 810 squawk system	1335.00
4012	50-pin x 12 (3-pin XLR-type connectors) system interconnect	590.00
TW5W	1 x 5 2-channel, 3-pin XLR-type passive splitter	106.00
4022	1 x 2 25-pair, 50-pin passive splitter	40.00
4024	50-pin connecting block with hand tool	62.00
4025A	1 x 4 25-pair, 50-pin passive splitter	95.00

Prices and Specifications Subject to Change Without Notice.

Series 4000 IFB System

The program-interrupt system is used primarily for cueing on-air talent. It is based on a modular building-block concept that allows the user to configure a system sized to meet his requirements. Main system components consist of control stations, user stations and central electronics. A system may grow to 4 4003 Control Stations, 3 4010 Central Electronics and 12 or more 4020 User Stations.

Brief operational description of an IFB System: The talent is receiving a program feed through the IFB System components. The director pushes a button on his control station which interrupts the program feed and permits the talent to receive a message from the director's microphone. 2 or more talent positions may be interrupted independently or together.

The Series 4000 IFB System control stations are designed to provide the necessary switching commands and voice signal origination that ultimately becomes the part of the composite IFB signals to the talent user stations. Each station provides a given number of switch functions according to its model number. (All switches are illuminated momentary pushbuttons with 2 brightness levels.) The 4001 has 6 switches: IFB-1 through IFB-4, IFB All and SA (studio announce). The 4002 has 11 switches: IFB-1 through IFB-6, IFB All, SA-1 and SA-2. 4003, with 16 switches, provides IFB-1 through IFB-12, IFB-All, SA-1, SA-2 and SA-3.

Each control station model may be ordered with a high quality gooseneck microphone permanently attached to the top panel. (An "M" suffix is added to the model number; 4001M, 4002M and 4003M.) Should an existing microphone be more suitable for operations, the "M" suffix model need not be ordered. A terminal-strip connection on each control station microphone preamplifier circuit board accepts a microphone- or line-level signal from the existing microphone. Any convenient nearby microphone may be used, i.e., an intercom headset microphone, a paging microphone, audio-slate microphone, etc.

The 4010 central electronics unit contains all the necessary control functions and electronics to provide the active link between 4001, 4002 and 4003 control stations and 4020 user stations. It performs silent electronic switching between program and voice, assigns the program channels to the appropriate outputs, sets the program/voice level mix to the talent, and supplies 2 channels of composite audio, combined with a DC voltage, to the 4020 user stations. In addition, it provides convenient front panel monitoring facilities for set-up and tuning.

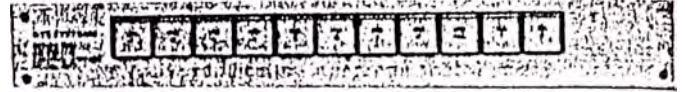
The 4020 user station, a small "belt pack" package, allows the user to receive audio signals as designated by the central electronics unit and control stations. It is the electronics package typically used by on-air personnel, such as newscasters, sportscasters, musicians, etc.

The 4020 contains the necessary electronics to provide a stereo audio signal to the user. 2 power amplifiers rated at 1/2W each are capable of driving almost any set of headphones, earphones, or even small loudspeakers.

01	4 IFB, 1 SA control station	\$ 805.00
02	8 IFB, 2 SA control station	775.00
03	12 IFB, 3 SA control station	998.00
	20" gooseneck panel microphone	140.00
10	Central electronic, 4 IFB, 1 SA.	1920.00
20	Talent electronics/portable user station	258.00
01-RMA	Rackmount adaptor for 4001 or VCP6A	90.00
02-RMA	Rackmount adaptor for 4002	90.00
25A	1 x 4 25-pair 50-pin passive splitter	95.00



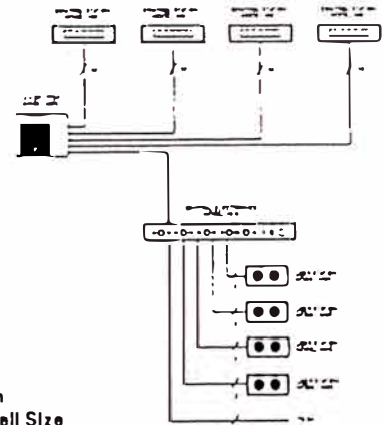
4001



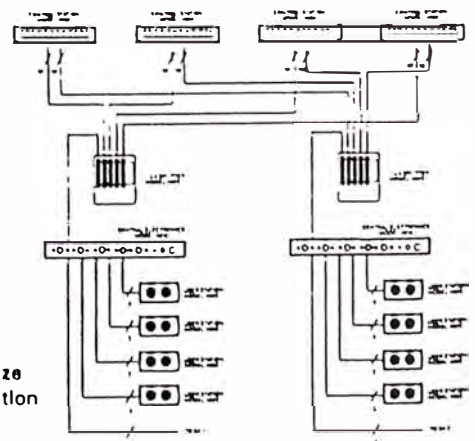
4002



4010



IFB System
Typical Small Size
System Configuration



IFB System
Typical Medium Size
System Configuration

Wireless Sound Enhancement System (72-76MHz) Hearing Assistance (Complies With American Disability Act)

This personal FM sound system is designed especially for use in churches, theaters, auditoriums, amusement parks or any situation—indoors or outdoors—where hearing can be difficult. It actually brings a speaker's voice, music or other program sound directly to the listener's ear, so that distracting noises, reverberation or distance from the sound source do not interfere with a person's ability to hear.

The system consists of a single-channel base station or belt-pack transmitter and any number of tunable, personal receivers, which operate on the FM wideband frequencies between 72 and 76MHz. Up to 8 operating channels are available and the receivers may be easily tuned to any of the channels being used. All components are compatible with all FM wideband auditory assistance equipment.

Complete System

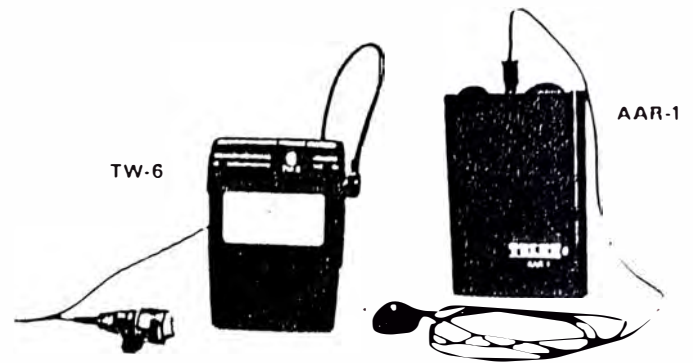
Model	Cat. No.	Description	Price
	70679-XXX*	Single channel high-performance system includes: 1 AAT-2N High performance transmitter 3 AAR-10N Single channel receivers 3 SEB-1 Earbuds with cushion covers 1 WP-1 Wall plaque	\$780.00

Transmitters

AAT-2N	70676-XXX*	Base transmitter with balanced mic/line/70.7V input	\$540.00
WP-1	19758-XXX*	Portable battery transmitter with auxiliary input and TLM-O microphone	415.00

Receivers (earbuds priced separately)

AAR-10N	19791-XXX*	Single channel receiver without earbud	\$75.00
WR-1	19726-000	Multi-channel tunable receiver without earbud	115.00



Earphones (for non-hearing impaired to moderate hearing loss)

SEB-1	59840-005	Single earbud with cord	\$8.50
DEB-2	59840-001	Dual earbud with cord	10.80
CCS-12	59840-006	Cushion covers for SEB-1 and DEB-2 (package of 12)	4.10
HED-1	59840-003	Ultra lightweight headphone	10.00
HED-2	59840-003	Lightweight headphone	12.50
HED-3	63510-021	Full cushion noise reduction headphone	37.95

Microphones for TW-6

NCM-1	70486-000	Noise cancelling boom mic with earhook	\$89.00
NCM-2	64100-000	Noise cancelling boom mic with headband	89.00
TLM-D	17765-003	Directional lapel mic, clip, windscreen	47.00
TLM-O	17765-005	Omni lapel mic, clip, windscreen	47.00
TLM-O12	65702-000	Omni lapel mic with 12' cord	53.00

*The last 3 digits in the transmitter catalog number (XXX) will be determined by the frequency that is selected.

Announcer's Earsets

Lightweight, durable construction • Field replaceable cords and accessories • Snap-fit, positive contacts • Super-flex cables with strain relief • Interchangeable component parts • Telethin miniature magnetic receiver available in 5 different impedances • Small, medium, large earmolds available • Volume control optional with cords • Frequency response 70-20000Hz ±dB useable • Weight 1.7 oz.—complete with cord • Typical applications—TV/broadcast cue monitor, surveillance monitor, private listening

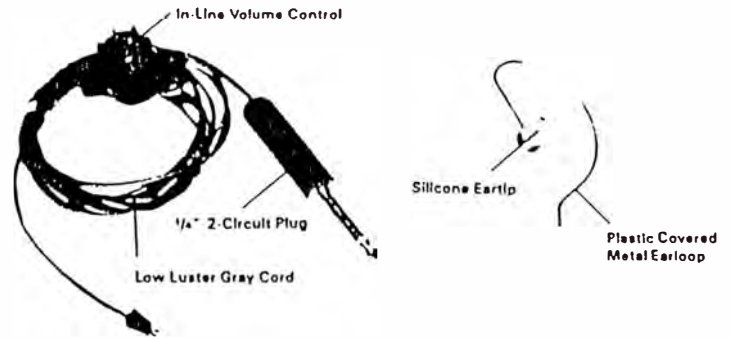
Used by major TV networks and stations, it is specifically designed for conspicuous listening on camera. The extremely efficient miniature driver element requires only nominal operating power and enables the announcer to hear cue or program buses while working with a live microphone.

Telethin Magnetic Receivers

Model	Cat. No.	Description	Price
TR-04	60012-000	15 ohms, earset, Tele-Fi	\$11.00
VR-04	60012-003	125 ohms, earset, Tele-Fi	11.00
WR-04	60012-005	500 ohms, earset, Tele-Fi	11.00
WR-04V	60150-039	500 ohms, earset, Tele-Fi with volume control	33.00
XR-04	60012-007	1000 ohms, earset, Tele-Fi	11.00
YR-04	60012-009	2000 ohms, earset, Tele-Fi, Persona Phone	11.00

Earset/Telethin Accessories

EM-2	18013-000	Tele ear acoustical shell, earset, Persona Phone, Telethin receivers	\$7.75
EF-2	09252-000	Plastic covered metal earloop, earset, Telethin receivers	3.50
EF-3	18304-000	Nylon earloop, earset, Telethin receivers	3.50
FC-1	18068-000	Under chin tube and foam cushion, Tele-Fi	7.75
FS	71116-000	Earphone shell holder, small ear	10.00
FL	71116-001	Earphone shell holder, large ear	10.00
MV-2	18183-000	Monoset stethoscope	47.00
MV-3	18183-003	Monoset stethoscope with 5' cord	47.00
VL-1	35401-014	Earmold, large-right, earset	15.00
VL-2	35401-019	Earmold, large-left, earset	15.00
WM-1	35401-012	Earmold, medium-left, earset	15.00



EMM-2	35401-017	Earmold, medium-right, earset	\$15.00
EMS-1	35401-010	Earmold, small right, earset	15.00
EMS-2	35608-000	Earmold, small left, earset	15.00
ET-1	35608-000	Eartip, earset	4.50

Standard Cords—(Color Gray)

CMT-2	60013-000	Tele-Fi monoset receiver, 5' cord, 1/4" plug	\$14.00
CMT-92	60013-013	Tele-Fi monoset receiver, 5' cord, 90°/140° plug	14.00
CMT-98	60013-015	Tele-Fi monoset receiver, 5' cord, 140° plug	14.00
CCT-2	19652-000	Tele-Fi monoset receiver, 5' coil cord, 1/4" plug	16.00
CMT-95	60013-073	Tele-Fi monoset receiver, 5' cord, .097" plug	16.00
CMM-2	03280-000	Twinsset, 5' cord, 1/4" plug	14.00
CCM-2	19652-001	Twinsset, 6' coil cord, 1/4" plug	19.00
VXT-3	19619-001	Tele-Fi monoset receiver, 500 ohms, with volume control, 5' cord, 1/4" plug	36.00
VYT-3	19616-000	Tele-Fi monoset receiver, 2K ohms, volume control, 5' cord, 1/4" plug	36.00
CCX-2	19652-004	Persona Phone, 5' coil cord, RA mini plug	16.00

Prices and Specifications Subject to Change Without Notice.

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ARRISUN 12

Lamphead
 Weight: 22.5 lbs.; Lampholder: G38 high voltage; Mounting: 1 1/8" stand mount

Electronic Ballast Flicker Free
 Voltage: 90-132/192-264V; Current: 12.5A at 120V; Weight: 28 lbs.

Compact Ballast
 Voltage: 120V, 60Hz; Current: 13.5A at 120V; Weight: 48 lbs.

2 PAR System with magnetic ballast \$4420.00
 2 PAR System with electronic ballast 6350.00
 12300 ArriSun 12 head with 4 lens holders 1965.00

Accessories

112320 ArriSun 12 lens holder, 0.8 lb.; 571210 4-leaf barndoor, 3 lbs.; 105203 25' head/ballast cable, 575W and 1200W, 6.5 lbs.; 505204 50' head/ballast cable, 575W and 1200W, 11.8 lbs.; 512340 1200W HMI PAR lamp, 2.0 lbs.; 512805 1200W compact ballast, 120V, 60Hz, 47 lbs.; 105812 575W/1200W electronic ballast, 120/208/220V, 50/60Hz; 112930 AS12 lamphead case with liftout tray for lens holders; 512915 Compact ballast case, 26 lbs.; 505920 Electronic ballast case, 26 lbs.

ARRISUN 40/25

Lamphead
 Weight: 43 lbs.; Lampholder: G38 high voltage; Lens Diameter: 12"; Mounting: 1 1/8" stand mount

Electronic Ballast Flicker Free
 Voltage: 195-250V; Current: 21A at 220V; Weight: 43 lbs.

Compact Ballast
 Voltage: 120/220V, 60Hz; Current: 38A at 120V; Weight: 138 lbs.

540300 ArriSun 40/25 PAR head \$8000.00

Accessories

540301 Adaptor cable for 2500W lamp; 540325 Lens set (spot, medium, super wide); 540329 Frosted fresnellens; 525203 25' head/ballast cable; 325204 50' head/ballast cable; 532510 4-leaf barndoor; 532515 8-leaf barndoor; 540245 4000W single ended HMI lamp; 525245 2500W single ended HMI lamp; 532550 15.5" full single scrim; 532552 15.1" full double scrim; 525805 2500W compact ballast, 120V, 60Hz; 525807 2500W electronic ballast, 190-250V, 50/60Hz; 540805 4000W compact ballast, 120V, 60Hz; 540807 4000W electronic ballast, 190-250V; 540808 375W-4000W Universal electronic ballast, 190-250V, 50/60Hz; 540390 AS 40/25 lamphead case with liftout lens holder; 540395 AS 40/25 lens case; 540915 Compact ballast case; 525920 Electronic ballast case

ARRISOFT 1000

Weight With Cable: 13 lbs.; Cable: 25'; Aperture: 7.7" x 9.5"; Construction: Steel; Lampholder: Recessed single contact; Mounting: 3/8" stand mount

536100 Arrisoft 1000 \$360.00

Accessories

536116 Egg crate; 636120 Filter frame; 536125 Soft-white reflector; 536126 Hard reflector; 536127 Cool reflector; 536128 Warm reflector; 536129 Gold reflector

ARRISOFT 2000

Weight With Cable: 19 lbs.; Cable: 25'; Aperture: 8.2" x 17.1"; Construction: Steel; Lampholder: Recessed single contact; Mounting: 3/8" stand mount

536200 Arrisoft 2000. \$465.00

Accessories

536215 Egg crate; 536220 Filter frame; 536225 Soft-white reflector; 536226 Hard reflector; 536227 Cool reflector; 536228 Warm reflector; 536229 Gold reflector

MINI-FLOOD

Weight: 5.5 lbs.; Cable: 25' cable with inline switch; Reflector: High purity aluminum; Lampholder: Recessed single contact

572100 1000W with integral barndoor and 25' cord with inline switch \$240.00

MINI-CYC

Weight: 5.5 lbs.; Cable: 30" cable, 25' cable with inline switch, available request; Reflector: High purity aluminum; Lampholder: Recessed single contact

535100 1000W with integral barndoor, pipe clamp and 33" cable \$250.00



536200



571200

ARRILITE 600

Weight With Cable: 3.6 lbs.; Cable: 11.5' cable with inline switch; Reflector: Anodized aluminum; Lampholder: 2-pin prefocus; Mounting: 3/8" stand mount

571600 Arrilite 600, with integral accessory holder and safety mesh \$310.00

Accessories

571610 4-leaf barndoor; 571620 Safety glass; 531350 5" full single scrim; 531351 5" half single scrim; 531352 5" full double scrim; 531353 5" half double scrim; 571654 Dichroic filter; 571660 Handgrip; 571690 4-light case; 571693 3-light case; 570111 ARRI umbrella; 570026 ARRI umbrella holder

ARRILITE 650

Weight With Cable: 5.2 lbs.; Cable: 11.5' cable with inline switch; Reflector: Anodized aluminum; Lampholder: Recessed single contact; Mounting: 3/8" stand mount

571066 ARRILITE 650, with integral accessory holder and safety mesh \$310.00

Note: Arrilite 650 uses same accessories as Arrilite 1000

ARRILITE 1000

Weight With Cable: 5.2 lbs.; Cable: 11.5' cable with inline switch; Reflector: Anodized aluminum; Lampholder: Recessed single contact; Mounting: 3/8" stand mount

571100 ARRILITE 1000, with integral accessory holder and safety mesh \$320.00

Accessories

571110 4-leaf barndoor; 571150 7 1/4" full single scrim; 571151 7 1/4" half single scrim; 571152 7 1/4" full double scrim; 571150 7 1/4" half double scrim; 571154 Dichroic filter; 571193 3-light case; 571195 Heavy-duty case; 570111 ARRI umbrella; 570026 ARRI umbrella holder

ARRILITE 2000

Weight With Cable: 8.1 lbs.; Cable: 11.5' cable with inline switch; Reflector: Anodized aluminum; Lampholder: Recessed single contact; Mounting: 3/8" stand mount

571200 ARRILITE 2000, with integral accessory holder and safety mesh \$440.00

Accessories

571210 4-leaf barndoor; 571250 10" full single scrim; 571251 10" half single scrim; 571252 10" full double scrim; 571250 10" half double scrim; 571254 Dichroic filter; 571290 2-light case; 571295 Heavy-duty case; 570111 ARRI umbrella; 570026 ARRI umbrella holder

1000W Studio Fresnel

Weight With Cable: 15.2 lbs.; Cable: 25' cable with inline switch; Hanging model with 2.5' cable (specify plug required); Lens: 6.9" low expansion borosilicate fresnel; Reflector: spherical specular high purity aluminum; Lampholder: medium bipost; Mounting: combination mount for 5/8" stand or 1 1/8" stand; hanging model includes pipe clamp
 32100 1000W studio fresnel, stand model, 7" lens \$585.00
 32101 1000W studio fresnel, hanging model, 7" lens \$595.00
 32105 1000W studio fresnel, pole operated, 7" lens \$825.00

Accessories

531210 4-leaf barndoor; 531215 8-leaf barndoor; 531220 Filter frame, hinged; 531230 Snoot; 531255 Wire guard; 531250 9" full single scrim; 531251 9" half single scrim; 531252 9" full double scrim; 531253 9" half double scrim; 531510 Operating pole for pole-op fixtures; C02050 Pipe clamp with 1/2" bolt; C01000 Junior pipe clamp; 853276 Safety cable

2000W Studio Fresnel

Weight With Cable: 27 lbs.; Cable: 25' cable with inline switch (specify plug required); Lens: 10" low expansion borosilicate fresnel; Reflector: spherical specular high purity aluminum; Lampholder: Medium bipost; Mounting: 1 1/8" stand mount. Hanging model with pipe clamp and 2.5' cable upon request

32200 2000W studio fresnel, stand model, 10" lens \$ 850.00
 32201 2000W studio fresnel, hanging model, 10" lens \$860.00
 32205 2000W studio fresnel, pole operated, 10" lens \$1150.00

5000W Studio Fresnel

Weight With Cable: 36 lbs.; Cable: 25' cable (specify plug required); Lens: 12" low expansion borosilicate fresnel; Reflector: spherical specular high purity aluminum; Lampholder: Medium bipost; Mounting: 1 1/8" stand mount. Hanging model with pipe clamp and 2.5' cable upon request

532500 5000W studio fresnel, stand model, 12" lens \$1275.00
 532501 5000W studio fresnel, hanging model, 12" lens \$1285.00
 532505 5000W studio fresnel, pole operated, 12" lens \$1475.00

Accessories (2000W/5000W)

532510 4-leaf barndoor; 532515 8-leaf barndoor; 532520 Filter frame, hinged; 532530 Snoot; 532555 Wire guard; 532550 15 1/2" full single scrim; 532551 15 1/2" half single scrim; 532552 15 1/2" full double scrim; 532553 15 1/2" half double scrim; 532560 Outrigger color frame; C02050 Pipe clamp with 1/2" bolt; 853276 Safety cable

300W Fresnel

Weight With Cable: 6.5 lbs.; Cable: 25' cable with inline switch; Lens: 3.2" low expansion borosilicate fresnel lens; Reflector: Spherical specular high purity aluminum; Lampholder: 2-pin prefocus; Mounting: 5/8" stand mount

531300 300W fresnel 3" lens \$375.00

Accessories

531310 4-leaf barndoor; 531320 Filter frame; 531330 Snoot; 531350 5" full single scrim; 531351 5" half single scrim; 531352 5" full double scrim; 531353 5" half double scrim; 571195 Heavy-duty case

650W Fresnel

Weight With Cable: 7.1 lbs.; Cable: 25' with inline switch; Lens: 4.3" low expansion borosilicate fresnel lens; Reflector: Spherical specular high purity aluminum; Lampholder: 2-pin prefocus; Mounting: 5/8" stand mount

531600 650W fresnel, stand model, 4" lens \$395.00

Accessories

531610 4-leaf barndoor; 531620 Filter frame; 531630 Snoot; 531650 6 3/8" full single scrim; 531651 6 3/8" half single scrim; 531652 6 3/8" full double scrim; 531653 6 3/8" half double scrim; 853276 Safety cable; 571195 Heavy-duty case



531205



531505

1000W Fresnel

Weight With Cable: 11.2 lbs.; Cable: 25' cable with inline switch; Lens: 5.1" low expansion borosilicate fresnel lens; Reflector: Spherical specular high purity aluminum; Lampholder: Medium bipost; Mounting: Combination mount for 5/8" stand or 1 1/8" stand. Hanging model with pipe clamp and 2.5' cable upon request

531100 1000W fresnel, stand model, 5" lens \$555.00
 531101 1000W fresnel, hanging model, 5" lens \$565.00

Accessories

531110 4-leaf barndoor; 531115 8-leaf barndoor; 531120 Filter frame, hinged; 531130 Snoot; 531150 7 3/4" full single scrim; 531151 7 3/4" half single scrim; 531152 7 3/4" full double scrim; 531153 7 3/4" half double scrim; 853276 Safety cable

2000W Fresnel

Weight With Cable: 17.5 lbs.; Cable: 25' cable with inline switch; Lens: 6.9" low expansion borosilicate fresnel lens; Reflector: Spherical specular high purity aluminum; Lampholder: Mogul bipost; Mounting: Combination mount for 5/8" stand or 1 1/8" stand. Hanging model with pipe clamp and 2.5' cable upon request

531200 2000W fresnel, stand model, 7" lens \$750.00
 531201 2000W fresnel, hanging model, 7" lens \$760.00
 531205 2000W fresnel, pole operated, 7" lens \$875.00

Accessories

531210 4-leaf barndoor; 531215 8-leaf barndoor; 531220 Filter frame, hinged; 531230 Snoot; 531250 9" full single scrim; 531251 9" half single scrim; 531252 9" full double scrim; 531253 9" half double scrim; 853276 Safety cable

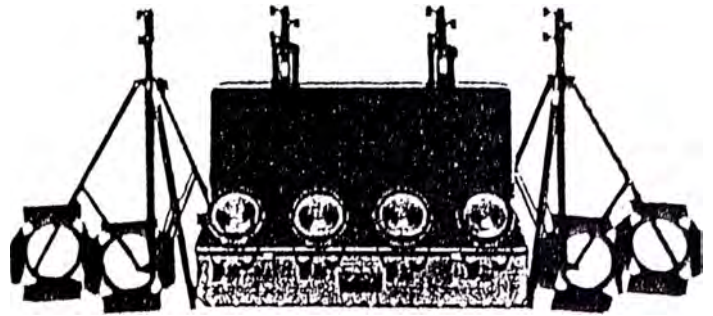
5000W Fresnel

Weight With Cable: 34 lbs.; Cable: 22'; Lens: 10" low expansion borosilicate fresnel lens; Reflector: Spherical specular high purity aluminum; Lampholder: Mogul bipost; Mounting: 1 1/8" stand mount. Hanging model with pipe clamp and 2.5' cable upon request

531500 5000W fresnel, stand model, 10" lens \$1200.00
 531501 5000W fresnel, hanging model, 10" lens \$1210.00
 531505 5000W fresnel, pole operated \$1350.00

Accessories

532210 4-leaf barndoor; 532215 8-leaf barndoor; 532220 Filter frame, hinged; 532260 Outrigger color frame; 532230 Snoot; 532250 13" full single scrim; 532251 13" half single scrim; 532252 13" full double scrim; 532253 13" half double scrim; 531510 Operating pole for pole-op fixtures; 853276 Safety cable



ARRILITE 1000/4 Heavy-Duty Kit—4 ARRILITE 1000s provide maximum output for field production versatility.

1984 Softbank I Kit (75 lbs.)

300 (1) 300W Fresnel; 531800 (2) 850W Fresnel; 571100 (1) Arrilite 0; 531310 (1) Barndoor 300W Fresnel; 531320 (1) Filter frame 300W Fresnel; 531350 (1) 5" scrim full single; 531352 (1) 5" scrim full double; 340 (1) FKW 300W lamp; 531810 (2) Barndoor 850W Fresnel; 531620 Filter frame 850W Fresnel; 531850 (2) 6⁵/₈" scrim full single; 531852 6⁵/₈" scrim full double; 531840 (2) FRK 650W lamp; 571110 (1) Barndoor Arrilite 1000; 571150 (1) 7¹/₄" scrim full single; 571152 (1) 7¹/₄" m full double; 571145 (1) DXW 1000W lamp; 571159 (1) Chimera video small; 571158 (1) Chimera 7¹/₄" speed ring; 570050 (4) AS-2 stand; 1195 (1) Heavy-duty case (40" x 19¹/₂" x 12³/₄".) \$3150.00

1989 Fresnel/ARRILITE Softbank II Kit (76 lbs.)

1600 (3) 650W Fresnel; 571100 (1) ARRILITE 1000; 531810 (3) barndoor 650W Fresnel; 531620 (3) filter frame 650W Fresnel; 531650 (3) 6" full single scrim; 531852 6⁵/₈" full double scrim; 531640 (3) FRK 300W lamp; 571110 (1) barndoor ARRILITE 1000; 571150 (1) 7¹/₄" scrim single; 571152 (1) 7¹/₄" scrim full double; 571145 (1) DXW 1000W lamp; 571158 (1) Chimera 7¹/₄" speed ring; 571159 (1) Chimera video pro all; 570050 (4) AS-2 stands; 571195 (1) heavy-duty case (40" x 19¹/₂" x 12³/₄".) \$3200.00

1974 ARRILITE 2000 Softbank III Kit (62 lbs.)

1200 (2) ARRILITE 2000; 571210 (2) barndoor ARRILITE 2000; 571250 10" full single scrim; 571252 (2) 10" full double scrim; 571240 (2) FEY 300W lamp; 571258 (1) Chimera 10" speed ring; 571259 (1) Chimera artz bank small; 570050 (2) AS-2 stands; 571295 (1) heavy-duty case (31" x 18" x 13¹/₂".) \$2550.00

71905 ARRILITE 600/3 Compact Kit (35 lbs.)

1800 (3) ARRILITE 600; 571610 (3) 4-leaf barndoor; 570052 (3) AS-1 stand; 571640 (3) DYS 600W 3200K 75 hour lamp; 571893 (1) heavy-duty compact case (24" x 12" x 11"). \$1500.00

71910 ARRILITE 600/4 Kit (43 lbs.)

1800 (4) ARRILITE 600; 571610 (4) 4-leaf barndoor; 570051 (4) AS-01 stand; 571640 (4) DYS 600W 3200K 75 hour lamp; 571890 (1) heavy-duty light case (31" x 12" x 11"). \$2000.00

71915 ARRILITE 650/3 Compact Kit (46 lbs.)

1085 (3) ARRILITE 650; 571110 (3) 4-leaf barndoor; 570051 (3) AS-01 stand; 571140 (3) FAD 650W 3200K 100 hour lamp; 571193 (1) light-eight compact case (31" x 16¹/₄" x 8³/₄".) \$1500.00

71931 ARRILITE 650/4 Heavy-Duty Kit (70 lbs.)

71085 (4) ARRILITE 650; 571110 (4) 4-leaf barndoor; 571150 (2) 7¹/₄" full single scrim; 571151 (2) 7¹/₄" half single scrim; 570050 (4) AS-2 stand; 71140 (4) FAD 650W 3200K 100 hour lamp; 571195 (1) heavy-duty case (40" x 19¹/₂" x 12³/₄".) \$2200.00

71925 ARRILITE 1000/3 Compact Kit (46 lbs.)

71100 (3) ARRILITE 1000; 571110 (3) 4-leaf barndoor; 570051 (3) AS-01 stand; 571145 (3) DXW 1000W 3200K 300 hour lamp; 571193 (1) Light-eight compact case (31" x 16¹/₄" x 8³/₄".) \$1575.00

71951 ARRILITE 1000/4 Heavy-Duty Kit (70 lbs.)

71100 (4) ARRILITE 1000; 571110 (4) 4-leaf barndoor; 571150 (2) 7¹/₄" full single scrim; 571151 (2) 7¹/₄" half single scrim; 570050 (4) AS-2 stand; 71145 (4) DXW 1000W 3200K 300 hour lamp; 571195 (1) heavy-duty case (40" x 19¹/₂" x 12³/₄".) \$2350.00

71972 ARRILITE 2000/2 Heavy-Duty Kit (56 lbs.)

71200 (2) ARRILITE 2000; 571210 (2) 4-leaf barndoor; 571250 (1) 10" full single scrim; 571252 (1) 10" full double scrim; 571240 (2) FEY 2000W 3200K 300 hour lamp; 571295 (1) heavy-duty case 2K (40" x 19¹/₂" x 3¹/₂".); 570050 (2) AS-2 stand \$1725.00

71980 650/4 Fresnel Kit (70 lbs.)

531800 (4) 650W Fresnel, 4.3" lens; 531810 (4) 4-leaf barndoor; 531620 (4) filter frame, hinged; 531840 (4) FRK 650W 3200K 150 hour lamp; 531850 (4) 6⁵/₈" full single scrim; 531852 (4) 6⁵/₈" full double scrim; 570050 (4) AS-2 stand; 571195 (1) heavy-duty case (40" x 19¹/₂" x 12³/₄".) \$2875.00

571985 300/650 Fresnel Combo Kit (73 lbs.)

531300 (2) 300W Fresnel, 3" lens; 531800 (2) 650W Fresnel, 4.3" lens; 531310 (2) 4-leaf barndoor; 531320 (2) filter frame, hinged; 531350 (2) 5" full single scrim; 531352 (2) 5" full double scrim; 531340 (2) FKW 300W

3200K 150 hour lamp; 531810 (2) 4-leaf barndoor; 531620 (2) filter frame, hinged; 531840 (2) FRK 650W 3200K 150 hour lamp; 531650 (2) 6⁵/₈" full single scrim; 531852 (2) 6⁵/₈" full double scrim; 570050 (4) AS-2 stand; 571195 (1) heavy-duty case (40" x 19¹/₂" x 12³/₄".) \$2825.00

571975 1000/3 Fresnel Kit (75 lbs.)

531100 (3) 1000W Fresnel, 5" lens; 531110 (3) 4-leaf barndoor; 531120 (3) filter frame, hinged; 531150 (3) 7³/₄" full single scrim; 531152 (3) 7³/₄" full double scrim; 531145 (3) EGT 1000W 3200K 250 hour lamp; 570050 (3) AS-2 stand; 571195 (1) heavy-duty case (40" x 19¹/₂" x 12³/₄".) \$2850.00

571993 ARRILITE/Fresnel Mini Kit (50 lbs.)

531300 (2) 300W Fresnel, 3" lens; 571600 (2) ARRILITE 600; 531310 (2) 4-leaf barndoor; 531320 (2) filter frame, hinged; 531340 (2) FKW 300W 3200K 150 hour lamp; 571810 (2) 4-leaf barndoor; 571640 (2) DYS 600W 3200K 75 hour lamp; 531350 (2) 5" full single scrim; 531352 (2) 5" full double scrim; 570051 (4) AS-01 stand; 571690 (1) heavy-duty 4-light case (31" x 12" x 11"). \$2325.00

571996 ARRILITE/Fresnel Combo Kit (76 lbs.)

531800 (2) 650W Fresnel, 4.3" lens; 571100 (2) ARRILITE 1000; 531810 (2) 4-leaf barndoor; 531620 (2) filter frame, hinged; 531650 (2) 6⁵/₈" full single scrim; 531852 (2) 6⁵/₈" full double scrim; 571145 (2) DXW 1000W 3200K 300 hour lamp; 571110 (2) 4-leaf barndoor; 571150 (2) 7¹/₄" full single scrim; 571152 (2) 7¹/₄" full double scrim; 531640 (2) FRK 650W 3200K 150 hour lamp; 570050 (4) AS-2 stand; 571195 (1) heavy-duty case (40" x 19¹/₂" x 12³/₄".) \$2650.00

571986 Soft/Key Kit (68 lbs.)

(2) 650W Fresnel; (1) ArriSoft 1000; (2) barndoor 650W Fresnel; (2) filter frame 650W Fresnel; (2) 6⁵/₈" scrim full single; (2) 6⁵/₈" scrim full double; (2) FRK 650W lamp; (1) filter frame ArriSoft 1000; (1) FCM 1000W lamp; (3) AS-2 stand; (1) heavy-duty case (40" x 19¹/₂" x 12³/₄".) \$1775.00

571987 Super Combo Kit (68 lbs.)

(1) 1000W mini flood; (1) 300W Fresnel; (2) 650W Fresnel; (1) FHM 1000W lamp; (1) barndoor 300W Fresnel; (1) filter frame 300W Fresnel; (1) 5" full single scrim; (1) 5" full double scrim; (1) FKW 300W lamp; (2) barndoor 650W Fresnel; (2) filter frame 650W Fresnel; (2) 6⁵/₈" scrim full single; (2) 6⁵/₈" scrim full double; (2) FRK 650W lamp; (4) AS-2 stand; (1) heavy-duty case (40" x 19¹/₂" x 12³/₄".) \$2450.00

571988 Key/Fill Combo Kit (68 lbs.)

(2) 1000W mini flood; (2) 650W Fresnel; (2) FHM 1000W lamp; (2) barndoor 650W Fresnel; (2) filter frame 650W Fresnel; (2) 6⁵/₈" scrim full single; (2) 6⁵/₈" scrim full double; (2) FRK 650W lamp; (4) AS-2 stand; (1) heavy-duty case (40" x 19¹/₂" x 12³/₄".) \$2350.00

871910 Quick-Pak Mounting Kit (43 lbs.)

570143 (1) ARRI maglc arm; C15100 (3) ARRI super-clamp with 5/8" pin; D02000 (3) 2¹/₂" grip head; D05000 (3) 20" extension arm; C10000 (3) ceiling scissor clamp with 5/8" pin; F08010 (1) 3" wall plate; E01000 (1) bar clamp adaptor; F10000 (1) 6" pump cup with 3" pin; F06000 (1) baby offset arm; R03001 (4) 20 lb. sandbag—empty; I08001 (1) 12 x 18 flag; I08000 (1) 12 x 18 flag frame; I08028 (1) 12 x 18 single scrim; I08030 (2) 12 x 18 silk; 571894 (1) Quick-Pak mounting kit case (24" x 12" x 11"). \$1000.00

Prices and Specifications Subject to Change Without Notice.

6" and 8" Theater Fresnels

1000W lamp (6"), 2000W lamp (8") • Beam candlepower: Spot—175,000, Flood—11,200 (6"); Spot—358,000, Flood—37,500 (8") • Lamp sockets U.L. recognized, medium prefocus (6"), mogul prefocus (8") • Easy handling lightweight aluminum • Combination of diecast and extruded aluminum promotes heat exchange and rapid dissipation • Improved rack and pinion design with Torlin® Insulators for smooth focusing • Lens door is diecast with removable gel clips and a spring loaded safety clip for rugged trouping requirements • All operating controls are thermally insulated for cool handling • High intensity spot • C-clamp included with all hanging models



Theater Fresnel



Mini-Pro

6" Theater Fresnel

213-515	6", 1000W	\$255.00
118-013	8-leaf barndoor	95.00
120-005	Color frame	6.50
122-147	Set, single, half single scrim	37.00
130-003	Dichroic filter	220.00
138-045	Combo stud for flat yoke	21.00
138-049	6" high hat	27.00
138-069	Safety cable	10.00

Lamps		ANSI-Code	
176-167	500W, 120V, 3050K, 500 hour	BTL	\$ 50.00
176-168	500W, 120V, 3200K, 100 hour	BTM	50.00
176-169	750W, 120V, 3050K, 750 hour	BTN	50.00
176-170	750W, 120V, 3200K, 200 hour	BTP	60.00
176-171	1000W, 120V, 3200K, 250 hour	BTR	55.00
476-091	1000W, 220V, 3200K, 200 hour	CP52	POA*
476-092	1000W, 240V, 3200K, 200 hour	CP52	POA*

8" Theater Fresnel

213-525	8", 2000W	\$410.00
118-032	8-leaf barndoor	125.00
120-015	Color frame	9.00
122-148	Set, single, half single scrim	42.00
138-045	Combo stud for flat yoke	21.00
138-051	8" high hat	37.00
138-059	Safety cable	10.00

Lamps		ANSI-Code	
176-191	1000W, 120V, 3050K, 500 hour	BVT	\$ 75.00
176-192	1000W, 120V, 3200K, 250 hour	BVV	85.00
176-193	1500W, 120V, 3200K, 300 hour	CWZ	115.00
176-194	2000W, 120V, 3200K, 300 hour	BVW	100.00
476-627	2000W, 240V, 3200K, 400 hour	CP53	POA*
476-629	2000W, 220V, 3200K, 400 hour	CP53	POA*

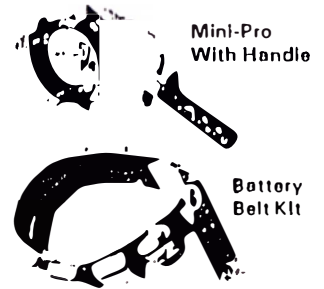
Mini-Pro® Portable/Location Lighting

• Utility yoke contains finger operated on/off switch • Recessed power receptacle permits use of detachable 120V or 30V power cord • Completely portable. Designed for stand mounting or handheld operation • Operates at 30V, 120V or 240V AC/DC • Safety lock prevents accidental loss of accessories from mounting clips • Smooth field. No hot spots • Variable focus produces 3:1 range • Dichroic filter available for daylight shooting • "Quartz" lamps for high efficiency • Applications: key, back, kicker, side lighting • Maximum wattage: 650W

100-091	Mini-Pro	2 lbs. 12 oz.	\$ 165.00
118-016	4-leaf barndoor	1 lb. 2 oz.	40.00
122-137	Set, single, half single scrim	8 oz.	37.00
130-009	Dichroic filter	12 oz.	160.00
138-001	Beam booster	8 oz.	42.00
138-005	Camera bracket	4 oz.	16.00
140-003	30V battery cord	8 oz.	42.00
140-021	Battery belt 30V, 250W, with 120/220V charger	14 lbs.	1260.00
140-022	Battery belt 30V, 250W, with fast charge ability	16 lbs.	1310.00
140-023	Electronic high-speed charger	16 lbs.	945.00
142-011	25' extension cord (feeds 3 units)	2 lbs.	27.00
142-012	9' cord	8 oz.	11.00
148-030	Carry case for kit (metal)	12 lbs.	285.00
152-050	Mini-stand	3 lbs. 4 oz.	100.00
156-005	Handle	8 oz.	13.00
156-006	Mitee grip	2 lbs. 4 oz.	105.00



Pro-Kit IV



Mini-Pro With Handle

Battery Belt Kit

Lamps		ANSI-Code			
176-090	250W, 30V, 3400K, 25 hour (G.E. only)	DYG	1 oz.	\$40.00	
176-091	420W, 120V, 3200K, 75 hour (G.E. only)	EKB	1 oz.	45.00	
176-092	600W, 120V, 3200K, 75 hour (G.E. only)	DYS/DYV	1 oz.	35.00	
176-093	650W, 120V, 3400K, 25 hour (G.E. only)	EKD	1 oz.	40.00	
176-094	650W, 220/240V, 3200K, 50 hour (G.E. only)	DYR	1 oz.	40.00	

ENG/Location Lighting Kits

Mini-Pro Kit

Designed for use with 30V battery power. 120V or 220V. Draws 15A at 120V and 8A at 220V.

Kit Includes: (3) 100-091 Mini-Pro; (2) 118-016 4-leaf barndoor; (1) 122-137 Scrim set—single, half single; (1) 142-011 25' extension cable; (1) 148-030 Metal case; (3) 152-050 Mini-stand with 1/2" stud; (3) 176-092 600W, 120V lamp (150-050 kit); (3) 176-094 650W, 220V lamp (150-051 kit)

150-050 120V with metal case	\$1260.00
150-051 220V with metal case	1260.00

Pro-Kit IV

Designed for use with 120V or 220V lamps for foreign location work. Draws 20A at 120V and 11A at 220V.

Kit Includes: (2) 100-091 Mini-Pro; (2) 104-341 Mini-Broad; (3) 118-016 4-leaf barndoor; (1) 142-011 25' extension cable; (1) 148-030 Metal case; (3) 152-050 Mini-stand with 1/2" stud; (1) 156-012 Gaffer grip; (2) 176-002 650W, 120V lamp (150-052 kit); (2) 176-092 600W, 120V lamp (150-052 kit); (2) 176-007 800W, 220V lamp (150-053 kit); (2) 176-094 650W, 220V lamp (150-053 kit)

150-052 120V with metal case	\$1470.00
150-053 220V with metal case	1470.00

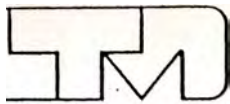
Battery Belt Kit

Batteries are rechargeable NiCad cells. Belt comes complete with 14-hour overnight charger and an integrated cable. Charger is designed for 120V and 240V input power.

Kit Includes: (1) 100-091 Mini-Pro; (1) 140-003 30VDC cord; (1) 140-021 Battery belt with charger unit (120V/240V); (1) 148-030 Carry case (metal); (1) 156-005 Mini-Pro handle; (1) 176-090 250W, 3400K, 30V lamp, 25 hours

150-063	\$1785.00
150-065 Battery belt kit with fast charge capacity	1890.00
160-066 Battery belt kit with high speed charger	2730.00

*Price On Application



LTM CORPORATION OF AMERICA

Sungun™ 200 S/E

The perfect DC daylight fixture for location news reporting, with an average lighting capacity of over 45 minutes on a standard 30V belt. The combined weight of the head and the electronic ballast is less than 5 lbs.

Includes: Sungun 200W S/E head with cable, 30V electronic ballast and barndoor. \$4,656.00

Luxarc™ 200

The Luxarc 200 is the most compact and portable member of the HMI line. The focusing ratio and the low power draw (2 amps) of the 200 give it the versatility required for interior daylight motion picture location filming and video productions.

Includes: Luxarc MKIII head with 5" fresnel, 200W ballast 120V/60Hz, mains cable, 50' head to ballast cable, 4-leaf barndoor and hinged gel frame. \$3,388.00

Cinepar™ 200 S/E

The Cinepar 200W S/E is the most compact of Cinepar fixtures. It uses a daylight single-ended bulb and a set of 4 lenses for focusing. Its compact head size, lightweight electronic ballast and low power consumption make it ideal for interior and exterior location lighting applications.

Includes: Cinepar 200W single-ended head, ballast, mains cable, 33' head cable, barndoor, 4 lenses and 4 lens rings. \$4,688.00

Luxarc 575

The Luxarc 575 is an excellent interior daylight source. The wide focusing ratio of the 575 gives it the versatility required for motion picture location filming, video production and news applications.

Includes: Luxarc MKIII head with 7" fresnel and wire screen, 575W ballast 120V/60Hz, mains cable, 50' head to ballast cable, 4-leaf barndoor and hinged gel frame.

575W Luxarc system, magnetic \$5,016.00
575W Luxarc system, electronic \$6,665.00

Cinepar™ 575 S/E

The Cinepar 575 S/E incorporates the latest in single-ended HMI technology into a 575W open-faced light fixture that is designed to provide maximum light output and minimum power draw. The intense beam is projected from a highly polished, hand-spun reflector and can be molded via 3 interchangeable lenses (medium, super wide and frosted fresnel).

Includes: Cinepar 575W single-ended head, 575W ballast with attached mains cable and 50' head to ballast cable.

575W Cinepar system, magnetic \$4,757.00
575W Cinepar system, electronic \$6,406.00

Luxarc 1200

The Luxarc 1200 is an excellent interior daylight source. The extremely wide focusing ratio of the 1200 gives it the versatility required for motion picture location filming or video production.

Includes: Luxarc MKIII head with 10" fresnel and wire screen, 1200W ballast, 120V/60Hz, mains cable, 50' head to ballast cable, 4-leaf barndoor and hinged gel frame.

1200W Luxarc system, magnetic \$6,292.00
1200W Luxarc system, electronic \$7,293.00

Cinepar 1200 S/E

The Cinepar 1200 S/E provides great versatility in all lighting applications. It operates on just 12.5A AC and uses a 1200W single-ended HMI lamp mounted in the axis of the reflector.

Includes: Cinepar single-ended head with clear lens, fixed ring with wire screen, 3-lens rings, 1200W ballast, 120V/60Hz, mains cable and 50' head to ballast cable

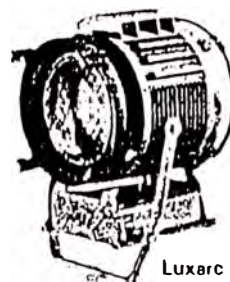
1200W Cinepar S/E system, magnetic \$5,345.00
1200W Cinepar S/E system, electronic \$6,346.00

Luxarc 2500

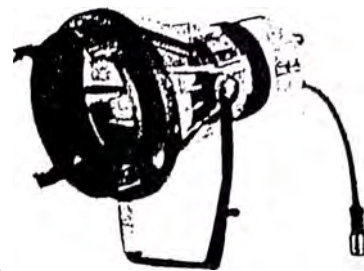
The 2500's output makes it powerful enough for exterior lighting. The Luxarc 2500's focusing ratio makes it well-suited for motion picture location filming and video production. It features the smallest 2500 head size on the market, with quick-release mount coolers for tool-free lamp changing and an easily transportable ballast.

Includes: Luxarc MKIII head with 12" fresnel and wire screen, 2500W ballast 120V/60Hz, mains cable, 50' head to ballast cable, 4-leaf barndoor and hinged gel frame.

2500W Luxarc system, magnetic \$11,722.00
2500W Luxarc system, electronic \$13,545.00



Luxarc 2500



Cinepar 4000 S/E

Cinepar 2500 S/E

The Cinepar 2500 S/E's many applications include background lighting for wide night shots, projection of light beams through building windows, powerful bounce, long throw fill and lightweight crane mounting.

Includes: Cinepar 2500W single-ended head with clear lens, fixed ring with wire screen, 2500W ballast 120V/60Hz, mains cable and 50' head to ballast cable.

2500W Cinepar S/E system, magnetic \$11,445.00
2500W Cinepar S/E system, electronic \$13,268.00

Luxarc 4000

The Luxarc 4000's 10:1 focusing ratio makes it especially applicable to interior or exterior location filming and video production. It features high output with low AC power consumption and quick-release mount coolers for tool-free lamp changing.

Includes: Luxarc MKIII head with 14" fresnel and wire screen, 4000W ballast 120V/60Hz, with attached mains cable, 50' head to ballast cable, 4-leaf barndoor and hinged gel frame.

4000W Luxarc system, magnetic \$11,969.00
4000W Luxarc system, electronic \$13,437.00

Cinepar 4000 S/E

The Cinepar 4000 S/E's many applications include background lighting for wide night shots, projection of light beams through building windows, powerful bounce, long throw fill and lightweight crane mounting.

Includes: Cinepar 4000W single-ended head with clear lens, fixed ring with wire screen, 4000W ballast 120V/60Hz with attached mains cable and 50' head to ballast cable.

4000W Cinepar S/E system, magnetic \$12,500.00
4000W Cinepar S/E system, electronic \$13,968.00

Luxarc 6000

The Luxarc 6000 has a 20" fresnel lens and 220V mini-ballast with exceptional maneuverability. Featuring hot restrike and quick-release mount coolers for tool-free lamp changing, the Luxarc 6000 is ideal for interior and exterior daylight filming.

Includes: Luxarc MKIII head with 20" fresnel and wire screen, 6000W ballast 220V/60Hz, 50' head to ballast extension cable and mains cable.

6000W Luxarc system, magnetic \$14,735.00
6000W Luxarc system, electronic \$18,156.00

Super Lite™ 12000

Features a compact 220V mini ballast, rugged location construction and a 24" fresnel lens, the Super Lite 220V 12000 provides continuous high intensity output and broad, even beam spread. As with all LTM HMIs, the electronics compartment is thoroughly isolated from the lamp housing, guaranteeing instant hot restrike capability time after time. The 220V ballast is exceptionally compact and is mounted on balloon tires with retractable T-handle for easy maneuverability.

Includes: Super Lite head with 24" fresnel and wire screen, 12000W ballast 220V/60Hz (for low voltage 12K bulb only), mains cable with pigtail end 50' head to ballast cable.

12000W Super Lite system, magnetic \$22,256.00
12000W Super Lite system, electronic \$22,377.00

Luxarc 18000

The 18000 provides 60% more output in flood position and 25% more in spot than the already powerful Super Lite 12K. The Super 18000 is constructed according to the highest standards of performance and durability.

Includes: Luxarc head with 24" fresnel and wire screen, Alimarc 18000W ballast 380V/60Hz, transformer 220/380V, 10' ballast to transformer cable and 50' head to ballast cable.

18000W Luxarc system \$27,186.00

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General Catalog	Sony Broadcast
Product Catalog	Grass Valley